

Does Community-Based Conservation Shape Favorable Attitudes Among Locals? An Empirical Study from Nepal

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ABSTRACT / Like many developing countries, Nepal has adopted a community-based conservation (CBC) approach in recent years to manage its protected areas mainly in response to poor park–people relations. Among other things, under this approach the government has created new “people-oriented” conservation areas, formed and devolved legal authority to grassroots-level institutions to manage local resources, fostered infrastructure development, promoted tourism, and provided income-generating trainings to local people. Of interest to policy-makers and resource managers in Nepal and worldwide is whether this approach to conservation leads to im-

proved attitudes on the part of local people. It is also important to know if personal costs and benefits associated with various intervention programs, and socioeconomic and demographic characteristics influence these attitudes.

We explore these questions by looking at the experiences in Annapurna and Makalu-Barun Conservation Areas, Nepal, which have largely adopted a CBC approach in policy formulation, planning, and management. The research was conducted during 1996 and 1997; the data collection methods included random household questionnaire surveys, informal interviews, and review of official records and published literature. The results indicated that the majority of local people held favorable attitudes toward these conservation areas. Logistic regression results revealed that participation in training, benefit from tourism, wildlife depredation issue, ethnicity, gender, and education level were the significant predictors of local attitudes in one or the other conservation area. We conclude that the CBC approach has potential to shape favorable local attitudes and that these attitudes will be mediated by some personal attributes.

Owing primarily to widespread park–people conflicts, and taking a cue from the worldwide trend in participatory management and its own successful experiences in community forestry, Nepal has recently embarked upon a community-based conservation (CBC) approach to managing its protected areas, as reflected in institutional, legislative, and regulatory changes (e.g., Keiter 1995, Mehta and Kellert 1998, Heinen and Mehta 1999, 2000). For example, the Conservation Area Act of 1989 allowed for the creation of conservation areas (HMG 1989), a new category of protected area for the country. These are the areas in which many extractive uses are permitted, community development is promoted, and the management structure is largely

participatory. As an extension of this approach, the Buffer Zone Management Act, passed in 1993, allowed for the management of buffer zones around other types of protected areas (HMG 1993). Following this legislation, buffer zones have been declared outside and adjacent to park or reserve boundaries, in which local user group committees are granted management and use rights to forest resources and 30%–50% of the funds earned by parks or reserves is earmarked for local community development (Heinen and Mehta 2000).

Annapurna Conservation Area (ACA), established in 1986, was the precursor of the CBC approach in protected area management in Nepal. ACA is managed by the Annapurna Conservation Area Project (ACAP) under the administrative umbrella of a national nongovernmental organization (NGO), the King Mahendra Trust for Nature Conservation. Based on the experiences in ACA, Makalu-Barun National Park and Conservation Area (MBNP/CA) was established in 1991. The Conservation Area (MBCA) component of MBNP/CA functionally and now legally forms the buffer zone of the Makalu-Barun National Park (MBNP). MBNP/CA is

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managed by Makalu-Barun Conservation Project (MBCP), a joint undertaking of the Department of National Parks and Wildlife Conservation (a government wildlife agency), and The Mountain Institute (an international NGO).

Both these conservation areas largely follow the CBC approach in formulating, planning, and implementing various policies and programs. For example, ACA and MBNPCA, the foci of this study, have formed formal, grassroots-level institutions with authority and responsibility for managing community forests and pasturelands. Local institutions, specifically conservation area management committees (CAMCs) in ACA and community forest user group committees (CFUGCs) in MBCA have legal rights to use and manage designated forested areas in accordance with an operation plan prepared by the committees following some standard guidelines provided by their respective project (Mehta and Kellert 1998, Heinen and Mehta 1999). These committees are the executive body consisting of members selected from among the local users. In addition to these two main committees, other target-specific, formal committees have been formed and local people are encouraged to participate.

Both of these conservation areas have implemented community-initiated infrastructural development programs such as improvement in trails, enhancement of physical facilities in schools, micro-hydroelectricity generation, and provisions for health posts, drinking-water, and small-scale irrigation facilities. Although the bulk of funding for these programs is made available by the implementing organizations (i.e., ACAP and MBCP), local people contribute in kind or cash (Gurung 1993a, Mehta and Kellert 1998). The policy of local contribution is based on the belief that when local people are interested enough in a venture to invest in it—as opposed to receiving a perhaps unwanted gift—they will have a greater interest in sustaining the venture (Wells 1994, p. 272)

In addition, these conservation areas have offered various kinds of training and educational opportunities to local people to build up human capital and enhance the local economy (Lama and Lipp 1994, DNPWC/TMI 1995). Another major program is to promote nature-based tourism so as to expand off-farm employment opportunities for local people (Gurung and DeCoursey 1994, Lama and Sherpa 1995). The wildlife policy of both conservation areas stipulates issuance of hunting licenses for selected species found in community forests and allows local residents to hunt and trap pest animals within the confines of farms (Shrestha and others 1990, S. Bajracharya, Director, ACAP, personal

communication 1997). However, this policy has yet to be implemented in either area.

Objectives of the Study

Prior to recent people-friendly legislation and establishment of conservation areas and buffer zones, all national parks and wildlife reserves in Nepal established during the 1970s and the early 1980s followed a centralized, preservation-oriented approach that restricted the customary usufruct rights of local people and denied their participation in park/reserve management (Mehta and Kellert 1998, Heinen and Mehta 1999). The army was deployed in these parks and reserves to protect forest and wildlife resources from people. The revenue earned from park/reserve management (mainly entrance fees) went directly to the government and little, if any, returned for local level development. In addition, local people suffered (and still suffer) from wildlife depredation without any due compensation. All this fostered widespread park–people conflicts and led local people to hold negative attitudes toward these traditional parks and reserves (Mishra 1984, Sharma 1990, Leisure and Mehta 1993, Heinen 1993, Mehta 1996).

It is now widely accepted that long-term survival of protected areas in developing nations will be jeopardized if needs, aspirations, and attitudes of local people are not accounted for (e.g., Machlis and Tichnell 1985, MacKinnon and others 1986, McNeely 1990, West and Brechin 1991, Kemf 1993, Raval 1994, Ghimire and Pimbert 1997, among others). The CBC approach to protected area management seeks to accommodate local peoples' needs and aspirations by empowering them, promoting their active participation in local resource management, and improving their economic welfare (e.g., Western and Wright 1994, Stevens 1997, Mehta and Kellert 1998, Songorwa 1999).

In the foregoing context, it would be useful for policy-makers and managers in Nepal and elsewhere to know if the adoption of a people-oriented CBC approach to protected area management fosters better local attitudes. In a heterogeneous society such as Nepal, it is also essential to know if socioeconomic and demographic factors influence the attitudes. This paper examines the attitudes of local people toward ACA and MBCA, and ascertains important factors influencing these attitudes.

Conceptual Framework and Research Hypotheses

Protected areas are essentially a “social space” (Ghimire and Pimbert 1997), and as such they cannot

be divorced from the human context. A comprehensive approach to understand the human dimension of protected area management is provided by Firey's (1960) conceptual framework of resource use theory. This theory recognizes three value factors or frames of reference—ecological, economic, and ethnological/cultural—that interact with each other and play a role in determining local perception toward and fate of a resource system. The resource system (for example, ecotourism in and forest products extraction from a national park) is viewed differently by different social groups within their own frame of reference. Social groups differ in their needs, perceptions, and attitudes of a park or resource system along the lines of their personal attributes. There is growing empirical evidence in support of the thesis that local peoples' support for protected areas depends mainly on their perceptions of costs and benefits of living in or around such areas against the background of socioeconomic and demographic considerations (see for example, Infield 1988, Heinen 1993, Newmark and others 1993, Fiallo and Jacobson 1995, Ite 1996, De Boer and Baquete 1998, Allendorf 1999).

Based on the foregoing conceptual framework, we selected a set of personal cost and benefit variables associated with major intervention programs in ACA and MBCA that we hypothesized would affect local attitudes. For example, we predicted that economic benefits from tourism, membership in formal local committees, and participation in project-sponsored training programs would be significantly associated with favorable local attitudes. Membership in local committees was assumed to engender empowerment to individual members by dint of their direct role in decision-making.

Second, since community forestry practices in these conservation areas and elsewhere in Nepal invariably place restrictions on the use of forest resources to regulate user behavior (Hobley and others 1996, Mehta and Kellert 1998), we hypothesized that these restrictions may pose problems in meeting forest products needs of some people and accordingly influence their attitudes. Third, given the widespread wildlife depredation in both conservation areas (Oli 1993, Mehta and Kellert 1998) and the current ban on hunting or trapping of any wild animal, we hypothesized that those people who could not afford the economic loss from wildlife damage and therefore wanted to kill pest animals would hold less favorable attitudes.

In addition, we scrutinized the influence of socioeconomic and demographic factors on local attitudes. Sociodemographic factors such as age, gender, education, and income (class) have been shown to influence

attitudes in some cases, although not consistently (e.g., Kellert 1980, Solecki 1997).

The Research Setting

ACA is located in the western Himalayas whereas MBCA is situated in the eastern Himalayas of Nepal (Figure 1). ACA covers an area of 7629 sq km; MBCA encompasses 830 sq km. Both study sites harbor a wide diversity of flora and fauna due to immense altitudinal (ranging from less than 1000 m to over 8000 m) and ecological variation. Well-known endangered species inhabiting these areas include snow leopard (*Panthera uncia*), musk deer (*Moschus moschiferous*), red panda (*Ailurus fulgens*), and clouded leopard (*Neofelis nebulosa*).

About 120,000 people live in ACA, while about 32,000 people reside in MBCA. Local communities in ACA reside in various hamlets under 55 different village development committees (VDCs, the smallest political and administrative unit in rural Nepal), which are further placed under the jurisdiction of seven sectoral (or regional) offices of ACAP. Local communities in MBCA live under the jurisdiction of 12 VDCs and four sectoral offices of MBCP.

As elsewhere in the country, local communities living in both conservation areas represent varying ethnic, cultural, and linguistic groups (see, for example, Stevens 1997 for ACA and Nepali and others 1990 for MBCA). The great majority of people in both areas rely on subsistence agriculture and pastoralism for their livelihoods, although many supplement their income with soldiering, seasonal labor, trade, and tourism. Residents of most parts of ACA have relatively easy access to nearby urban centers (and therefore, markets for agricultural products) by road or air. In contrast, MBCA is relatively remote and few local markets exist for agriculture products. In general, local people in MBCA are poor and suffer from chronic food deficiencies (Shrestha and others 1990, p. 20).

Women in these conservation areas, and elsewhere in Nepal for that matter, are involved in a range of economic activities including firewood and fodder collection, agriculture, animal husbandry, food processing, and domestic chores (Acharya and Bennett 1983, Gurung 1993b). Despite their important role, however, women's participation in local resource decision-making is marginal (Häusler 1993). The establishment of ACA and MBCA has sought to rectify this problem by providing informal education (adult literacy classes) and forming women-specific institutions (for example, "mothers' groups" in ACA) in order to empower them more fully.

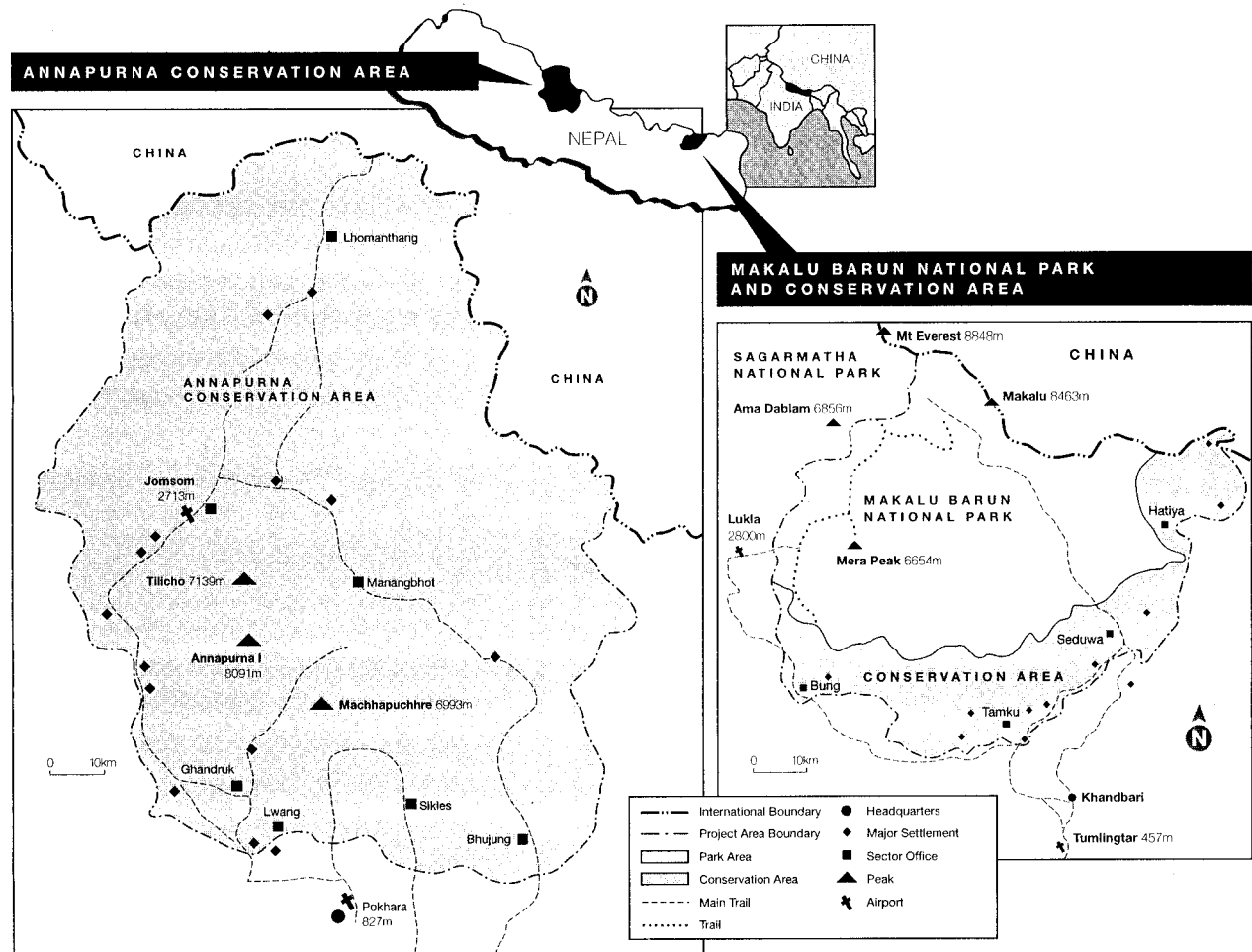


Figure 1. Map showing locations of the study areas.

Local communities in both conservation areas extensively utilize nearby forests for firewood, fodder, timber, grazing, and other forest products. Most of these forest products are collected for subsistence purposes. Local people pay a specified fee to newly formed user group committees (i.e., CAMCs and CFUGCs) for collecting economically valuable forest products, specifically timber. The local committees enforce rules regarding the time, place, and amount for harvestable forest products.

Tourism is important, especially in ACA—the most visited trekking area in Nepal—which receives over 50,000 foreign visitors annually. Tourism in MBCA is far more limited, involving some 1000 visitors only. However, the number of tourists in MBCA is growing annually by more than 30% (Lama and Sherpa 1995, p. 1). Local people benefit economically from tourism in many ways such as by providing room and board to individual trekkers, selling raw foods (cereals, vegeta-

bles, and dairy and poultry products) directly to group trekkers, manufacturing and selling handicrafts to visitors, and to some extent by serving as porters.

Research Design, Data Collection, and Analysis

This study adopted a multimethod approach relying on both quantitative and qualitative data from primary and secondary sources. Multisite and multimethod studies have increasingly been carried out by researchers today to better understand social phenomena (Creswell 1994, Rossman and Wilson 1994). The quantitative data for this study came mainly from a questionnaire survey, whereas the qualitative data were obtained by informal interviews with key local informants and project staff. Surveys, if they involve probability sampling, have the important advantage in that they yield results that can be generalized to a larger population (Ward and others 1991). On the other

hand, qualitative data help verify, triangulate, and enrich quantitative data (Stone and Campbell 1984).

Of seven sectors in ACA, four were chosen for a questionnaire survey based on discussions with senior ACAP officials. Time and resources precluded a complete sampling in ACA because it is much larger. Nonetheless, these four sectors (namely, Jomsom, Ghandruk, Lawang, and Bhujung; see Figure 1) are representative microcosm of ACA in terms of the coverage of major programs, accessibility, ethnic diversity, and the local economies. Of 29 VDCs under the jurisdiction of these sectors, 12 were randomly selected to administer the survey. In contrast, all four sectors and 12 VDCs of MBCA were included in this study.

A structured questionnaire survey was administered to a sample of 400 randomly selected households living in 12 VDCs in each of ACA and MBCA during 1996 and 1997, for a total period of eight months. Stratified sampling was used to ensure representative proportions of the major ethnic groups in the regions. Current voter lists of 12 VDCs in each conservation area formed the sampling frame. One adult person (≥ 18 years old) in each household was interviewed in his/her residence. Questionnaires were written in Nepali and administered orally. Questions were framed to seek information on peoples' attitudes toward their respective conservation area, forest use and wildlife depredation issues, benefits from tourism, membership in local institutions, participation in training, and demographic variables (gender, ethnicity, education, economic class, and age). Most of the questions were close-ended, although some open-ended contingency questions were included.

Qualitative data were obtained from informal, unstructured, and open-ended interviews with key informants such as school teachers and community leaders. Information obtained from qualitative methods was used to provide additional insights into management issues. Published and unpublished official documents were reviewed for information on the projects' past and current policy and programs. Finally, selected project staff were interviewed both individually and in groups to obtain their perspectives on important policy and management issues.

Quantitative data were analyzed using the Statistical Package for the Social Sciences (SPSS) Version 9. Attitudes toward each conservation area were measured by three related statements (with five possible responses) that were combined to form a single attitude scale. The internal consistency of the scale was measured by the reliability coefficient, Cronbach's alpha (Cronbach 1951).

Responses to each of the statements were graded

and summed, resulting in an overall score for each respondent on this attitude scale. The scale was used for two inferential statistics. A two-sample *t* test was performed on the scale scores to ascertain whether there were significant differences in attitudes between the respondents of ACA and MBCA. Logistic regression (see Meanard 1995 for an introduction to this technique) was also performed on the scale for each conservation area to determine whether tourism benefits, membership in local institutions, participation in training, forest product use, wildlife depredation issues, and socioeconomic and demographic variables helped explain why some respondents held more favorable attitudes than others toward their respective conservation area.

Results

Demographic Characteristics of Respondents

A total of 800 respondents (400 respondents in each conservation area) were interviewed in the house-to-house attitude surveys. The gender breakdown of the sample for ACA was 217 men (54%) and 183 women (46%), while that for MBCA was 318 men (79.5%) and 82 women (20.5%). The respondents ranged from 18 to 81 years of age; 30% and 44% in ACA and MBCA, respectively, were classified as young (18–35 years old); 41% and 44% in ACA and MBCA, respectively, were classified as middle-aged (36–55 years old); and 29% and 12% in ACA and MBCA, respectively, were classified as old (56 years old and above). The ethnic breakdown of the sample for ACA was 33% Gurungs, 31% Hindu caste groups (such as Brahmins, Chhetris, and other occupational castes), and the rest (36%) were other smaller ethnic groups including 13% Thakalis, 12% Magars, 8% Lobas, and 3% Tamangs (see Bista 1987 for description of ethnicity in Nepal). Among MBCA respondents, 62% were Rais, 20% Bhotas, 11% Sherpas, and 7% other ethnic groups.

Almost half of the respondents (46% and 47% in ACA and MBCA, respectively) were illiterate, defined as those who had never attended any formal or adult literacy education; 44% and 43% in ACA and MBCA, respectively, had attended either some form of adult education or completed primary school (a fifth-grade education); 10% each in ACA and MBCA had graduated from high school or attended some college. The majority of respondents (63%) in ACA were classified as wealthy whereas 37% were classified as poor. The opposite was true for MBCA—the majority of respondents (76%) were classified as poor and only 23% as wealthy. This classification was not based on an absolute

Table 1. Attitudes of respondents toward ACA^a

Attitude statements	Responses (%)					Mean ± SD ^b
	SA	A	NO	D	SD	
1. The conservation area was created for the betterment of our community.	35.0	51.0	12.5	1.0	0.5	4.19 0.72
2. I am generally satisfied that my village is included in the conservation area.	36.0	51.0	12.0	0.5	0.5	4.21 0.71
3. Generally speaking, I like the conservation area.	40.0	47.3	10.5	2.0	0.3	4.25 0.74

^aN = 400. SA, strongly agree; A, agree; NO, no opinion; D, Disagree; SD, strongly disagree.

^bOn a 1–5 scale, a high mean score indicates a positive attitude. Respondents were assigned a score of 5 for SA, 4 for A, 3 for NO, 2 for D, and 1 for SD.

Table 2. Attitudes of respondents toward MBCA^a

Attitude statements	Responses (%)					Mean ± SD ^b
	SA	A	NO	D	SD	
1. The conservation area was created for the betterment of our community.	15.8	63.3	11.5	8.3	0.8	3.85 0.81
2. I am generally satisfied that my village is included in the conservation area.	14.0	73.0	2.8	10.0	0.3	3.91 0.76
3. Generally speaking, I like the conservation area.	11.5	70.5	6.5	10.0	1.5	3.80 0.83

^aN = 400. SA, strongly agree; A, agree; NO, no opinion; D, Disagree; SD, strongly disagree.

^bOn a 1–5 scale, a high mean score indicates a positive attitude. Respondents were assigned a score of 5 for SA, 4 for A, 3 for NO, 2 for D, and 1 for SD.

scale; respondents who reported to have enough annual income to support their basic household expenditures (food and clothing) were classed as wealthy, whereas those without enough income to do so were classed as poor.

Attitudes Toward Conservation Areas

The results indicated that the overwhelming majority of respondents held favorable attitudes toward both ACA and MBCA (Tables 1 and 2). On average, 87% and 83% of the respondents in ACA and MBCA, respectively, either strongly agreed or agreed with the three attitude statements. Mean scores on individual attitudinal statements ranged from 4.19 to 4.25 in ACA and from 3.80 to 3.91 in MBCA on a 5-point scale. The scores of these three statements were summed to create a single attitude scale for each conservation area. Cronbach's alpha for ACA scale was 0.87, while for that of MBCA was 0.77. The mean scale score on a 15-point scale for ACA was 12.7 and while that of MBCA was 11.6.

Since ACA was established five years before MBCA and thus had more time for its programs to be implemented, we tested the proposition that the residents of

Annapurna might have developed better attitudes than MBCA residents. This was confirmed. A two-sample *t* test performed on the scale scores of both conservation areas showed that ACA residents had significantly better attitudes than MBCA residents ($P \leq 0.0001$). Tables 1 and 2 also indicate the differences in respondents' attitude strength between ACA and MBCA; comparatively more respondents in ACA than MBCA strongly agreed with all three attitude statements; furthermore, comparatively fewer respondents in ACA than MBCA showed any negative attitudes.

Factors Affecting Attitudes Toward Conservation Areas

In response to the open-ended question "If you like this conservation area, why do you like it?" 59% of ACA respondents attributed their liking to community forestry, 44% referred to community development programs, 30% indicated wildlife conservation, 26% mentioned ACA's role in creating general awareness among local people toward environmental problems, 10% attributed it to tourism, and 6% referred to trainings. These percentages total more than 100% because respondents could give multiple answers. In response to

Table 3. Logistic regression showing relationship between personal attributes and favorable attitudes toward ACA^a

Variable	B	SE	Wald	P	R
Tourism benefit (yes)	0.28	0.34	0.68	0.41	0.00
Membership (yes)	0.40	0.25	2.61	0.11	0.03
Training (yes)	0.83	0.26	10.27	0.001	0.12
Forest use (big problem)	0.08	0.15	0.30	0.58	0.00
Kill pest (yes)	-0.31	0.26	1.44	0.23	0.00
Gender (female)	-0.82	0.25	10.67	0.001	-0.13
Age (older)	-0.26	0.17	2.29	0.13	-0.02
Class (wealthier)	-0.42	0.26	2.64	0.10	-0.03
Education (higher)	-0.09	0.21	0.19	0.66	0.00
Ethnicity (1) (Gurungs)	0.93	0.30	9.88	0.002	0.12
Ethnicity (2) (others)	-0.08	0.28	0.08	0.78	0.00

^a*N* = 384. B = logistic regression coefficient, SE = standard error, Wald = Wald statistic (which has a χ^2 distribution), *P* = significance, and *R* = *R* statistic (indicating the relative contribution of each independent variable to the model in explaining the variance of the dependent variable).

the corollary open-ended question to ACA respondents “If you dislike this conservation area, why do you dislike it?,” only 32 (8%) gave an opinion. These respondents attributed their dislike to the restrictions on killing pest wild animals, inequitable distribution of development projects among sectors, inadequate attention to agriculture and livestock development, poor outreach on the part of the project staff, and strict forest use rules.

No such direct questions regarding the reasons for liking and disliking the conservation area were asked of MBCA respondents in the questionnaire. However, informal interviews with community leaders and school teachers in the conservation area indicated similar reasons of peoples’ like and dislike—they liked the area mainly because of community development and community forestry programs. On the other hand, the reasons for local people disliking the area included unfair distribution of development projects among four sectors, unkept promises on many community development items, the ban on killing depredating wild animals, and restrictions on forest use.

Logistic regression results revealed that ACA residents who hold more favorable attitudes were likely to be men ($P \leq 0.001$), Gurungs ($P \leq 0.002$), and those who participated in the project’s sponsored trainings ($P \leq 0.001$; Table 3). Although not significant at the 5% error level, a trend is noticeable in that the poor ACA residents were more likely than the wealthier to hold favorable attitudes ($P \leq 0.10$). Residents holding more favorable attitudes toward MBCA were more likely to be Sherpas ($P \leq 0.02$), better educated ($P \leq$

Table 4. Logistic regression showing relationship between personal attributes and favorable attitudes toward MBCA^a

Variable	B	SE	Wald	P	R
Tourism benefit (yes)	0.59	0.30	3.81	0.05	0.07
Membership (yes)	0.12	0.32	0.13	0.71	0.00
Training (yes)	0.46	0.30	2.31	0.13	0.03
Forest use (big problem)	-0.14	0.17	0.61	0.43	0.00
Kill pest (yes)	-1.52	0.43	12.70	0.001	-0.17
Gender (female)	0.50	0.34	2.18	0.14	0.02
Age (older)	-0.17	0.22	0.55	0.46	0.00
Class (wealthier)	-0.32	0.33	0.92	0.34	0.00
Education (higher)	0.46	0.23	4.07	0.05	0.07
Ethnicity (1) (Rais)	0.05	0.41	0.01	0.91	0.00
Ethnicity (2) (Bhotes)	-1.37	0.58	5.51	0.02	-0.10

^a*N* = 371. B = logistic regression coefficient, SE = standard error, Wald = Wald statistic (which has a χ^2 distribution), *P* = significance, and *R* = *R* statistic (indicating the relative contribution of each independent variable to the model in explaining the variance of the dependent variable).

0.05), those who benefited from tourism ($P \leq 0.05$), and those who did not want to kill pest wild animals ($P \leq 0.001$; Table 4). The direction of each independent variable is indicated in parenthesis, with the sign of the coefficients showing whether associations with that value are positive or negative (Tables 3 and 4).

Discussion

The positive attitude among the overwhelming majority of ACA and MBCA respondents is a very encouraging finding. It is interesting to note that on average 85% of respondents ($N = 800$) showed favorable attitudes, while only 15% either held no opinion or showed any negative attitudes toward these conservation areas (Tables 1 and 2). Since the findings of this study are based on random samples, it can be inferred (95% confidence level) that the proportion of local people who would have held favorable attitudes was between 82.5% and 87.5% (with $\pm 2.5\%$ sampling error).

In contrast, local people living in and around traditional parks or reserves in Nepal have generally shown negative attitudes. For example, based on a survey in Koshi Tappu Wildlife Reserve, a small reserve in the eastern lowlands and Nepal’s only Wetland of International Importance, Heinen (1993) reported that most (65%) respondents expressed negative attitudes about the reserve. In another study conducted in Royal Bardia National Park, a large park in the western lowlands of Nepal, the data presented by Leisure and Mehta (1993) indicate that 80% of the respondents held indifferent

or negative attitudes about the park, while only 20% showed any positive attitudes. In both studies, local people liked the park/reserve mainly because of provisions for thatch grass collection and protection of forests; they disliked it mainly because of wildlife damage and restrictions on free access to park/reserve resources.

Local people in both ACA and MBCA suffer from wildlife depredation; 74% and 96% of the respondents in ACA and MBCA, respectively, reported facing some wildlife depredation problems. People in both areas also face restrictions on the use of forests and other natural resources. Yet the overwhelming majority showed favorable attitudes. As the results indicated, local people liked the conservation areas mainly because of community development and community forestry programs. Community development is much more focused and visible in ACA and to a lesser extent in MBCA than in other protected areas in Nepal. Although community forestry in conservation areas imposes restrictions, the program itself is participatory and local people develop a sense of ownership with legal rights to harvest forest products for subsistence use as well as for sale (see Mehta and Kellert 1998).

On the other hand, most of the parks and reserves in Nepal, managed by the government wildlife agency and military units, do not have the same level of commitment to community development and local participation. Until recently, community development was not a priority. Although local people are allowed to collect some forest products from parks and reserves (Heinen and Kattel 1992), they are required to obtain permission from the management authority and thus they do not have control over the resources. Apparently, for local people the costs of living in and around parks and reserves in terms of wildlife damage and erosion of local control outweigh benefits they obtain, resulting in negative attitudes. Whether or not attitudes will change in traditional protected areas with the recent enactment of the buffer zone management legislation and concomitant social intervention programs remains to be seen.

Although the majority of local people in both areas held favorable attitudes toward their respective conservation area, ACA residents were found to hold comparatively better attitudes than MBCA residents. This difference can partly be attributed to the longer existence of ACA. ACA was established in 1986, while MBCA was established in 1991 and, therefore, the former was in place for 10 years (in contrast to 5 years for the latter) when this study was conducted. Personal observations, interviews, and literature review indicated that both community development and community forestry pro-

grams are much more visible in ACA than MBCA. Since local people in both areas favor these two main programs, it is expected that ACA residents would hold better attitudes than MBCA residents. Another reason could be related to the scale of wildlife depredation and poverty in these two conservation areas; our data indicate that comparatively more people in MBCA than ACA suffered from wildlife depredation and were also poorer. The prevalence of wildlife damage in the midst of widespread poverty in MBCA is not likely to foster the same scale of favorable attitudes as in ACA.

Logistic regression results (Tables 3 and 4) indicated that participation in training significantly influenced the attitudes of ACA residents, but not MBCA residents. These results were rather surprising as training is an important activity in both conservation areas; for example, 27% and 30% of the respondents in ACA and MBCA, respectively, reported that at least one member of their household had received some sort of training. One plausible explanation is that more people in ACA are using their acquired skills to their benefit (economic or otherwise) than in MBCA. For example, many local farmers of Lawang sector, ACA, have been trained in vegetable and seed production and are benefiting economically from this venture (G. Basnet, Conservation Officer, ACAP, personal communication 1997). On the other hand, in MBCA, by the time this study was completed, very few trained people were found to be using their newly acquired skills, and there was little posttraining follow-up from MBCP. In the case of ACA, however, it should be noted that only 6% of respondents in the open-ended question mentioned training as their reason for liking the conservation area. Apparently, training influences attitudes, although many people may not consider it of great importance.

One of the plausible explanations for the significant association between benefits from tourism and favorable attitudes in MBCA but not in ACA could be that tourism was prevalent in ACA before the establishment of the conservation area (Bunting and Wright 1985), so perhaps most people do not see tourism as a product of ACA's efforts. On the other hand, tourism started only after the establishment of MBCA (Lama and Sherpa 1995). MBCA residents might view the arrival of tourists and associated economic benefits as linked to the publicity MBCA received after its establishment. Another reason could be that for relatively wealthy ACA residents tangible benefits such as extensive infrastructure development and product-oriented training might be as appealing as economic benefits occurring from tourism. In contrast, community development in MBCA is very limited and so are alternative means of income. Therefore, even a meager income from tourism for

MBCA residents may become important compared to ACA residents.

The significant association between wildlife depredation and local attitudes in MBCA was expected. Our survey results indicated that the overwhelming majority of respondents (91%) in MBCA (compared to 73% in ACA) wanted to hunt pest animals, and a Pearson χ^2 test revealed that a significant majority of these people were poor ($P \leq 0.05$). As discussed earlier, both wildlife depredation and poverty seem to be much more pronounced in MBCA than ACA. Poor people in MBCA, with few alternative sources of income, possibly cannot adjust to the economic loss from wildlife damage. As confirmed by our study, these people were less likely to hold favorable attitudes toward MBCA, given that the management has done nothing so far to relieve people from wildlife depredation. On the other hand, people in ACA are generally wealthier and, apparently, seem able to adjust to wildlife damage.

Our prediction of a significant relationship between membership in newly formed local committees and favorable attitudes was not confirmed. The results indicated that both members and nonmembers equally held favorable attitudes toward the conservation areas. Apparently, membership in committees does not seem to be an asset that people want from and/or relate to conservation areas. However, it must be noted that it was rather close to being significant in the case of ACA ($P \leq 0.11$; Table 3). It appears that committee membership in ACA was acting as a proxy for and suppressed by the variable "participation in training." This hypothesis is supported by the fact that there was a significant correlation ($P \leq 0.0001$) between membership and training.

Our other prediction of forest use problems as a predictor of local attitudes was also not confirmed. In our sample, 54% and 36% of the respondents in ACA and MBCA, respectively, reported they had no problem in meeting their forest product needs; however, for 28% of the respondents in ACA and 29% in MBCA, forest product availability did pose a small problem, while 18% and 35% in ACA and MBCA, respectively, stated it was a big problem for them. One would assume that people who consider forest product availability a big problem might develop negative attitudes toward the conservation area. One probable explanation for the insignificant results could be that local people are adjusting to forest product scarcity by relying on other means. For example, personal observations as well as discussions with community leaders and project staff indicated that people in both conservation areas have begun to plant firewood and fodder trees on their homesteads to meet their needs. The seedlings for

these trees come mostly from the nurseries established and managed by the conservation area projects. So although some people face problems in meeting their forest product needs, they also understand that the conservation area management is endeavoring to help them overcome this problem, and hence they have not developed significant negative attitudes.

Logistic regressions for both ACA and MBCA revealed only one common significant demographic predictor—ethnicity. Gurungs compared to Hindu caste groups in ACA and Sherpas compared to Bhotes in MBCA were more likely to hold favorable attitudes. Gurungs (in contrast to Hindu caste groups) have been in the forefront of ACAP activities from its inception in 1986 (see Stevens 1997). ACAP established its headquarters and began pilot project operations first in Ghandruk VDC, which consists of settlements inhabited predominantly by Gurungs. Since 1990, ACA has gradually expanded its jurisdiction and programs to other VDCs and sectors. However, not all VDCs and sectors have received an equitable share of development projects (Heinen and Mehta 1999). Community leaders of some VDCs (including those where most Hindu caste groups are concentrated) resent this inequity; one community leader commented "ACA is Ghandruk and Ghandruk is ACA," suggesting that Ghandruk has been the focal point and showcase for ACA.

Similarly, Sherpas (along with Rais) live in sectors of MBCA that have received comparatively more development programs from MBCP than the sector in which Bhotes are concentrated. By the time the MBCA study was completed (December 1996), there were very few visible community development programs that had occurred where Bhotes lived. This might partly explain the difference in attitudes between Sherpas and Bhotes. Another plausible reason could be that Sherpas benefit more from tourism than any other caste/ethnic groups in the conservation area; in contrast, Bhotes benefit little, if at all (see Mehta and Kellert 1998). Since benefit from tourism is significantly associated with favorable attitudes in MBCA, this may explain why Sherpas hold better attitudes than Bhotes.

The finding that males in ACA were more likely to hold favorable attitudes than females was unexpected, given the prominent role of ACA in the overall welfare of women. For example, scores of women have benefited from the Developing Women's Entrepreneurship for Tourism program, which assists women to utilize tourism opportunities (Adhikari and Lama 1997, p. 25); as of 1996, over 5000 women had attended adult literacy classes and 60 girls from poor families were provided stipends to pursue their formal schooling (Adhikari and Lama 1997 pp. 23–24); the establish-

ment of mothers' groups has provided a sense of empowerment to women (Gurung 1993b). One would assume that females would hold equally favorable attitudes about ACA. A possible explanation for this unexpected result could be that women in ACA have become more aware of their rights and capabilities as a result of the aforementioned intervention programs; this awareness may have made women desire more rights and programs than ACA is presently delivering, resulting in less favorable attitudes.

Another significant result was the impact of education level in influencing local attitudes in MBCA—respondents with high school degrees and those attending colleges were more likely to hold favorable attitudes toward MBCA. This could partly be attributed to the conservation education programs that MBCA has launched in most high schools to generate environmental awareness as well as interest in the conservation area among students. These programs include classes on environmental subjects, environmental essay writing contests, debates, and quizzes. No such programs of comparable scale were evident for primary school students at the time of this study. Furthermore, although some nonformal conservation education programs such as clean-up campaigns, street theaters, and audio/visual displays were targeted at generally illiterate villagers, this was still in a rudimentary stage. Apparently, in contrast to people with little or no education, high school graduates were in a much better position to comprehend the importance of the conservation area, resulting in positive attitudes.

On the other hand, the insignificant relationship between favorable attitudes and education level in ACA could be attributed to both extensive informal and formal conservation education programs there. The Conservation Education and Extension Program (CEEP), along with CAMCs, are the major vehicles through which ACA implements its programs (Parker 1997). The formal education component of CEEP entails implementing a conservation education curriculum for grades 6–8, whereas the informal part comprises extension activities including mobile awareness camps, adult literacy classes for women, study tours, audiovisual displays, and street theater performances. One of the overall aims of CEEP is to inform local people of the ACA's ethos and programs (Parker 1997). All this suggests that people in general, regardless of their education level, are likely to be aware of the importance of ACA, resulting in favorable attitudes.

It is contended that environmental education (both formal and informal) can be very instrumental in effecting positive environmental attitudes among people (Jacobson 1995, Kellert 1996) and, by extension, their

support for protected areas (MacKinnon and others 1986, Fiallo and Jacobson 1995). Iozzi (1989, p. 5) noted that (formal) environmental education is effective in teaching positive environmental attitudes and values when programs and methods designed specifically to achieve those objectives are used. Our own results support these contentions.

Conclusions

This study shows that local attitudes about the two conservation areas were generally positive and that, in general, these attitudes related to the people's perceived or real benefits from implemented community development and community forestry programs. The finding of ACA residents having better attitudes than MBCA residents suggests the possibility of improved local attitudes when people realize tangible benefits from intervention programs over the course of time. In contrast to the poor attitudes of local people living in and around parks and reserves managed under the earlier "fences and fines" approach in Nepal, the CBC paradigm in the conservation areas is certainly working in generating more favorable attitudes. This is a positive sign for these conservation areas, and for other CBC projects elsewhere in Nepal or other parts of the developing world.

Among the personal costs and benefits variables, logistic regression results indicated three significant predictors—participation in training in ACA, and tourism benefit and wildlife depredation issue in MBCA. The results suggest that participation in training becomes a significant predictor of attitudes only when the learned skills are used in some productive way, as the case of ACA shows. Our MBCA results suggest that tourism benefit is an important consideration for local people; this is hardly surprising, as tourism, however little, provides much needed economic support for over quarter of the local population (Mehta and Kellert 1998) and, seemingly, they relate this benefit to the existence of the conservation area. For the relatively wealthier ACA residents, it seems that benefits from other social intervention programs (particularly infrastructure development programs such as trails, bridges, hydroelectricity, health posts, and schools) have overshadowed the significance of tourism, which existed as a major economic activity prior to the establishment of the conservation area.

Given the widespread poverty and wildlife depredation in MBCA, it was not surprising to find that the majority of respondents wanted to kill pest wild animals and that these people held less favorable attitudes. Although the wildlife depredation issue did not signif-

icantly influence local attitudes in ACA, interviews with project staff and community leaders indicated that this remains a major contentious issue in that area as well. Therefore, it is incumbent upon the authorities of both conservation areas to address this issue immediately to maintain local support. Studies should be planned to reduce wildlife damage through methods such as fencing, stall feeding livestock, and better herding management. Moreover, local farmers should be allowed to hunt or trap pest animals (specifically nonendangered ones) to minimize their economic loss.

Interestingly, caste/ethnicity turned out to be a significant factor in determining local attitudes in both conservation areas. Heinen (1993) also reported caste/ethnicity as one of the significant factors of local attitudes in his study of Koshi Tappu Wildlife Reserve, Nepal. Among other sociodemographic factors, gender became an important predictor in ACA while education level significantly influenced local attitudes in MBCA. The results suggest that not all the sections of local communities are equally satisfied with the conservation areas. Equitable distribution of development projects to all communities, more power to and programs for women and ethnic minorities, and expanded and effective conservation education programs targeted at illiterate as well as less educated people (specifically in MBCA) are needed to address this matter.

Overall, the results suggest that adopting a CBC approach (with its people-oriented policies and programs) to managing protected areas in developing countries is likely to improve peoples' attitudes and, thus, park–people relations. However, whether the improved park–people relations translate into the long-term biodiversity conservation and sustainable utilization of natural resources is another question, and is not covered in this paper. Studies like this and a few others that have attempted to evaluate sociological and/or biophysical aspects of on-going CBC programs are important in that they add to our understanding of this new emerging paradigm.

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