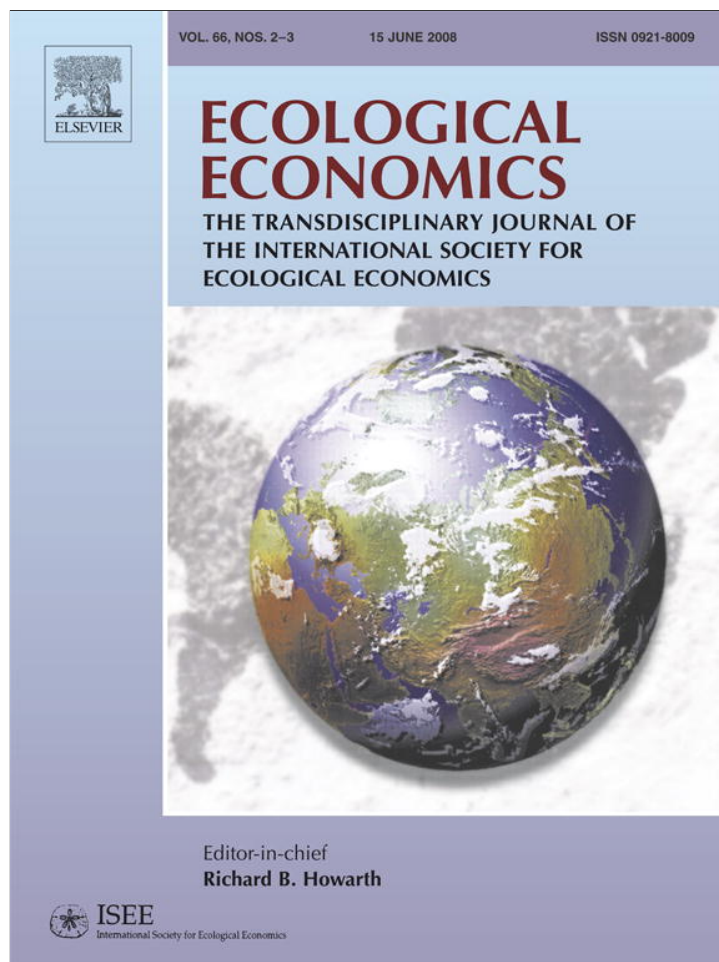


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SURVEY

Contingent valuation of ecotourism in Annapurna conservation area, Nepal: Implications for sustainable park finance and local development

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ABSTRACT

To determine willingness to pay (WTP) for candidate entry fees, contingent valuation surveys were administered to 315 foreign visitors to the Annapurna Conservation Area, Nepal, during April and May of 2006. The results of logit regression showed that the bid amount, family size, visitors' satisfaction, the use of a guide, and group size were the most significant predictors of WTP. Results suggest that most visitors would be willing to pay an entry fee considerably higher than the current fee of 27 U.S. dollars (USD). The mean and median WTP were 69.2 and 74.3 USD, respectively. The most common explanation for WTP by respondents was a desire to better protect the environment. The most common explanation for unwillingness to pay was that the bid was simply too expensive. Two models were developed based upon different predictions of visitor numbers (an optimistic case and pessimistic case) to calculate the expected revenue production and likely gross local economic impact of candidate entry fees. Based on this analysis, we recommend an increase in the entry fee to USD 50. In the optimistic scenario, this higher entry fee leaves a budget surplus. In the pessimistic scenario, it would reduce current budget deficits.

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1. Introduction

Protected areas (PAs) are commonly established to conserve biodiversity, protect ecosystems, and maintain ecological processes; many PAs are also expected to contribute to sustainable development and poverty reduction (Neto, 2003; Scherl et al., 2004; Rogerson, 2006). Numerous PAs throughout the world, however, are not financially self-sufficient; as a result, they are unable to meet either conservation or

development objectives (IUCN, 2005). Much discussion within the conservation sector in recent years has focused on enhancing the financial sustainability of PAs, which can be defined as “the ability to secure sufficient, stable and long-term financial resources, and to allocate them in a timely manner and in an appropriate form, to cover the full costs of PAs and to ensure that PAs are managed effectively and efficiently with respect to conservation and other objectives” (Emerton et al., 2006, p.15).

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In the developing world, sustainable conservation funding mechanisms are disturbingly scarce. A lack of adequate funds has jeopardized conservation in areas of high biodiversity by limiting the ability of managing entities to carry out critical tasks such as boundary delineation, enforcement, and education. As a result, many parks exist merely on paper. This lack of funding could be attributed to a failure to recognize both the market and non-market benefits of protected areas. These include income from tourism as well as non-monetary amenities that can contribute to improved quality of life. Because governments do not recover these benefits, they are seldom motivated to allocate adequate funds for proper management of parks (Dixon and Sherman, 1990). Moreover, negative impacts upon local residents often make the enforcement of park regulations politically unsavory (Dourojeanni, 2002), hampering the interests of those in power to fund management activities.

To date, PAs in the developing countries receive a hefty share of funding from the governments of the developed countries and from non-governmental organizations (NGOs). This poses a number of problems. First, heavy dependence on external funds for park management is unlikely to be sustainable in the long-term. Such funding mechanisms are generally provided on short-term cycles — most commonly from three to five years. Meanwhile, park management efforts may take decades to yield measurable conservation outcomes (Baral et al., 2007a). Second, external funding can promote a displacement of responsibility for managing parks away from government entities into the hands of other special interests (e.g., Zaidi, 1999). Finally, continual reliance on outside sources of income may preclude sufficient institutional development of domestic park management agencies in the long run (Wells et al., 2004).

While the need for more sustainable mechanisms for financing state-run PAs is apparent, the means for doing so can be debated (Munasinghe and McNeely, 1994; IUCN, 2005; Emerton et al., 2006). Emerton et al. (2006) identified a number of potential mechanisms for enhancing the financial sustainability of PAs. These include foreign financing from governments or NGOs, domestic financing from the domestic government or in-country NGOs, private sector support through the market-based provision of goods and services compatible with PA objectives, leveraging local support through costs and benefits sharing, or market-based strategies implemented by the PA itself, including tourism charges, resource user fees, bioprospecting charges, and payment for ecological services. A critical review of each of these mechanisms is beyond the scope of this paper, though a number of these mechanisms are in place in PAs across Nepal and elsewhere. This study rather focuses upon the potential of visitor fees. Visitor fees are particularly promising in areas of high visitation due to their ability to generate income through market-based demand for the protected area product. Moreover, visitor fees also come with the potential to regulate visitor numbers through appropriate pricing in over-visited areas.

While relying on the tourism market is subject to multiple external factors, such as the global economy and general safety and stability issues, it removes a potential over-reliance upon philanthropic or political trends, which lie further from

the control of PA managers and may be subject to more frequent and less predictable change (Heinen and Kattel, 1992). Even with substantial income from tourism charges, however, political trends can still hamper the financial sustainability of PAs as tourism revenue can be re-directed to other realms of national budgets (Heinen and Kattel, 1992). We argue that because PAs are a main attraction of nature-based tourism, they should be able to claim a fair share of the revenues they produce. Demonstrating the benefits of re-investment of park profits would be critical to legitimizing such claims.

Tourism is one of the world's largest industries, and is growing rapidly worldwide, particularly in the Asia and Pacific region (28% growth in 2004: World Tourism Organization, 2006). Ecotourism, which can be defined as nature-based tourism that aims to minimize environmental impacts and to contribute to economic development of local communities, has shown prospects for successfully funding conservation and sustainable development programs (Drumm and Moore, 2005). Nepal has benefited from ecotourism; still, skeptics doubt the sustainability of the industry owing to its environmental impacts and lack of monitoring mechanisms (Forsyth, 1991; Nepal, 2002).

Although the Annapurna Conservation Area (ACA) has been in place since 1986, it was only legally recognized as a PA only in 1992 with a mandate to protect the environment, manage ecotourism and promote sustainable development (ACAP, 1997). A major goal of ACA in its official management plan is “to promote nature conservation through sustainable development of tourism” (ACAP, 1997). For more than a decade, ACA has been striving to develop tourism with minimal negative environmental impacts that can generate enough revenue to manage the protected area. As such, ACA reflects the essence of ecotourism.

The revenue generated from ACA's ecotourism is used to fund projects intended to benefit local communities through both conservation and development initiatives. Although ACA received external funding at its outset, its core management operations are now financed entirely through visitor entry fees (Gurung, 2003). ACA is largely seen as a successful model of community-based conservation (Mehta and Heinen, 2001; Baral et al., 2007a), and financial sustainability is an important reason behind its success. In ACA, the ecotourism approach has lessened negative environmental impacts typically associated with other forms of tourism, but has yet to maximize economic benefits to local people (Nyaupane and Thapa, 2004). Such benefits could further enhance not only local quality of life, but also conservation efforts through the strengthening of local constituencies for biodiversity conservation (Salafsky and Wollenberg, 2000; Wells and McShane, 2004; Naughton-Treves et al., 2005; Sheil et al., 2006). This study employs contingent valuation (CV) to examine possibilities for enhancing ACA's revenues through increasing tourist entry fees to the area.

In the past 50 years, the focus of CV has shifted from valuing environmental damages to valuing environmental protection (Alberini and Kahn, 2006). CV is becoming a popular policy tool in biodiversity conservation and protected area management. It has been used to place an economic value upon endangered species conservation (Kotchen and Reiling,

2000; Bandara and Tisdell, 2003; de Mendonca et al., 2003; Baral et al., 2007b); the protection of habitats (vanKooten and Schmitz, 1992; Loomis and Gonzalez-Caban, 1998; Farber et al., 2002); protected areas (Moran, 1994; Hadker et al., 1997; Togridou et al., 2006); ecosystem services (Turner et al., 1995; Laughland et al., 1996); and the existence of biodiversity (Turpie, 2003). Few international case studies exist in the published literature regarding economic analysis of park entry fees (Bateman et al., 1994; Shultz et al., 1998; Dharmaratne et al., 2000; Walpole et al., 2001; Lee and Han, 2002). In absence of economic analyses, many protected areas in the world have not optimized their income from park use (Dixon and Sherman, 1990). ACA is no exception.

Maximizing revenue generation by levying reasonable entry fees on visitors can garner much needed funds for conservation and may help to prevent market failures of ecotourism if the demand is price elastic. Empirical research elsewhere has shown that visitors might commonly be willing to pay more than current entry fees (Bookbinder et al., 1998; Walpole et al., 2001). This paper explores this one mechanism for enhancing the financial sustainability of ACA — increasing entry fees. In this paper, we address how large of an entry might be acceptable for ACA based on the results of the CV method and econometric modeling. We also examine socio-economic and trip characteristics to determine the most powerful predictors of willingness to pay (WTP) higher entry fees. We also calculate the expected gross local economic impact of candidate entry fees and recommend options for restructuring the present entry fee.

The recent political tribulations faced in Nepal highlight the importance of this research (Baral and Heinen, 2006). The number of visitors to ACA plummeted as the Maoist insurgency escalated soon after 2000 (Table 1). Although ACA had previously been financially self-sufficient by levying entry fees on visitors, the revenue generated during the years of the Maoist insurgency was not enough to meet expenditures. Entry fees of USD 36 or higher could have buffered the park against running a deficit over the four year down turn. The research explores the feasibility and potential direct consequences of raising the entry fee.

1.1. Study area

ACA (7629 km²) is the largest protected area in Nepal, managed by an autonomous non-governmental organization, the National Trust for Nature Conservation. The area boasts the

world's 10th highest peak, Annapurna I (8091 m), and the world's deepest river valley, the Kali Gandaki (ACAP, 1997). Its relatively easy access and well-developed infrastructure for the tourism industry make it one of the most popular trekking destinations in the world. In 2003, a total of 40,668 foreign tourists visited ACA compared to 13,950 visitors in Mt. Everest National Park and 4773 visitors in Langtang National Park, other popular trekking destinations in the same ecological zone (DNPWC 2006). The elevation ranges from 1000 m to over 8000 m, contributing to wide gradients in habitats promoting a rich biodiversity. ACA harbors 22 different forest types (including the world's largest Rhododendron forest) with 1140 plant species (ACAP, 1997). The area is replete with faunal richness with 101 species of mammals (including a flagship species Snow Leopard *Panthera uncia*), 478 birds, 32 reptiles and 21 amphibians. The landscape is dominated by the majestic Himalayas, spectacular mountains, deep river valleys and gorges, and high plateaus. The region is also culturally diverse; about 120,000 people belonging to various ethno-religious groups inhabit the area, many of whom are actively involved in the tourism industry. Others benefit less directly through the redistribution of entry fee revenue to community projects.

2. Methods

2.1. Survey instrument

A written questionnaire was administered to 315 foreign tourists between April and May of 2006 to collect written responses to primarily closed-ended questions. The questionnaire was divided into six sections: 1) purpose, motivations and activities; 2) the relationship between the domestic insurgency and ecotourism; 3) assessment of ecotourism in ACA; 4) environmental attitudes; 5) willingness to pay; and 6) demographic information. The survey consisted of multiple-choice, dichotomous yes/no, and ordered-rank responses, though a few open-ended questions were also posed to provide further explanations for checked responses. Surveys were written in basic English to maximize response rates and respondent understanding. A paragraph explaining that ACA relies solely on entry fees for its conservation and development program preceded the WTP question. It stated that the management authorities believed the entry fee of USD 27 to be low and were contemplating raising it. It also relayed that an increased entry fee could provide more funds to enhance visitors' experience, conserve biodiversity, and promote local economic development. Respondents were then presented a referendum-type WTP question asking if they would be willing to pay a specific amount as a new entry fee. Ten bid amounts were assigned at random, one bid amount for each survey: USD 30, 40, 50, 60, 70, 80, 90, 100, 110, and 120. Respondents' most important reason for their willingness-to-pay response was solicited in an open-ended follow-up question. These responses were coded and tallied. Most respondents completed the surveys in less than 30 min.

The surveys were reviewed by two experts in the field prior to their implementation. The survey administrator was also present to answer questions while the respondents filled out the surveys. High response rates on all questions, with the

Table 1 – Total number of visitors, revenue generated by entry fees, expenditures and balance of ACA budgets. A negative sign indicates deficit

Year	No. of visitors	Revenue (USD)	Expenditures (USD)	Balance (USD)
1999	67,485	1,822,095	1,155,890	666,205
2000	75,278	2,032,506	1,263,543	768,963
2001	65,313	1,763,451	2,091,462	–328,011
2002	38,642	1,043,334	1,798,483	–755,149
2003	40,668	1,098,036	1,499,191	–401,155
2004	42,347	1,143,369	1,342,249	–198,880

Source: Personal communication with ACAP staff in Pokhara, 2006.

exception of income, and very few reported requests for clarification from the survey administrator, suggest the general success of the method employed.

2.2. Sampling

As the most visited destination within ACA, Ghorepani was selected to represent a reasonable cross-section of visitors to the area. Most visitors taking different trekking routes within the region spend some time here. Ghorepani also presents an economic middle ground in the area, as costs for goods and services are generally higher to the North and cheaper to the South. Conducting the surveys in Ghorepani thus provided an opportunity for a broad cross-section of visiting tourists. There are about 40 hotels in Ghorepani. After check in, most visitors relax in a dining hall in the evening. Our research assistant visited all hotels with visitors during this time over a two-month period, introduced herself, explained the study, and requested verbal consent from all visitors in the dining hall to fill out the surveys. Of 345 respondents requested to complete the surveys, only 30 declined. The research assistant remained available for clarification throughout the duration of each self-administered survey.

2.3. Contingent valuation

In our case, CV methods have two major benefits over other assessment techniques: (1) CV methods are able to assess an individual's willingness to pay (WTP) for hypothetical changes in entry fees, and (2) they can reliably value trips regardless of whether the destination in question is the primary or secondary purpose for the overall trip. A strong criticism of CV is that answers obtained from surveys relying upon hypothetical propositions are subject to a variety of biases (Diamond and Hausman, 1994). The primary sources of bias identified in the literature include: design bias, which involves subjectivity in the establishment of initial bids or payment vehicles; operational bias, which refers to unfamiliarity with the good to be valued; hypothetical bias, usually an upward

bias in WTP based on the fact that expectations of having to submit an actual payment may not be present; and strategic bias, which is related to individuals' intention not to reveal their true preferences, comparable to the free-rider problem (Lesser et al., 1997). While certain sources of potential bias cannot be entirely removed from the method, each can be controlled to a certain degree through careful study design, allowing for reasonably reliable results (Arrow et al., 1993; Venkatachalam, 2004).

In this study, we designed the CV survey to simulate as closely as possible to a real market. We minimized design and operational biases by establishing bids based upon the pre-existing entry fee and using it as a familiar vehicle for payment. In this way, respondents had a real-world baseline and example upon which to base their responses. The entrance fee to the park provides a more concrete contingency factor than others commonly used in CV studies, such as environmental quality improvements or existence values (Lee and Chun, 1999; Jorgensen et al., 2001; Turpie, 2003). A referendum-type question was employed to present respondents, who are familiar with discrete choices in market transactions, with easy response categories (Hanemann, 1994). Hypothetical bias was addressed by suggesting to visitors that the conservation area may actually consider raising the entry fee. While strategic bias may be impossible to eliminate, we have no reason to suspect a uni-directional bias in the study. Some respondents may have minimized their WTP based on a fear of having to actually pay it, while others may have maximized it to reflect a desire to demonstrate strong environmental or cultural values associated with ACA resources.

2.4. Logit regression

We used logit regression to model the relationship of the binary dependent variable (WTP) to the independent variables. A statistical summary and explanation of all variables included in the model are provided in Table 2. We hypothesized that respondents who are older, who are male, who have smaller nuclear families, who have higher levels of education,

Table 2 – A summary of variables used in the Logit Regression Model

Variables	Description	Mean ± SD
Age	Ratio scale: respondents were asked to write their actual ages based on calendar years.	36.8 ± 13.0
Gender	Binary scale: males = 1 and females = 0.	0.55 ± 0.49
Family size	Ratio scale: total number of people living in respondent's household.	2.15 ± 1.33
Education	Ordinal scale (0 to 5): No degree achieved = 0, Secondary education = 1, associate degree = 2, bachelor's degree = 3, master's degree = 4, doctorate degree = 5.	2.85 ± 1.25
Environmental membership	Measured on binary scale, if respondents were members of environmental organizations then coded "1" otherwise "0"	0.25 ± 0.44
Environmental concern	Index: Respondents were asked to rate four statements on a 5-point scale from strongly disagree (1) to strongly agree (5): whether they were concerned about environmental issues, whether they were concerned about conservation of energy in the area, whether they complied with regulations, and whether they were willing to abide by ecotourism ethics. An index was developed by summing the responses on each statement. Reliability analysis revealed Cronbach's $\alpha = 0.70$, suggesting a valid index. Theoretically, the index score can range from 4 to 20. Higher scores indicate greater environmental concern.	15.18 ± 2.70
Visitors' satisfaction	Ordinal scale (1 to 10): Respondents were asked to rate their overall experience on a scale from one to ten, ten being the most positive.	8.26 ± 1.33
Guide	Binary: Respondent hired a guide = 1, No guide = 0.	0.50 ± 0.50
Group size	Ratio scale: The number of visitors including respondents traveling together.	4.78 ± 3.90
Bid amount	Ratio scale: The bid amount ranged from 30 to 120 US dollars.	73.82 ± 29.14
Willingness to pay	Binary: Willing to pay = 1, not willing to pay = 0.	0.51 ± 0.50

Table 3 – Estimate of the gross local economic impact based on visitors' reported expenditures and visitor-days

	Mean	SD	Min	Max	N
Visitor-days in ACA	14.85	6.31	1	30	310
Amount spent in a day (USD)	20.86	17.91	5	120	268
Expenditures on accommodation, food, etc. of a visitor	14.85*20.86=309.77 USD				
	USD	Total # of visitors in 2005	Economic activities		
Total revenue generated by entry fees	27.0	35,625	961,875.00		
Total expenditures of visitors within ACA	309.77	35,625	11,035,556.25		
Total Gross Local Economic Impact			11,997,431.25*		

* Banskota and Sharma (1997) found that approximately 60% of gross revenue from tourism stays within the area. Assuming this 40% leakage rate, the net local economic would be USD 7,198,458.75.

who are members of environmental organizations, who are environmentally concerned, who derive more satisfaction from their ecotourism experiences, who hire nature guides, and who travel in a larger group would be willing to pay higher fees than others. Most of the variables tested have shown significant predictability in other contingent valuation studies regarding natural resources (Moran, 1994; Loomis and Gonzalez-Caban, 1998; Shultz et al., 1998; White et al., 2001; Lee and Han, 2002). The following equation was estimated:

$$\text{Probability (WTP)} = \alpha + \beta_1 \text{ bid amount} + \beta_2 \text{ age} + \beta_3 \text{ gender} + \beta_4 \text{ family size} + \beta_5 \text{ education} + \beta_6 \text{ environmental group membership} + \beta_7 \text{ environmental concern} + \beta_8 \text{ visitors' satisfaction} + \beta_9 \text{ guide} + \beta_{10} \text{ group size} + \text{error} \quad (1)$$

where α is the constant and β_i are the coefficients of the explanatory variables. The goodness-of-fit of the model was estimated using the maximum log-likelihood ratio. We did not include respondents' income in the logit regression model in order to make a statistical model compatible with the economic hypothesis of utility maximization. We used a utility model as suggested by Hanemann (1984) in which discrete choice probabilities are independent of the individual's income (See Hanemann's paper for further detail on this).

2.5. WTP econometric model

The WTP question presented a dichotomous response option in which the respondents were asked if they would or would not be willing to pay a given bid amount A. Visitors were assumed to maximize their utility while expressing their willingness to pay the specified bid amount in exchange for access and improved experience. Following Hanemann (1984), the probability that a respondent would be willing to pay a given bid amount is assumed to follow a standard logistic variate:

$$\text{Prob (YES)} = \left(1 + e^{-(\alpha + \beta A + X\Phi)}\right)^{-1} \quad (2)$$

where α is a constant parameter, β is the coefficient of the bid variable A, X is the vector of other explanatory variables influencing the response, and Φ is the vector of the corresponding slope parameters. Using estimated parameters of Eq. (2), the median WTP amount was computed as,

$$\text{WTP} = \frac{\alpha + \bar{X}'\Phi}{\beta} \quad (3)$$

The mean WTP was calculated by numerical integration of the expected values of WTP, ranging from 0 to the maximum bid (120). The chi-square test of independence was used for testing associations between categorical variables.

3. Results

3.1. Sample characteristics

Of 315 respondents, 1.3% had no formal education, 16.4% completed high school, 21.1% had associate degrees, 26.0% had bachelor degrees, 27.3% had master degrees, and 7.9% had doctorate degrees. About one fourth (25.5%) of the respondents were members of environmental organizations (N=298). The top five environmental organizations to which respondents belonged, listed in order of their reported frequency, were Green Peace, World Wildlife Fund, Sierra Club, National Trust UK, and the German Alps Club. About 34% of respondents did not mention their income, and those who mentioned fell into the following income brackets: less than USD 20,000 (20%), USD 20–40,000 (15%), USD 40–60,000 (15%), USD 60–80,000 (8%) and more than USD 80,000 (8%). The sample represented visitors from 27 countries; the most common were the United Kingdom (17.5%), German (14.6%), France (13.3%), the United States (7.9%), and the Netherlands (7.6%). A high proportion of respondents (82.8%) reported a positive experience in ACA, rating their satisfaction as an eight or higher on a ten point scale; 15.2% reported a near-average experience (five to seven on the ten-point scale). Only 2.0% reported a negative experience (four or less on the ten-point scale) in ACA (N=301). The proportion of respondents who reported a desire to revisit the area again in the future was high (87.1%, N=285). Forty-three percent reported no comparable alternative destination to ACA in the world for a similar ecotourism experience (N= 268).

3.2. Local economic impact

We computed the gross economic impact of tourism upon the local economy based on visitors' reported expenditures and visitor-days. We asked respondents how many days they were planning to be in the ACA and how much were they spending each day. We then used this information to calculate visitors' gross expenditures. On average, tourists stayed in ACA 14.8± 6.3 visitor-days and spent USD 20.9± 17.9 per day (Table 3). One

respondent each mentioned spending USD 500 and 200 daily, and four mentioned spending USD 1 or 3 daily. These were considered outliers and were discarded from the analysis. The average per-visitor expenditure was USD 309.8 per trip, so the total expenditure of 35,625 visitors was USD 11,035,556. Visitors also paid a USD 27.0 entry fee for access; this is categorized as revenue in the further analyses. The aggregate gross local economic impact (expenditures and fees) resulting from the 35,625 visitors in 2005 was roughly USD 11,997,431. Banskota and Sharma (1997) found that only 60% of tourist expenditures typically stays within the local economy. We used this figure to estimate the net local economic impact from ecotourism to be USD 7,198,459. This yields a per capita net average annual income from tourism of approximately USD 60 amongst the 120,000 residents of the region.

3.3. Willingness to pay

Three-hundred and five of the 315 respondents answered the willingness to pay question. Just over half (50.5%) were willing to pay the bid amount specified in their surveys. The logit regression model was robust in fitting the data, correctly classifying 67.6% cases ($\chi^2_{10}=56.08, p<0.001$, Table 4). Of the ten variables, five were significant predictors of WTP in our model: the bid amount, family size, visitors' satisfaction, the use of a guide, and group size. The negative signs of bid amount and family size indicated that the higher the bid amount or greater the family size, the lower the probability of willingness to pay. Meanwhile, higher levels of satisfaction led to higher probabilities of willingness to pay. Respondents who hired a guide were more willing to pay than those who did not as were respondents traveling in a larger group. The signs of coefficients of age, gender, education, environmental membership and environmental concern were as expected, though these variables did not explain significant variations in WTP. While respondents who were older, male, more educated, members of environmental groups, and expressed greater environmental concern were more likely to be willing to pay, their predictive ability was overpowered by the other variables in the study.

There was a near perfect negative correlation between the bid amounts and the probability of accepting the bids ($r=$

Table 4 – Results of logit regression on WTP

Explanatory variables	Coefficient	Std. Error	z	$P> z $
Bid amount	-0.0235	0.0051	-4.60	0.001
Age	0.0119	0.0114	1.04	0.298
Gender	0.2042	0.2905	0.70	0.482
Family size	-0.3995	0.1156	-3.45	0.001
Education	0.1092	0.1161	0.94	0.347
Environmental membership	0.2995	0.3232	0.93	0.354
Environmental concern	0.0148	0.0554	0.27	0.789
Visitors' satisfaction	0.2948	0.1282	2.30	0.021
Guide	0.6768	0.2866	2.36	0.018
Group size	0.0884	0.0394	2.24	0.025
Constant/Intercept	-1.7529	1.4540	-1.21	0.228

Likelihood-ratio $\chi^2_{10}=56.08, p<0.001, N=262$, Log-likelihood = -153.37, Correctly classified = 67.6%. The values in bold face highlight significant statistical results.

Table 5 – Frequency of the bid amounts, and their proportions of observed and expected "Yes" responses

Bid amounts in USD	Frequency	Observed "Yes"	Expected "Yes"
30	35	0.771	0.739
40	33	0.636	0.691
50	34	0.756	0.639
60	30	0.400	0.583
70	32	0.469	0.525
80	29	0.571	0.466
90	27	0.348	0.408
100	32	0.290	0.353
110	35	0.343	0.301
120	28	0.360	0.254

-0.99, $p<0.001$). The chi-square goodness-of-fit test between the observed and expected probability distributions of bid amounts also suggested a good fit of the model ($\chi^2_9=0.99, p=0.999$; Table 5). As estimated from the econometric model, the median WTP was USD 74.3 and the mean WTP was USD 69.2. The current entry fee was thus only 39% of visitors' average willingness to pay.

3.4. Reasons for WTP

Three-quarters (74.4%) of the respondents answered the WTP follow-up question. Of these, respondents who were willing to pay gave reasons more frequently (76.6%) than those who were not (70.2%). These reasons are summarized in Table 6.

3.5. Analysis of candidate entry fees

We considered the four amounts lower than the median WTP as candidate entry fees for further consideration: USD 40, 50,

Table 6 – A summary of responses to the follow-up WTP question

Descriptions	Percent
<i>Reasons why respondents were willing to pay for increased entry fee (N=118)</i>	
1 To protect nature, forests, wildlife, ecosystems, or environment	26.3
2 Conditional support, only if funds are judiciously used	17.8
3 The area is beautiful, unrivaled and unique	13.6
4 To enhance experience through cultural preservation	13.6
5 Economic development of the area	13.6
6 I can afford it; the entry fee is reasonable	11.0
7 I like to donate to worthy causes, general philanthropy	4.2
<i>Reasons why respondents were not willing to pay for increased entry fee (N=106)</i>	
1 I cannot pay; the fee is too expensive	57.5
2 Concerns about corruption, misuse, and leakage of funds	19.8
3 It is the job of the Nepalese government	4.7
4 Entry should be free; I prefer to donate	4.7
5 I paid tourist tax or Maoist extortions	3.8
6 I prefer to visit other places	3.8
7 Unsatisfactory service	3.8
8 Entry fee is too expensive for shorter visits	1.9

Table 7 – Candidate entry fees, expected number of visitors, expected revenue and gross local economic impact (in USD) based on the highest (75,278) and lowest (35,625) number of visitors in the years 2000 and 2005, respectively

Candidate entry fees	Percent willing to pay	Pessimistic scenario			Optimistic scenario		
		Expected visitors	Expected revenue	Expected gross economic impact	Expected visitors	Expected revenue	Expected gross economic impact
40	69	24,618	984,732	7,626,017	52,020	2,080,806	16,114,281
50	64	22,755	1,137,771	7,048,945	48,083	2,404,185	14,894,890
60	58	20,767	1,246,050	6,433,148	43,883	2,632,987	13,593,671
70	52	18,700	1,309,063	5,792,976	39,516	2,766,137	12,240,944

60 and 70. Based on the total number of visitors from 2000–2005, we considered two scenarios: the pessimistic and the optimistic. The lowest number of visitors to ACA was in 2005. This figure was used as a baseline for the pessimistic case. The highest number of visitors was in 2000. This number was used as the baseline for the optimistic case. On November 21, 2006, the Maoist rebels signed a comprehensive peace accord with the government, shunned violence and joined mainstream politics. If the peace holds, visitation is likely to rebound in ACA in the future. Thus, these figures make reasonable bounds to consider. For both scenarios, we computed percent changes in the revenue generated by entry fees and the likely gross local economic impact for each of the four candidate fees. The probability of accepting each fee was generated by the econometric model. It was then multiplied by the number of total visitors in each scenario to compute the expected number of visitors for each fee. These figures were used to estimate the expected revenue and gross local economic impact (Table 7). The present revenue and local economic impact were bases for computing their percent changes presented in Table 8. We assume that the amount of money spent during the visit in local communities by each visitor is unaffected by the entry fee.

Revenue generated from entry fees increased as candidate fees increased. The marginal rate of growth in revenue was highest at the candidate fee of USD 50, and slowed as fees increased beyond USD 50 (Table 8). Expected gross local economic impact showed an inverse relationship with increasing entry fees. With fewer visitors expected to be willing to pay the higher fees, total tourist expenditures decline in the model. Marginal declines in gross local economic impact widen only

slightly as candidate fees become higher. Based on this analysis alone, USD 50 might make a reasonable entry fee.

4. Discussion

The current entry fee is considerably below what most respondents stated they would be willing to pay. Although this fee was sufficient to meet expenditures during times of peace, ACA suffered budget deficits during the peak of the Maoist insurgency (Table 1). An entry fee of USD 50 would minimize budget deficits even in the pessimistic scenario and leaves considerable surpluses in the optimistic scenario.

While raising the fee could lead to potential resistance amongst local hotel entrepreneurs (Laarman and Gregersen, 1996; Goodwin et al., 1997), the increased revenue available for community conservation and development projects could help to temper protest. Benefits from entry fee revenue returned to the community are more equitably shared amongst community members than direct gains obtained through direct participation in the tourism industry. In addition, the non-economic values of more sustainable and ecologically sound tourism, such as improved quality of life and environmental quality, have become widely recognized in the region (Bajrachayra, 2003). Thus, popular support for an increased entry fee may be possible. The expected slight decrease in visitation to ACA predicted by the models might also help to curb some of the undesirable impacts of over-visitation, including overcrowding, trail erosion, wildlife disturbance and conflicts, litter, pollution and other forms of natural resource damage.

Inequitable distribution of economic benefits often poses a serious challenge for sustainable development (Saharia, 1982; Gillingham and Lee, 1999; Baral and Heinen, 2007). In ACA, a small population of hotel owners garners the majority of direct economic gains from tourism. Excluding the entry fee and dividing the total visitors' expenditures by the total number of hotels (546) yields an average annual gross income for hoteliers of USD 20,212. While we did not investigate hotel expenditures in this research, the gross income figure and general observations in the region suggest that the average net income for a successful hotelier in Annapurna is far above the average 2005 per capita net income of USD 280 of other Nepalis. For example, Banskota and Sharma (1997) estimated up to 76% for goods in Ghorepani and 68% leakage of tourism revenue in Ghandruk. Even discounting for the highest of these figures, lodge operators in ACA are still relatively wealthy. In ACA, about 70% of revenue generated by the entry

Table 8 – Marginal changes in expected revenues from entry fees and gross local economic impact (USD) for each candidate entry fee

Candidate entry fee	Marginal change from one candidate fee to the next ^a	
	Expected revenue	Expected local gross economic impact
40	<2%	–31%
50	15%	–5%
60	11%	–6%
70	7%	–6%

^a Marginal values for the USD 40 entry fee are based on comparison to expected values for the current entry fee (USD 27). In both the optimistic and pessimistic scenarios, the percentage changes in revenue and economic impact are the same.

fee is returned to communities for conservation and development projects. Thus, increasing the entry fee could also serve to reduce economic disparity through a redistribution of a portion of this wealth.

Of course, a reasonable concern would be that visitation might decline more than expected with a higher entry fee. Only 43% of the sample suggested that ACA was the only destination they would consider adequate for meeting their purposes for travel. Other likely destinations might include Mt. Everest (Sagarmatha), Langtang, and Makalu-Barun National Parks. These parks currently charge half the entry fee of ACA, yet experience from about 10% to one-third of the visitation of ACA. The relatively easy access to ACA and its international fame may be enough to limit the redistribution of tourists to these other parks. A few parks with exceptional natural endowments and international fame are charging even higher entry fees without any significant decrease of visitors. For example, Galapagos National Park, Ecuador charges USD 100 while Parc des la Volcano, Rwanda charges USD 250 to international visitors (Brown, 2001; Drumm and Moore, 2005).

Our results also suggest some potential avenues for ensuring high quality visitor experiences in ACA. Visitors experiencing ACA with a guide and in larger group sizes showed greater willingness to pay higher entry fees. While these findings can be partially interpreted through an economic lens — that those who can afford to travel in groups and hire local guides can afford a higher price — they also suggest that those having positive social experiences in ACA and those who are well-oriented to the site may be willing to pay more for the experience. Managers may consider implementing measures to further encourage and enhance group travel and facilitate guide training.

Respondents' open-ended responses to why they were willing to pay higher entry fees also have management implications. The most common reason cited for supporting a higher entry fee was to enhance the protection of nature. Managers might consider placing additional emphasis on showcasing their efforts in this respect to visitors. Such activities carry the potential of enhancing both visitor experience and their willingness to pay higher entry fees.

Protected areas managers run a risk of becoming complacent when entry fees are meeting their expenditures. Not only does ecotourism often incur indirect costs through the need to mitigate the impacts of over-visitation, but also, as demonstrated by the Maoist insurgency in Nepal, external political and/or social issues can bring about acute changes in visitation. With the Maoist insurgency subsiding and visitor numbers rebounding, now may be the opportune moment for increasing the fee.

5. Conclusion

Our measurement of visitors' willingness to pay for ecotourism experiences in ACA has shown encouraging results. Most visitors report that they are willing to pay substantially more than the current entry fee. With the end of a decade-long Maoist insurgency, visitor demand is likely to rebound, mitigating to some degree the potential decline in tourists who would refuse to pay a higher entry fee. Our study suggests that

USD 50 might make a reasonable entry fee. Due to uncertainties in the real effects on visitation of a fee increase, park authorities may wish to consider implementing this fee on a trial basis or pursuing incremental increases over time, culminating in the USD 50 fee some years into the future. With regular monitoring, the impacts of any fee increases upon visitation could be understood more completely.

The study reveals that an increase in the entry fee is likely to provide considerable additional resources for biodiversity conservation and sustainable development of the area without severe costs to the local communities. Moreover, an increased entry fee could influence a more equitable distribution of conservation benefits by redistributing benefits currently accrued by a small number of hoteliers to broader communities through conservation and development projects. Increased equity in the distribution of such benefits may enhance local support for biodiversity conservation efforts (Wells et al., 2004).

Three trip characteristics demonstrated the most positive influences on visitors' willingness to pay higher entry fees: the use of a guide, larger group size, and overall visitor satisfaction. Managers might therefore also consider further facilitating guide training and encouraging group travel in the region. Due to the uncertainty of the impacts of any of the changes recommended in this article, however, regular monitoring of fluctuations in visitors is strongly advised as changes are implemented.

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