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Article in *Forest Policy and Economics* · April 2014

DOI: 10.1016/j.forpol.2014.01.002

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Diversifying finance mechanisms for protected areas capitalizing on untapped revenues

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ARTICLE INFO

Article history:

Received 7 November 2013

Received in revised form 9 January 2014

Accepted 13 January 2014

Available online xxxx

Keywords:

Annapurna

Contingent valuation

Conservation trust fund

Park finance

Protected areas

Willingness to pay

ABSTRACT

Protected areas' financial sustainability is critical for improving their effectiveness in conserving biodiversity. This paper aims to estimate visitors' willingness to pay (WTP) higher entry fees to access the Annapurna Conservation Area (ACA) in Nepal, determine variables influencing their WTP decisions, and explore strategies for diversifying ACA's finance mechanisms. Contingent valuation surveys were administered to a random sample of 401 visitors in 2012. About 62% of the visitors were willing to pay higher entry fees than the current US \$25 fee. The logit regression results showed that the bid amount, educational attainment and use of a guide were statistically significant predictors of WTP decisions. The mean and median WTP amounts were US \$116.7 and US \$122, respectively. *Ceteris paribus*, increasing the entry fee to US \$122 would yield about 20 million US dollars in surplus revenues in the next 5 years, which can be earmarked for establishing a conservation trust fund to diversify ACA's finance mechanisms.

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1. Introduction

Protected areas (PAs) are the cornerstone for biodiversity conservation in the developing world, but the real concern is how they should be funded. A critical issue in PA management is the lack of adequate financial resources. Recognizing the issue, one of the goals set by the Convention on Biological Diversity (CBD) is to ensure financial sustainability of PAs in the developing world. Financing PAs can be complex and challenging because the funds need to be collected from all available sources: (1) government budgets, (2) site-based revenues, and (3) international subventions and donor funds (WCPA-IUCN, 2000; Emerton et al., 2006; Bovarnick et al., 2010). Funds from some sources might be more reliable, easier to raise and more flexible in budget allocation than others.

The most important source of funding for PAs appears to be government budgets. One of the mandates of governments is to ensure the perpetuity of PAs for the benefits of present and future generations. Governments in developing countries allocate a certain proportion of funds to manage their PAs, but the funds might not be adequate to cover the costs (Mansourian and Dudley, 2008). The sole dependence upon government budgets can be problematic for PAs because the environment sector often gets the least priority when revenues are constrained. PAs can generate site-based revenues such as entrance fees, recreation and tourism permits, concessions, payments for environmental services, and other fees including scientific research. These

revenue sources can reduce the dependency on government budgets and promote the sites' financial self-reliance. Particularly, tourist entry fees can bring in substantial revenues to cover most costs of PA management if the sites are attractive (Baral et al., 2008). Because all PAs might not be attractive to visitors and there might not be any incentive for revenue generation at the site-level in the central collection and allocation treasury system, the contribution of site-based revenues for park management can be limited. Another major source of PA financing in the developing world is the international subventions and donor funds in various forms such as the financial support from the international conservation accords (e.g., World Heritage Convention, Ramsar Convention), debt-for-nature swaps, conservation trust funds, or private donations. These support mechanisms generally emphasize capacity building, infrastructure investments and 'scientific' management, so they are crucial in the establishment phase of PAs, but the support often comes with strings attached and grantors' own priorities, so a major concern is that these types of funds might not address site-level priorities. Each funding mechanism has its own prospects and limitations, and one mechanism might not be inherently better than the other, but a diverse portfolio of funding mechanisms can buffer against the vagaries of funding.

A general agreement is that a significant increase in funding is necessary to manage PAs effectively in the developing world. Given the level of underfunding and increasing costs of PA management, relying on only one finance mechanism is risky (James et al., 1999; Flores et al., 2008; Hein et al., 2013). Under certain circumstances, (1) tourism entry fees, and (2) conservation trust funds not only provide necessary financial resources to manage PAs but also help to minimize the risk of financial volatility together. Nature-based tourism in PAs has become

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one of the fastest growing sectors of the world's largest industry of tourism (Balmford et al., 2009; Kirkby et al., 2011). A number of empirical studies have shown public approval of park entry fees and reported that visitors are willing to pay substantially higher entry fees to access many PAs (Dharmaratne et al., 2000; Mmopelwa et al., 2007; Santhakumar, 2009). Thus, tourism has helped to gather financial resources for PAs in the developing countries during the times of economic prosperity and political stability. A legitimate question is whether tourism is a reliable source to cover recurrent costs of PA management in the long run. The volatile and fickle nature of the tourism market may undermine the affirmative response. For example, many national parks in Kenya, Uganda and Zimbabwe attracted a huge following of tourists in the times of political stability providing adequate revenues to manage the parks, but the visitor numbers plummeted as a result of civil unrest during the 1990s leaving managers unable to find the wherewithal to sustain them (see, Emerton et al., 2006). Tourism can be an ally for PAs in good times but a total stranger in times of need.

Conservation trust funds (CTFs) have shown some promise in making conservation happen in the developing world. They are legally independent institutions that raise, invest and grant financial resources for nature conservation (particularly for PA management) in the form of endowment funds, sinking funds and revolving funds (CFA, 2008; Flores et al., 2008). *Endowment funds* ensure that the principal is kept in perpetuity while only the investment income is used to finance PAs. *Sinking funds* are designed to disburse both the capital and investment income over the long period of time to finance PAs. *Revolving funds* are established from the recurrent incomes from taxes, fees, fines or payment for ecosystem services that are specially earmarked for PAs. Over 50 CTFs have been established throughout the world mainly under the aegis of various multilateral agencies, and they have been shown to be effective in providing somewhat stable funding for nature conservation (Preston and Victorine, 2011; Irawan et al., 2012). CTFs can also absorb big amounts of funding at a time and disburse it over time as per the absorptive capacity of recipients. There are some challenges in establishing the CTFs, however: it requires many years of sustained funding to build the seed capital, it takes a lot of efforts, and it may not provide a short-term return to manage PAs. Reflecting upon the above discussion, it seems that both tourist entry fees and conservation trust funds in tandem are more likely to ensure financial sustainability of PAs in the developing world than relying on a single source of funding.

The Annapurna Conservation Area (ACA) in Nepal is one of the few PAs in the developing world, which is supposed to enjoy the so called “well-funded status.” It made a smooth transition from relying entirely on donor funds during the formative years to becoming almost self-reliant financially in the later stage by charging entry fees to foreign visitors. ACA first introduced the entry fee of NRs 200 in 1989 to foreign visitors, and later increased the entry fee to NRs 1000 in 1996 and then to NRs 2000¹ in 2001. A study conducted in 2006 showed the current entry fee to be only about one third of what visitors were willing to pay (Baral et al., 2008). No doubt, tourism has played a critical role in the success of ACA, but its role can be limited in the future. Tourist entry fees covered a substantial proportion of ACA's budgets in times of peace, but tourism revenues dried up when the number of foreign visitors decreased as a result of the 9/11 terrorist attack in the US and the rise of the Maoist insurgency in Nepal (Thapa, 2004; Baral and Heinen, 2006; Baral et al., 2008; Baral, 2013). A large fluctuation in visitor numbers contributed to the volatility in revenue generation, which in turn escalated the uncertainty in the implementation of management plans (Fig. 1, Table 1). ACA's own experience highlighted the risk of relying heavily on tourism to fund conservation activities in the long run. It is thus critical to build a diverse, stable and secure funding portfolio for the ACA's financial sustainability. To manage ACA in an effective and efficient way, securing its financial sustainability is

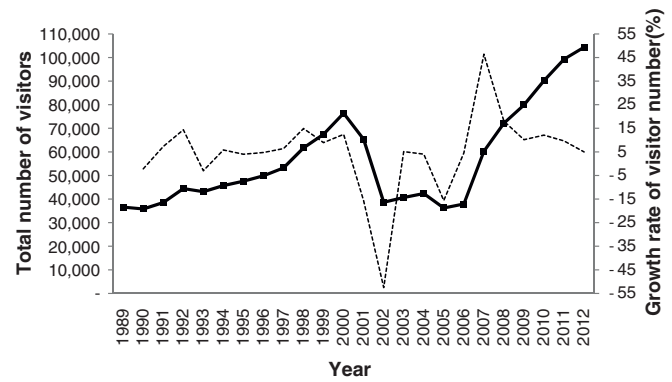


Fig. 1. The total number of visitors (bold solid line) and the growth rate of visitor number (dotted line) in the Annapurna Conservation Area (Data source: ACAP, Pokhara, 2013).

the necessary first step. Therefore, time has come to put the claim of “well-funded status” under scientific scrutiny and think about innovative ways to diversify finance mechanisms.

The overarching goal of the paper is to explore strategies to diversify finance mechanisms for the ACA. In order to do so, the specific objectives are to assess foreign visitors' willingness to pay (WTP) for entry to ACA, to determine the influence of socio-demographic variables on WTP, and to measure the local economic impacts of tourism. Both the quantitative and qualitative data are collected and analyzed. After estimating the mean and median WTP amounts, the policy implications for diversifying financial mechanisms are discussed. As such, this analysis sheds light on how to design policies that ensure appropriate money transfer from foreign recreation beneficiaries to attain ACA's financial sustainability. The results contribute to a policy discussion regarding how to secure PAs financially in the developing world. Once a basic sense of financial security for PAs is created, managers can focus their time and efforts solely to conservation issues.

2. Methods

2.1. Survey instrument

After some modifications, we used the survey instrument developed, tested and implemented by Baral et al. (2008) for a similar study conducted in ACA in 2006, obviating the need for a pilot test. With an intention to collect diverse yet relevant information, the questionnaire was divided into five sections: (1) purpose, motivations and activities;

Table 1

The total number of visitors, revenue generated by entry fees, expenditure and balance of ACA's budgets on a fiscal year basis. A negative sign indicates deficit.

Fiscal year	No. of visitors	Revenues (NRs)	Expenditures (NRs)	Balance (NRs)
2001/2002	49,655	98,181,400	12,771,676	85,409,724
2002/2003	37,021	72,287,000	121,856,359	-49,569,359
2003/2004	44,969	86,669,200	110,447,578	-23,778,378
2004/2005	35,370	67,374,000	192,235,353	-124,861,353
2005/2006	36,879	69,862,800	110,828,371	-40,965,571
2006/2007	50,129	94,661,800	111,234,473	-16,572,673
2007/2008	65,257	124,143,800	131,791,660	-7,647,860
2008/2009	75,925	136,127,000	144,279,374	-8,152,374
2009/2010	85,278	147,454,800	160,464,000	-13,009,200
2010/2011	95,314	161,752,400	160,954,456	797,944
2011/2012	101,422	179,337,800	192,526,428	-13,188,628

Source: NTNC Office, Kathmandu, 2013. The exchange rate was US \$1 = NRs 90.0 on June 2, 2013. Some data in revenues and expenditures may contain certain inconsistencies and inaccuracies inadvertently or deliberately while reporting to outsiders. These types of data are often considered 'sensitive' or 'proprietary' by NGOs in Nepal, so they are usually reluctant to disclose accurate funding information in case it is used against them. Rather than the absolute values, their trend is more important for the purpose of this study.

¹ The exchange rate was US \$1 = NRs 73.95 on January 1, 2001.

(2) assessments of risk and safety; (3) attitudes towards ecotourism and the environment; (4) willingness to pay; and (5) visitors' background information. In the survey, quantitative variables were measured on ratio, interval, ordinal and binary scales, and qualitative data were collected through open-ended questions that were posed to provide further explanations for quantitative responses. The four-page survey instrument was written in plain English to improve clarity and comprehension for non-native speakers particularly.

2.2. Sampling and data collection

The survey instrument was administered to 404 foreign visitors between April 23 and May 9 of 2012 to collect written responses. Ghandruk was selected for administering surveys because it is one of the most visited sites within the ACA, thus increasing the probability of accessing a representative cross section of visitors (the population for the study). The ex-post analysis showed that this approach actually worked well because visitors taking different routes within the ACA were captured in the surveys. In the absence of a relevant sampling frame of visitors, we resorted to cluster sampling of hotels to access random samples of foreign visitors. Based on the occupancy rate of 22 hotels in total, 9 were classified as low frequency hotels and 13 as high frequency hotels. Each day 4 or 5 hotels belonging to both types were selected at random by lottery after obtaining the permission from hotel owners to survey visitors in their hotels. After check in, visitors commonly relax in the evening in their hotel dining room, making it easier to access them in a minimally intrusive manner. After briefing about the research project, all the foreign visitors staying at the sample hotels were requested to fill out the surveys. We approached 628 visitors, but 172 did not meet the selection criteria because they either just began their trek or could communicate in English only through interpreters. Of the 456 visitors requested, 38 declined to participate and 404 returned the filled out surveys (14 did not return) during the 17 days of field research. Three incomplete surveys were discarded during the analysis phase. The overall response rate was 88.6% and the effective response rate was 87.9%. It took 22.1 ± 10.5 min on average (\pm sd) to fill out self-administered surveys, the native English speakers taking shorter time (14.5 ± 4.1 min) than the nonnative speakers (31.5 ± 8.2 min). One author remained available to answer questions or provide clarification while the surveys were being completed.

2.3. Contingent valuation

The contingent valuation method is a primarily applied economic tool based on a survey technique to estimate the value of environmental goods and services that are not traded in the conventional market (Arrow et al., 1993; Carson, 2000). By creating a hypothetical marketplace, people are directly asked to report their willingness to pay (accept) to obtain (forgo) a specified good or service rather than inferring it from observed behaviors in the regular market (Venkatachalam, 2004). The contingent valuation method has also been used extensively to estimate recreational benefits of tourism in natural areas (Shultz et al., 1998; Walpole et al., 2001; Lee and Han, 2002; López-Mosquera and Sánchez, 2011; Chen and Jim, 2012).

Because the goal was to estimate willingness to pay (WTP) using a single bound dichotomous question, we measured the compensating variation for the improvement in environmental quality for recreation. Therefore, WTP was operationalized as the amount that must be subtracted from people's income to keep their utility constant:

$$V_1(y-A, p, q_1; X; \Psi) = V_0(y, p, q_0; X; \Psi) \quad (1)$$

where V denotes the indirect utility function, y is income, A is the bid amount, p is a vector of prices faced by the individuals, q_0 and

q_1 are the alternative levels of environmental quality (q_1 being improved quality), X is a vector of other characteristics, and ψ is a preference parameter. To maximize the utility from recreation, the individuals would make a trade-off between income and environmental quality given their other characteristics. Individuals respond to the stated bid such that:

$$\text{Response} = \begin{cases} \text{"yes"} & \text{if } WTP \geq \text{bid} \\ \text{"no"} & \text{if } WTP < \text{bid} \end{cases}$$

The following contingent valuation scenario was presented to visitors in the survey.

Financial resources are always scarce for the better management of protected areas in developing countries. At present, ecotourism seems to be a viable option to generate adequate revenues. Annapurna solely relies on entry fees levied on foreign visitors to fund its conservation and development programs. The park authority believes that the current entry fee (US \$25) is too low. It is very likely that the entry fees will go up soon. By raising the entry fees, the park authority would use the additional money toward improvements in the park experience by catering to visitors' needs, conserving biodiversity and promoting sustainable economic development. Please remember that any extra money you spend on entry fees could be spent on other purchases or could be saved.

Following the scenario, visitors were presented a single bound referendum-type WTP question asking if they would be willing to pay a specific amount (\$A) as a new entry fee. The dichotomous choice approach was used because it mimics a behavior in regular markets where consumers purchase or decline to purchase a good or service at a given price. Because the approach is shown to be incentive-compatible, understanding that a majority but not a single vote is required for change, telling the truth is in the respondents' best interest (Hoehn and Randall, 1987). A major demerit of the dichotomous choice approach is that WTP cannot be observed directly but it needs to be inferred from the yes/no responses. Twelve bid (\$A) values were offered equally within the range between US \$30 and \$200, and varied randomly across respondents, one bid amount for each survey. In the completed surveys, the frequency of 12 bid values ranged between 25 and 43. Two debriefing questions were also included. An open-ended follow-up question solicited most important reason for a visitors' willingness-to-pay response. These qualitative responses were later coded and tallied. Also, respondents' opinions regarding how a majority of the visitors would react to the proposed plan of an entry fee hike were collected.

2.4. Logit regression model

To model the relationship of the selected explanatory variables to the binary response variable (WTP), we used logit regression in STATA. The description and summary statistics of all the variables included in the model are provided in Table 2. One or more of the selected variables have shown statistically significant relationships with willingness to pay in several contingent valuation studies conducted elsewhere (Moran, 1994; Loomis and Gonzalez-Caban, 1998; Shultz et al., 1998; White et al., 2001; Lee and Han, 2002; Baral et al., 2008). Informed by the existing theories, we hypothesized that respondents who are older, who are male, who have smaller nuclear families, who have higher levels of education, who are members of environmental organizations, who are environmentally concerned, who derive more satisfaction from their trip, who hire nature guides, and who travel in

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

Variables	Description	Mean \pm std. dev.*
Age	Respondents were asked to write their actual age based on calendar years. (Ratio scale)	36.51 \pm 13.59
Gender	Respondents who identified themselves as men were coded 1 and women were coded 0. (Binary scale)	.4586 \pm .4989
Family size	Reported total number of people living in a respondent's household. (Ratio scale)	2.41 \pm 1.26
Education	Reported highest level of education attained measured on a 6-point scale: no degree achieved = 1, secondary education = 2, associate degree = 3, bachelor's degree = 4, master's degree = 5, doctorate degree = 6. (Ordinal scale)	4.16 \pm 1.11
Environmental membership	Respondents who reported to be members of environmental organizations were coded 1, otherwise 0. (Binary scale)	.1475 \pm .3550
Environmental concern	Respondents were asked to rate four statements on a 5-point scale from strongly disagree (1) to strongly agree (5) measuring their attitudes toward the environment: 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 $\alpha = .68$, suggesting a valid index. Theoretically, the index score can range from 4 to 20. Higher scores indicate greater environmental concern. (Interval scale)	14.50 \pm 2.46
Visitors' satisfaction	Respondents were asked to rate their overall experience on a scale from one to ten, ten being the most positive. (Ordinal scale)	8.33 \pm 1.21
Use of a guide	Respondents who hired a guide were coded 1, otherwise 0. (Binary scale)	.7132 \pm .4528
Group size	The number of people including a respondent traveling together on a trip to Annapurna. (Ratio scale)	3.67 \pm 3.41
Bid amount	Respondents were asked different proposed entry fees ranging from 30 to 200 US dollars drawn randomly. (Ratio scale)	92.87 \pm 46.64
Willingness to pay	Respondents who were willing to pay higher entry fees were coded 1, otherwise 0. (Binary scale)	.6159 \pm .4869

* Mean and variance are appropriate summary statistics for ratio and interval scales, we nonetheless presented them for ordinal variables because it is easier to evaluate WTP at the mean.

a larger group would be willing to pay higher entry fees than others. The following equation was estimated:

$$\begin{aligned} \text{Probability (WTP)} = & \alpha + \beta_1 \text{ bid amount} + \beta_2 \text{ age} + \beta_3 \text{ gender} \\ & + \beta_4 \text{ family size} + \beta_5 \text{ education} \\ & + \beta_6 \text{ environmental membership} \\ & + \beta_7 \text{ environmental concern} \\ & + \beta_8 \text{ visitors' satisfaction} + \beta_9 \text{ use of a guide} \\ & + \beta_{10} \text{ group size} + \text{error} \end{aligned} \quad (2)$$

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. Furthermore, we tested the model for misspecification and examined various residual plots.

Because we had the WTP data elicited from a dichotomous choice, a common approach was to set up a simple random utility model which assumes that utility is linear in income (Hanemann, 1984). The linear model was appealing because its parameters could be easily interpreted, for example, the negative bid coefficient could be interpreted as the marginal utility of income. In the linear model, the income variable drops out while solving Eq. (1) to estimate the change in utility (WTP). We therefore did not include the income variable in the regression model (Eq. (2)) to be consistent with the theoretical model. Besides, including the income variable could add practical problems to the analysis. If the household income is not shared equally between the household members, the aggregate income might poorly explain a specific individual's WTP. A reliability of CV estimates can be inferred by checking their consistency with economic theory and a priori expectations. The theory suggests that more wealthy visitors are more likely to pay higher bid amounts than less wealthy visitors, so including both the income and bid amount variables in the same regression model might lead to multicollinearity problem. Furthermore, insignificant income-effects, which are more likely to appear in empirical research due to measurement errors or other reasons, can undermine the reliability of CV estimates.

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 travel 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:

$$\text{Prob(Yes|A, X)} = \left(1 + e^{-(\alpha + \beta A + X' \phi)} \right)^{-1} \quad (3)$$

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. (3), the median WTP amount was computed as,

$$\text{WTP} = \frac{\alpha + X' \phi}{\beta} \quad (4)$$

The mean WTP amount was calculated by numerical integration of the expected values of WTP, ranging from 0 to the maximum bid amount (200) using Eq. (3). We obtained the 95% confidence intervals for mean WTP running the Monte Carlo simulation developed by Krinsky and Robb (1986) implemented in STATA with the "wtpcikr" command (Jeanty, 2007).

3. Results

3.1. Sample characteristics

Of the 401 respondents, 45.7% were men and 54.3% were women. The average age of visitors was 36.51 \pm 13.59 years (mean \pm sd), but women were younger (34.01 \pm 10.75) than men (39.51 \pm 15.89) on average ($t = 4.09$, $p < .01$, $df = 396$). Almost all respondents had a formal education: 8.5% graduated from high school, 15.0% had associate degrees, 32.2% had bachelor's degrees, 35.5% had master's degrees and 7.8% had doctoral degrees (1.0% had no formal schooling). The average travel group size consisted of 3.67 \pm 3.41 members: 42.7% were traveling with their friends, 21.5% with their family, 10.3% with their family and friends, 11.5% with tour groups, and 1.0% checked the 'others' category (13.0% were traveling alone, not included in the group size estimation). Only 6.7% of the respondents had visited the ACA previously. On a scale from 1 to 10, visitors on average gave the score of 8.33 \pm 1.21 for their overall satisfaction during the trip in Annapurna. On average, visitors spent 8.14 \pm 5.04 days in the ACA (range 4 to 31 days). Two hundred and eighty six (71.3%) visitors hired a guide; and among them, 52.3% rated their guide's knowledge about nature, culture and ecotourism as excellent, 37.5% rated as good, 6.7% rated as fair and

3.1% rated as poor. About 15% visitors reported that they are a member of environmental organizations such as Green Peace, World Wildlife Fund and Sierra Club.

3.2. Local economic impact

Economic impact was narrowly defined in this study as the tourism's contribution to the existing local economy and the level of economic activity as measured by the total amount of money spent by foreign visitors in the area. Based on visitors' reported expenditures and visitor-days, we calculated the gross economic impact of tourism on the local economy. Foreign visitors stayed in ACA for 8.14 ± 5.04 visitor-days and spent US \$32.01 per day on average (Table 3). The average expenditure per visitor during the trip was \$260.56, so the total expenditure of 91,685 foreign visitors in 2012 was \$23,889,444. Foreign visitors also paid \$25 for access, so the revenue generated by entry fees was \$2,292,125. Summing up the visitors' expenditures and revenues yielded the total gross economic impact of \$26,181,569 in 2012. The net local economic impact of tourism was estimated to be \$15,708,941 based on the fact that only 60% of tourist expenditures typically stays within the local economy (Banskota and Sharma, 1997). This yielded a net local economic impact of \$178.85 per capita and \$705.13 per household given that the total population in ACA was 87,832 living in 22,278 households in 2011.

3.3. Predictors of WTP

To assess whether the fitted logit regression model was valid and reliable, several diagnostic procedures such as testing for model misspecifications, computing the goodness-of-fit statistic, examining multicollinearity and inspecting residual plots were conducted. There was no misspecification error in the model because the predicted value (\hat{y}) was statistically significant ($\beta = .9052$, $z = 6.56$, $p < .01$) but its second order term (\hat{y}^2) was not ($\beta = .1792$, $z = 1.61$, $p = .108$) in the link test as expected. A large p-value of the Hosmer and Lemeshow's goodness-of-fit test indicated that the model fitted the data well ($\chi^2_8 = 4.76$, $p = .783$). There was no problem of multicollinearity because the average values of the variance inflation factor and tolerance were 1.07 and 0.94, respectively. The plots of Pearson and deviance residuals revealed the clustering of observations in expected patterns and the lack of influential observations in the model. Furthermore, the model correctly classified 68.5% of the cases, and there was a close fit between the observed and expected frequencies of the WTP responses (Fig. 2). Internal validity of WTP responses as measured by the Spearman's correlation coefficient ($r = .76$, $p < .01$) supported the theoretical proposition that wealthy visitors were more willing to pay than less wealthy visitors. These results suggested statistical adequacy of the model so that the inferential claims can be made.

About 62% of the visitors were willing to pay more than the current entry fee of US \$25. Of the 10 variables tested, 3 were statistically significant predictors of WTP decisions: the bid amount, educational attainment and use of a guide (Table 4). As measured by their effect size, the influence of these variables was big enough to have real meaning or practical implications. A 1.8% drop in the odds of willingness to pay would occur if the bid amount was increased by 1 dollar. The odds of a visitor willing to pay an increased fee who was accompanied by a guide were about 4 times higher than a visitor not accompanied by a guide. The odds of willingness to pay would increase by 23.5% if the visitor's level of education increased from one lower category to another adjacent higher category.

On a 5-point scale, 28.4% reported that a majority of the visitors would strongly or moderately support the proposed plan of an entry fee hike, 35.7% mentioned that the visitors would neither oppose nor support the plan, and 35.9% mentioned that the visitors would moderately or strongly oppose the plan. There was a statistically significant association between WTP responses and the opinions regarding the

proposed entry fee hike plan ($\chi^2_4 = 68.44$, $p < .01$): 57.1% of the respondents who were not willing to pay mentioned that a majority of visitors would oppose the plan compared to 22.4% who were willing to pay.

3.4. Reasons for WTP decisions

In a follow-up question, 89.0% of the respondents gave reasons for their WTP decisions (Table 5). Although the respondents who were not willing to pay gave reasons more frequently (92.2%) than those who were (87.0%), the association was not statistically significant ($\chi^2_1 = 2.59$, $p = .108$). At first, 32 codes were used to synthesize information contained in 355 qualitative WTP responses and then 17 higher order categories were developed from the codes inductively. The most frequently mentioned reasons for supporting higher entry fees were that the price was fair and reasonable, and the visit was a worthwhile lifetime experience. About two thirds of those who opposed the higher entry fees either considered the fee to be too expensive or suggested that the fee should be charged on a per day basis.

3.5. Magnitude and implication of WTP amount

The mean WTP amount was US \$116.7 and the median WTP amount was \$122. The 95% confidence intervals around the mean ranged between \$109.4 and \$139.7. Fairly close values of the mean and median suggested their symmetric distribution. The current entry fee (\$25) was only 21.4% of the average WTP amount.

According to the official data, tourism revenues did not cover the expenditures of park management for 9 years in the last 11 fiscal years (Table 1). Given that visitors were willing to pay substantially higher entry fees and there were budget deficits, it would be a prudent policy decision to raise the entry fee. What would be an appealing entry fee? A simple simulation exercise was done under three different scenarios of candidate entry fees (US \$40, \$80, and \$122). About 82%, 68% and 50% of the visitors were expected to make a trip if the entry fee is increased to \$40, \$80 and \$122, respectively. Assuming that the annual ACA's budgets would increase by about 5%, the expected surplus revenues in the next 5 years would be \$19,662,947 in the \$122 scenario, \$16,189,356 in the \$80 scenario, and \$4,821,242 in the \$40 scenario (Table 6).

4. Discussion

The results indicate that foreign visitors are willing to pay substantially higher entry fees in the ACA. The current entry fee is only about one fifth of their average WTP amount. Visitors are willing to pay higher fees mainly because they consider them to be reasonable, they felt that the tourism experience is worthwhile, and they agree that the funds are required to maintain and conserve the area. Some visitors are willing to pay higher fees only if the money goes for park improvement but not elsewhere, like the sentiment expressed in other studies (Mmopelwa et al., 2007; Peters and Hawkins, 2009). Both the mean and median WTP amounts in this study are significantly higher than those reported (USD 69.2 and 74.3, respectively) about 7 years ago (Baral et al., 2008). It appears that the ACA has failed to capture the easily available revenues from nature-based tourism. These results are in line with empirical studies conducted in other PAs that show visitors' willingness to pay higher entry fees (Bookbinder et al., 1998; Walpole et al., 2001; Ransom and Mangi, 2010; Han et al., 2011).

Only three variables significantly influenced visitors' WTP decisions in this study: the bid amount, use of a guide and educational attainment. These variables are also shown to influence WTP decisions in other empirical studies (Shultz et al., 1998; Lee and Han, 2002; Baral et al., 2008). Because it is practically infeasible to charge differential entry fees based on educational attainment or the use of a guide, managers can only manipulate the bid amount to increase the revenues in this

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

	Mean	Std. dev.	Min	Max	n
Visitor-days in ACA	8.14	5.04	4	31	401
Amount spent in a day (USD)	32.01	24.48	5	150	336
Expenditure sans entry fee per visitor	8.14 × 32.01 = 260.56 USD				
	USD	Number of foreign visitors in 2012		Economic activities	
Total revenue generated by entry fees	25.0	91,685		2,292,125	
Total expenditures of visitors within ACA	260.56	91,685		23,889,444	
Total gross local economic impact of tourism				26,181,569*	

* 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 impact would be USD 15,708,941.

case. It is quite surprising that the two variables family size and visitors' satisfaction that predicted the WTP decisions in the 2006 study did not have any influence in this study (Baral et al., 2008). In empirical research, inconsistent results can be due to a sheer chance or the differences in sample characteristics. Although the mean and variance of family size and visitors' satisfaction are quite similar between the two studies, more visitors (about 62%) in this study affirmatively answered the WTP question than in the 2006 study (about 51%, Baral et al., 2008). This might have influenced the results. In both the studies, at least five explanatory variables included in the regression model did not predict the WTP decisions. Meta-analysis of several case studies would be helpful to refine variable selection criteria and make concrete recommendations regarding which variables to choose for comparative studies.

Assessing the economic impacts is the primary motivation for monitoring the sustainability of tourism (Miller and Twining-Ward, 2005). Nature-based tourism in Annapurna has generated sizeable economic impacts based on the measurement at the individual or household level. The per capita gross economic impact of tourism in Annapurna is about one fourth of the Nepalese per capita income of US \$742 in 2012. Although the total economic impact has increased over the past 6 years due to the increased number of visitors, the average amount spent by an average visitor during the trip decreased sharply since 2006 (Baral et al., 2008). This is mainly because visitors are spending significantly fewer days in the ACA at present than in 2006. Increasing the entry fee can help to make up for the difference in visitor expenditures to some extent. Given the gross economic impact of US \$26 million in 2012, a critical issue is not how much economic impact tourism has generated but whether the economic benefits from tourism are distributed equitably among the local people. In the present model, the disproportional amount of visitor expenditures is taken by about 500 hotel owners. Only the revenue generated by the entry fees is earmarked to local people in the form of sustainable development activities at the social level.

Tourism benefits are not distributed to individuals, so only few people directly involved in tourism are benefiting from tourism disproportionately. Such inequality in the distribution of tourism benefits is also reported from elsewhere, which can ultimately undermine the sustainable development philosophy (Torres and Momsen, 2005; He et al., 2008; Xu et al., 2009; Ahebwaa et al., 2012). Only equitable distribution of benefits can foster the sustainability of tourism in the long run.

The real question is what should be done with the surplus revenues? A simple simulation exercise of increasing the entry fee under the three different scenarios showed that there would be about 5 million to 20 million dollar surplus revenues in the next 5 years if the number of visitors and ACA's budget increase as expected. In addition to the availability of funds, the absorptive capacity of the management authority is critical for the proper use of the funds. It is unlikely that the ACA can manage the funds about double the size of its present budget in an efficient and effective way. At the same time, it is imprudent not to tap the foregone revenues. In such a situation, establishing a conservation trust fund (CTF) would be a perfect policy intervention for the judicious use of the surplus revenues. The untapped revenues would provide a reasonable amount of seed money (5 to 20 million US dollars in the next 5 years) to establish the trust fund. By capitalizing the untapped revenues and investing them, the trust fund can help to endure the vagaries of the tourism market and provide a stable stream of funds for park management. This position is also supported by the fact that CTFs have proven their efficiency and reliability as a PA financing mechanism elsewhere (CFA, 2008; Irawan et al., 2012). There must be changes in the existing laws and regulations to establish the CTF because unlike its neighbors Bhutan, India and Bangladesh, no such fund ever established in Nepal. An encouraging point is that the Nepalese government needs to create a legal framework to implement its policy of handing over the ACA management authority to local communities by 2017 (Baral and Stern, 2010). Thus, there exists an opportunity to piggyback on that legislative reform initiative to craft the legal framework required to

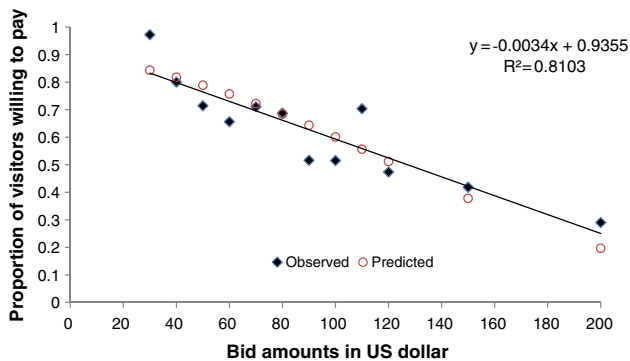


Fig. 2. A demand function derived from the observed frequency of 'yes' responses to various bid amounts presented as a candidate entry fee. The predictions based on the econometric model are shown in open circles. A linear trend line fitted to the observed data is shown in filled diamonds.

Table 4
Logit regression of WTP responses on the bid amount, and other socio-demographic and trip characteristic variables.

Explanatory variables	Coefficient	Std. error	z	P > z	Effect size
Bid amount	-0.01817	.00271	-6.72	<.001	-1.8%
Age	-0.00655	.00932	-0.70	.482	-0.7%
Gender	0.03105	.24143	0.13	.898	3.1%
Family size	0.02862	.09232	0.31	.757	2.9%
Education	0.21080	.10485	2.01	.044	23.5%
Environmental membership	-0.05493	.33234	-0.17	.869	-5.3%
Environmental concern	0.07950	.04929	1.61	.107	8.3%
Visitors' satisfaction	0.03874	.09887	0.39	.695	4.0%
Use of a guide	1.28401	.26465	4.85	<.001	261.1%
Group size	0.01260	.03554	0.35	.723	1.3%
Constant/intercept	-0.91537	1.21167	-0.76	.450	

Likelihood-ratio $\chi^2_{10} = 73.47$, $p < 0.001$, $N = 387$, Log likelihood = -221.65, correctly classified cases = 68.5%.

Table 5
A summary of responses to the follow-up WTP question.

Description	Frequency
<i>Reasons why visitors were willing to pay for increased entry fee</i> <i>n</i> = 213	
1 It is a fair and reasonable price for me	21.6%
2 It is a worthwhile lifetime experience for me	20.7%
3 To support park maintenance and conservation	17.4%
4 To support conservation and sustainable development of the area	9.4%
5 To protect the local natural environment for future generations	8.5%
6 To support economic development of the area	8.0%
7 The place is unique and needs to be conserved	7.0%
8 To support the ecotourism model implemented in the area	5.6%
9 Pay only if the additional money is used properly	1.9%
<i>Reasons why visitors were not willing to pay for increased entry fee</i> <i>n</i> = 142	
1 Unaffordable, the entry fee is too expensive	54.2%
2 Price based on per day is more appropriate	10.6%
3 Dissatisfied with the service of the area	8.5%
4 Preferred to visit other places	7.7%
5 Concerns about corruption, misuse, and leakage of funds	7.0%
6 Pay lower than the bid amount	5.6%
7 Nature should be free	4.2%
8 Local tax should be used for conservation	2.1%

establish the CTF. As such, the trust fund's structure, scope of activities, priorities, and funding procedures need to be worked out involving all the stakeholders.

Resistance from visitors would be minimal because about two thirds of the visitors are expected to either support the entry fee hike or remain neutral to it. There might be some resistance from local hotel owners and travel agencies to increase the entry fees because they might feel that their business will be adversely affected by such a move. Because the entry fee hike will provide greater good to society, most local people are likely to support the move. By building a trust and deliberating for social benefits, winning political support for the fee hike might not be a difficult task. Because the surplus revenues through increased entry fees would provide the initial capital for the trust fund, there is no need to rely on other sources for financing the fund. Unlike most CTFs that are established on the initiative and funding at the international level, the proposed trust fund would be established and entirely funded through the local initiative. Nonetheless, the technical support for establishing the trust fund can be procured from international organizations having expertise in this domain. Once the trust fund is established, it can also facilitate to channel conservation funds from government agencies and donor organizations to increase the capital level. By establishing the trust fund, finance mechanisms can be diversified even though the seed money comes from the same revenue stream of tourist entry fees. It is easier to save for rainy days when the 'discretionary money' is still available.

This study has some limitations. The use of English language precluded some visitors from participating in the surveys. Translations into other languages would have facilitated the participation of visitors whose English language skills are not high enough to provide reliable answers, but time and resource constraints made it infeasible to translate the survey instrument. Furthermore, translations might not reduce a language bias anyway. It is unlikely that the results would have been different substantially had we translated the survey instrument. Only the people who were already in the area were surveyed, which excluded perspectives of the prospective visitors. It is almost impossible to get a true representative sample of foreign visitors ex ante. Furthermore, we had to survey visitors during the second best season due to logistics. We might have missed some portion of visitors whose experiences might have been different but not reflected in this study. Nonetheless, it is felt that the results reveal the noteworthy information about how to manage the entry fees. Furthermore, the projections of visitor numbers, tourism revenues and expected surpluses are made on the basis of simple assumption of a linear growth, which might not capture the complexity of real world.

Table 6

Expected number of visitors, revenues, expenditures and surpluses over the next 5-year period under the three different scenarios of entry fee hike.

Fiscal year	Entry fee raised to US \$122			Entry fee raised to US \$80			Entry fee raised to US \$40		
	Expected expenditures ^a	Expected visitors ^b	Expected surpluses ^d	Expected revenues ^c	Expected visitors ^b	Expected surpluses ^d	Expected revenues ^c	Expected visitors ^b	Expected surpluses ^d
2012/13	2,247,898	46,784	5,707,656	3,459,758	63,626	2,842,208	5,090,106	76,726	3,069,035
2013/14	2,362,139	49,540	6,043,872	3,681,733	67,374	3,027,806	5,389,945	81,245	3,249,820
2014/15	2,482,186	52,458	6,399,893	3,917,707	71,343	3,225,260	5,707,446	86,031	3,441,254
2015/16	2,608,333	55,548	6,776,887	4,168,554	75,546	3,435,316	6,043,650	91,099	3,643,965
2016/17	2,740,892	58,820	7,176,087	4,435,195	79,996	3,658,766	6,399,658	96,465	3,858,617
Total seed money available		19,662,947			16,189,356			4,821,242	

^a In the last 5 years, the ACAP's budget increased by an average annual rate of 5.08%. Taking the budget of the fiscal year 2011/2012 as the starting value (NRs 192,526,428), projections were made for the next 5 years based on that growth rate. Exchange rate was US \$1 = NRs 90.0 on June 2, 2013.

^b At first, the projection for visitor numbers for the next 5 years was made based on the average growth rate of 5.89% per year for the period between 2001 and 2012, and the total number of foreign visitors (88,363) in the fiscal year 2011/2012 as the starting number. Although there are few visitors from the South Asian countries, they were excluded here because they pay NRs 200 only for entry as compared to NRs 2000 for foreign visitors. As predicted by the model 50%, 68% and 82% of the projected visitors would make a trip if the entry fee is increased to US \$122, \$80 and \$40, respectively. The expected number of visitors was then estimated by multiplying the respective proportions of visitors under those scenarios.

^c It is the product of the expected number of visitors times the proposed entry fees (\$122, \$80 and \$40, respectively).

^d It is the difference between the expected revenues and the expected expenditures.

Given a unique case study, caution should be used when transferring conclusions to other areas.

5. Conclusions

Annapurna lures a large number of foreign visitors who are willing to pay higher entry fees; thus, there is a potential for collecting additional revenues from tourism. ACA's own experience highlights the risk associated with relying heavily on tourism revenues to finance conservation in the long run. The results provide critical information to park managers to adjust the entry fee with full knowledge of potential impacts on local tourism. Accomplishing the goal of diversifying finance mechanisms can be materialized by seizing the opportunity of establishing the conservation trust fund at the local level. ACA has been a leader in mobilizing local communities for nature conservation and exploiting tourism to fund conservation activities (Baral and Stern, 2010; Baral, 2013). By establishing the conservation trust fund on its own initiative capitalizing on untapped revenues, it can be a leader and role model once again for other PAs for diversifying conservation finance.

The study reveals considerable untapped revenues in the form of consumer surplus in an attractive site and provides an analytical basis for rethinking financial sustainability of PAs in the developing countries. Those PAs that attract a large number of visitors should consider exploring untapped tourism revenues and instituting policies to channel such revenues to diversify finance mechanisms by establishing conservation trust funds. Under certain circumstances, diversifying finance mechanisms for sustainable financing of PAs could be a realistic goal. Even with the same revenue stream of tourist entry fees, a diverse portfolio of funds can be established to finance PAs in the developing countries. Given the rapid loss of global biodiversity, even securing one PA at a time makes a huge difference.

Acknowledgments

We heartily thank the hotel owners in Ghandruk for allowing us to conduct surveys in their hotels. We greatly appreciate the generous help of the visitors by filling out the surveys. Thanks are due to ACAP offices for granting the research permission and providing the support in the field. We thank Ram Gurung for providing us the relevant information promptly. Sapna Kaul and Benjamin Crain provided invaluable comments on the earlier draft. We would like to thank two anonymous reviewers for their constructive comments.

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