GeoJournal **50:** 329–337, 2000.

Environmental economics of the Khangchendzonga National Park in the Sikkim Himalaya, India

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Received 12 April 2000; accepted in revised form 15 September 2000

Key words: contingent valuation, bidding game, biodiversity, protected areas, conservation

Abstract

A contingent valuation survey was conducted involving local community members, domestic and foreign visitors to estimate the environmental economics of the Khangchendzonga National Park and to elicit their willingness-to-pay (WTP) for its maintenance and conservation. Using a random survey, the average WTP was US$ 8.84 for foreign visitors per visit, followed by US$ 6.20 per household per year by local community members and US$ 1.91 per domestic visitor per visit for improvement in environmental conservation. The WTP was strongly influenced by age, education and income. The present study demonstrated that the contingent valuation method (CVM) is a promising approach, however it lacks inclusion of non-monetary contributions. The WTP for environmental management by the local communities was mostly in kind or time for services. The CVM can be a useful tool for decision-makers regarding investment and policy purposes for management of biodiversity hot spots and protected areas in developing countries.

Introduction

Over the last three decades, there has been growing debate on the effects of tourism in developing countries. Mountaineering and trekking have recently inflicted adverse impacts on environment of high altitude areas (Jeffries, 1982; Pawson et al., 1984; Karan and Mather, 1985; Banskota and Upadhyay, 1991; Zurick, 1992; Rai and Sundriyal, 1997). Experience has shown that market forces may conserve too little biological diversity. However, 'conservation' does not mean non-use, but wise use, which contributes to sustainable development (McNeely, 1988). Protected areas of biodiversity interest provide a variety of benefits and services, which are essential for the economic development of a region. The economic valuations of protected areas are rarely quantified (Bergstron et al., 1990 and Dixon et al., 1994). In the past, these areas were valued only for products such as timber, fuel, fodder and non-timber forest produce. Intangible benefits of these areas have not been properly accounted by the policy-makers while implementing development programs in developing countries. However, in developed countries, economic valuations of natural resources have been used in conservation and management of protected areas (Pearce et al., 1994). Contingent valuation methods are widely applied in estimating the economic value of both marketed and non-marketed goods (Brookshire et al., 1983; Majid et al., 1983; Walsh et al., 1989; Dixon and Sherman, 1990).

Ecotourism promotes conservation of the natural and cultural heritage of an area, and simultaneously improves the living standards of host regions' inhabitants (Boo, 1990; Lindberg and Hawkins, 1993). This study deals with the importance of ecotourism in the Khangchendzonga National Park (KNP). The Yuksam-Dzongri-Goechha La trekking corridor inside the KNP is the most popular destination for adventure (trekking and mountaineering) and nature tourism in the eastern Himalayan region. The present study demonstrates the application of environmental economics in a developing country for biodiversity management in protected areas. The estimation can prove useful for the added costs of fuel-wood, fodder and timber management prescriptions needed to protect critical habitats in this park. An attempt has also been made to demonstrate the practicality of developing WTP functions for managers in estimating the benefits of other environmental values of forests, such as soil erosion and recreation. Therefore, the valuation was taken as a case study that could be also applied in other biodiversity rich protected areas of the Hindu-Kush Himalayan region as well as other mountain regions of the world.

Khangchendzonga National Park

Sikkim, a small state of India covering an area of 7096 km^2, with a population of 405505, is recognized as biodiversity 'Hot Spot' of global significance (Khoshoo, 1992). It is situated in the most magnificent range of snowclad mountains, with the world's third highest peak, Khangchendzonga (8598 m) (Figure 1). KNP falls in the north and west districts of Sikkim. It was designated as a national park in August 1977, with a total area of 850 km^2. The area was originally under reserve forest status prior to its designation

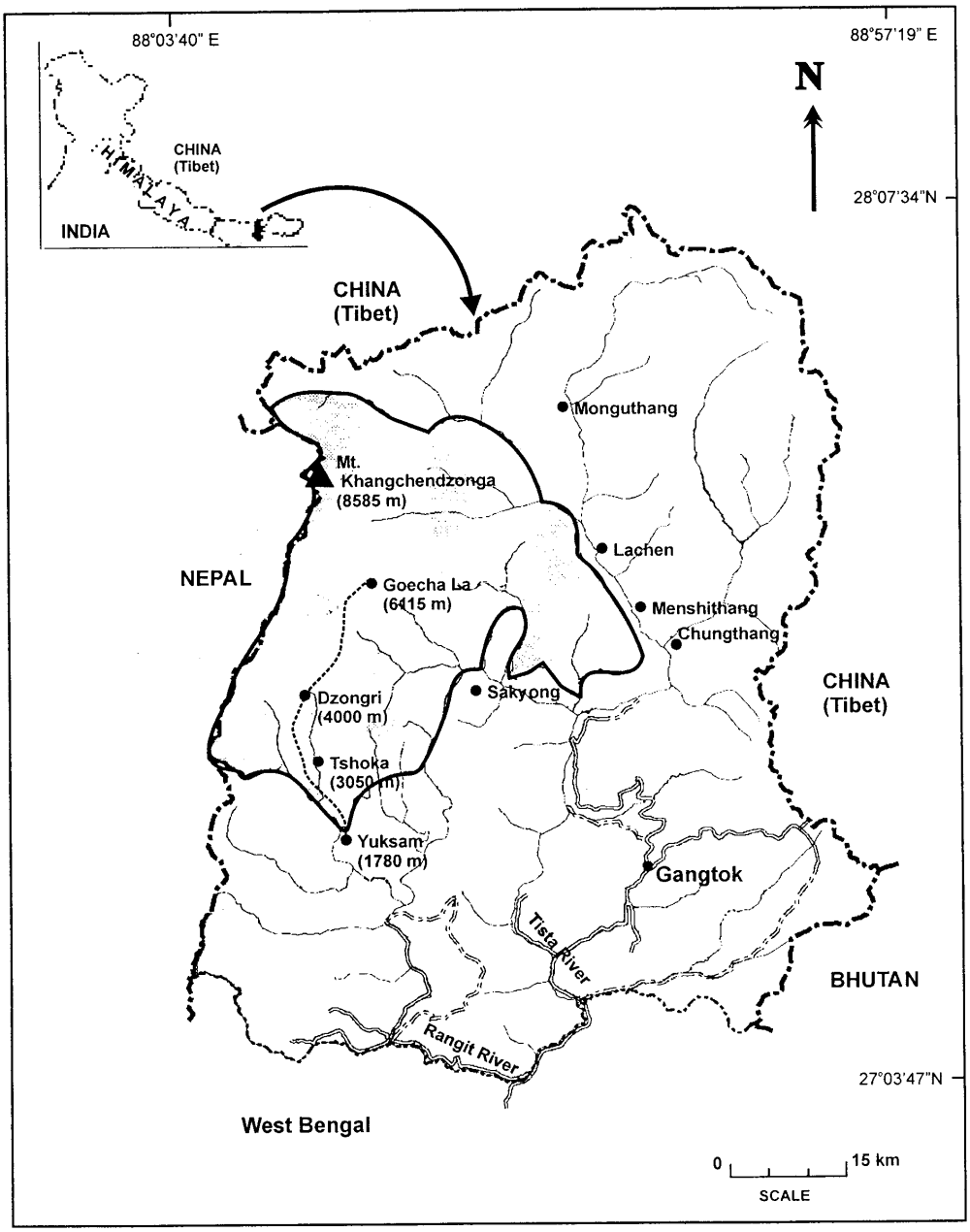

Figure 1. Map showing the Yuksam-Dzongri-Goechha La trekking corridor of Khangchendzonga National Park.

ás a national park. In 1996, the area of this national park was extended to 1784 km^2 (25.14% of the total geographical area of Sikkim) realizing its importance for having diverse habitats, floral and faunal diversity. Many villages such as at Yuksam, Sakyong, Chungthang, Menshithang, Lachen and Monguthang surrounding the park depend on the park's natural resources for subsistence living (Figure 1). The state and central governments are working to include more areas in this park and to designate it as biosphere reserve. Most of the areas in the buffer zone of the proposed biosphere have been identified for ecotourism and are also accessible to the villagers.

The northern half of the KNP is situated in the restricted zone and therefore this part is not accessible to the visitors.

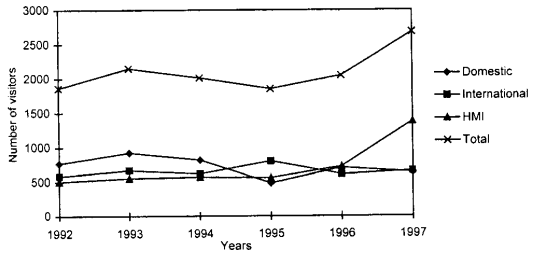

Figure 2. Annual inflow of visitors to the Yuksam-Dzongri-Goechha La corridor (1992–1997).

Entry into the park is allowed only with a valid permit, which is for 15 days for foreign tourists. The topography and the peaks along with the forest wilderness in the park areas form the main attraction of the KNP. The faunal and floral wealth of the KNP is rich and diverse. The Yuksam-Dzongri-Goechha La trekking corridor is a 45-km long trek located in the Southwestern part of the KNP (Figure 1). Tourism on this trail started before 1960. The tourist inflow suddenly increased after a relaxation of government rules in 1990 (Rai and Sundriyal, 1997). Number of trekkers increased steadily from 1992 to 1997 (Figure 2). Around 1300 visitors trekked at this site and additional 1379 mountaineering trainees also used this trek in 1997. In addition to changes in the annual visitation, the travel destination faces seasonal fluctuations. The park received more tourists particularly in Summer and Fall trekking seasons (Table 1). Travel groups involve large numbers of support staff to organize the trek. Local travel agents from Gangtok and adjoining Darjeeling district of West Bengal organize the trekking for foreign tourists. Domestic tourists organize their own treks independently. Besides visitors, local communities from the surrounding areas also exploit the natural resources of this park by grazing livestock and extraction of fuel, fodder, and timber.

Yuksam is the only settled habitation on the trail, with 11 villages, 274 households, and a total population of 1572. The last village, with 9 households, is located 16 km away from Yuksam at Tshoka on the trail with a total population of 59 people (Tibetan refugees). The most dominant ethnic group in Yuksam is the Limbu followed by Bhutia, Lepcha, Nepali and Tibetan refugees. Most of them pursue traditional agricultural livelihoods. Some have associated themselves with tourism related activities in recent years. About 110 persons worked as porters for tourist treks, 8 families have lodge/hotels, 25 families rear Yak/Dzo to provide pack animals and 6 individuals are trained local guides. The cost and benefit flows to the local community, visitors and government sector associated with the KNP is given in Table 2.

Methods

The 1997 study was based on a random survey of 545 respondents, consisting of 125 (23%) domestic visitors, 325 (60%) foreign visitors and 95 (17%) local community members. Categories of respondents were the international tourists termed as foreign, the Indian tourists as domestic and the people living in the area as local community. Out of the total respondents only 243 (31 local people, 50 domestic and 162 foreign visitors) showed their willingness-to-pay (WTP) for conservation while others refused. The visitor statistics provide information on socio-economic variables like age, sex, educational level, occupation and income. The interviews were conducted through a structured questionnaire (Bishop and Heberlein, 1992; Arrow et al., 1993) over a period of six months (March to May and October to December), corresponding with the two peak tourist seasons. The basic interview schedule was designed in English although the interviewer was trained to conduct the interview in the language with which the respondent was most comfortable (the interviewer was trained to translate key words in simple but accurate terms in common local languages). At the outset, the interviewer introduced herself to the respondent on behalf of the Sikkim Biodiversity and Ecotourism Project. Respondents were told about the nature of the project. The nature of the interview was explained, and the issues of the KNP were introduced. The respondents were assured that responses were to be used for research purposes, that their co-operation to this effort was sought, and that their confidentiality would be maintained. A brochure containing general information about the KNP and about some of the environmentally sensitive issues of the KNP was facing was presented at a specific point in the course of the interview. Hence, all respondents were brought to a minimum level of information about the benefits of preserving and maintaining the KNP. The interviews were conducted only with adult visitors who had a defined source of income, because they were considered more likely to be realistic in making personal valuations for the willingness-to-pay for the conservation of the KNP vis-à-vis their budget constraint (Brown and Henry, 1989). Face-to-face interviews, which lasted for about 30 minutes (Arrow et al., 1993), were conducted in the KNP.

The Contingent Valuation Method (CVM) was used for valuation of non-marketed goods. This method has been providing acceptable economic measures of social benefits of recreational activities (Walsh, 1986; Navrud and Mungatana, 1994). The CVM is a standardized and widely used method for ascertaining WTP for conservation (Vaux et al., 1984; Mitchell and Carson, 1989; Hoevenagel and Lindel, 1993; Hanely and Spash, 1993; Bateman and Willis, 1995). Only CVM has the potential of estimating non-marketed values (also known as existence and bequest values or passive-use value). The CVM uses survey questions to elicit people's preferences for public goods by asking them how much they would be willing to pay to get specified improvements or to avoid decrements in them (Mitchell and Carson, 1989).

The validity of WTP responses was of concern, specifically, would the respondent actually pay the money they identified in the survey? There have been dozens of studies testing the validity of stated WTP by comparison of values derived from other methods. Carson et al. (1996), Hanemann

Table 1. Seasonal variations in number of tourists and mountaineering trainees in Yuksam-Dzongri-Goechha La trekking corridor of Sikkim Himalaya, 1997

Seasons	Yuksam-Dzongri-Goechha La trekking corridor					
	Domestic Tourist		Foreign Tourist		HMI	
	Number	Group	Number	Group	Number	Group
Winter	6	2	18	7	315	5
	(1)		(3)		(23)	
Spring	35	7	146	30	342	5
	(5)		(22)		(25)	
Summer	287	37	145	37	351	6
	(45)		(22)		(25)	
Rainy	31	8	26	6	181	4
	(5)		(4)		(13)	
Fall	283	50	327	52	190	2
	(44)		(49)		(14)	
ΣX	642	104	662	132	1379	22
	(100)		(100)		(100)	
t value (0.05)	178	27	155	25	104	1.9

Percentage of annual total in parenthesis.
HMI = Himalayan Mountaineering Institute trainees.

(1994) and Dixon et al. (1994) determined that CVM derived estimates of WTP for recreations were slightly smaller than WTP from actual behavior based methods for valuing recreation.

Due to the hypothetical nature of CV markets, the method is susceptible to biases (Cummings et al., 1986; Mitchell and Carson, 1989; Arrow et al., 1993; Knetsch, 1993; Freeman, 1993; Hoovengel, 1994; Diamond and Hausman, 1994). Attempts have been made to minimize the biases in order to get a reliable estimate of the economic value of recreation. One of the most important potential biases of CVM is scenario misspecification, especially misspecification of the amenity to be valued. This is a particularly serious bias in estimating non-use values. In our case, where use values were estimated, the problem should be minimal. Responses were obtained only after the visit in the park had occurred, hence visitors were familiar with the non-use goods. There are four methods for applying CVM viz. contingent referendum, payment card method, open ended question method and bidding game. The bidding game method has been applied in the present study. Community based household information was collected by primary survey using stratified random sampling. Secondary data on tourist inflow were collected from the tourism department, police and wildlife check posts (entry points).

Survey design

A detailed survey questionnaire was developed to generate the basic information and their willingness-to-pay.

Conservation details

Questions in this part were based on the importance of environmental issues perceived by the respondents. An attempt has been also made to measure whether or not the respondent demonstrated inherent value for the environment and non-use values. Questions about the environmental attitudes of the respondent rating for the justification of biodiversity loss in context of the KNP, its avoidance, and reasons for visiting to the Yuksam-Dzongri-Goechha La trekking corridor. Preferences were measured on a five-point scale ranging from 'strongly agreed', 'agreed', 'neutral', 'disagreed', to 'strongly disagreed'.

Bidding game details

To estimate the extent of information bias prevalent in the Indian context for economic valuation, we used the bidding game technique. First, the respondents were asked whether they were willing to pay for the non-market benefits after having been asked for information about the commodity. If the answer was 'no' the interview was ended with that particular respondent. If the answer was 'yes', the second step was to determine the maximum amount he/she was willing to pay by the bidding process. The interviewee started the bidding by a higher amount. If it was above the respondent's willingness-to-pay, the interviewer reduced the bid gradually until the interviewee's answer was 'yes', whereupon the value was recorded. If the respondent agreed to the interviewer's initial higher amount, the interviewer gradually raised the bid until the respondent said 'no'.

Respondents who showed an inability to pay in cash were considered for their willingness to actually do service in the park. These respondents were asked if they were willing to contribute their time towards the maintenance of the KNP. This provided an opportunity for those who could not pay for the KNP but had the willingness to actually do service for the park. Respondents were also asked how many days per year they would be willing to work in the park voluntarily.

Socio-economic details

This section of the questionnaire was designed to collect information on socio-economic variables used in the re-

Table 2. Summary of cost/benefit flows for Khangchendzonga National Park

Population	Benefits from preservation	Costs from preservation
Recreational tourist (Both Foreign and Domestic)	Recreational value	Entrance fees to Tourism and Forest Departments
	Aesthetic value	
	Non-use value	
Local Community	More tourist inflow leads to increase in income	Loss of fuelwood and timber collection from the forest
	Employment possibilities	
	Minor forest products and NTFP	
	Educational benefits	
	Non-use value	Opportunity cost for other development
Government	Tourism revenues from: entrance fees and Govt. huts rental	Operational expenses
		Administrative expenses
	Forest revenue from: entrance fees and Govt. huts rental	
Non-Users	Non- use value	Payment of domestic taxes

Table 3. Basic Statistics of important variables

Respondents	Variables					
	Age	Sex	EDQ	OCU	INC ($)	WTP ($)
Foreign Visitors						
Mean	38.96	1.41	15.11	4.25	4011	8.84
Std. Dev	11.73	0.49	1.50	0.82	4281	11.94
Domestic Visitors						
Mean	32.71	1.18	14.90	4.01	159	1.91
Std. Dev	8.29	0.38	1.12	1.23	66	4.05
Local Community						
Mean	36.20	1.09	8.53	3.19	832	6.20
Std. Dev	8.67	0.29	4.76	1.42	375	19.08

AGE: Respondent's age in years; SEX: Male-1, Female-2; EDQ: Year of schooling; INC: Income (households annual income for local community and monthly for visitors); OCU: Occupation; Service-5, Professional-4, Business-3, retaired-2 and student-1 for visitors and Tourism involved-5, Service-4, Bussiness-3, Labourer-2, and Agriculture-1 for community members; WTP: Willingness to Pay (per trip for visitors and annually for local community).

gression estimation. Name and addresses, age, education, occupation and annual incomes were collected from the interviewees.

Statistical analysis was done using Systat Version 6.0 (1996).

Results

Basic Findings

The preliminary findings and summary statistics of the sample of 545 respondents are presented in Table 3. In the case of local community members the sample had a mean age of 36 years, with respondents ranging from 20 to 55 years of age. More than 90% of the sample consisted of male respondents. The mean household size was 5 members and ranged from 2 to 9 members. As far as domestic visitors were concerned, mean age was 33, with respondents ranging from 19 to 65 years of age. The foreign visitors mean age was 39, ranging from 20 to 67 years of age (Table 3). With respect to educational qualification of the local communities, 15% of the respondents were illiterate and 23% had less than 10 years of schooling. About 34% of the respondents had obtained high school, 9% higher secondary and 19% had a bachelor's degree. The educational qualification of the domestic visitors showed that 9% were master degree holders, 81% bachelor degree holders and 10% had higher secondary education. In the case of foreign visitors, 25% of respondents had master degrees, 60% bachelor degrees and 15% had a higher secondary education.

Occupation of local community members showed 31% of respondents from service sector, 32% farming and off-farm activities, 21% tourism and 16% business people. Occupation of domestic and foreign tourists showed 45% and 40% in government service, 34% and 51% profession-

Table 4. Reason for visiting Yuksam-Dzongri-Goechha La Corridor of Sikkim (1997)

Reasons	Visitors			
	International		Domestic	
	Number	(%)	Number	(%)
Holiday/pleasure	73	22.46	36	28.80
Trekking/mountaineering	101	31.08	20	16.00
To encounter wilderness	52	16.00	6	4.80
Mountain viewing	76	23.38	44	35.20
Interest in flora/fauna	13	4.00	3	2.40
Interest in local culture	10	3.08	16	12.80

als, 10% and 6% business, 10% and 1% students, respectively. Small fractions (1 to 2%) of domestic and foreign visitors were retired persons. Thirty four per cent of the foreign tourists were French and Swedish, 16% British, 11% German, 5% American and 33% were from other countries.

The attractions for visitors were diverse. A majority came for recreation/trekking, followed by viewing mountain peaks, wilderness and bird watching, and specialized interest groups on flora and culture (Table 4). Trekking duration ranged from 5 to 15 days with an average of 9 days. Normal daily expenditure by tourists ranged from US$ 5 to US$ 45, with average value of US$ 26 depending on nature of trek (independent or organized tourism). In response to their interest on protecting the forest/wildlife of the park, about 23% of foreign and 26% of domestic tourists were "not interested", 26% of foreign and 42% of domestic tourists "fairly interested", 33% of foreign and 12% of domestic "interested", and 18% foreign and 20% domestic "very much interested".

Analysis of the visitors' attitude on environment perception towards protection of the KNP revealed that 42% and 59% of domestic and foreign visitors considered it "very important", 38% and 32% "important", 12% and 5% "not very important" and 8% and 4% "unimportant", respectively. Perception on biodiversity loss justification in the context of India showed that the majority of both domestic and foreign tourists agreed to this point (Table 5). A question on the direct relevance of the KNP for avoidance of biodiversity loss at any cost were not acceptable to the local community, the reason being their dependency on natural resources. In contrast, about 50% of both domestic and foreign tourists agreed to the avoidance of biodiversity loss at any cost (Table 5).

In response to environmental problems and steps to be taken for conservation, about 10% said that there was no need to conserve the biodiversity of the KNP because it was already in good condition, while 90% expressed conservation needs. On the question about who should conserve and maintain the KNP, about 55% were not sure. Of proposed implementing authorities, the majority of international tourists felt that the conservation in the KNP should be a collective effort, with the next ranked being government and community jointly (Table 6). The domestic tourists responded similarly, desiring government and community jointly to play the main role, followed by collective effort and then government (Table 6). When asked whether they feel responsible for the maintenance of the Yuksam-Dzongri-Goechha La trek route, 85% of the respondents gave a positive response, whereas 15% responded negatively.

Table 5. Respondents' perception on the importance of environmental issues (%).

Opinion	Respondents	QUESTIONS	
		Biodiversity loss justification in the context of India	Avoidance of KNP biodiversity loss at any cost
Strongly	LC	–	28
disagreed	DT	3	2
	IT	1	2
Disagreed	LC	–	40
	DT	4	24
	IT	1	28
Neutral	LC	–	17
	DT	19	19
	IT	22	13
Agreed	LC	–	13
	DT	64	48
	IT	63	50
Strongly	LC	–	2
agreed	DT	10	7
	IT	13	7

LC = local community; DT = domestic tourist; IT = foreign tourist
(–) This question was not asked to the local community

Table 6. Respondents attitude for the protection of park

Implementing authority	Visitors			
	International		Domestic	
	Number	(%)	Number	(%)
Government	38	12	19	15
Non-Government Organization (NGO)	10	3	9	7
Local Community	10	3	12	10
Government and Community	123	38	49	39
Collective effort*	142	43	30	24
Can't Say	2	1	6	5

*Includes visitors, local community, travel operators, NGOs, and government

Analyzing Willingness-to-pay

Generally those respondents who are getting direct benefits from the park were considered for the analysis of WTP, but in the present study the WTP was assumed to be a function of the respondents' personal characteristics and income level. Another variable, education level, was used as an explanatory variable. Greater number of years of schooling would arguably increase the knowledge of a person. Perhaps education would help a person comprehend news about the environmental effects of economic development. Age and gender were also used as explanatory variables. Table 7 presents the results from the WTP exercise for domestic, foreign visitors, and local community showing average response rate to be 45% on the question regarding the

Table 7. Results from the contingent valuation (CV) question

Variables	WTP		
	Foreign visitors	Domestic visitors	Local community
Mean value per visitor (US$)	8.84	1.91	6.20
**Aggregate value for all visitors (US$)	5852	1226	1699
*Respondents with WTP (%)	50	40	33
+Response rate (%)	49	19	35

WTP: Willingness to pay, US$ 1 = Rs.38/- (as per the conversion rate in 1997).
**The non-respondents were assumed to have a WTP equal to those that answered.
*Based on total respondents who responded positively for WTP.
+Based on total visitors/House holds.

motivation behind respondents WTP for conservation. Only 31 local households indicated a willingness to pay for better management of the KNP. About 25 households said that they were willing to pay, but due to their financial constraints and other responsibilities they were unable to pay. Thirty households indicated willingness to perform voluntary work by providing manual labour for trail maintenance and cleanup. Respondents who were willing to volunteer agreed to set aside about one day per month. Some of them said they could provide seedlings for plantations in the surrounding areas. Nine households refused completely to pay in kind or in cash for conservation. In case of foreign tourists, only 49% indicated a positive reaction to WTP for conservation, while 27% agreed on condition that the amount would be utilized in a constructive manner, and 24% refused to pay. In case of domestic tourists, about 60% respondents showed an indifferent attitude towards paying for conservation because they felt that it was the responsibility of the state government and local communities.

An analysis of the WTP provides an opportunity to study the content and context validity of the interview schedule. The basic statistics are listed in Table 3. An Ordinary Least Squares (OLS) regression was used to analyse WTP. The regression revealed that the variables attained the expected signs, as presented in Table 8. The R^2 value is encouraging in the present context. Age showed a positive correlation with WTP in the case of all domestic, foreign visitors, and local communities. It was found that the middle age group and older age group of people could spare the money to accept CV bids while the young age group could spare less. This suggests that age is a major factor for all types of respondents to accept the WTP.

Educational qualification did not show a significant correlation with WTP when zero bid was included, however, on exclusion of "refuse the bids", it showed positive correlation with WTP ($P < 0.003$). This was mainly attributed to less educated respondents opting for most of the "refused the bids" for WTP. Fifty-five per cent of the total responses were "refused to pay". Occupation was not a major factor to accept the CV bids. Those people who were directly involved with tourism related activities and getting more economic returns were interested to pay for WTP as compared to those who were not getting the economic benefits from tourism. Our results also indicate that businessmen were willing to pay more than professionals. This finding has important policy implications as businessmen have the most potential for financing environmental improvements. Sex also did not influence the visitation rate and WTP for conservation. The income of visitors significantly influenced their WTP for conservation of the area (Table 8).

Table 8. Result of multiple regression estimation

Components				
Dependent variables	WTP			
No. of observation	243			
Multiple R	0.348			
Squared multiple R	0.121			
Adjusted squared multiple R	0.103			
Standard error	489.155			
Variables	Coefficient	Std. Error	t value	$P <$
AGE	9.534	2.860	3.334	0.001
SEX	−41.927	68.196	−0.615	0.539
EDQ	34.167	11.195	3.052	0.003
OCU	−6.886	31.567	−0.218	0.828
INC	0.005	0.002	3.148	0.002

Analysis of variance

	Sum-of-squares	DF	Mean-Squares	F-Ratio	$P <$
Regression	7828703.690	5	1565740.738	6.544	0.000
Residual	5.67075E+07	237	239272.254		

AGE = Age, SEX = Sex, EDQ = Educational qualification, OCU = Occupation, INC = Income

For the entire sample, using means of variables, the estimated Willingness-to-pay for the management of the KNP was US$ 8.84 by foreign visitors per trip, US$ 1.91 by domestic visitors per trip, and US$ 6.20 by the local community on an annual basis. This shows that the foreign visitors had higher recreational/conservation values than did the domestic visitors and local community members. The question regarding the confidentiality concerning the right amount for their conservation contribution, about 26% of local community members, 22% of domestic, and 20% of foreign visitors stated that they were "very confident", while 55%, 52%, and 40% were "confident", respectively. About 13% of local community members, 16% of domestic, and 28% of foreign visitors were "undecided"; the remaining were "not very confident". These responses suggest that the amount stated by the respondents were valid.

Discussion

The number of visitors is increasing at a very fast rate in Sikkim. The rate increased 155% from 1980 to 1995 (Rai and Sundriyal, 1997). Compared to other parks in India, the frequency of visitors was less in the KNP because most of the visitors seldom return to trek for a second time in the same area. Therefore, the WTP stated by all the visitors was for that particular trek, while a small number of foreign tourists stated that they would like to help voluntary organizations for community and environmental development in the host region. This study revealed that the visitors' WTP did not depend upon the benefits they would get in preserving the park, but most of them stated that their WTP was just to keep the beautiful, unexploited landscape and rich biodiversity of this area intact. The demands for nature tourism/ecotourism in Sikkim by foreign and domestic visitors have also been increasing enormously. Walsh (1986) gave an overview of the price elasticity of demand for various recreational activities. The price elasticity of demand for a recreational activity is generally low when the proportion of income spent on it is low (Walsh, 1986). This may be an indication of the income effect at the national income level. As respondents income levels grow the income elasticity may improve for environmental goods. The probability of participation increased with age and increasing income. The magnitude of economic problems restricted domestic visitors from visiting the park because the entry fees for the park are relatively high as compared to other protected areas. Therefore, visits to the KNP are given low priority by most of the domestic tourists, that is, except for a few rich individuals and people from India's West Bengal, Maharashtra, Delhi, and Gujarat State. WTP for all categories of visitors and local community showed significant co-variance. The WTP was significantly related to age, education and income levels. Our findings are similar to those of Walsh (1986), where age and income appeared to be the most important socio-economic variable determining the probability of participation in recreation activity. This was expected, as an increase in income level would show respondents' greater willingness to spend on recreation. Sex did not significantly influence the WTP. The WTP per trip was much higher for foreign tourists than domestic tourists, which was mainly attributed to higher income levels and environmental awareness. Local residents' WTP for the entire year is no less significant for this group has a long term stake in the area. Aspects of time, services, or traded goods (tree seedlings in the present study), contributed by the local community, are of no less value than WTP. Therefore, contributions by those who are willing to give time and materials for environmental conservation should be a part of WTP. A quantification methodology of this needs to be developed in future studies. Annual WTP equals US$ 8777 for the maintenance and preservation of the KNP when extrapolated to total visitors and community households. This is significant. The WTP amounts strongly support the enterprise-based community involvement in biodiversity/nature conservation, and suggest that the concept of ecotourism has percolated to all levels of direct and indirect beneficiaries/stake holders.

Conclusions

This environmental valuation study has been carried out in a developing country. It demonstrates that the contingent valuation method (WTP) is a promising approach since it includes a broad range of societal concerns about environmental management. However, the WTP lacks inclusion of non-monetary contributions. The WTP for the KNP is emphatically positive. The responses from local communities, domestic and foreign visitors about their willingness to conserve serve as a good indicator of the role that visitors (in an ecotourism as enterprise setting) can play in conservation. Mean WTP per visitor per visit was higher for foreign visitors than domestic visitors attributable to their higher income and general awareness. It is especially important to note that the local communities are willing-to-pay for environmental management, mostly in kind or time for services. Therefore, CVM could be a useful tool in providing more relevant information for decision-makers for investment and policy purposes in biodiversity hot spot and protected area management.

Acknowledgements

The authors are grateful to the Director, G.B. Pant Institute of Himalayan Environment and Development and The Mountain Institute, U.S.A., for providing necessary facilities and grants. The work is a part of the Sikkim Biodiversity and Ecotourism Project, which received support from the Biodiversity Conservation Network funded by USAID. IDRC-Canada provided financial support to Iyatta Maharana.

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