Recreational Demand for Fewa Lake: An Application of Travel Cost Method

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ABSTRACT

Economic valuation of non-market commodities like the recreational amenities provided by national parks, lakes, zoos and sanctuaries is complex and new in Nepal. In this study it is intended to analyze the recreational demand of Fewa Lake by using individual travel cost method. Fifty Nepali visitors were interviewed by administering close ended questionnaire schedule. Most of the respondents were urban unmarried males with secondary and above qualifications, earning a monthly income of around rupees ten thousand. The regression result shows cost of travelling, income, age, education and location as the major determinants of demand for Fewa Lake's recreational amenities. The consumer surplus was estimated to be Rs. 18.5 per Nepali visitor per trip. It can be inferred that a provision of entry fee along with quality enhancement would attract more visitors and generate revenue for this Lake.

INTRODUCTION

Increasingly, society is placing greater demands on nature based recreational amenities which have indirect market values. Pokhara Valley is one of the most beautiful places in the world, while Fewa Lake is its spectacular attraction where international and domestic tourists throng every year to be with its serene beauty to watch snow caped mountain range and enjoy boating. There is lack of proper management and proper fee system for utilization of amenities provided by the lake. Therefore, this study applies a travel cost method to measure the value of the lake.

The travel cost method was developed from a suggestion made by Harold Hotelling that empirically a demand schedule could be used to compute the total benefits produced to park visitors (Hotelling, 1947). On the basis of Hotelling's suggestions, Clawson (1959) then carried out some rigorous research using the developments contained in Hotelling's suggestions (Clawson, 1959).

Travel cost method is a primary non-market valuation method which estimates revealed preferences by comparing the travel costs of visitors or attendees to a particular (recreational) site or event (Shaw and Rogers,2005). Garrod and Willis (1999) put it that the method is primarily employed to estimate the demand or marginal valuation curve for recreational sites. Similarly, Sarker and Surry (1998), Sohngen *et al.* (1999), Shrestha *et al.* (2002), Blackwell (2007) and Anderson (2010) are just a few who have employed the ITCM.

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Bell and Leeworthy (1990) evaluated the recreational demand by tourists for saltwater using the TCM and found out that the daily consumer surplus per visitor is about 34 US$ (Bell & Leeworthy, 1990). Similarly, Kaosa-ard, *et al*., (1995) using TCM to measure the Khao Yai National Park's use value and non-use value, found the average WTP for entrance fee is 22 baht per person and average WTP after some improvements was 44 baht per person (Kaosa-ard, et al.). Khan (2004) studying the recreational demand of Margalla Hills Park, suggested a park entrance fee of Rs. 20 per person could raise Rs. 11 million revenues annually for park management and improvement.

This study intends to identify the major factors that determine the recreational demand of Fewa Lake among Nepali respondents and explore their willingness to pay for improved lake condition.

DATA AND METHODS

In this study individual visitors were chosen as respondents for interviews. "Visitors" were defined as those Nepalese individuals who travelled to Fewa Lake for the purpose of recreation. A closed ended questionnaire schedule to be filled in by enumerators was surveyed for a week at the shore facing Tal Barahi Temple at Lakeside during November 2012. It is estimated that about a quarter of a million foreign tourists visit Pokhara but there are no proper accounts of internal tourists. Constrained by funding, only 50 Nepali respondents were sampled by visiting the above site over a week (about 7 persons per day).

In order to model the travel cost function, it has been followed the Freeman (1993) and assume that the individual's utility depends on the number of visits to the Fewa Lake, the quality of the Lake, and the quantity of the numeraire. The individual solves the following utility maximizing problem:

$$Max: U (X, r, q) \dots \dots \dots (1)$$

Subject to the twin constraints of monetary budget:

$$M = X + c.r \dots \dots \dots (2)$$

Where X = the quantity of numeraire whose price is one,

r = number of visits to the Fewa Lake,

q = environmental quality at the site,

M = exogenous income,

c = monetary cost of a trip,

It is assumed that r and q are (weak) complements and opportunity cost is controlled for this study. Maximizing equation (1) subject to the constraint of equation (2) yield the individual's demand functions for visits:

$$r = r (Pr, M, q). \dots \dots (3)$$

Various independent variables were used to explain variation in the dependent variable r. Both economic theory and the considerable experience of recreation managers have shown that demographic and other independent variables influence recreation visitation.

Demographic variables such as age, sex, education, income, marital status, rural versus urban residence and family size affect recreational demand. Intuitively it is assumed as age increases, participation decreases. It was expected that men would be more likely to participate than women. People with higher education were expected to appreciate outdoor nature-based activities more than people with less formal education. Household income is positively associated to the rate of lake visits while urban dwellers are likely to visit more than people from rural areas. Similarly, a better-quality park should attract an individual more often than a degraded-quality Lake.

The model is specified as follows:

$$r_i = \beta_0 + \beta_1\,TC + \beta_2\,MI + \beta_3\,AV + \beta_4\,VHLE + \beta_5\,HS + \beta_6\,D_1 + \beta_7\,D_2 + \beta_8\,D_3 + e_i \ldots \ldots (4)$$

Where r_i stands for the number of visits by the **i**th individual to Lake per period of time, TC is the *travel cost* that refers round trip total cost from an individual's residence to and from the site. MI is the monthly income, AV the age of visitor, VHLE visitor's highest level of education, *HS* refers size of the household, D_1 is dummy for sex, 1 if male and 0 otherwise, D_2 is dummy for location, 1 if urban dweller and 0 otherwise, D_3 is dummy for park quality, 1 if the visitor's perception about the site's recreational facilities is good and 0 if bad. The data entry and analysis was done in SPSS Version 16.

RESULTS AND DISCUSSION

The following table shows the demographic characters of the respondents. Most of the sampled respondents were fairly educated (secondary above) unmarried urban adult males among which a large proportion was engaged in salaried job or, run self proprietorship petty shops and earn a monthly income around ten thousand Nepalese rupees.

Table 1: Descriptive Analysis of Sample Respondents

Variables	categories	n=50
Age (years)		33.08
Household size		5.46
Sex	Male	82%
	Female	18%
Marital Status	Unmarried	62%
	Married	38%
Level of Education	Illiterate	16%
	Primary	18%
	Secondary up to plus 2	22%
	University level	44%
Location	Urban	60%
	Rural......................................	40%
Monthly income	0-5000...................................	6%
	5000-10000...........................	54%
	10000-20000.........................	24%
	20000-30000.........................	6%
	30000-50000.........................	8%
	50000-100000.......................	2%
Profession	Agriculture/farming..............	18%
	Self proprietorship/retail shop.	40%
	Salaried job got private........	32%
	Foreign employment...............	4%
	Unemployed...........................	6%

Source: Field Survey, 2012.

Regression Analysis

First, the variables were tested for auto-correlation. According to Loomis and Walsh (1997), an absolute value of 0.8 indicates the possibility of multicollinearity. The correlation matrix displayed in Appendix 1 however shows no correlation higher than 0.46, which indicates that there is no multi-co linearity problem with data set. All variables could thus initially be included in the analysis. The adjusted R square value is around 40 percent.

Table 2: Estimated Result of Regression Equation

Variables	Std. Coefficients	t-statistics	P value
(Constant)	3.456	5.127	0.000
Cost of travel***	-0.350	-2.842	0.007
monthly income***	0.357	2.688	0.010
Education***	-0.455	-3.161	0.003
Age **	-0.378	-2.630	0.012
household size	-0.368	-0.922	0.362
Dummy1 Sex (Male=1)	0.037	0.313	0.756
Dummy2 location**(Rural=1)	-0.277	-2.171	0.036
Dummy3 visitors perception (good=1)	0.190	1.542	0.131
Adjusted R^2	0.40298		

*Notes: * Significant at 10% level; ** significant at 5% level; *** significant at 1% level*

As per the above table cost of travel, monthly income, education, age and location are statistically significant. The negative sign of coefficient of cost of travel implies that the higher the price paid by visitors to reach the lake, the lesser would be their frequency of visits. A unit increase in the cost of travel to the lake (price) would decrease the visitation rate (demand) by 0.35 times. Monthly income is positively related to rate of visitation of lake. If the income of consumer is raised by one unit then the rate of visit to the lake would increase around by 0.36 times. The coefficient of education does not have the expected sign. Age and visitation rate to the lake are negatively related. An increase in the age of the visitors by 1 year would decrease the rate of visitation to the lake by 0.378 times. Among the dummies, only location is significant. If the chance of visitors, residence being a rural, is 100 percent then the visitation rate would fall by around 30 per cent.

Recreational Value of Fewa Lake (consumer surplus)

Till date there is no any entry fee to Fewa Lake.

Table 3: Recreational Value of Fewa Lake in a Week of November, 2012

Willingness to Pay [WTP] in NRs.	n = 50	Value
0	16%	0
15	20%	150
20	52%	520
35	6%	105
50	6%	150
Total	100	925
		CS = NRs. 18.5/person per visit

Source: Field survey, 2012

The table above indicates that 84 per cent of the respondents are willing to pay for the improved condition of the lake. From the improved amenities of the lake, more than half of the respondents are willing to pay NRs. 20 as entry fee whereas 6 per cent of them are willing to pay NRs. 35 and NRs. 50. The consumer surplus (CS) is NRs. 18.5 /person for a trip to Fewa Lake among Nepali visitors.

CONCLUSION

From the study we may conclude that non-market valuation techniques can be used to estimate the economic benefits of environmental resources such as national parks, lakes and public parks. Most of the respondents in this study were adult unmarried, and higher secondary educated urbanites. The major determinants of recreational demand of Fewa Lake are travel cost, income of individuals, age, education and residential location. On the basis of consumer willingness to pay (WTP), the study infers that consumers are willing to pay an entry fee if Lake quality is well maintained and improved. The policy makers and stakeholders of such amenities have ample room for raising revenue for improving and conservation nature based sites.

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Annex - I

Correlation Matrix

	Sex	age	HH size	Education	Location residence	Monthly Income	Perception of visitors	Cost of travel
Sex	1.00	-0.08	-0.06	0.03	-0.17	0.16	-0.05	0.03
age	-0.08	1.00	0.13	-0.47	-0.13	-0.06	-0.15	0.05
HH size	-0.06	0.13	1.00	-0.13	-0.13	-0.35	-0.12	-0.16
Education	0.03	-0.47	-0.13	1.00	0.30	0.28	-0.21	0.43
Location residence	-0.17	-0.13	-0.13	0.30	1.00	0.34	0.12	0.26
Monthly Income	0.16	-0.06	-0.35	0.28	0.34	1.00	0.12	0.22
Perception of visitors	-0.05	-0.15	-0.12	-0.21	0.12	0.12	1.00	-0.24
Cost of travel	0.03	0.05	-0.16	0.43	0.26	0.22	-0.24	1.00

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