"Estimating willingness to pay for recreational services of two public parks in Peshawar, Pakistan"

AUTHORS	Himayatullah Khan Farman Ali Humayun Khan Mahmood Shah Saba Shoukat

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Himayatullah Khan (Pakistan), Farman Ali (Pakistan), Humayun Khan (Pakistan), Mahmood Shah (Pakistan), Saba Shoukat (Pakistan)

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Abstract

The present paper estimates willingness to pay (WTP) for recreational services of two parks in Peshawar, Pakistan. The data were collected from a sample of 500 respondents in September-October 2013. The paper aims to answer the following questions: What determines visitors' WTP? Whether improvement in recreational benefits would lead to a higher demand for park visitation with people willing to pay a higher price for better quality of environmental services? In order to understand the determinants of the visitors' WTP responses and to see whether these determinants are consistent with economic theory, multivariate analyses were performed to explore variation in various measures of the respondents' WTP. Cost of travel, visitors' income, and distance from home to park, education, and quality of recreational services were significant determinants of WTP. Own-price elasticities of demand were negative in all cases. Cross-price elasticities were positive and significant for both parks showing substitute relationship. Park demand visitation was significantly income elastic for both parks.

Keywords: recreation, willingness to pay, demand for parks visitation, consumer surplus, Pakistan.
JEL Classification: A10, Q26, Q51, Q56.

Introduction

Ecotourism in Pakistan. Ecotourism implies a responsible travel to natural areas that conserves the environment and improves the welfare of local people. Ecotourism means education, for both tourists and residents of nearby communities. Ecotourism helps raise funds for environmental protection, research and education through a variety of mechanisms, including park entrance fees, tour companies, hotel, airline and airport taxes and voluntary contributions. Ecotourism plays a pivotal role in increasing natural resource conservation and economic growth. Literature relevant to ecotourism has focused upon the role of user fees in the management of national parks and protected areas, primarily in developing countries. In many developing countries seeking to balance environmental and economic growth objectives, the challenges facing policy makers are particularly great.

Pakistan, like other developing countries, is seeking to revitalize its tourism sector, including nature tourism to an expanding system of national parks and reserves. Pakistan is one of the poorest in terms of bio-diversity in South Asia. It has experienced high rates of deforestation in recent years (World Resource Institute, 1996). Forests cover as little as 5% of the country area. Due to ever-increasing population, it is losing more and more forests cover primarily because of conversion of forests to agricultural uses as well as residential uses. The Government of Pakistan has, in recent years, felt a serious concern over the deforestation and has shown significant interest in the growth of a renowned national park system. Pakistan has a number of national parks, reserves, and wildlife refuges in different parts of the country. Despite limited number of national parks and reserves their management is far from satisfactory. This may partly be because of insufficient governmental funds and open access of visitors to these places. There is a need for a thorough investigation of how these parks can be well managed and how these environmental resources can be valued.

Research problem. Public goods like national parks and local public parks benefit society in many different ways. They perform not only ecological functions but also provide recreational facilities to visitors. They are a source of valuable foreign exchange earnings to national exchequers. There are only few parks in the country and these are also threatened by various activities like forest fire, soil erosion, and human settlement inside the parks, pollution created by the villagers or visitors inside the parks as well as encroachment by local villagers. Thus, the overall negative and undesirable impact caused by one or another reason may be associated with insufficient funding for managing these parks (Grandstaff and Dixon, 1986; Kaosa-ard et al., 1995).

Usually, there may be two sources of funds required for park management: the federal and/or provincial government budgetary allocation and revenues generated from park entry fees. The government budget allocated for management of national parks in Pakistan is very limited as it competes with other developmental programs including education, health care, infrastructure, defense spending, etc. in the country. Therefore, the other alternative can be used to generate more and more revenues for park management. At present a very low entry fee is charged and entry into various parks is almost free. Charging

entry fees into these parks can, therefore, generate sufficient funds. Furthermore, park revenue from entry fees may be increased provided parks were priced suitably. This suggests that although the federal government budget for national park management is faced with stiff competition from other items in the budget, adjusting park entrance fees may increase park revenue. The present study probes into the possibility of enhancing park entry fees to reflect the recreational benefits that national parks provide to the visitors. Public parks in Pakistan face shortage of funds for their management and are threatened by different activities performed by humans and nature. Their recreational benefits are declining day by day. There is a dire need for their management on sustainable basis, which in turn requires their correct valuation. This study focuses on two parks: (1) Tatara Park and (2) Bagh-e-Naran. Both these parks are located in Hayatabad, Peshawar.

Research questions to be answered. If environmental resources were marketable goods, their value would be easily determined and realized in the market like ordinary goods and services. But recreational uses of environmental resources are affected by changes in quality of services. Recreational benefits of national parks are also affected by the quality of environmental and recreational services. This study seeks to answer some research questions: (1) What are the factors that determine visitors' WTP for recreational services of public parks? and (2) Whether improvement in recreational benefits of national parks would lead to a higher demand for recreational benefits with people willing to pay a higher price for better quality of environmental services?

1. Literature review[1]

There are many environmental valuation studies in the literature but only few of them have used economic approach to calculate welfare measurement[2]. Some studies have combined the travel cost method (TCM) with the open-ended contingent valuation method (CVM) to assess willingness to pay (WTP). Chase et al. (1998) studied ecotourism demand and differential pricing of natural park access in Costa Rica. The study presents a conceptual framework and empirical analysis of the impacts of introducing differential entrance fee policy at three national parks in Costa Rica. Contingent behavior methodology has been designed to elicit information on foreign tourists' hypothetical park visitation behavior at alternative entrance fee levels. The study has also

estimated park visitation demand functions and price and income elasticities. Grandstaff and Dixon (1986) used the zonal TCM and found the consumer surplus of Lumpinee Park use value to be 132 million Baht. However, the CVM found this value to the tune of 130 million Bahts. Kaosa-ard et al. (1995) used the TCM to measure the Khao Yai National Park use value and the CVM method to measure its nonuse value. The TCM estimates showed the direct benefit of 1,420 Baht per visit, of which 870 Baht is the consumer surplus. The average WTP for entrance fee is 22 Baht per person. The average WTP after some improvements is 44 Baht per person. The average nonuse value for Thais is 730 Baht per person per year. The average nonuse value for non-Thais is 183 Baht per person per year. These findings indicated that the value of Khao Yai National Park was certainly positive and was of reasonable magnitude. After some improvements, the WTP for each park visit increases from 22 to 44 Bahts per person, which suggests some positive marginal benefit of park improvements. When compared to the marginal cost, it indicated that park improvements would yield a net gain to society. The review of studies conducted earlier shows that even though some studies (Grandstaff and Dixon, 1986; and Kaosa-ard et al., 1995) carefully measured the environmental benefits, but these two studies focused on a single park and did not include park substitutability in their analysis. Only one study (e.g., Isangkura, 1998) was based on multi-park system. But these three studies were undertaken in Thailand. Studies conducted in other developing countries though somewhat better suffered from methodological limitations of one type or another. The present study, which is an empirical investigation of WTP for entry into Tatara Park and Bagh-e-Naran in Peshawar can be considered as a pioneering work in park valuation in the country. This study focuses on two parks mentioned above and uses the concept of a multi-park system which allows the researcher to explore consumer preferences for recreational attributes and how consumers may substitute one recreational park for another. As these recreational resources are different in terms of recreational attributes, adopting a multi-park system will enable the researcher to learn about the consumer preference ordering for these recreational attributes, given that they are able to substitute one site for another. In addition, it uses an improved methodology, as it employs a combination of OLS, Tobit and Logit models to assess respondent's WTP for improved services of national parks.

2. Research methodology

In modeling consumer behavior towards environmental goods, it is often important to consider the

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[1] This section is mainly based on literature reviewed in Arin and Sills (2001) and Chase et al. (1998). See also Khan (2006) and Khan (2007a, 2007b).
[2] For further details about environmental valuation methods, see Bateman and Willis (1999).

possible substitutes to the environmental goods in questions. This study therefore assumes that there exists a multi-park system where a number of recreational parks are located close to each other. The consumer will make a choice from among these sites. Specifically, the consumers will face a choice between two different recreational areas, each endowed with different recreational services or attributes. The study employs the contingent valuation method. In order to understand the determinants of the visitor's WTP responses and to see whether these determinants are consistent with economic demand theory, a series of multivariate analyses were performed with the data obtained from the questionnaire. Various independent variables were used to attempt to explain the variation in different measures of visitor's WTP for improved recreational services of the two parks.

This study was concentrated on the users' group for a number of reasons. The individual visitors instead of households were chosen as respondents for interview. "Visitors" were broadly defined as those who use the two parks for recreation. On the whole 500 respondents (280 from Bagh-e-Naran and 220 from Tatara Park) were interviewed for data collection. The visitors were randomly chosen for interviews. Specifically, visitors were either interviewed at the gate when they were entering into park or in the park enjoying recreational benefits. The survey was undertaken in September-October 2013. The desired data were collected with the help of a pre-tested interview schedule. The analyses were done in SPSS and Eview.

2.1. Econometric models. *2.1.1. Ordinary least squares (OLS) models.* The following model was estimated using OLS method:

$$Y_i = \beta_0 + \beta_1 TC + \beta_2 Inc + \beta_3 Edu + \beta_4 Age + $$
$$+ \beta_5 Dis + \psi_1 D_1 + \psi_2 D_2 + \varepsilon_i, \qquad (1)$$

where Y_i are the Final bid for WTP amounts, *TC* are the total travel cost (Rs.), *Inc* is the Household's income (Rs./month), *Edu* is the Respondent's educational level (years completed), *Age* is the Respondent's age (years), *Dis* is the Distance (km), D_1 is 1 if respondent is male and 0 otherwise, and D_2 is 1 if respondent's perception about Park's recreational facilities is good and 0 if bad.

Specification of the functional form is crucial to the benefit estimates obtained. In practice the choice of the functional form needs to be determined empirically. There is some consensus that a semi-log gives the best results namely regressing the logarithm of visitation rates against travel cost, etc. (Bann, 1998). However, we also used double log functional form of the above model to estimate (own- and cross-) price and income elasticities of demand for visitation of the two parks.

2.1.2. Logit model. The exploration of whether a person is willing to pay for visitation of the national park was also done using Logit models[1]. This model was chosen because of its ability to deal with a dichotomous dependent variable and a well-established theoretical background[2].

The model is specified as follows:

$$P_i = E\left(Y = 1 \mid X_i\right) = [1 / \left\{1 + e^{-(\beta_0 + \beta_i \sum X_i)}\right\}]. \qquad (2)$$

where P_i = is the probability that $Y = 1$, X_i is a set of independent variables explained above and β_i are coefficients to be estimated corresponding to logistic distribution. Taking a natural logarithm of equation (2) we obtain:

$$L_i = \ell n \left\{P_i / (1 - P_i)\right\} = \beta_0 + \beta_i \sum X_i + \varepsilon_i, \qquad (3)$$

where L_i (logit) is the log of the odd ratios and is linear in both independent variables and parameters. The estimation method to be used will be maximum likelihood estimator (MLE).

3. Empirical results

Table 1 shows some of the descriptive statistics of the 500 respondents interviewed.

Table 1. Descriptive statistics of the respondents

Variables	Mean	Std. dev.	Min.	Max.
No. of recreational trips	15.56	15.8	1.00	18.00
Distance (km)	30.12	16.30	1.17	70.41
No. of trips to Tatara Park	3.30	2.53	0.00	13.00
No. of trips to Bagh-e-Naran	1.65	5.34	0.00	22.00
Age (years)	47.95	11.30	17.00	60.60
Household size	6.10	10.40	4.34	11.35
Monthly income (Rs)	20000	3345.6	9,000	45,000
Sex:				
Male	60 %			
Female	40 %			
Marital status:				
Single	42%			
Married	58%			
Education:				
None	20 %			
Primary	55 %			
Secondary	10 %			
Technical diploma	02 %			
Bachelor's degree and above	13%			

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[1] There might be distinction in the application of probit and logit models in dealing with qualitative variable cases. Probit is thought to better suit the experimental data while logit might be more appropriate for the survey data (Bann, 1998).
[2] For more detailed discussion, see Alberini et al. (1997), Alberini (1995), and Kannien (1995).

Table 1 (cont.). Descriptive statistics of the respondents

Variables	Mean	Std. dev.	Min.	Max.
Residence:				
Peshawar city	60 %			
Peshawar Dist. (other than Peshawar City)	20 %			
Other NWFP	12%			
Other provinces	08%			

3.1. Descriptive statistics. On average, the sample respondents visited nature-based recreation about 8.5 times per year with their mean yearly spending on recreation of Rs. 9000. Their mean monthly income is Rs. 20,000. About 60 per cent of the respondents are male and 40 per cent are female. As many as 58 per cent were married and 42 per cent were single. The average age of the respondents was 48 years and the average household size was about 6. The average distance between the two parks and the respondents' origin was 30 km. More than half (55%) of the respondents had primary level of education and 20% were illiterate. Only 10 per cent had secondary level of education. The rest had got technical diplomas, bachelor's degrees and graduate degree.

Over 56 per cent of the visitors visited occasionally and 26 per cent visited only once in a year or once in a lifetime. Less than 55 per cent of the visitors considered quality of the parks as good compared to 35 per cent who believed it bad or very bad, with about 10 per cent answering with don't knows. These figures demonstrates that majority of the visitors were happy with recreational quality of the parks. Visitors' judgement on water quality seems to have some impact on their willingness or unwillingness to pay. Majority (60%) of the respondents belonged to Peshawar City and 20% to District Peshawar (excluding from Peshawar City and surrounding areas). The NWFP (other than Peshawar) accounted for only 12 per cent whereas other provinces accounted for 8 per cent only. No foreigners were found to be interviewed.

On the question about how more resources should be allocated for the park management, 50 per cent of the respondents preferred an increase in entrance fee, 30 per cent chose reallocation of government budget, 20 per cent advocated voluntary donations towards parks' management fund and one per cent indicated no particular reference.

3.2. Willingness to pay for improved services: results from multivariate analyses. To better understand the determinants of respondents' WTP responses and to see whether these deter-

minants are consistent with economic demand theory, a series of multivariate analyses were performed with the survey data. Table 2 presents results of three multivariate models of the determinants of the WTP responses. Five of the independent variables are statistically significant determinants of visitors' WTP in all three of the multivariate models.

Table 2. Multivariate models of the determinants of visitors' WTP responses

Variables	OLS	Logit
Dependent variable	Final bid	Final bid
Independent variables		
Intercept	8.33 (0.92)	-0.053 (-0.25)
Total travel cost	- 0.076 (-3.41)***	-0.013 (-6.02)***
Visitors' income	2.41 (3.23)***	0.075 (5.76)***
Education	1.05 (2.13)**	0.026 (2.45)**
Age	0.09 (1.78)*	0.78 (1.34)
Distance	-13.57 (-3.08)***	-0.23 (-(2.74)***
Sex (male = 1 and female = 0)	1.32 (0.46)	0.057 (0.56)
Quality of recreational facility (good = 1 and bad = 0)	3.23 (5.33)***	0.55 (4.48)***
Log. (L)	-	463.31
R^2	59.20	-
F-stat	21.6	-
Sample size	500	500
Percent predicted correctly		76.7

Notes: ***, **, and * implies statistical significance at 1%, 5% and 10%, respectively.

The respondents' income is statistically significant indicating a positive correlation with visitors' WTP for improved recreational services of both parks. Education level and age of the respondents have also positive but small impact on WTP responses. Similarly better quality of recreational services also attracts a higher amount of WTP. Travel cost is statistically significant and has a negative effect coefficient implying that higher travel costs to parks reduces visitors WTP. Travel cost to substitute site, as an independent variable was not included in the models as both parks are located side by side. Sex variable has no impact on WTP amounts.

Overall, these multivariate results are in accord with economic theory and prior expectations, and are robust with respect to estimation technique and model specification. The overall explanatory power of the models is not bad; for example, the R-squared value for the OLS model is 58 per cent. The robustness of the results and the large number of statisti-

cally significant independent variables indicate the WTP responses are not random but are rather systematically related to respondents' and households' characteristics.

3.3. Demand elasticities. For any particular park, elasticities of park visitation demand can be calculated from marginal effects associated with the estimated demand coefficients. The estimated elasticities associated with the own-price, cross-price, and income variables are shown in Table 3. As is customary, the own-price elasticities are located on the main diagonal. These are negative in all cases due to the inverse relationship between entrance fees (price) and visitation demand (quantity). Own-price elasticity is greater than unity for Bagh-e-Naran and nearly unit elastic for Tatara. Cross price elasticities are positive and significant for both parks indicating their substitute relationship. Finally, park demand visitation is significantly income elastic also for both parks.

Table 3. Estimated elasticities of park visitation demand

Variable	Bagh-e-Naran	Tatara Park
Price Bagh-e-Naran	-1.13*** (0.40)	0.091*** (0.13)
Price Tatara Park	0.29*** (0.089)	-0.94*** (0.12)
Income	0.091** (0.05)	0.27*** (0.087)

Notes: *** Significant at 1% level. ** Significant at 5% level.

Conclusions and implications

Ecotourism has grown in importance over the past decades and is now a major contributor to the economies of numerous developing countries including Costa Rica, Belize, Ecuador, Kenya, Nepal, and Thailand (Lindberg and Huber, 1993). This paper contributes to an understanding of the role that economic analysis can play in the management of protected areas. The park visitation demand elasticities estimated at two different parks demonstrate homogeneity characterizing tourist behavior and park attractions and amenities. The estimated cross-price elasticities show that substitutability in visitation demand can exist between parks with different attractions. Thus charging differential entrance fees can effectively push tourists from one park to another, which may be desirable as part of a park management strategy to solve overcrowding at one park or to encourage local economic development at another. Regarding determinants of respondents' WTP responses income, age of respondents, education and quality of recreational services of parks are positively related to visitors' WTP responses. Thus, education plays an important role in environmental conservation. So the government needs to strengthen its efforts in reducing illiteracy. Similarly, improving quality of amenities and environmental services will bring more revenues to the public exchequers and at the same time help develop natural resources on sustainable basis.

The study successfully employed the CVM to know WTP of the respondents for two parks. The method has proven useful. Because the concept of substitutability between recreational sites could be addresses through the analysis. Secondly, the recreational value and hence entrance fees for these two parks could be determined systematically, that is, the entrance fee for national parks will reflect the level of recreational services of each recreational site. The parks which offer more recreational amenities to the visitors can charge a higher entrance fee than those which offer less.

Finally, it is recommended that authorities adopt a systematic approach in determining the entrance fees for all the national parks in Pakistan. National parks that provide more recreational services should charge higher entrance fees than those, which provide less recreational services. This study demonstrates how such a formula may be applied and how the system of entrance fees can be established. This innovation should raise revenue for park management and help ensure that park recreation will continue its contribution to society.

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