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Estimating Willingness to Pay for Parks: Evidence from a Developing Country

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Abstract

This study estimates visitors' willingness to pay (WTP) for the economic, health and social benefits that they get by visiting the public parks. Primary data through a structured questionnaire was collected from 400 respondents using Bagh-i-Naran Park, situated in Hayatabad, Peshawar, Khyber Pakhtunkhwa, Pakistan. Regression results estimated using Logit model show that the cost of visiting public parks, family size, interaction with nature, gender, health issues, and concern for protection & conservation of nature were the key factors that affected WTP for visiting public parks. Contrary to the general observation, income, education and age of the respondents were found statistically insignificant. The study concludes that visitors are willing to pay more as they become more aware about the social, health, economic and environmental benefits of public parks.

Key words: visits to parks, willingness to pay, contingent valuation method, logit model.

1. Introduction

Natural and manmade parks are developed to provide leisure and scenic opportunities to visitors. Natural parks usually include a countryside, hilly areas, or occasionally sea or fresh-water sites protected by the state for the enjoyment of the general public. Parks generate environmental benefits like protecting plant and animal habitation, reducing air pollution, and purification of water and nature. These creates recreational services for the community, generate financial benefits for both governments and people (Levitz, 2014); its utmost ignored benefit is the impact that parks have on economic growth and financial

welfare. It is frequently assumed that these services are flexible expenditures, beneficial for providing a standard life, but have little impact on people's financial health. That is why, investment in national parks and other recreational services may possibly be considered less significant than other kinds of investments (i.e. infrastructure developments or commercial encouragements), above all while economic development is a prime objective of the parks (Rabare et al., 2009).

Pakistan has 255 protected areas, out of which 14 are national parks, 99 are wildlife sanctuaries, and 96 are public parks capturing about to 91,700 square kilometers or 10.5% of the state's land (Pakistan Tourism Corporation, 2015). In Khyber Pakhtunkhwa, parks being an important part of the tourism contribute to the society by performing not only environmental functions but also delivering recreational facilities. Bagh-e-Naran is one of the recreational parks that became popular with the establishment of the Hayatabad Township as there are not enough green areas in the city of Peshawar. The park comprises of gardens, a small zoo with rare birds and animals appealing inbound and outbound tourists. Alvarez (2008) identified economic, social and health benefits of park as it generates revenue in the form of fees and charges, hosting festivals and sports events while the social and health benefits contribute to the savings on health expenditures and provide a place for families gathering and socialization. However, given all these benefits, policy makers, urban planners, governments and people are unaware of the rupee value associated to these benefits. They are also unaware of the benefits and willingness to pay for improvement in services or providing additional services in parks. This study is an effort to estimate the economic value of Bagh-e-Naran considering its economic, health and social benefits. In particular, this study estimates the WTP for improvement of existing services in Bagh-e-Naran.

The importance of the research study lies in the fact that this study may generate common awareness among policy makers about the effectiveness of the local tourism industry, and help them to formulate effective policies regarding financial resources and management for the betterment of the park and local tourism. It will provide guidance for efficient and organized approach for determining the entry fees for all the parks in the country. Furthermore, this study is useful in terms of the delivering and managing public resources and the improvement of parks and other recreational services in the study area. This paper consists of five sections. The next section reviews the selected existing literature, followed by research methods given in section 3, results and discussion in section 4 and conclusions and policy recommendations in section 5.

2. Literature Review

The economic benefits of parks and walkable pathways in Pakistan and various parts of the world have been widely discussed in a number of studies. These research studies have discussed the connection of willingness to pay for parks with various variables dividing them into three main categories. These categories include economic and financial benefits, health and social benefits and environmental and conservational benefits. For example, Alvarez (2008), Navrud and Mungatana (1994), Mathieu et al. (2003), Khan and Vasilescu (2008), Khan (2013), Reynisdottir et al. (2008), Hawkins & Peters (2008) have used Travel Cost Method (TCM) and Contingent Valuation Method (CVM) to estimate the WTP for parks using various variables. At the same time some research articles have argued about the relative importance of the parks from economic and

financial point of view, for example see Rafiq et al. (2007), El-Bekkay et al. (2013), Melaku (2007), Sitotaw (2003), Garvin (2000), Bedimo-Rung et al. (2005). Temperini et al. (2017) studied the indirect benefits of the parks in terms of using the parks logo on the food products and found that younger and woman consumers were more willing to pay for the products carrying the parks log/brand. The studied done by Gies (2007) and Henderson-Wilson et al. (2017) revealed that public parks are the best places for people with health issues and thus helps in reducing social issues as well. While some of the studies suggest that parks are unavoidable for the protection and conservation of nature (Lewis, Cheung & Jim (2013), Hultman et al. (2015)). Cook and Fleming (2007), Mendes (2001), Konijnendijk, et al. (2013) and Henderson-Wilson et al. (2017) have studied the leisure and relaxation aspects of parks. These studies conclude that public parks not only offer opportunities for children to play which improve strength and harmonization, intellectual skills but also shape healthy societies by creating stable neighborhoods and their development in urban areas. Parks also provide opportunities to the community to work together, know, trust and look out for one another, resultantly causes increase social benefits. Parks brings an increase in physical activities, reducing obesity and stress, improving mental health, and reducing noise etc. Most of the studies mentioned above used TCM and CVM which were developed by Hotelling (1949) and were later on redefined and practically applied by Clawson and Knetsch (1966).

3. Research Methods

3.1 Conceptual Model

The types of benefits and their effect on the economic value of parks are conceptualized in Figure-1. The figure presents three major factors including economic, health and social benefits affecting the economic value of parks. Collectively these three factors determine the quality of life. A community close to a park, with low crime rate, good social interaction and festivities is considered better as compared to others. The economic value of parks can be direct or indirect. The direct benefits of parks primarily stem from entry fees. Parks might charge different fees on special occasions such as sports tournaments, musical evenings etc. Organizers of the events are also charged fees depending on the nature of the event. All these fees directly contribute to the income of the park. Parks also increase property values, which increase the property tax collection. Crompton (2001) reviewed thirty studies estimating the effect of New York Central parks on property value. These studies suggest that the value of property increased 20 percent due to their proximity to central parks. These studies also show that proximity of the properties to central park increases the increase in the value of property is about 10 percent. Crompton (2001) suggests that the incremental value of property tax can be used to retire a debt taken to develop the park.

People from surrounding areas and people understanding recognition of the park for its amenities and natural attraction visit from across the globe. These visits lead to expenditure on international as well as local travel. These expenditures indirectly contribute to the economic value of parks. Travelers also make expenditure on food, boarding and lodging during travel, which also indirectly contribute to the economic value of parks. Similarly, private businesses either located in the surroundings of the

parks or equipment required to enjoy the amenities offered by park increase their sale. Businesses on one hand pay taxes on their income, while the increase in the articles sold leads to increased collection of taxes (including sales tax) on these articles.

Health benefits directly contributes to the economic value of parks too (Figure 1). Today's society faces a number of health issues including obesity, diabetes, depression, cardiac disease and blood pressure to name a few. Sedentary and inactive lifestyles are considered to be one of the most important reasons for these health issues. This has raised the importance of parks in providing opportunities to tackle health issues. Increase in physical activity controls obesity and boost the immune system. Physical activity also reduces the incidence of cardiac diseases, stress and increases life expectancy. Recreational activities are also important contributors to mental health and quality of life. The positive effect of these activities on depression, relieving stress, improving self-esteem and personal growth are very well known and documented.

Social benefits are also important component in estimating value of parks (Figure-1). Parks and recreational activities help in strengthening communities and promote social interaction. These activities provide youth the opportunities to be involved in health activities, resulting in improved performance in education. The recreational activities also deter them from involving in negative activities. Drugs and criminal activities have reached academic institutions and recreational activities can strongly deter these. Parks and recreational facilities can lead to safer neighborhoods, volunteerism, and stewardship.

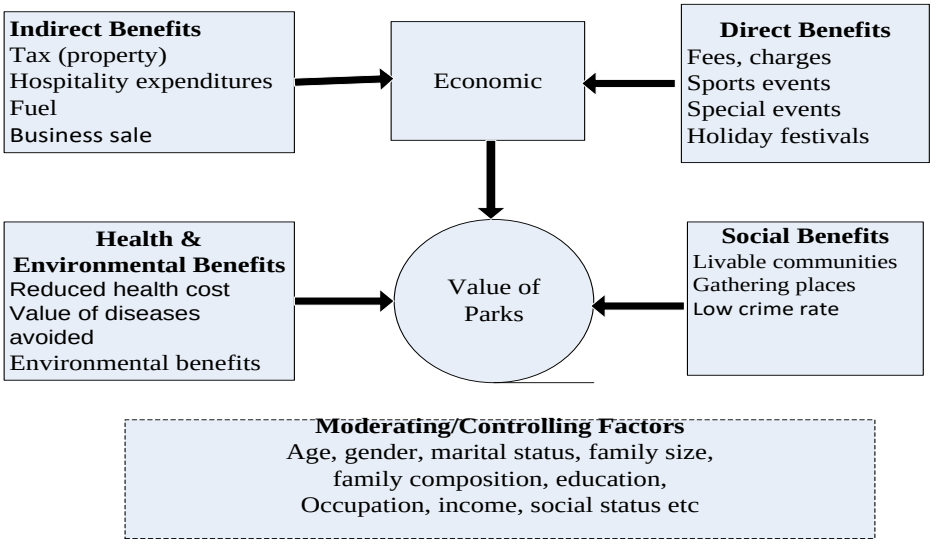

Figure 1: Factors Affecting Parks' Benefits

3.2 Empirical Model

Contingent valuation method (CVM) estimates the value of a good by directly asking people to report their willingness to pay (WTP) to use or obtain a good. Therefore, it provides a hypothetical marketplace for making transactions. The method is used for

commodities not exchanged in markets such as parks. Although, CVM has been criticized as tool to value noneconomic goods, the technique correctly predicts 91 percent of times (Cropper and Alberini, 1998). Willingness-to-pay questions uses dichotomous choice approaches, asking respondents that whether they would buy the good at the stated prices. This approach is favored over others approaches, because it decreases the cognitive burden on the respondent. To describe the WTP, let's assume household with a utility function, U (*X, Q*), where *X* is a consumer good while *Q* is a public good. Utility depends on the quantity of both *X* and *Q* consumed. It is assumed that utility increases with the increase in consumption of *X* and *Q* subject to the income constraint; *I = PX*, where *P* represents market price. The household minimize its expenditures, *PX*, subject to attain a given level of utility, U = *U* (*X, Q*), leads to the expenditure function, *e*(*P*,*Q*,*U*). Now if change occurs in the availability of public good by any government project, the WTP for this change, changes the expenditure function of the household. The new willingness to pay (WTP′) is the difference between two expenditure functions, and if the change in public good is incremental such that *Q′*>*Q*, then the WTP will rise.

$$WTP' = e(P, Q, U) - e(P, Q', U) \quad (1)$$

Equation (1) in-terms of indirect utility function is given as under.

$$WTP' = I - e(P, Q', V(P, Q, I)) \quad (2)$$

where *V* represents the indirect utility function, *I* is monthly income, *P* is a vector of prices, *Q* and *Q′* are the alternative levels of the public good. Since the expenditures needed for desired utility level are less than the income, WTP′ is positive. If the change in public good is a decrement, Q > Q″, the respondent will be willing to pay to escape the decrement. In this case expenditures required for desired utility level with decrement are higher than income of the respondent, *WTP* is still positive.

$$WTP = f(S, O) \quad (3)$$

where *S* is a matrix consisting of socio-economic characteristics of the individual and *O* is a matrix consisting of other variables including perception of the individual related to parks and its benefits. The empirical model is given in equation (4).

$$WTP_i = \alpha_0 + \alpha_1 TCP + \alpha_2 VIN + \alpha_3 VEL + \alpha_4 VAG + \alpha_5 DP + \alpha_6 D + \varepsilon_i \quad (4)$$

where WTP_i is the final offer for willingness to pay amounts, *TCP* is the total cost of travel to park, V*IN* is the visitor's income, *VEL* is the visitor's educational level, *VAG* is the visitor's age, *DP* is the distance from Park, *D* is one if respondent is male and 0 otherwise and ε_i is the error term and α represent the parameters to be estimated.

3.3 Sample Size

Universe of the research study is the Hayatabad Township where Bagh-e- Naran is located and total estimated population of the town is about 100,000 (Development Statistics of Khyber Pakhtunkhwa, 2014). To determine the sample size with 95% confidence level and 5% margin of error, the following formula was used:

$$n = \frac{z^2 \times p(1-p) / e^2}{1 + (z^2 \times p(1-p) / e^2 N)} \quad (5)$$

where *n* is sample size, *N* represent population size, *e* is the margin of error, *z* shows the z score. Assuming a value of 5 percent for *e*, a population of 100,000, the sample size came to 400 respondents for this study.

4. Results and Discussion

Table 1 presents the results from estimating the Logit model for determining the probabilities of the respondents' WTP depending upon various socio economic variables while table 2 provides the effect of perception based variables on WTP. For Sensitivity analysis, the model was run with and without health benefits, in order to find out the effect of health issues on the WTP. Model 1 and model 2 (robust) illustrates the effects of various variables on the willingness to pay while Model 3 and 4 indicate the effect of other variables other than health benefits on willingness to pay in proposed Policy-A. Results of Model 2 shows that socio economic variables i.e. income, education, marital status, and age are statistically insignificant, explaining that these variables have no effects on WTP for park's benefits proposed in Policy-A. These findings of the study are in accordance with the existing literature of Han & lee (2002), Walling et al. (2000), Schläpfer (2006), Khan (2006), Whitehead et al. (2001), Kim et al. (2010), Trott et al. (1992) and Herath, & Kennedy, (2004). The estimated models presented in tables 1 and 2 show that both the models fitted the data very well as more than 40 percent of the variation in the dependent variable is explained by variation in the independent variables.

Results further shows that the family size (in Number) is negative and statistically significant at 1% level of significance, showing that there is an inverse relationship between number of family members and amount offered for WTP for park's benefits. The dummy variable representing gender status of the respondent is statistically significant at 10%, where female respondents were found to have less WTP for the Policy-A, contrary to the general expectations. The possible reasons that bring female respondents to have less WTP for Policy-A in the study area might be that comparatively very few female respondents were interviewed, even though respondents were interviewed randomly. Due to the traditions and customs of the study area, females are not encouraged to go outdoor, hence female visitation to the parks is very low. In the study area females are typically house wives and are not doing any job consequently making them financially dependent. In the study area females love to visit regions and pay additionally where male is not allowable, and public parks are not one of them. Another dummy is used to capture the effect of health issues on willingness to pay for the public parks. The health issues are found to have a significant impact on the willingness to pay. Thus the study reveals that the respondents with no health issues are reluctant to pay a higher amount for park benefits in proposed Policy-A. These results of the study are supported by the conclusions of the existing literature of Wilson *et al.* (2017). The results of the table further indicate that the variable "interacting with nature keeps the respondent optimistic and positive" is statistically significant at 1% level of significance. Respondents are found to have high WTP for the proposed Policy-A. The finding of the study is in accordance with the existing literature (Lewis et al., 2013, Reynisdottir et al., 2008).

Table 1: Estimating the Effect of Socio-Economic Factors on Willingness to Pay

	Model-1	**Model-2 (Robust)**
Income (Rs.)	0.229	0.229
	(0.15)	(0.26)
Education (Years)	-0.558	-0.558
	(1.46)	(1.23)
Dummy if respondent is married 0 otherwise	3.058	3.058
	(11.4)	(11.1)
Dummy if respondent is male 0 otherwise	-15.78	-15.78*
	(9.78)	(6.55)
Age (Years)	0.785	0.785
	(2.55)	(2.25)
Age Squared	-0.00569	-0.00569
	(0.038)	(0.035)
Family Size (Number)	-1.441**	-1.441***
	'(0.48)	(0.40)
Dummy if respondent visit alone 0 otherwise	14.25	14.25
	(7.82)	(7.49)
Dummy if respondent has health issue 0 otherwise	-21.24	-21.24**
	(10.9)	(7.20)
Cost of visiting parks (Rs)	-0.027	-0.0270*
	(0.022)	(0.013)
Interacting with nature keeps me optimistic and positive	19.28	19.28***
	(37.6)	(5.50)
Health	13.93	13.93
	(20.0)	(12.7)
I feel Relax at home after visiting park	-19.35	-19.35
	(30.2)	(24.4)
Stress	-237.3***	-237.3
	(28.2)	(152.0)
I Sleep well after visiting park	-3.738	-3.738
	(15.5)	(10.5)
Constant	274.8***	274.8
	'(64.5)	'(154.8)
Number of observations	157	157
R-Squared	0.482	0.482
Adjusted R-Squared	0.426	0.426
F-Statistics	8.734***	.

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

Table 2: Estimating the Effect of Perception Based Variables on Willingness to Pay

	Model-3	Model-4 (Robust)
Income (Rs.)	0.460**	0.46
	(0.16)	(0.24)
Education (Years)	-1.145	-1.145
	(1.64)	(1.55)
Dummy if respondent is married 0 otherwise	10.04	10.04
	(11.2)	(13.8)
Dummy if respondent is male 0 otherwise	-17.95	-17.95*
	(10.3)	(7.02)
Age (Years)	1.229	1.229
	(2.78)	(2.58)
Age Squared	-0.0239	-0.0239
	(0.042)	(0.033)
Family Size (Number)	-1.200*	-1.200**
	(0.53)	(0.37)
Dummy if respondent visit alone 0 otherwise	14.11	14.11
	(8.31)	(7.69)
Dummy if respondent has health issue 0 otherwise	-14.68	-14.68
	(11.7)	(8.42)
Cost of visiting parks (Rs)	-0.0456	-0.0456*
	(0.024)	(0.020)
After visiting park I feel more motivated	6.571	6.571
	(14.6)	(12.0)
After Visiting park I feel full of Energy	3.455	3.455
	(11.9)	(14.6)
Park bring people together as family groups and community activities	-14.16	-14.16
	(14.8)	(14.8)
Park helps in building healthy community	-10.56	-10.56
	(16.5)	(35.9)
Park Contribute to Economy through employment and tourism	64.08***	64.08
	(16.4)	(34.9)
Park Protects and Conserve natural environment	-70.31***	-70.31**
	(19.3)	(23.2)
Constant	71.37	71.37
	(49.3)	(47.2)
Number of observations	157	157
R-Squared	0.424	0.424
Adjusted R-Squared	0.359	0.359
F-Statistics	6.451***	6.828***

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

5. Conclusion and Policy Recommendations

This study used logit model to estimate the effect of various socioeconomic and health factors on the WTP for visiting the parks. The study verifies that the family size (in numbers), cost of visiting parks, interaction with nature, gender status, health issues, and protection & conservation of nature by parks are amongst the key factors that affect WTP for the public parks, and are statistically significant. The study also determined that average WTP for proposed improvement in terms of Policy-A for public parks in the study area were Rs.72. Low income of the residents was observed to be one of the variables that adversely affect the willingness to pay for the public parks. Therefore, steps need to be taken to encourage the poor people to take the same benefits from parks as their richer counter parts take. In order to inform and aware the general public about the social, health, economic, environmental and financial benefits of parks, both the government and civil society should come forward and launch different kind of awareness campaigns. Since the family size was observed to have a negative impact on WTP for the public parks, larger families may be encouraged to visit too by waiving fees or giving them discounts. Finally, government of Khyber Pakhtunkhwa should focus on the maintenance and improvement of already existing public parks.

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