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Determination of Willingness to Pay for Entrance fee to National Park: An Empirical Investigation

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ABSTRACT

This paper examine the determinants of willingness to pay (WTP) of Bhitarakanika National Park (BNP), Odisha in India. Primary data has been collected from the visitors through survey method. We used multiple regression model to determine the WTP for entrance fee at BNP. The estimated results concluded that, income, age, day spent, marital status and travel cost have positively significant relationship with WTP whereas, gender is negatively affecting to WTP. From the policy perspective, we are suggesting to raise the entrance fee from Rs.20 to Rs. 40 which can raise the park revenue of BNP.

Keywords: Willingness to pay, Survey method, Multiple Regression, and Travel cost

Mathematics Subject Classification: 62P20

Journal of Economic Literature (JEL) Classification Number : C8, C80, and C13

1. INTRODUCTION

The demand of recreation, wilderness and leisure is increasing day by day due to the heavy work pressure and stressful environment. In this regards, National park plays an important role for providing recreational facilities to the public by preserving the ecosystems. But sometimes, due to the increase in the recreational pressure environmental damage is occurring gradually. Though national park benefits society in many ways like ecological functions, recreational benefits and to earn foreign exchange from international travellers, still we are not able to preserve the national park properly. The important reason for mismanagement of the national park is insufficient fund. So, now –a-days the recent issue for national park is that of inappropriate entrance fee. A strategy could be implemented and formulated by the government and the private sector in managing the national park that would combine both by charging appropriate amount of entrance fee for the visitors. So it is important to determine visitor's attitudes and willingness to pay towards the entry fee for the potential conservation benefits of the national parks.

The economic valuation plays a key role in the measurement of damages from ecosystem degradation. There are some factors which influence the decision of individuals to contribute money for the protection of natural resources. Most common factors are environmental behaviour and awareness (Martin-Lopez et al., 2007), demographic variables (Samsudin et al., 2009; Khodaverdizadeh et al., 2009; Xiu-hua song et al., 2013; Samdin et al.,2010), besides this there are some other factors which also affects the decision of individuals to pay. These includes visitors satisfaction, use of guide and group size (Baral et al., 2008), travel cost and quality of the park (Khan 2006). He used the total cost method and found that various factors influence the WTP are travel cost, household income, and the quality of the park. Some social factors also influence the WTP of visitors for the national parks. An empirical study was carried out in two national parks of North Greece and the result show that social norms and social trusts have a strong influence both on decision of individuals to pay and the specific amount stated (Halkos and Jones, 2011). Similarly, Lindberg (1991) noted that age, education level and income are influencing WTP for national park. Further, Togridou et al. (2006) shows the determinants of visitors WTP for Marine national park in Greece. He concluded that information source through environmental education programmes can be helpful to determine the visitors censuses estimation errors and helpful to spread the feedback word-of-mouth information among friends and relatives. This conclusions also noted by Langford et al. (2001), Baloglou and Mecleary (1999), Hughes and Morrison-Saunders (2003). Further, Temsegen et. al. (2013) examined household willingness to pay for rehabilitation of degraded forest resources in a hypothetical market. This study indicates that age, social participation, distance of firm land from the forest priority area are the significant predictors of Willingness to pay for rehabilitation of degraded forest resources. De Utpal Kumar and Devi Amrita (2013) used both revealed and stated willingness to pay to identify the visitors average actual payments for the recreation benefit enjoyed by visiting the site and for the conservation of the scenic beauty and found that income and education have significantly positive impact on it.

The main objective of this paper is to find out the factors which influence the willingness to pay for the Bhitarakanica National Park at Odisha. The authors are keen to find out the determination of WTP, because this national park is a good attraction point for the visitors by which we can get more recreational benefits and foreign exchange earnings; but the revenue earned by the forest department of Odisha is very less. As the revenue is less, the preservation and development of national park is not satisfactory. Therefore, this study attempts to determine the factors which can influence the willingness to pay for an appropriate entrance fee, so that government will earn revenue and the preservation of the park will be possible. An empirical study has been conducted by using primary survey method during the period of November 2010 to February 2011.

2. AN OVERVIEW OF BHITARAKANIKA NATIONAL PARK (BNP)

Bhitarkanika is one of the rich, lush green vibrant eco-system lying in the estuarine region of Brahmani- Baitarani in the North-Eastern corner of Kendrapara district of Odisha. It has much significance with regard to ecological, geomorphologic and biological background which includes mangrove forests, rivers, creeks, estuaries, back water, accreted land and mud flats. The data has been showing that, every year almost 10000 visitors visit to Bhitarakanika National park. The most important attraction point of the tourist is mangrove forest which is the second largest in India, the Giant salt water crocodiles, white crocodiles, Indian python, king cobra, black ibis, olive Ridley sea-

turtles, spotted dears, 7 varieties of Kingfisher birds, almost 1.30 hr boat journey, jungle stayed at night so that the tourist can fill the sound and environment of the jungle.

3. DATA SOURCES AND METHODOLOGY

This study is based on primary data, which is gathering from the personal interview with the respondents (visitors). Survey has been conducted on November to February of 2011 in Bhitarkanika National Park. The primary data consist of visitors' socioeconomic characteristics; visitor's perceptions about ecotourism resources, attitude, and their WTP for entrance fee to enjoy the ecotourism resources at BNP. In this study total 450 respondents are interviewed for collection of data. Here simple random sampling has been used for data collection. The interview methods used in this research was face-to face interview to the visitors. Finally we could able to incorporate only 400 sample in our study due to some unavailability of data. The questionnaire for this research has been designed to gather primary information such as socio demographic profile, attitude, and visitors' willingness to pay for entrance fee at BNP and travel cost to BNP.

It could be hypothesized that WTP for entrance fee by individuals 'i' (visitors) of the National park (Bhitarkanika) as the site j are affected by a variety of factors, including social and economic factors. The functional form of WTP for entrance fee to BNP is as follows:

$WTP_{ij} = f(Y, S, C, L, T)$

Where, Y = income; S = socio-economic variables (age, sex, marriage,); C = Travel cost; L = length of stay; T = times of visit to the BNP.

Linear regression method is used to establish to determine the WTP for entrance fee of BNP. Tisdell and Wilson (2000) used this method to identify several factors that had influenced WTP among visitors to a conservation programme for sea turtles in Mon Repos, Australia. Kosz (1996) also used multiple regressions model to estimate the WTP among visitors to 'Donau-Auen' national park. He discovered that the amount of WTP depend significantly on the professional standing of the respondent and also on age, personal income, the number of children living in the same household, the residential area and plans for future visits. Lindsey and Holmes (2002) studied tourist support for marine protection in Nha Trang, Viet Nam. The WTP for protection was highly influenced by education and income. In this present paper, the dependent variable is WTP for an entrance permit and there are seven predictor's variables, such as age of the respondent, income of the respondent, day spent on that spot, gender, and marital status, travel cost of the respondent and time of visit of the respondent. Costs of visit will depend on the distance travelled and /or the time taken to travel, an admission fee and other expenses. This demand functions are applied to simulate a demand curve for recreational use of the park. Visitors are assumed to react to opportunities that have been offered to them by expressing their yield an estimate of consumer surplus.

4. EMPIRICAL RESULTS

A survey was conducted in November 2010 to February 2011 at Bhitarakanika National Park. A total of 400 respondents were interviewed. The preliminary findings and statistics of 400 respondents are presented below.

Table-1: Descriptive Statistics of the Respondents

Variables	Number of Respondents	Mean	Std. dev	Minimum	Maximum
Age	400	34.21	10.290	16	72
Income	400	22636	11236.525	7000	90000
Times of Visit	400	1.397	0.652	1	4
WTP	400	39.650	15.543	20	95
Travel Cost	400	4324.210	2329.252	1000	10000
Days Spent	400	1.45	0.031	1	4

Sources: Authors calculation

In the above table 1, the mean WTP for entrance fee is Rs.39.65 (40) with respondents ranging from Rs 20 to 95. The sample had a mean age of 34.21(35) years, with respondents ranging from 16 to 72 years of age. Out of 400 respondents 57% (228) respondents consist of male and 43% (172) respondents are of female. With respect to income, the average income of the respondents is 22900 and the income is varying from 7000 to 90000. In the case of marital status, 82.5% (330) respondents had married; and 17.5% (70) had unmarried. With respect to travel cost (which is including both food and other expenditure in the surrounding place) the maximum amount spent by respondents are of Rs 10000 for visiting BNP, and the lowest amount spent by the respondents is Rs 1000 only. Finally With respect to days spent mean days spent is 1.45 and it ranges from 1 to 4.

We have employed the multiple regression method for determining the factors which influence the entrance fee of the Bhitarkanica national park. The econometric model is used for empirical study for measuring the recreational value of Bhitarakanika National park as follows:

$$WTP = \beta_0 + \beta_1 INCM_t + \beta_2 AGE + \beta_3 DS + \beta_4 GEN_t + + \beta_5 MAR_t + \beta_6 TC_t + \beta_7 TV + \square_t \ldots (1)$$

Where:

$INCM_t$ = Income of the respondent at time t; AG_t = Age of the respondent at time t; DS =Day spent of the respondent; GEN_t = Gender of the respondent at time t; MAR_t = Marital status of the respondent at time t; TC_t = Travel cost of the respondent at time t; TV = Times of visit of the respondent to BNP.

The coefficients β_1, β_2, β_3, β_4, β_5, β_6 and β_7 show the elasticity coefficient of income, age, day spent, gender, marital status, travel cost and Times visit respectively.

We employ the multiple regression method for determining the willingness to pay for entrance fee of Bhitarakanika National Park. Best fitting autoregressive AR (m) and MA (n) model is identified before estimating the OLS model. The order structure of AR(m) and MA(n) model is determined on the basis of the Akaike's Information Criterion (AIC) supplemented with the Ljung-Box Q statistics for

the absence of serial correlation in residuals and the results is presented in Table 3. Hence, the order of 3 autoregressive and moving average of 1 term has been included in the model to correct the autocorrelation in the residual. The estimated Ordinary Least Square (OLS) is shown in Table 2.

Table 2: **Results of Multiple Regression Representation**

Explanatory/ Dependent Variables	Willingness to pay (WTP_t)
Constant	-0.883* (-2.64)
Income (Y_t)	0.35* (11.69)
Travel Cost (C_t)	0.035* (2.19)
Age (AG_t)	0.124 (0.96)
Marital Status (MAR_t)	0.033* (2.79)
Gender (GEN_t)	-0.057* (-2.12)
Day Spent (DS_t)	0.085* (3.81)
Times of Visit (TV_t)	-0.01 (-1.05)
R- squared	0.56
Adjusted R-squared	0.54
D.W statistics	1.99

Source: Authors own calculation; * indicates significance at the 1% levels; the parenthesis shows the t-value.

Table-3: Ljung-Box Q-Statistics

Q(5)	0.786(0.375)	Q(12)	11.767(0.162)
Q(8)	4.239(0.375)	Q(16)	15.348(0.223)

Source: Authors own calculation, the parenthesis shows the p-value.

The above table 2 shows the results of multiple regression model to determine the willingness to pay of BNP. The results suggested that, income is one of the important factor which determine the willingness to pay of the national park. This results shows, income is positively affecting the willingness to pay for BNP. In other words, higher the income leads to higher the willingness to pay and vice versa. One of the key factors which is influencing the WTP is travel cost. In this case, this study finds there is positive relationship between travel cost and WTP. It means, higher the travel cost leads to higher the WTP of the visitors. This result is differed from other previous studied such as;

Joshi and Dhyani, 2009; Doggart and Doggart, 1996; Drost, 199; which is conducted on different national park in India as well as abroad too. The possible reason for this is that, as many visitors spent more in terms of money to visit this national park for getting better facilities and enjoy in optimum ways as they likes and hence, they want to pay more. The second possible reason is that, those who are coming to BNP from too long distance by spending more money it implies that, there income is more. As there income is more they also willing to pay more for getting better facilities and want to preserve this park for their post generation. Finally, the forest department of Odisha charges very negligible amount (i.e. Rs.20 for Indian and Rs.1000 for foreigner) to entry this park. Therefore, all Indian are willing to pay more. This study entirely dominate by Indian visitors and due to less visitors of foreigner on that particular time of study, we are not able to cover the willingness to pay for foreigner visitors. We included age as one of another factors which can affects the WTP of the visitors. But, in this case we are not getting any significant results. It means age is not the constraints to going this park. As it is a natural park which can attract all kind of aged people; who can come and takes all kind of benefits in terms of enjoyment to visit this park. We takes marital status is another important factor which can influences the WTP of the visitors. We found statistical positive significant results between marital status and WTP to BNP. It suggested that, marital people who visited to this park are willing to pay more and this results also supported by the pervious literature such as (Samdin et al., 2010). Further, gender also affect WTP of the visitors (Kamri, 2013) and hence we include this into our WTP equation (Bowker *et al*.1999) In this case, we found that gender is negatively affecting WTP. It means that female visitors are willing to pay more as compare to male visitors. In the next case, we included day spent at BNP as one of the determining factor for WTP. In this case, we found significant positive impact on WTP. This suggested, those who spent more days inside the park are willing to pay more. In BNP there is facilities to visitors who can stay inside the park and the park is entirely cover with mangrove forest. Hence, it is obvious fact that those person who are spending more time or days inside the park are willing to pay more. Finally, this study included times of visit to BNP is one of another determinates of WTP. It is also one of the important factors to determine the willingness to pay of the visitors. In simple words, those person who are coming to enjoy BNP once more time are included into WTP functions. But, we are not getting any statistical significant results.

5. VISITOR'S OPINION ON DEVELOPMENTAL ISSUES OF THE BHITARAKANICA NATIONAL PARK

There are some suggestions of the visitors in order to develop the National Park and eco-system services of the Bhitarakanica. So that it will attract more tourists within the nations as well as abroad. This also help to increase the willingness to pay for the entrance fee by which the revenue generation of the park will be more. These are as follows: (1) Stop the speed boat so that it will less harm of the crocodile. (2) Stop the diesel boat and use the CNG type of boat. So that it would very environmental friendly. (3) Instead of using motor cycle, the cycle/Rickshaw should be provided inside the park. (4) Using of the solar light inside the park. (5) Hot water should be available through solar light. It is because in winter there is very cold inside the park. (6) Co-operate with private agency with department so that the tourist department of Orissa can achieve its goal. (7) Develop the jetty system of Bhitarakanika National Park, so that the tourist dissatisfaction will be reduced. (8) Give proper information inside as well as outside the park. (9) Need some more tree plantation in the jungle. (10) Sufficient boat should be available. (11) Toilet facilities both inside as well as outside the park should be more in number. (12) Internet booking of boat and room should be introduced with keeping of

detail information of tourist. (13) Tea, coffee and snacks should be provided at different point inside the park. (14) Improvement for checking plastic and such kind of thing at the entry point, and (15) One children entertainment park is required inside the park.

6. CONCLUSION

In this paper, we examine the determinate of willingness to pay for entrance fee of the visitors to Bhitarakanika National Park in Odisha. We used survey method to collect the data during the period of November 2010 to February 2011. This park is open every years between September to April and the remaining month (i.e. May to July) the park is closed due to nesting and crocodile breeding progress. This period has been chosen for the study, because during this period there is more number of visitors are interested to come to enjoy the natural vegetation at Bhitarakanika.

In the beginning step of this paper, we presented the descriptive statistics of the primary data. The analysis clearly reveals that the majority of the visitors are willing to pay for entrance fee an extra amount for the betterment of the national park of Bhitarakinka. So that, it can both managed as well as preserve for the future generation and maintain balance environment. The study recommends that the entrance fee for Bhitarakanika National park be increased from rupees 20 to rupees 40 per person which would increase the park revenue from two lakhs to four lakhs per year (approximately 10,000 visitors use to visit this national park per year).

We used multiple regression model to analyse the factor which determine the willingness to pay for the entrance fee in the second step of this study. In this regards, we concluded that the income is positively affecting to willingness to pay for entrance fee, i.e. a one percentage change in income leads to increasing 0.35 percentage change in willingness to pay of the visitors. Similarly, this paper concluded that a one percentage change in travel cost leads to increasing 0.035 percentage changes in willingness to pay of the visitors. Further, this study found 1 percentage statistical positive significant relationship between marital status and willingness to pay. This suggested that a one percentage change in marital status tends to raise 0.033 percentage change in willingness to pay. In addition to that, this study also found statistically positive relationship between day spent and willingness to pay, i.e. a one percentage change in day spent by the visitors at Bhitarakanika National park tends to raise 0.085 percentage change in willingness to pay. In contrast to that, this paper found that only gender is statistically negatively affecting the willingness to pay, i.e. a one percentage change in gender leads to decreasing 0.057 percentage change in willingness to pay of the visitors to Bhitarakanika National park. However, the factors such as age and times of visit to Bhitarakanika National park are not statistical significantly influencing the willingness to pay to determine the entrance fee.

From the policy perceptive, this study recommends that the children below 16 years of age and senior citizens be charged half price. School children or university students who visit the park as part of school activities should be exempted from entrance fees. Entrance fee exemption may also be granted during special holidays at half of the charges. Furthermore, certain parts (such as the lower section) might charge a lower entrance fee to facilitate access to low-income families, while the full entrance fee should apply to the middle and upper sections of the park. These provisions should help to ensure that, while the new entrance fee increases the park's revenue, it should not become a burden for low-income visitors. Lastly, it not only increase the government revenue; but also will help to develop the ecosystem services as well as provide better management than previously.

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