

Estimating the Visitors Willingness to Pay for An Entrance Fee of Mudumalai Tiger Reserve, The Nilgiris: A Contingent Valuation Approach

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ABSTRACT

Reserves, sanctuaries and other similar areas are all ecological units which have both monetary as well as ecological gains to those related with them. Apart from this, the tourism industries of emerging nations like India are benefitted in more ways than one. But, unfortunately the maintenance of such protected areas is not economically viable due to shortage of funds. The areas lack stable sources of income. In such a state of affairs, the option of increasing the entrance fee charged to visitors can be considered. Hence, the primary objective of this paper is to estimate visitors' willingness to pay (WTP) for environmental conservation and analyze factors influencing WTP for higher entrance fee by using contingent valuation method in Mudumalai Tiger Reserves (MTR), The Nilgiris, Tamil Nadu. A purposive sampling technique was used to choose 372 visitors and the logistic regression analysis was employed to investigate factors that influencing WTP for higher entrance fee in MTR. The empirical result shows that the majority of the respondents (72%) were willing to pay a higher entrance fee and the average willingness to pay was Rs.52.58 for the purpose of environmental conservation, whereas the remaining 28% were unwilling to pay a higher entrance fee. According to the logistic regression result, respondent education, respondent's occupation, family income and distance were the most significant predictors of the visitors' WTP. Thus, keeping the policy in view the outcome of this research advises increasing the visitor entrance fee from Rs.15 to Rs.50 as it will facilitate better revenue to the management, in addition to providing financial independence and efficiency in a feasible method of biosphere preservation.

Key words: Protected area, Entrance fee, Contingent valuation method, Willingness to pay, Logistic regression.

Journal of Economic Literature (JEL) Classification: Q01, Q23, Q26

Mathematics Subject Classification: 62J12, 62G99

1. INTRODUCTION

Protected areas, regarded as the main element in biodiversity conservation in many places around the globe occupy nearly 13.9 per cent of the earth's surface with approximately 120,000 designated areas (Coad, Burgess, and Fish, 2010). The central aims of creating protected areas are: the protection of ecosystems, the maintenance of ecological processes and conservation of biodiversity

(Baral, Stern, and Bhattarai, 2008). The creation of such protected areas is expected to contribute considerably to sustainable development and reduction of poverty among the local people living near their boundary (Rogerson, 2006). In addition, the growing concerns regarding the steep fall in the number of global biodiversity resources nowadays has helped to increase awareness on the importance of such resources in maintaining the balance of the ecosystem functions. There is a strong belief that the biodiversity resources form the basis for sustainable natural functions in addition to having the potential for human use, which includes the opportunity for scientific research apart from recreational benefits such as ecotourism (Nijkamp, Vindigni, and Nunes, 2008).

Even though there are frequent inconsistencies between tourism and the conservation goals, even more so in nature-based tourism, which depends on the availability and the use of natural resources in protected areas as tourism products (Mohd Rusli, Alias, Khairil, and Shuib, 2009), majority of the tourism related protected areas such as national parks, wildlife sanctuaries and reserves exist as public facilities because of their non-rival consumption and non-exclusion in nature. The designation of these areas as public facilities creates free riders and over-usage problems (Lindberg and Huber, 1993; Samdin et al, 2013). In order to meet the objectives of ecotourism, it is indispensable that one has an in-depth familiarity and comprehensions of the economics involved, and thereby view the subject and the entities in it from a monetary stand point as goods and services facilitating gains. Substantial proof is available to show that there is a gradual reduction in the allotment of money to reserve areas for improvement and maintenance. This shortage of funding coupled with the harmful effects of tourism- littering, soil erosion, vegetation destruction and so on has put protected areas in a very precarious position (Chen and Jim, 2012).

In destinations where nature-based tourism is the primary product, the methods of obtaining extra resources to care for, and augment natural beauty, has been an eternal concern to the management. One option is charging entrance fees to tourists. This is a psychological way of maintaining the value of the area in the eyes of the visitors. These charges would be nothing in comparison to the customer satisfaction (Sharpley & Sharpley, 1997; Lindberg and Huber, 1993; Samdin et al, 2013).

The tourists may be inclined to pay more entrance fees if they regard entry into the reserve area as worth more than the money for the same. Thus, while in the process of drafting a pricing tactic, the willingness to pay must be kept in consideration with respect to the entry fee (Bardecki and Michelle Cook, 2011). In this regard, this study raises three key research questions such as: Are the visitors themselves actually willing to pay for access? What are the factors that influence visitors' willingness to pay? How to estimate the visitors' willingness to pay for environment conservation? This study seeks to address these questions by adopting the contingent valuation method (CVM) to estimate visitors' willingness to pay (WTP) for environmental conservation and analyze factors influencing WTP for higher entrance fee in Mudumalai Tiger Reserves (MTR), The Nilgiris, Tamil Nadu.

2. MATERIAL AND METHODS

The location of the study, Mudumalai tiger reserve is nestled in the mountains of the Nilgiris district of the state of Tamil Nadu. It is adjacent to the Wayanad wildlife Sanctuary on the North West, Bandipur Tiger Reserve on the north, the south and the east the Singara and Sigur Reserved Forests which

forms the boundary of Nilgiri North Division. MTR is a comparatively newly created Tiger Reserve which was opened only in April 2007. It is geographically situated at the tri-junction of Tamil Nadu, Karnataka and Kerala states. It is one of the few areas in the country with a rich and varied terrain, flora and fauna and generates multiple ecosystem services. Mudumalai plays an important role in biodiversity conservation of animals; especially large mammals, by offering habitat contiguity of about 3300 km with three other protected areas in the region. The reserve functions with the main objectives: to maximize recreational experience of the visitors through various activities, minimize the impact of tourism on wildlife and its crucial habitat, increase visitors' concern for nature conservation, create a sense of belongingness and public support for the conservation and create opportunities for the local people to compensate for their sacrifices for conservation. In order to achieve these, the management authority of the reserve considered raising the entrance fee of MTR. In this context, to meet the goals, this study has chosen MTR and used the contingent valuation method.

For the purpose of establishing an entrance fee that would be tolerable to the visitors as well as viable to the management, the economic approaches of environmental valuation procedures were formulated in the way of non-market techniques. The contingent valuation method (CVM) is one among the well-known and widely used methods. Environmental goods and services have been extensively valued based on this technique. Ciriacy-Wantrup were the pioneers in using this technique for calculating the side effects of soil erosion in 1947 (Venkatachalam, 2004; Salazar and Garci, 2007; Fatahi, 2010). The method was often used in research relating to valuation, especially in forest valuation (Amir Hosein Firoozan et al., 2012). The data for this study were derived from primary survey. The survey was conducted in the month of July 2016 to September 2016. The purposive sampling technique has been used for sample selection of 372 visitors with the help of interview schedule containing all relevant information incorporating important variables. It is derived on the basis of National Oceanic and Atmospheric Administration (NOAA) panel suggestions, that as far as CVM studies are concerned, incorporating one on one interview in person is a better and more bankable way of data collection, even equal to a self-administered survey (Arrow et al., 1993). Hence, the direct face to face interview was employed for the data collection. The interview schedule for this research has been designed to collect primary information such as socio-economic, demographic information of visitors and visitor's willingness to pay for entrance fee at MTR.

3. ANALYSIS AND RESULTS

As was previously mentioned, the survey was conducted from July 2016 to September 2016 at MTR. A total of 372 visitors were interviewed. This section presents the descriptive statistics that was collected from 372 visitors in face to face interviews. Among the most important variables, age of the respondent, family size, respondent education, respondent occupation, family income and distance are included for the descriptive analysis. Based on the survey, the socio-demographic and economic characteristics of the respondents are presented in the table 1 and 2 below:

Table 1: Socio-demographic and economic characteristics of the respondents.

Variable	Category	Frequency	Percent
Gender	Male	319	85.8
	Female	53	14.2
Location	Rural	58	15.6
	Semi-Urban	82	22.0
	Urban	232	62.4
Marital status	Single	100	26.9
	Married	265	71.2
	Separated/Divorced	7	1.9
Family type	Joint Family	51	13.7
	Nuclear Family	321	86.3
Age of the Respondent	20-30	108	29.0
	31-40	144	38.7
	41-50	79	21.3
	Above 50	41	11.0
Respondent Occupation	Coolie works (wage labour)	44	11.8
	Government / Private employment	201	54.0
	Self-employed/Business man	127	34.1
Family Income (Per Month)	9000-30000	74	19.9
	30001-45000	77	20.7
	45001-65000	80	21.5
	65001-85000	65	17.5
	above 85000	76	20.4

Primary data, 2016

Table 2: Descriptive Statistics of the respondents

Variables	Number of respondents	Mean	Std. Devi	Minimum	Maximum
Age of the Respondent	372	37.10	8.96	24.00	70.00
Family Size	372	3.93	1.13	1.00	9.00
Respondent Education	372	15.43	3.12	.00	24.00
Family Income (Per Month)	372	64721.77	48558.25	9000.00	400000.00
Distance traveled (KM)	372	201.49	247.04	12.00	798.00

Primary data, 2016

The socio-demographic and economic characteristics of the respondents indicate that males constitute 85.8 percent of the sample interviewed while females constitute the remaining 14.2 percent. More than 60 percent of the respondents were from urban areas, 22 percent from semi-urban areas and 15.6 percent of respondents were from rural areas. 71.2 percent were married and 26.9 percent were single. Among total surveyed respondents, 13.7 percent lived in joint families and remaining 86.3 percent lived in nuclear families. Respondents surveyed belonged to various age groups. More than 65 percent were below 41 years, 21.3 percent were 41 to 50 and the remaining 11 percent respondents were above 50 years of age. The average age of the respondents was 37 years. Of the total respondents surveyed, 54 percent reported being government/private employees, 34.1 percent engaged in self-employed/businesses and only 11.8 percent were coolies (manual labourers). The respondents' monthly family income indicates that nearly 41 percent earn between Rs.9000 -

Rs.45000 monthly, those that earn between Rs.45001- Rs.65000 were 21.5 percent while those within the range of Rs.65001-Rs.85000 were 17.5 percent and above Rs. 85000 were 20.4 percent of the respondents family income. The average monthly family income of the respondents was Rs.64721.77 years. The average family size and years of respondent education was 3.93 and 15.43. The average distance travelled by the respondents to reach the MTR was 201.49 KM.

Table 3: Respondents opinion about current entrance fee and willingness to pay for higher entrance fee

Variable	Category	Frequency	Percent
How should these conservational and recreational services be financed	Raise the entry fees	94	25.3
	Raise govt. budget	219	58.9
	Donation	46	12.4
	Others	13	3.5
How do you consider the current entrance fee (Rs.15) of MTR	Too Much	9	2.4
	Acceptable	105	28.2
	Too Little	258	69.4
WTP higher entry fees	Yes	268	72.0
	No	104	28.0
Entrance fee	Rs.15- 30	60	22.4
	Rs. 31-50	162	60.4
	Rs. 51-100	30	11.2
	Above 100	16	6.0

Primary data, 2016

Table 3 depicts the respondent's opinion about alternative sources of fund generation and willingness to pay for higher entrance fee. The question of the necessity of money for providing better facilities and conservation at the MTR and opinions regarding the mode of arranging it was gathered from the respondents. Based on the information acquired from the tourists, the opinions were sorted into two categories: one, increasing the entrance fee and two, increasing the Govt. spending. Regarding this, 58.9 percent of respondents advocated in favour of increasing the government budget, 25.3 percent opined to raise the entrance fee, 12.4 percent said that donation could generate funds needed for the purpose and 3.5 percent said other sources could be tapped e.g.: private sector can be entrusted to manage the rest areas, food accommodation facilities and so on. As regards to the views of respondents on the current entrance fee, nearly 70 percent of the respondents considered current entrance fee of Rs.15 as too less, 28.2 percent of respondents were of the view that the current entrance fee is acceptable and only 2.4 percent of respondents opined Rs.15 as too much for MTR. Regarding willingness to pay for higher entrance fee, it could be noted that 72 percent of the respondents were ready to pay higher entrance fee and 28 percent were not willing to pay.

Respondent's willingness to pay has been classified into five categories i.e., Rs.15-30, Rs.31-50, Rs.51-100 and above 100. When the 268 respondents were asked about a slight rise in the entry fees of MTR, 60.4 percent of the respondents were ready to pay around Rs.31-50 while 22.3 percent of them were ready to pay only Rs.15-30.

Factors influencing the WTP for higher entrance fee

The responses of willingness to pay and non-willingness to pay for the higher entrance fee requires the use of parametric probability models relating to 'Yes' or 'No' responses. Logistic Regression has been applied to evaluate the variables influencing the probability of individual's WTP. Here, the dependent variable is whether or not a respondent is willing to pay the amount quoted during the primary survey, while, the independent variables are the selected socio-economic and demographic characteristics of the respondents. Factors like age of the respondent, family size, respondent education, respondent occupation, family income, distance and site quality were included in the model as independent variables. The results of the parameter estimates of the logistic are shown in table 4.

Table 4: The result of logistic regression analysis

Predictor	Beta	Std. error	t- value	Sig.	Ex (B) (Odds Ratio)	Inverse Odds Ratio
Age of the respondent	-0.002	0.017	0.019	0.890	0.998	1.002
Family size	-0.307	0.253	1.473	0.225	0.736	1.359
Respondent Education	0.152	0.060	6.350**	0.012	1.164	-
Respondent occupation	1.367	0.355	14.843***	0.000	3.924	-
Family Income	0.000	0.000	14.310***	0.000	1.000	-
Distance	-0.446	0.135	11.015***	0.001	0.640	1.563
Site quality	0.036	0.190	0.035	0.851	1.036	-
Constant	-4.164	1.431	8.469	0.004	0.016	62.500
2 Log likelihood: 282.335 ^a				Chi-square: 158.520		
Cox & Snell R Square: 0.347				Level of significance: 0.000		
Nagelkerke R Square: 0.500				Total Sample size: 372		
Percent of right prediction: 82.8 %						

Note: The statistical analysis has been made using SPSS statistical package, *, ** and *** indicate significance at 10%, 5% and 1% level respectively.

Based on the results summarized in table 4, the coefficients had a chi-square value of 158.520 which is significant at 1 percent level and ensures the predictive capability of the independent variables included in the model: in other words, a test of the model was a good fit. Nagelkerke R of 0.50 indicated a moderately strong relationship between prediction and grouping. The overall model was good as -2 log likelihood stood at 282.335^a. The results reveal that almost 82.8 percent of respondents were correctly allocated to predicted WTP either 'yes' or 'no' responses in the model respectively. This analysis showed that the results were satisfactory.

According to the logistic regression results, the coefficient of respondent's education is significant at 5 percent level. Respondent's occupation, family income and distance are significant at 1 percent level, while all other variables are insignificant at the level of 5 percent or 10 percent level of significance. This revealed that the age of the respondent's, family size and site quality are negative but do not significantly influence the WTP. To interpret the logistic regression model, both odds and inverse odds ratio have been calculated.

The coefficient of respondent's education is the important explanatory variable that determines the probability of WTP, which was found to be significant at 5 percent level. The positive sign implies that higher the educational level, the higher the probability of WTP. The influence of education on WTP agrees with many studies such as Baral *et al.* (2008), Wang and Jia (2012); Shamsudin and Rahim (2014), Radam *et al.* (2015) and Sanusi Ibrahim *et al.* (2017). The odd ratio of this variable is 1.164. It shows that highly educated people are willing to pay a 11 percent higher entrance fee than the less educated people. The respondent's occupation variable was significant at 1 percent level of confidence. Meaning that, the probability of WTP is likely to be higher for the occupation category (business people) than for the lower occupation category (Coolie). The odd ratio of this variable was 3.924. It shows that the WTP of higher occupation respondents is 39 percent higher than the lower occupational groups.

The estimated coefficient of family income, another important explanatory variable of higher probability of WTP is significant at 5 percent level. The inference is that, higher the income, higher the probability of WTP as opposed to those with low or lower income. This result is aligned with many literatures such as Wang and Jia (2012), Bhandiri and Heshmati (2010), Reyinisdottir *et al.*, (2008), Seongseop, Wong and Cho, (2007), Togridon *et al.* (2006), Radam *et al.* (2015) and Sanusi Ibrahim *et al.* (2017). The odd ratio of this variable is 1.000; it means that the people from higher income groups are willing to pay an entrance fee 10 percent higher than the low income groups. Another crucial coefficient was distance and it was negatively significant at 1 percent level. It clearly implies that, the lesser the distance, higher the probability of WTP. The inverse odd ratio of this variable is 1.563. It shows that respondents closer to the MTR are willing to pay a higher entrance fee - 15 percent more than those far from the MTR.

Table 5: Descriptive statistics - willingness to pay for higher entrance fee (in Rs.)

Mean	52.59
Median	50.00
Mode	50.99
Std. Deviation	34.51
Range	280.00
Minimum	20.00
Maximum	300.00
N	268

Primary data, 2016

Table 5 shows the descriptive statistics of willingness to pay for higher entrance fee. The mean, median and mode willingness to pay are Rs.52.58, Rs.50.00 and Rs.50.00 respectively. The median and mode are almost same as the mean; this denotes that the majority of the respondents are willing to pay same the mean WTP.

4. DISCUSSION AND CONCLUSION

The CVM is a novel and one of a kind method of calculating the value of non-market goods like protected area resources. A large influx of funds has come out of the individuals' WTP, besides this, it

is a general belief that WTP is among the primary fund providers to protected areas. Therefore it is necessary to levy customer charges in ecotourism to facilitate effective maintenance. Moreover, an optimally balanced market can be achieved by this (Dixon and Sherman, 1991; Samdin et al. 2008). It can be the profit-generator of ecotourism. The aim of this research was to calculate the willingness of visitors in paying for environmental conservation and also to study the factors affecting WTP for higher entrance fee, with the help of contingent valuation method in Mudumalai Tiger Reserves (MTR), The Nilgiris, Tamil Nadu. To identify factors that influencing the willingness to pay for higher entrance fee, the logistic regression model has been used. Based on the results derived from this model, it is found that respondent education, respondent occupation, distance and family income are the most important influencing factors of the WTP for higher entrance fee. Also, the analysis has brought out that 72 percent of the visitors were willing to pay more than what is now the prevailing entrance charge of Rs.15 and the average willingness to pay was Rs.52. This experiential study serves as an useful strategy guide by highlighting the significance of economic valuation in the perspective of management of natural resources for the improvement of stable environmental plans and approaches that would aid in finding out the essential class of tourists and visitors who have the potential to help in maintaining the sustainability of the protected area resources - socially, monetarily and most importantly, ecologically. From the point of view of this policy, the results of the analysis recommend the increasing of the entrance fee from Rs.15 to Rs.50, to the MTR administration. Such a move will have manifold benefits such as producing more income, leading to sufficiency and efficiency ultimately contributing to a sustainable framework of conservation of diversity of the biosphere in the reserved area.

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