Pricing Nature Based Activities at Taman Negara National Park in Malaysia: A Contingent Valuation Method

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Abstract

Taman Negara is the Malaysia's premier national park and the largest in the country covering over 434,300 hectares of primary forest. It is home to much wildlife and is a popular tourist attraction to both local and foreign tourists. This study attempts to determine the economic value of nature based activities provided by Taman Negara National Park by eliciting visitors' willingness to pay (WTP) using contingent valuation method followed by single bounded dichotomous choices. A stepwise backward binary multivariate logistic regression model was used to measure WTP for various nature based services provided by TNNP and to determine the factors that influence the variation in WTP. Primary data were obtained from 368 local and foreign visitors which have been interviewed in TN Park. Study found that both local and foreign visitors were willing to pay more than the current charges for entrance permit as well as all services provided by TN Park. This study found evidence that visitors are willing to pay for existing activities such as Canopy walkway, Hide, Camping and Fishing, as a package whichis RM 52.5($17.5) per person. It is 110% more than the current charges of RM 25($8.3). The optimum pricing strategy should be a combination of policy objectives and information gathered from local and foreign visitors on WTP. In conclusion, the outcome of this study can be used as a tool for revising pricing policies on TN national park in Malaysia.

Key words: Dichotomous choice framework, Willingness to pay, Ecotourism, Pricing policies.

Introduction

Taman Negara was declared for conservation in 1938 and has become Malaysia's premier national park and the largest in the country covering over 434,300 hectares of primary forest, spans across three states Kelantan, Terengganu and Pahang - and is situated in the center of the Peninsula Malaysia(Ministry of Science Technology and the Environment, 2010). Taman Negara is the most extensive protected area of pristine, lowland, evergreen rainforest in the country and it is home to much wildlife and is a popular tourist attraction to both local and foreign tourists (Samdin, 2008). TNNP imposes six types of charges. Each visitor must take an entrance permit by paying RM1.00 ($0.33) to enter the park. Other charges would depend on the visitor's activities during the visiting time. Mainly there are four types of activities for visitors: (1) canopy walkway, (2) hide, (3) camping and (4) fishing. Existing pricing policy was established in 1998 and many researchers have emphasized the necessarily of reform the current archaic pricing policy.

The aim of this research is to propose appropriate pricing policy for previously mentioned four types of activities performed by national park. Proposed charging policy can be used for sustainable management of national park and it can be applied to provision of quality products and services for visitors (Hanemann, 1984). However, establishing a pricing policy for natural resources and nature based activities is challenge to policy makers, since natural resources and nature based activities do not traded in the market as other commodities (Johansson, 2000). Consequently, non-market valuation techniques were basically identified as tools of measuring the value of park nature based activities (Apestequim et al. 2006).

Materials and Methods

Contingent valuation elicitation questions may be open-ended or closed-ended. In an open-ended question the respondent asked to state the maximum amount that he or she willing to pay for the good or service that being valued (Arrow et al. 1993). Under closed-ended contingent valuation CV question or "dichotomous choice" approach the respondent is asked whether he or she is willing to pay a specific amount presented as the value of the improved service (Gunathilaka et al. 2007). Contingent valuation Method (CVM) is one of the commonly used methods for non-market valuation. In this study researcher

applied dichotomous choice framework with logistic model for measuring willing to for nature based activities (canopy walkway, hide, camping and fishing) in the TN national park. The reduced form of a typical logistic probability model for willing to pay on selected four activities and factors effecting for their decision can be written in the following form:

$$\Pr[Y_{t=1}] = \frac{e\beta x}{1 + e\beta x}$$

$$\Pr[Y_{t=1}] = 1 + e \frac{e\beta_0 + \beta_1 BID + \Sigma^n_1 = 1\, \gamma iSi + \Sigma^m_i = 1 xjFj}{\beta 0 + \beta 1 BID + \Sigma^n_1 = 1\, \gamma iSi + \Sigma^m_i = 1 xjFj}$$

Where,

Y = agreed or not for proposed specific amount (RM 50 or $16.7) for selected activates provided by park: (canopy walkway, Hide, camping and Fishing)

1= willing to-pay, 0 = Do not willing-to-pay

BID(X1) = Visitors Bid level (Willing to Pay) for nature based activities (RM per person)

S = Visitors Socio-economics characteristics

INC (X2) = Monthly Income of visitor (MR)

NIS (X3) = No of income sources

VLT(X4) = Visitors leisure time (holidays) per month;

EK (X5) = Existing knowledge on natural resources; (1) Good, (0) Otherwise

NNTN (X6) = No of night spend in park during their visiting period.

NAU (X7) = No of activities used after entered to the park.

NT (X8) = No of visiting time (previously)

F = Socio-Economic characteristics

Age (X9) = Years

SEX (X10) = (1) Male; (0) female

TV (X11) = Type of Visitors; (1) = Foreign, (0) = Local

EDC (X12) = Education: Respondents education level.

Sampling framework and data gathering tools

A personal interview was conducted on Malaysians and international visitors. The survey was conducted at various locations of the park during the period of 15-28 January 2012. The survey resulted in a total of 368 completed questionnaires, 235 internationals visitors and 133 Malaysians visitors.

Results and Discussion

Out of 368 respondents 261 agreed for paying proposed pricing package (RM 50 or $ 16.7) on four types of nature base activities in the park. According to parametric logistic model the mean value of WTP for those activities is MR.52.5 for every visiting per person ($17.5 per person).

A stepwise backward binary multivariate logistic regression model was applied to determine the key factors associated with willingness to pay decision of selected 368 responders. The empirical model distinguished with selected socio-economic and demographics characteristics which would be effected to visitors willingness to pay decision. Initial model was run with 12 explanatory variables. However after the 9th iteration, the model has selected nine key factors which were mainly influenced for respondent's decisions. Selected variable and model results are shows in Table 1.

Table: 1 Important indicators of the estimated logistic model.

Variables in the equation	B	Std. Error	Wald	Sig	Exp(β)	Percentage change in Odds[a]
Metric Variables						
BID(X1)	0.152	0.011	36.265	0.001	1.022	2.2
INC(X2)	0.358	0.775	11.038	0.001	1.431	43.1
NIS(X3)	0.601	0.552	6.209	0.013	1.825	82.5
VLT(X4)	0.679	0.677	8.494	0.004	1.973	97.3
NNTN(X6)	0.001	0.000	6.582	0.010	1.001	0.10
NAU(X7)	0.158	0.359	10.648	0.001	1.171	17.1
Non Metric Variables						
EK(X5)	0.747	0.559	5.778	0.016	2.111	-
TV(X11)	1.375	0.523	5.136	0.023	3.956	-
EDU(X12)	0.784	0.876	3.567	0.046	2.190	-
CONSTANT(β0)	7.98	2.193	52.085	0.000	0.000	-

Note: β = Logistic coefficient, Exp (β) = exponentiated coefficient, x8, x9, and x10 were rejected from the model. Percentage change in odds (only metric variables)= e^{bi} -1*100

Interpreting the logistic coefficients

In this final model almost all the variables except constant have positive signs, indicating the positive relationship between both independent variables and predicted probability. The estimated coefficient reflects very important logical relations. As visitors income level is higher and having more income sources they have shown high bid level for entrance permit to the park. Those who had proper knowledge of natural resources and more holidays, they have been reflected higher obligation for WTP than others. Foreign visitors were more committed for WTP than locals. Further, number of days spends in the park and number of activities used in the park during their visiting time increase WTP is tent to be increased. All those result is also consistent with theoretical expectation and empirical findings. In contract, according to the Wald Test statistics all measured variables were statistically significant statistics commonly at least five percent. However, age of visitors, their sex and time of previously visit were dropped from the model with backward iterations.

Since all exponentiated coefficients are greater than one, it denotes positive relationship with dependent variable. According to the value of percentage change in odds, a one -unit increase in visitor's income will increase the odds by 43.1 %. A one unit change visitor's income sources lads to increase the odds by 0.82.5%. Beside, one unit increase in visitors leisure time the odds will increase by 97.3 percent. However, number of night spends in park increase by one unit the WTP for TN park will increased by 0.10 percent. Thus, number of night spend in park does not reflects significant influences on decision of WTP.

Among exponentiated coefficients, existing knowledge on natural resources have been highly associated with the willing to pay decision. This coefficient is 13.11 means that, knowledgeable visitors have 111 percent higher odds than others (2.111-1*100). Simply, knowledgeable visitors are 111 percent higher enthusiastic for WTP other visitors. Foreign visitors were 295% higher odds than locals. Farther, those who were educated were 295% higher odds than those who were less educated.

Conclusions

This study found that both local and foreign visitors were willing to pay more than the current charges (MR 25) for major nature based activities provided by TN Park. On average visitors are willing to pay for four types of activities as RM 52.5 per person, while existing rate is RM 25 per visitor. Foreigners are more committed on WTP for TN Park activities than locals; on average foreigners WTP for those activities as a package is RM 78.6 and locals are RM 34.8 per visitor. The optimum pricing strategy should be a combination of information gathered from local and foreign visitors on WTP. Furthermore, this study found that the foreign visitors were willing to pay for nature based activities than local visitors. Thus, park management can be imposed price discrimination strategy between foreigners and locals to enhance park revenue. In conclusion, the outcome of this study can be used as a tool for revising existing pricing policies on nature based activities at TN national park in Malaysia.F urther, policy makers can identify the range of price increase of those activities without damaging the local and foreign tourism market at TN national park.

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