DETERMINING RECREATIONAL VALUE AND FACTORS ON WILLINGNESS TO PAY FOR USING JUNGLE PARK OF URMIA

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ABSTRACT

The present study uses a contingent valuation method to determine recreational value and individual willingness to pay (WTP) for exploiting Jungle Park of Urmia. The Logit model and maximum likelihood method are used for determining WTP and the related variables. Data collection was performed based on Cochrane methodology. A total number of 240 double-bounded dichotomous choice questionnaires were collected through in-person interviews, from which 20 questionnaires were excluded for incomplete information content. Statistical analysis of variables and estimation of parameters were done using MAPLE, SHAZAM and SPSS software programs. Results indicate that income and level of education were positively, while proposed price, age of respondent and family size were negatively influential on WTP. Also, average individual willingness to pay and average recreational value of households for each turn at the park were 4387 and 21935 Rials, respectively.

KEYWORDS: Contingent valuation, willingness to pay, Logit model, Jungle Park of Urmia

Paying due attention to natural capital is essential for sustainable development. Expressing the value of natural resources brings about questions on valuation of natural resources, which can be positively and optimally utilized in improving environmental policies. Accordingly, qualitative conceptualization of these resources, including a better understanding of ecological and environmental benefits, delegating national environmental issues to planners and decision-makers, preventing environmental degradation and uncontrolled exploitation of resources, is of dire importance (Vaze, 1998).

Economic valuation is a measure for determining the maximum amount an individual willingly pays in favor of a set of goods and services, while overlooking another set of goods and services. Studies reveal that contingent valuation is the most optimal method for obtaining conservational and recreational values of forest resources. It also helps determine individual willingness to pay under a certain hypothetical market scenario (Lee & Han, 2000).

Jungle Park of Urmia is host to many households from different corners of the city who resort to it to spend quality time with each other. Regarding the above discussion on valuation of natural resources and contributing to optimal decision-making for promoting social well-being, the present study undertakes to estimate individual WTP and related variables to take initial steps in optimal planning.

Abdollahi et al. (2010) used contingent valuation to examine WTP and related factors in visitors to Sardabeh in Ardabil and found it to be 4150 Rials. Raheli et al. (2011) evaluated recreational value of Band Village in Urmia, using continent valuation, and found it to be 500 million Rials. Hayati et al. (2011) estimated WTP of visitors to Ghoori Gol Wetland to be 7430 Rials with an annual recreational value of 743 million Rials. Hasshemi et al. (2011) determined recreational value of Noor Jungle Park of Mazandaran and estimated WTP of visitors up to 3875 Rials. Eami Meybodi & Qazi (2008) found that individual WTP of Saee Park reaches 1840 Rials per visit. Sardar Shahraki er al. (2011) used contingent valuation to calculate annual recreational value of Shahr Soukhite monument which turned to be 1292 million Rials.

Krieger (2001) revealed that recreational value of American East Forest was $10.43 per household, using contingent valuation. Leinhoop & MacMillan (2007) estimated recreational value of desert areas in Island as €243.16 each year. Lee & Han (2002) used contingent valuation method to calculate recreational value of five national parks in Korea, which was found to be $10.45 per household each year. Buckley et al. (2011) found that WTP for improving infrastructures of highland and lowland pastures were £9.08 and £12.22, respectively.

METHODOLOGY

Generally, contingent valuation is used as a standard and flexible means for measuring consumptive and nonmarket consumptive values of environmental resources. It aims at determining individual willingness to pay in certain hypothetical markets to see how respondents are willing to pay in secure markets (Emami Meybodi & Qazi, 2008).

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A double-bounded dichotomous choice questionnaire is used in the present study to evaluate individual willingness to pay for visitors. The questionnaire is designed in two parts. First, socio-economic status of people is measured, including job, education, income, address, age, and number of family members. The second part examines WTP of visitors and offers three price ranges of 3000, 6000 and 9000 Rials. Initially, the middle proposed price is offered and then the higher price in case of acceptance, and the lower price in case of rejection, is offered. Data collection was performed through in-person interviews and fill-in questionnaires from visitors with independent income. In fact, population of the study includes all visitors of the park with independent income. A Cochrane equation is used for accumulating 240 questionnaires, from which 20 were excluded for incomplete information. Thus, a total number of 220 questionnaires was obtained. Individual utility function is assumed as:

\[
(1) \quad U(Y, S)
\]

where U is indirect utility function; Y is income and S is a vector of other socio-economic factors. Visitors tend to pay part of their income (say, offered price A) to use environmental resources and gain a sense of utility and desirability. This sense of desirability and utility is higher when one uses environmental resources, as represented in the following equation (Raheli et al., 2010).

\[
(2) \quad (1, Y - A; S) + \varepsilon_1 \geq U(0, Y; S) + \varepsilon_0
\]

Where \( \varepsilon_0 \) and \( \varepsilon_1 \) are random variables with independent distributions and are zero in average. The difference in utility (\( \Delta U \)) as a result of using environmental resources is:

\[
(3) \quad \Delta U = U(1, Y - A; S) - U(0, Y; S) + (\varepsilon_1 - \varepsilon_0)
\]

A Logit model is used for examining WTP since it entails a dependent dichotomous choice variable. According to Logit model, the probability (\( P_i \)) of an individual accepting one of the proposed prices is as follows:

\[
(4) \quad P_i = F_n(\Delta U) = \frac{1}{1+\exp(-\Delta U)} = \frac{1}{1+\exp[-(\alpha - \beta A + \gamma Y + \theta S)]}
\]

where \( F_n(\Delta U) \) is cumulative distribution function with a logistic standard difference and contains some socio-economic variables of the study. Y and A are income and offered price, respectively, and S refers to other socio-economic properties. Parameters of Logit model are estimated using maximum likelihood method. Approximate average method is used for obtaining WTP through numerical integration of expected value of WTP ranging from zero to highest proposed price (A):

\[
(5) \quad E(WTP) = \int_0^{\max A} F_n(\Delta U) dA = \int_0^{\max A} \left(\frac{1}{1+\exp[-(\alpha' - \beta A)]}\right) dA
\]

where \( E(WTP) \) is expected value of willingness to pay and \( \alpha' \) is adjusted intercept added to original intercept (a) by means of socioeconomic terms: \( \alpha' = (\alpha + \gamma Y + \theta S) \).

It is noteworthy to mention that statistical analysis of variables and estimation of parameters of Logit model are done using SPSS, MAPLE and SHAZAM.

### RESULTS

After collecting data and questionnaires, some important socio-economic parameters were obtained. Results are given in Table 1. As can be seen, average age of respondents is 38 and average level of education is 12 years. Also, average family income is 9,000,000 Rials, while family size is 5 on average.

**Table 1: Essential Parameters**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>Max</th>
<th>Min</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age of respondent (year)</td>
<td>38</td>
<td>62</td>
<td>18</td>
<td>10.3</td>
</tr>
<tr>
<td>Education (year)</td>
<td>12</td>
<td>24</td>
<td>0</td>
<td>3.9</td>
</tr>
<tr>
<td>Family Income (Rials)</td>
<td>9000000</td>
<td>35000000</td>
<td>21000000</td>
<td>6973500</td>
</tr>
<tr>
<td>Family size (person)</td>
<td>5</td>
<td>8</td>
<td>1</td>
<td>1.5</td>
</tr>
</tbody>
</table>

Results of estimating coefficients reveal that coefficient of proposed price, as the most important descriptive variable of probability of WTP, with negative expected sign is statistically significant. It indicates that higher proposed price decreases likelihood of affirmative response in WTP. Coefficients of income and education are positive and statistically significant, indicating that higher levels of education and income promote the likelihood of affirmative response in WTP. However, coefficient
of age is negative and significant and implies that lower ages decrease the likelihood of affirmative response in WTP. Similarly, family size is negatively and significantly related to WTP. That is, increase in number of family members decrease the likelihood of affirmative response in WTP.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Coefficients</th>
<th>t-statistics</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed Value</td>
<td>-5.23</td>
<td>-1.3</td>
<td>0.0322</td>
</tr>
<tr>
<td>Proposed price</td>
<td>-0.005</td>
<td>-3.46</td>
<td>0.0000</td>
</tr>
<tr>
<td>Family income</td>
<td>0.0000032</td>
<td>4.56</td>
<td>0.0000</td>
</tr>
<tr>
<td>Education</td>
<td>0.215</td>
<td>2.54</td>
<td>0.0058</td>
</tr>
<tr>
<td>Age</td>
<td>-0.045</td>
<td>-2.41</td>
<td>0.0120</td>
</tr>
<tr>
<td>Family size</td>
<td>-0.501</td>
<td>-1.25</td>
<td>0.039</td>
</tr>
</tbody>
</table>

Parameters of Logit model are estimated using maximum likelihood method. Then, expected value of WTP, which signifies recreational value of Jungle Pak of Urmia, is calculated through numerical integration ranging from zero to highest proposed price, as follows:

\[
E(WTP) = \int_{0}^{\max A} F_u(\Delta U) dA = \int_{0}^{400} 0.0000032 \left( 1 + \exp\left(\frac{-21/935 - 0.005A}{\Delta U}\right) \right) dA = 4387
\]

Average willingness to pay per each person at each turn at the park is 4387 Rials. Also, average recreational value per each household, which is obtained through coefficient of WTP multiplied at number of family members, is 21935 Rials.

CONCLUSION

There is no doubt that people promote desirability and utility by using environmental and natural resources. However, how much they are willing to pay for this desirability and factors that influence their decision need to be observed carefully. It helps decision-makers adopt appropriate policies and plans for preserving and optimizing environmental resources and the current circumstances. The present study examines WTP and related factors in using Jungle Park of Urmia through a total number of 220 questionnaires. After collecting data, a Logit model was used for measuring WTP and parameters were obtained using maximum likelihood method. Our results are in agreement with many established findings in the literature, such that income and education were positive, while proposed price, age and family size were negative. All the variables were statistically significant. However, average WTP for using the park was found to be 4387 Rials, which was a bit higher than other findings. This implies the extent to which people care about environmental resources. According to our findings, the following suggestions are given:

A majority of studies in the literature have suggested increasing level of income in society; nevertheless, it seems to be impractical in the short run since it requires long-term policies and plans. Rising public awareness about the value of the environment through the media, designing recreational programs ad lotteries at the park may contribute to increase individual willingness to pay for using the park. Considering negative and significant correlation of family size with WTP, it is suggested that large families receive subsie or discount to be encouraged. Also, city authorities can promote people’s contribution through improving welfare and healthcare services, developing infrastructures, increasing biodiversity, and promoting quality and attractiveness of the park. On the other hand, the private sector can be involved by valuation of environmental resources.

REFERENCES


