

Estimating the outdoor recreational value of Shorabil lake based on Contingent Valuation Method (CVM)

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ABSTRACT

Sustainable management initiatives in Shorabil Lake require that economic analysis be identified to help maintain recreational quality of the lake. Shorabil Lake with the area of 150 ha is located in Ardabil city that is one of the most important attractive areas in national and regional level that can attract thousands of recreationists from other areas every year. Thus, the study of recreational value will help prediction of requirements, removing deficiencies and developing recreation in the region. This study was carried out with the aim of estimation recreational value of Shorabil Lake by using contingent valuation method and determining effecting factors. For investigation factors affected on the amount of willing to pay, applied logistic regression with maximum likelihood method. Required data for the study, supplied using of 256 queries from the lake visitors. The results indicated that the average willing to pay for each person to visit lake is 9236 Rials (US\$0.75) and annual willing to pay is 155682 Rials (US\$126.98). The results can be a key factor in better planning and managing the lake for future.

Keywords: Shorabil Lake, recreational value, logistic regression, willing to pay, contingent valuation method.

INTRODUCTION

Nowadays, the main environmental economy subject, which is almost publicly accepted, is the fact that the environment is inseparable from the economy and any change in one may affect directly the other one [9]. On the other hand, tourism with its special characteristics is considered as a dynamic industry with a shining future [8]. Tourism takes the third position in the world after oil and automobile industries and plays an important role in producing income for countries [8]. Although public awareness on the importance of conservation of natural resources has increased, their understanding of the benefits of conserving the natural ecosystem is still low [1]. Financial short-term returns become more important in determining development returns and social goals of the conservation are often given lip-services [1]. In recent decades, concerns have arisen about the proper valuation of the world's ecosystems. Valuation of non-market services and efficiencies is important due to factors such as recognize and understand environmental and ecological benefits by human. Lake ecosystems generate a wide variety of use values, the most important of which are fishes, recreation and other services. Since environmental goods and services (like tourism resources) are not traded in the usual markets, the benefits derived from these commodities are external to the market [10]. Non-market valuation (NMV) of environmental goods and services are undertaken to ascertain the individual's preferences for the various non-marketable environmental (Bateman et al., 2002). Over the years, NMV has become an important tool in both developed and developing countries [10], in most of the studies

the contingent valuation method is also used. Knetsch and Davis (1965) estimated the recreational value of Pitson Area Woods in Northern Maine, using CVM. The results indicated that maximum WTP to be approximately of \$72000. Navrud and Mungatana (1994) used CVM to estimate the economic value of tourism associated with Lake Nakaru National Park in Kenya. The visitor's consumer surplus was found to be approximately \$75 million annually vide the CVM. Shorabil Lake with the area of 150 ha is located in Ardabil city that is one of the most important attractive areas in national and regional level that can attract thousands of recreationists from other areas every year. Contingent valuation (CV) is widely used as a method to evaluate passive values of the natural environment [12,13]. The contingent valuation method (CVM), a stated preference method, has proven to be a useful technique for uncovering passing use values of ecosystem quality. The contingent valuation method is a simple, flexible nonmarket valuation method that is widely used in cost-benefit analysis and environmental impact assessment. This paper attempts to estimate the recreation value of Shorabil Lake, the natural beauty of the Ardabil city by using CVM and WTP for the preservation and improvement of the area. The main purpose of the paper is to estimate the economic value of Shorabil Lake regarding recreational use. In order to estimate the economic value of this lake used CVM. For goods have no market prices, the indicator of benefits is more difficult to estimate. The total economic value of natural resources include both use and non-use values [3]. Non-use values which are not associated with current or intended future use of an asset are more difficult to estimate. Studying the options and desires of people involving tourism regions and their available facilities can considerably help fulfill the needs and shortages existing in this region. One of the indicative indexes of people's outlook on a tourism region is the value made by visitors to visit and enjoy these regions. Non-use values can be estimated using methods which infer willing to pay (WTP). The main objective of the study is to estimate the recreational values of the Shorabil Lake.

MATERIALS AND METHODS

Study area

The Shorabil Lake with the area of 150ha is located near the city of Ardabil, Northwestern Iran. Elevation of this lake is around 1360m from sea level (Figure 1). Mean annual precipitation in the area is 350mm and mean annual temperatures range from -15 in January to +26 in July. It is one of the most important recreational areas at regional and national levels. The majority of recreationists arrive during the months of July to September. The Lake, attract 1600 visitors a day in peak periods (summer). The successfully of plans in this region, need environmental protection and tourism management.

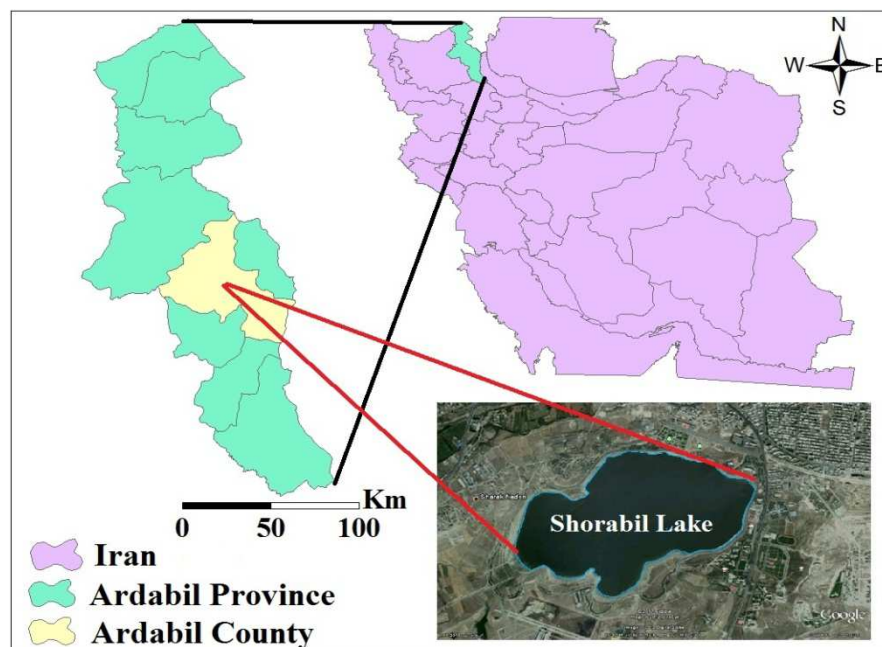


Figure 1. Location of study area

MATERIALS AND METHODS

The valuation approach

The contingent valuation method (CVM) is utilized in present study. The CVM has since been widely used to measure the use and non-use values of environmental quality, biodiversity, urban green spaces, national parks, and world heritage sites [2, 6, 5]. One of the main issues regarding contingent valuation is how we should evaluate

the observed responses and estimate a respondent's willingness to pay (WTP). CVM is a direct valuation method in which respondents are asked to express a willing to pay (WTP) or willingness to accept in response to a hypothetical market situation [4, 5]. A pretest was also done to check the validity and understandability of the contents of the questionnaire. In present study response to WTP surveys obtained using face-to-face interviews and personal interviews were used.

Data collection

The questionnaire was divided into three parts. Part one contained questions relating to socio-demographic backgrounds of the recreationists. Part two was related to the recreational characteristics of the individuals with respect to the use of the Shorabil Lake for recreational activities. Part three contained questions relating to the conservation of the lake. The format used to determine WTP included both open-ended and close-ended questions. The letters were designed to reduce the problem of free-riders (people who obtain benefits but not willing to pay) and to help to reduce interviewers biases. The open-ended format was used to allow flexibility and freedom for respondents to answer without pressures, thus avoiding the starting point bias and reducing hypothetical biases (Boyle, 2004). For goods that have no market price, eliciting the values using CVM implies the maximum WTP.

Sampling

A pretest was conducted on 50 respondents to verify whether the questionnaire was logical and unambiguous. After pretesting, the actual survey was carried out at the Shorabil Lake from July to September 2011 including weekends and public holidays. Taking into consideration the constraints in resources for data collection, a total of 231 visitors were selected for a 12-week survey period. To ensure that the sample represented the recreationist population, convenient selection and enumeration of the respondents were done on a staggered time frame which included weekends and public holidays. To avoid any spurious emotions affecting responses, they were informed that the study was being carried out for academic purposes only.

RESULTS AND DISCUSSION

Socio-economic characteristics

The socioeconomic characteristics of the sample at Shorabil Lake are summarized in Table1. According the information of table1 the mean age of respondents is 37.6 years. The mean income of the respondents is approximately US\$2070, the mean of family size is 0.75 and Most of the local visitors were residents living in the vicinity of the Shorabil Lake (82.7km). Also, number of visit from the lake is 39.2 turns per year. Table 2 shows the importance of natural resources declared by visitors. 211 respondents were believed that the lake has importance.

Table1. Socio-economic characteristics of visitors to the Shorabil Lake

Variables	Mean	Standard deviation	Minimum	Maximum
Age (year)	37.6	11.2	24	69
Educational status	11.4	4.7	0	19
Income (\$US)	2070.48	1328.56	0	7200
Family size (person)	0.75	1.7	1	6
Distance from lake (kilometer)	82.7	23.2	1.9	542
Number of visit from lake (yearly)	39.2	23.9	1	115

Table2. The importance of natural resources declared by visitors in questionnaires

Degree of importance	Very high	High	Intermediate	Low	Without importance
Number	141	70	23	22	0

Table 3.Factors influencing WTP

Variables	Estimated coefficient	t statistic	Change in probability	Significant level
Coefficient	0.4011	0.64	0.07	0.656
Suggestion price	-0.0029	-3.60	0.37	0.000
Monthly income	0.8101	-2.23	0.072	-0.09
Age	-0.2872	-2.23	0.072	-0.09
Educational level	-0.3560	1.92	0.13	0.0391

Correct prediction percent: 68%

*P*value: 0.01

McFadden determination coefficient: 72.3

Accuracy test: 72.3

To explore factors that affect respondent's WTP for recreational use of the lake, discrete variable logistic regression analysis was carried out. Whether a respondent willing to pay or not was framed in a binary-choice model. Let *y* represent a dichotomous variable that equals 1 if the respondent willing to pay and 0 otherwise. The maximum likelihood estimates for the logistic regression model are presented in Table3. Suggestion price, monthly income,

and educational level had effect on the respondent's WTP. The result of multiple regression analysis to determine the influence of various socio-economic variables on the WTP of the recreationists is shown in Table 3.

The mean value of WTP was calculated Rials9236 (US\$0.75) per visit.

$$WTP = \int_0^{15000} \frac{1}{1 + \exp \{-(0.4011 - (0.0029A))\}} dA = 9236$$

CONCLUSION

Our study conducted the estimate of WTP values from contingent valuation method. The results of present study provide evidence that the majority of respondents are willing to pay for environmental conservation [12]. An environment conservation fund could be established by the management of the Lake. The results imply that appropriate management of the fund would be vital [13]. In present study, the estimation of the recreational value of the lake is done using the CVM. With the proper sampling and questionnaire design the biases are reduced [1] in current study. The recreational values of the lake to recreationists were estimated at Rials9236 per visit.

The Shorabil Lake in Ardabil city is managed mainly for recreational use. On the basis of resulted from this study, variables including suggested price, income and educational level affected on pay for recreational value of the Lake. On the other hand, family size, genus, and the number of visit do not have significant effect on pay for recreational value of the Lake. The response "YES" in juvenile is more than old people that the negative coefficient of age in table determines it. On the other hand, there is a positive correlation between response "YES" and higher educational level. Also, there is a positive relationship between amount of income and probability of response "YES" in visitors. The results showed that with increasing 1% in suggested price, the probability of willing to pay will decrease 37%. The accuracy test of 72.3% in present study indicates that the variations described in present model, is significant in more than 1% level. The McFadden determination coefficient (72.3) shows that description variables of model describe variation of dependent variables of model. The present study addressed the WTP of recreationists and it is possible that other shareholders may also be willing to contribute for recreational use and management.

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