

Assessment of recreational value of Golestan Pardisan Forest Park Complex using a contingent valuation method (A case study in Golestan province, Gorgan)

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ABSTRACT: Concern for the environment and nature is growing constantly. The preservation of these areas should be considered earth duty of all nations and countries. Because maintenance of the causes leading to the international of states correlation and guarantee sustainable development and Enjoyment of all human beings the healthier environment will be. Environmental ensure the life of the current generation and future generations are growing. This study determines recreational value of Golestan pardisan Forest Park complex in Golestan and estimate of individual willing to pay for using a recreational complex with the use of contingent valuation method. For survey of effect of explanatory variable on individual willingness to pay, we use logit model and parameter of this model with the use of maximum likelihood method are estimated requisite data with the use of follow-up questionnaire 132 visitors of partisan complex are collected. The results show which 95.45 percent of people like to pay entrance fees to partisan complex. Medium of willingness, these people are estimated 13000 rials. Also recreational value of this pardisan complex is estimated 5785000000 annually. The results show which forest parks have high recreational value that this point can help plan-makers, economic, social and executive managers for planning of conservation and sustainable exploitation of natural resources.

Keywords: Conservation value, contingent valuation method, Pardisan Forest Park Complex, Golestan Province.

INTRODUCTION

Efforts have doubled role in estimating financial value of ecosystem services in panel. Management of human and natural systems. In micro level, studies of valuation cause access to datas about structure and utilization of ecosystems and their variable and complex role for protection of human welfare and in valuation of macro, ecosystem can participate in creation and improvement of indicators of human welfare and sustainable development (Hovareth and Faber, 2002).

Valuation of utilizations and services of non-market of environment are important for many reasons like recognition and understanding of benefits of ecology by human, presentation environmental problems of country to decision-markets plan-markets, make available relation between economic politics and natural revenue, measurement of roles and importance of ecological resources in support of human welfare and sustainable development, adjustment and improvement of collection of national accounts like gross national production and prevention of destruction and irregular exploitation of natural resources (Vaz, 1998; Eshim 2000 and Gaeo and colleagues 2001).

Total economic value of every natural source can be divided by consumed value and non-consumed and real exploitation of natural source that this includes direct consumed value like incomes accruing on wood, forage, food, raw and indirect consumed value are recreational activities, ecological services (Gutman 2007, Brun, 2002, Torras, 2000).

Ecology economic scientist believes that economic valuation for non-market services and benefits and ecology are necessary and denial of them for long period causes regret (Kant, 2007).

Economic valuation is a method which is used for measuring monetary value of services, Frontier value of ecology sources in developing planning and decision and management of rotation and preservation of natural ecosystem (Costanza, 1997).

Studies present which contingent valuation method is the only method that is used for determination of preservation value of forest resource. This method tries to determine individuals willing to pay under deterministic supposed market scenario (Han and Lee, 2002).

Contingent valuation method is the method that is preferred for valuation of services of natural resources. In this method are asked questions about individual willingness to pay or non-payment of entrance fees in increase or decrease of consumption of consumed goods.

In this method is supposed answerer differentiate between different sums and it shows individual valuation. Curve of Bradford shows a summary of economic theories of functions about individuals willingness to pay (WTP) that we expect it should include agreeable suggestions that it is showed in picture (1).

This curve shows maximum individual valuations for increase and decrease of fixing scale for environmental goods (Bradford, 1972).

Some of goods and ecological services haven't price-tag, for this reason there are doubt for their valuation and real importance, but most of them can be considered as public goods (Karimzadegan, 1993).

In spite of the fact that capabilities and potential in country, non-existence of tourism suitable infrastructure, non-existence of recognition toward Ecotourism in Iran, shortage of Ecotourism specialist, non-existence special suitable culture of tourism which cause destroy of natural views and lack of information in this case by communication media and publications are the most important reason of lack of tourist attraction in Iran. Where tourist countries can cause increase of per capita national income because they have natural views. So attraction of Ecotourism is very important that all of country which have tourist attraction must pay attention to it. Valuation of tourist areas and ecological utilization are very important for improvement of economic decisions which consider it as a good and free services (Khodavardizadeh, 2010). Many studies surveyed scale of benefits which are acquired visit of recreational areas by using a contingent valuation (CV).

For example Ochoria et. al (1995) acquired the existential of benefits of forest of costarica for per hectare of forest which is 238 dollars. Thomas, (1997) in America concluded from that people pay expenses between zero to 325 dollars a yearly for preservation of ground water against chemical pollution by using this method.

Pajivoula (2001) by using cv method estimated the willingness of native resident to pay and every tourist for repair and novation palace of roman is located in historical city split 170 and 45 dollar in order for every visitor.

Lee and Han (2007) estimated recreational value of five national parks in Southern Korea in average is 10.54 dollar for every family yearly. Amigous, (2002) estimated value of conservation habitat of river bank of garoun of france by using a contingent valuation method with tobit patterns, linear semi-log and two-stage heckman method 133, 13, 66, 67 franc respectively. Rinisdatir, (2008) by using CV method shows that average WTP of people as an entrance-free for national Eskaftafel Goulous water fall of Irland is 508, 133, million Isk. Asgari and Mehrgan (2001). Estimated willingness of family for historical buildings of Hamedan Ganjaname with the use of a contingent valuation method, is 1560 rials for every visitor. Khorshid dost (2004) by using contingent valuation method estimated the willingness of people in Tabriz for environmental conservation and decrease pollution in city, in average is 41140 monthly. Amirnezhad . (2006) estimated the preservation and recreational values of sisangan forest park, Nowshahr, by using a contingent valuation method is 2.5, 5.8, million rials in per hectare annually. Khodaverdizadeh, (2008) estimated the recreational value of Kandovan tourism village of eastazarbayan with the use of contingent valuation method, is 11715 annually.

Golestan city is the most beautiful province in country because it has historical places and natural and tourism attractions (Golestan province tourism handicraft and cultural organization, 1390). Golestan is one of big cities in Iran and it is the center of Golestan province which is in south east in Iran. This city is located with geographical coordinates 57 degree, 7 minutes eastern longitude 67 degree and 17 minutes northward, in map of Iran. Height of Golestan city of sea level is 1755 meter. Golestan city have 515114 population in 1385. Climate of Golestan is moderate in spring, it is cold and dry in Autumn and winter and average annual rain fall is 135 millimetres area of this city is 546 square kilometer. Golestan pardisan Forest Park complex have 300 hectare areas, which it is made by cooperation of charitable persons, it has role in pure of weather of Golestan. This complex has 500 thousand kind of tree like pine, cypress, elm, ect. This complex has big trees and it is verdant which are near together and they

cause pleasant and clean place which it is delightful and enjoyable place. we must analyse effective factors which affect desires of people economically and socially which can help us to foresee need and lacks of tourism areas. For example one of this factor is the value which people have it toward visit and use of this tourism areas that is direct benefits of recreations and people show it by their willingness to pay. The valuation method is one of the methods which has many utilizations in the search for measure of the individuals willingness to pay and the recreational value of ecological resources and tourism places. With due attention to this subject, in this study is tried to survey effective factors on the individuals willingness to pay for Forest Park jungle park and measure of recreational value of this park.

MATERIALS AND METHODS

In this study, is used the contingent valuation method for measure of the recreational value of Forest Park jungle park in Golestan city. The contingent valuation method (CV) is used as a standard and flexible instrument for measuring of consumed value and non- consumed of ecological resources. This method is offered by ciriacy-wantrup in 1974, but Davis used this method experimentally for the first time in 1963.

Method CV is tried to determine the individuals willingness to pay in scenario of certain supposed market. In other words method cv is tried to understand how answerer are satisfied to pay in scenario of certain supposed market. This method seem to be simple method. In this method we ask people about their willingness to pay for special good. In this method, we need economic theory and many methods and rules about sociology, psychology, atatistic, opinion poll (Amirnezhad and Khalilian, 1384).

In this method of dichotomous choice is supposed persons have utility function as fallow

$$U(Y, S)$$

U is indirect utility function, Y is the individual income, and S is vector from other social, economic factor of person. Every visitor is ready to pay sum of her/his income for using ecological resource as a offered sum (A) that this use is desired for them. This desirability is more than manner which person dosen't use ecological resource and this function shows it (Haneman, 1984).

$$U(1, Y - A; S) + \mu_1 \geq U(0, Y; S) + \varepsilon_0$$

ε_0 and μ_1 are stochastic with mean null which are yandom and independent from each other. The difference in utility ΔU is as the result of use of ecological resource, is as follows:

$$\Delta U = (1, Y - A; S) - U(0, Y; S) + (\varepsilon_1 - \varepsilon_0)$$

From of this dichotomous question naire for surving the individual willingness to pay which have a dependent variable with dichotomous choice. So logit pattern is used for surving effect of various explanatory variable on scale of WTP of visitors for determination of recreational value. On the basis of logit pattern, probability (P_i), the fact that person accepts one of suggestions, is showed as follows (Haneman, 1984):

$$P_i = F_{\eta}(\Delta U) = \frac{1}{1 + \exp(-\Delta U)} = \frac{1}{1 + \exp\{-(\alpha - \beta A + \gamma Y + \theta S)\}}$$

$F_{\eta}(\Delta U)$ function is cumulative distribution function with standard logistic and contains some of social- economic variables like income, proposed sum, age, sexuality, the number of persons of family, education. β, γ, θ are measureable coefficient which are $\beta \leq 0, \gamma > 0, \theta > 0$. Three methods are for accounting quantity of WTP: the first method is named mean WTP which is used for accounting the expective quantity WTP by numerical in tegral in limit null to infinite quantity the second method is named the total WTP mean which is accounting the expective quantity WTP by numerical integral (1) in boundary of $-\infty$ to $+\infty$ and the method is named mean WTP which is a part that is used for accounting the expective WTP by numerical integral in limit of null to infinite quantity suggestion maximum

(A). among these methods, the third method is better because this method retain constancy and compatibility of limitations with theory, statistical efficiency and ability to collect which is accounting as follows:

$$E(WTP) \int_0^{MaxA} \left(\frac{1}{1 + \exp[-(\alpha + \beta A)]} \right) da$$

$$\alpha^* = (\alpha + \gamma Y + \theta S)$$

$E(WTP)$ is the expective quantity of the willingness to pay, α^* is cross of adjusted origin which is added to the sentence (α) is cross of main origin by social and economic sentence. Logit pattern may be estimated as from of linear functions or logarithmic model which the from of linear functions are easy for accounting medium WTP. Elasticity of explanatory variable K (X_k) in logit pattern can be accounted, as follows (Judge, 1982):

$$E = \frac{\partial(B' X_K)}{\partial X_K} \cdot \frac{X_K}{B' X_K} = \frac{e^{BX}}{(1 + e^{BX})^2} \cdot B_K \cdot \frac{X_K}{B' X_K}$$

This elasticity for every explanatory variable explain that percent monomutation change in (X_k) cause percent multiple change in probability of success of dependent variable ($Y_i=1$).

With due attention to kind of explanatory variable, two separate methods are for accounting final effect in logit pattern.

If X_k be little variable, change in probability of success of dependent variable ($Y_i=1$) in consequence of unit one change in X_k is named final effect which is accounted as follows (Judge, 1982):

$$ME = \frac{\partial P_i}{\partial X_K} = \frac{\exp B' X}{(1 + \exp(B' X))^2} \cdot B_K$$

In this method the quantity of change in probability depend on primary probability and primary values of independent variable and their coefficients.

If X_k be dummy variable, final effect for this variable is change in probability of success of dependent variable ($Y_i=1$) which is resulted in change X_k from null to one, where as another variables is invariable in quantity (X^*). Quantity of final effect of dummy explanatory variable (ME_D) is accounted, as follows:

$$P(Y = 1 | X_K = 1, X^*) - P(Y = 1 | X_K = 0, X^*) = ME_D$$

Fixed quantities of another variables (X^*) are as sample condition for accounting of quantity of sample condition, we must consider the the quantity their for dummy variables and we must consider the quantity of their mean for another variables.

RESULTS AND DISCUSSION

Table (1) shows that mean variables of age, the numbers of the people who are under guardianship numbers of times of visit are 37.28 year old, 1.84 numbers and 29.48 times.

Table (2) is about the numbers of persons with different incomes and the most of persons have incomes between 400 to 500 thousands in month.

Table 1. some of important variables which are studied

variables	mean	Standard deviation	The least	maximum
Age	37.28	10.75	19	69
The numbers of The people who are under guardianship	1.84	2.16	0	9
The number of times of visit	29.48	25.45	3	100

Table 2. the numbers of persons with different monthly incomes

Monthly income	Lesser than 300 thousands	300 to 400 thousands	400 to 500 thousands	500 to 600 thousands	600 to 700 thousands	700 to 800 thousands	More than 800 thousands
number	19	25	33	22	11	16	6
percent	14.39%	18.93%	25%	16.66%	8.33%	12.12%	4.54%

Table (3) shows that the purpose of the most of visitors is to watch the natural views and to enjoy pure weather or for the most suitable recreation in place of residence for entertainment facilities.

Table 3. frequency distribution of the main reasons of visit of tourists of pardisan Forest Park complex

The reason of visit	Near to place of residence	The most suitable recreation in place of residence for facilities	Enjoyment of natural view and pure weather	For zoo and artificial waterfall in recreation
number	25	41	62	4
percent	%18.93	%31.6	%49.96	%3.3

According to table (4), the most statistical volum belong to the persons who have self-employment 36.36 percent, and the least belong to house hold group 3.78 percent. For purposes of educations the most statistical society belong to persons who have diploma 31.18 percent and graduate 24.24 percent and the least number of statistical society belong to illiterate persons (table 5).

Table 4. characteristics of answerer job

Job	Self-employment	clerk	housewife	worker	retired	Another case
Number	48%	42%	5%	12%	6%	19%
Percent	36.36%	31.78%	3.78%	9.09%	4.54%	14.39%

Table 5. characteristics educational answerer

Level of literacy	Ph.d	Post graduate	Under graduate	Associate	Diploma	High school	- Guidance school	To read and to write	Illiteracy
Number	6	13	32	16	42	6	15	6	1
Percent	0.75%	9.84%	24.24%	12.12%	31.18%	4.54%	11.36%	4.54%	0.75%

The individual willingness for conservation of every visitors that are determinate with due attention to numerous questions and scoring of these question. Every visitors are placed in table (6) for their answeres to these questions and their concession. You can see that many of visitors love to conserve.

Table 6. the individual willingness to conserve

The individual will ingness to conserve	Very little	Alittle	Medium	Much	Very much
Number	0	5	24	52	51
Percent	0%	3.78%	18.18%	39.39%	38.63%

Table (7) shows that many of visitors don't satisfy of cleanliness of toilet, the numbers of toilet , drinking water, welfare facilities, situation of conservation of pardisan complex, situation of parking of recreation or places for parking. When we improve these problems, the numbers of tourists and economical growth will increase.

Table 7. value of visitors of facilities in pardisan Forest Park complex

Description	Excellent	Good	Medium	Bad	Very bad
The situation of clean lines of toilet	0.75%	22.72%	38.63%	26.51%	11.36%
The number of toilet	0.75%	12.87%	29.54%	44.69%	12.12%
The situation of lands caped grounds	20.45%	57.57%	18.93%	2.27%	0.75%
The situation of accessible drinking water	2.27%	15.90%	26.51%	35.60%	19.69%
The situation of welfare facilities in pardisan Forest Park complex (like foodstuff shop and resurant)	7.57%	35.60%	40.15%	15.90%	0.75%
The situation of benches and places for sitting of family	10.6%	36.36%	31.81%	18.18%	3.03%
The situation of rules of pardisan Forest Park complex	16.66%	54.54%	20.45%	6.81%	1.51%
The situation of conservation of pardisan Forest Park complex	6.81%	37.12%	26.51%	26.51%	3.03%
The situation of accessibility to public transportation	8.33%	12.12%	26.51%	36.36%	16.66%
The situation of parking lot of recreation or places which are for parking of the individual transportation	3.03%	39.39%	29.54%	20.45%	7.57%

Table (8) - shows that the question about the individual willingness is asked like this at first average suggestive price is offered, if answerer doesn't accept it, we offer low suggestive price. If answerer accepts it, we offer high suggestive price.

Table 8. the situation of answering to three suggestive sum for estimating recreational valuation of parrdisan Forest Park complex

The situation of acceptance	The first suggestive sum 1000 tomans		Low suggestive sum. 500tomans	High suggestive sum. 200 tomans
The acceptance of suggestive sum	Number	56	35	20
	Percent	42.43%	26.51%	15.15%
Non-acceptance of suggestive sum	Number	76	41	36
	Percent	57.57%	31.06%	27.27%
Total	Number	132	76	56
	Percent	100%	57.57%	42.43%

The results of the individual willingness to pay are shown in table (8) which 76 persons 57.57 percent didn't accept the first suggestion and they didn't accept to pay 10000 rials for visiting of pardisan Forest Park complex while 56 persons 42.43 percent accepted. When lower than 5000 are suggested 41 persons 31.06 percent didn't accept second suggestion. answerer who accepted the first suggestion 10000 rials, they are placed in the higher group that do they accept to pay 20000 rials for visiting of pardisan Forest Park complex? 36 persons 27.27 percent didn't accept the third suggestion and 20 persons 15.15 percent accepted this suggestion. The results show that 95.45 percent of persons accepted to pay sums for using of pardisan Forest Park complex.

The results of estimation of logit pattern are in table (9). For surving of existence or non- existence of multicollinearity in this search are used analysis of variance test. The results of this test is shown that there isn't multicollinearity between explanatory variables which are used in pattern. For surveying existence and non- existence of heteroskedastic in logit pattern and probit can't use usual methods for example Brousch- Pagan test , White's, Gldfldkvant(GF).

Devid Mc Kinoun (1984) presented statistical as LM₂ for Heteroskedastic test of variance in logit pattern and probit. This statistic depends on LM method and one artificial regression is formed with the use of results of estimation of logit pattern or probit and this artificial regression is used for heteroskedastic test. Amount statistic LM₂ is in fitting pattern 2.3 and in as much as the valuation of probability of statistic is 0.53, hypothesis of existence of homoskedastic is accepted in this model (Whister, 1999). Logit pattern is estimated in from of linear functions and llogarithmic. The results of estimation of these two models proved that quantities of statistic of coefficient Mc Fadden and Likelihood-Ratio of linear function from is higher than logarithmic from so linear pattern is used statistic likelihood ratio (LR).

The quantity of this statistic is 165.23 in as much as this quantity is higher than the quantity of valuation of probability (p- value), so the total estimated method statistically is in level one percent significance. The quantities of coefficient of determination of Esterla, Madala, Kerag- ohler and Mc Faden are estimated for Logit pattern, which are 0.35, 0.27, 0.36 and 0.41 in order. These numbers with due attention to the numbers of observations of dependent variable, are utilitarian numbers. Percent of right prediction of the estimated method is 82 percent and in as much as the acceptable quantity of percent of right prediction is 70 percent for Logit and Probit patterns the quantity of percent of right prediction which is obtained in this pattern, showed utilitarian number. So this method is reliable for next analysis.

Table (9) show that the estimated coefficient are significance for explanatory variables of educations, incomes of visitors and suggestive price in 5 percent level, statistically. But variables of age, sexuality, number of persons are

bailed aren't significance, statistically. The primary estimated coefficients in Logit pattern show marks of effects of explanatory variables on probability of acceptance of dependent variable, but they haven't quantitative commentary but is elasticities and non linear functions are quantities of observation there isn't any guarantee that Logit function can pass of mean samples. So there is limitation for using of elasticity in mean. So Hensher and Johanson (1981), believe in that we must use weight elasticity. Applied weight for estimating of weight mean is predictable probability for each observation (Whister, 1999). This elasticity which is named the total elasticity of weight is used for commentary of the results of this search.

Table 9. result of estimation of logit pattern for recreational valuation of pardisan Forest Park complex

Variables	The quantities of estimated coefficient	The value of statistic	The elasticity in man	The total weight elasticity	Final effect
Display Of principle	-11.746	-2.36	-0.27	-0.4	-
Age	0.042	0.88	0.04	0.06	0.0009
Sexuality	1.114	0.73	0.02	0.03	0.014
Education	0.551	2.84	0.16	0.18	0.012
The numbers of persons who are under guardianship	-0.557	-1.30	-0.04	-0.06	-0.012
Income	0.000009	2.34	0.09	0.09	0.0000002
The suggestive price	-0.005	-2	-0.04	-0.07	-0.00012
Likelihood Ratio Test:165.23	Percent of right Prediction: 82%				
McFaddenR ² = 0.41	EstrellaR ² =0.35				
Cragg- UhlerR ² =0.36	MaddalaR ² =0.27				

The total weight elasticity with relation to variable of education which equal 0.18, is shown that with another fixed factors of increase one percent in education level, likelihood the willingness to pay for visitors is increased 0.18 percent and its reason is knowledge of persons of Environmental endowments and conservation of them that this subject for indirect results of increasing educational level and information. The quantities of considered elasticity for two independent variables of income of visitors and suggestive price are 0.09 and -0.07 respectively. With increasing one percentage in suggestive price causes decrease percentage of probability acceptance of individual willingness to pay. Marginal effect is respecting two independent variables of education and income which are 0.012 and 0.00000012 respectively. In other words, probability of acceptance of individual willingness is increased 0.012 and 0.00000012 respectively when we increase of one unit mentioned variables. Marginal effect variable of suggestive price equals -0.00012, it means increasing one unit of mentioned variable causes to decrease of probability acceptance of the individual willingness to pay of the required scale 0.00012 percentages. Mean individual willingness to pay are calculated 13000 for pardisan Forest Park complex for each visitor by using function 5:

(mean willingness to pay)*(number of annual visitors) = the value of annual recreational Golestan pardisan Forest Park complex

the value of annual recreational Golestan pardisan Forest Park complex = 13000 * 445000 = 5785000000 Rial.

Conclusion

Due to necessity of performance of plans of tourist development in different recreational areas, The measure of their profits are necessary. In this study, we use a contingent valuation method for recreational valuation of pardisan Forest Park complex. The results show which variables like education, income of visitors and suggestive price affect individual using this complex. Seriously. Also the result of this study show that majority of visitors and tourisms don't satisfy because toilet, parking and transportation aren't good. Solution of problems need exact and practical control of responsible. This study has achieved promising results in terms of management So that Showed Gorgan of people are aware of the importance of Forest parks And a substantial WTP to support, there improve and develop parks. Therefore, decision-makers and officials justification will provide Quality of Forest Park supports And low importance of forest resources due to lack of support by the government to prevent.

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