World Applied Sciences Journal 12 (Special Issue of Tourism & Hospitality): 64-72, 2011
ISSN 1818-4952

Evaluation of Improving Conditions on Recreational Value of Natural Ecosystems Case Study: Mountainous Zone of Darakeh in North of Tehran

[1]Afsaneh Naeimifar, [2]Houman Liaghati, [2]Naghmeh Mobarghei and [3]Mohammad Mojabi

[1]Member of Young Researchers Club, Department of Agriculture,
Shahr-e-Qods Branch, Islamic Azad University, Tehran, Iran
[2]Environmental Science Research Institute-University of Shahid Beheshti, Iran
[3]Tehran Municipality Urban Planning and Research Center, Iran

Abstract: In this study, In order to optimize management of natural resources, the influence of improving natural environment on increasing recreation value of Darakeh, Tehran has been investigated. By using contingent valuation method, recreation value of mentioned area estimated and compared in current situation and in the situation in which targeted facilities of tourist were provided. After responding 240 questionnaires and by Heckman two stage method, recreation value of Darakeh per hectare in 2009 - 2010 were respectively IRR 50,000,000 and 120,000,000 with current facilities and on the condition of providing facilities that tourists want. After omitting deficient questionnaires, null protesting and without reason response, respectively 58% and 81% of persons with reliable response (161 responses) in current situation and improved situation were ready to pay entrance fee in order to use Darakeh. With regards to Tobit model, it is expected that 83% of people who are not willing to pay entrance fee, will be willing to pay after 10% improvement in the area facilities. In both studied situation Heckit Model's result showed that economical indexes such as income level and number of family members has meaningful influence both in first stage (decision on willingness to pay) and in second stage (action after decision making). With regards to big difference between recreational values of each hectare of Darakeh in two studied situations, it is necessary that authorities pay more attention to keeping recreational areas like Darakeh, improving environmental conditions and improving welfare, hygiene and safety facilities. This issue is of more importance in metropolises like Tehran whose residents are exposed to many kinds of pollution and shortage of green space.

Key words: Contingent valuation · Recreational value · Darakeh · Tobit Model · Two stages Heckman Model

INTRODUCTION

Natural ecosystems have been always considered as one of the most important recreational centers for human and this has been increased due to change in life styles and decrease of access to natural places especially in metropolises. Unfortunately, only a part of provided services by natural ecosystems have the capability of being exchanged in the market and value of other services which have no market is not considered. This is while disorder or destroy of any of above mentioned services causes irreparable damages which in many cases human communities try to substitute by huge expenses. In recent years, scientists of environmental economics have tried to evaluate value of non-market services of ecosystems by use of various methods. Being aware of these values has influence on the way of use and management of natural resources as well as providing the possibility entrance of these hidden values into cost-benefit equations, consequently this awareness causes decisions about environment to be more logical and rational.

One of these hidden and non-market values is recreational value of ecosystems. Since there is no market for evaluation of non-market recreational services of ecosystems, the most common approach based on assumed market, is conditional evaluation of environmental benefits [1].

In this approach people are questioned about their willingness to pay in return for quality or quantity improvement of environmental goods or their willingness to receive compensation in return for quality or quantity decrease of environmental goods.

Corresponding Author: Dr. Afsaneh Naeimifar, Member of Young Researchers Club, Department of Agriculture, Shahr-e-Qods Branch, Islamic Azad University, Tehran, Iran, E-mail: a.naimifar@shahryariau.ac.ir.

The first time this approach was utilized in USA in 1958 for determining recreational value of a national park and then in Europe in 1970 decade [2-5].

In 1990 decade, contingent valuation method was used for the first time for valuation of public goods such as access to park, healthy water and beautiful landscapes [5]. Since marginal cost of more people's using public goods is zero, we can calculate sum of willingness to pay of respondents and calculate total willingness to pay.

At the time being contingent valuation method is extensively used in economic valuation and analysis of environmental services and blessings. This wide application is indebted to two factors. First, although this method needs considerable questioning, it doesn't need many data inputs and its utilization is relatively easy. Second, theoretically we can use this method to valuate all kinds of values either consumer or values [6-8].

In part of overseas studies, recreational value of 5 national parks in South Korea was achieved equal to $10.54 by use of contingent valuation method for each family [9]. Recreational values of tropical and temperate jungles were respectively $112 and $36 per hectare[10], and recreational value of Malaysia jungles has been estimated equal to $740 per hectare [11].

In Iran Yakhshakhi (1972) brought up the issue of recreational value[12]. Then Majnounian (1976) valuated two parks in Tehran by using contingent valuation method[13]. Among domestic studies, willingness to pay of Tabriz people in order to protect environment is about IRR 41.14 thousand monthly [14,15], annual recreational value of Sisangan jungle park in Noshahr is thousand IRR 2.6 million per hectare [16]. Total annual recreational value of Saee park in Tehran is over IRR 2.7 billion [17] and total annual recreational value of Mohtasham park in Rasht is over IRR 856 million [18].

Among northern valleys of Tehran, Darakeh valley attracts more than half of tourists due to being smoother, safer, less elevation, having more virgin environment in comparison with other mountainous zones of Tehran [19]. But on the other hand, lack of various welfare, hygienic and safety facilities or limitation of accessible facilities, existence of environmental complications such unhealthy discharge of garbage and consequently destroying natural and virgin environment cause to decrease recreational desirability in opinion of many tourists.

Therefore, in the present study the influence of improving conditions and facilities of this zone on its recreational value has been investigated by contingent valuation method. Economic valuation of natural ecosystems in different environmental conditions will have creative influence on optimized management of natural resource and more efficiency of environmental policies with regards to desirability of Darakeh in comparison with other recreational places of Tehran and gradual disappearing of natural ecosystem of Darakeh due to lack of market and considering its services for free.

Research Methodology: Scientists of environmental economics usually use two methods of travel cost and contingent valuation for determining recreational value of natural ecosystems.

Because Darakeh is part of Tehran using travel cost will cause deviation of achieved results [20]. Because some of tourists use their private vehicle and some use public vehicles in order to arrive this area. Some tourists live near this area, so they walk to arrive there. So contingent valuation method based on people's willingness to pay is used in this study. Mentioned method tries to determine people's willingness to pay in hypothetical market. There are 5 general attraction methods for determining amount people's willingness to pay. Among these methods open ended technique is easy to answer for respondents and doesn't result in any starting point bias. On the other hand, it causes to decrease completion time of questionnaire and executing cost of a plan. Therefore, extraction open-ended technique or unlimited questions have been used for determining recreational value of Darakeh [21].

In open ended method, used econometric technique of Tobit model and Heckman two-stage method. Therefore another advantage of using open-ended method is separation of factors that have influence on decision on willingness to pay and factors that have influence on the amount of willingness to pay (the stage after decision making). We can also check the change of influence of different variables on recreational value of areas in groups who are willing to pay and groups who are not. But in other information extraction techniques such as one-dimensional and bi-dimensional dual choice which use econometric models and Logit and Probit, differentiation between influential factors on willingness to pay and influential variables is not possible.

In Tobit, we can observe dependent variable when its value is more or less than a certain amount [22]. Estimated Tobit model for tourists of Darakeh is as below:

$$C_i^* = \beta' X_i + \varepsilon_i^* \quad (1)$$

$$C_i^* = C_i \text{ if } C_i > 0 \quad (2)$$

$$C_i^* = 0 \text{ if } C_i \leq 0 \quad (3)$$

In which β' is parameter value vector, X_i is a regressor vector including social, economical and environmental traits of respondents and ε_i^* is error term. Ci is real level of willingness to pay for a person who is willing to pay. C_i^*level of willingness to pay that is considered for estimation of tobit model.

Maddala (1983) believes that observations over sensor edge can be expressed as below: [23]

$$E(C_i) = E(C_i | C_i^* > 0) = \beta' X + E(\varepsilon_i | \varepsilon_i > -\beta' X_i) \quad (4)$$

$$E(C_i | C_i^* > 0) = \beta' X_i + \delta \frac{\varphi(B'Xi/j)}{f(B'Xi/j)} \quad (5)$$

Where $\Phi(\beta' X_i / \delta)$ and $\Phi(\beta' X_i / \delta)$ are respectively standard normal density function, standard normal accumulative density function with amount of $(\beta' X_i / \delta)$. Left part of equation (4) shows expectation value of C_i when $-\beta' X_i > 0$ is bigger than zero. $E(\varepsilon_i | \varepsilon_i \geq -\beta' X)_i$ in equation (4) mathematical expectation is part of error when it is bigger than $-\beta' X_i$

Tobit specification provides the possibility of considering decisions related to willingness to pay and conditional level of willingness to pay in order to make decision. Mc Donnald and Muffit (1982), relation between the whole observations, average of observations over than sensor point of dependent variable and probability of being over sensor point as below:

$$E(C_i) = \Phi(Z) E(C_i^*) \quad (6)$$

$$Z = \beta' X_i / \delta \quad (7)$$

Then below equation has been used in order to assess influence of change in variable X_i on C_i (total elasticity):

$$\frac{\partial E(Ci)}{\partial Xi} = \varphi(Z)\left[\frac{\partial E(Ci)}{\partial Xi}\right] + E(Ci^*)\left[\frac{\partial \varphi(z)}{\partial Xi}\right] \quad (8)$$

On the other hand, total elasticity of sum of elasticity of expectation level probability of willingness (first part of right side of equation) and elasticity of conditional expectation value (second part of right side of equation) [24].

Goodness of fit of Tobit model is calculated by use of r^2 (second power of correlation coefficient between real values and predicted values C_i) The closer is r^2 to 1, the more is goodness of fit.

Heckman two-stage method is based on this assumption that a collection of variables influence on people's decision about willingness to pay and other collection of variables influences on willingness to pay after decision making [25].

In this approach, Probit model is calculated by maximum likelihood approach which checks factors that influence on decision about paying entrance fee. In order to calculate Probit Model, observations related to dependent variables over sensor edge are placed equal to 1 and other observations below sensor edge are placed equal to zero.

$$Y_i = \beta' X_i + U_i \text{ if } i+1\ Y_i > 0 \quad (9)$$

$$I = 0 \text{ otherwise}$$

When calculating Probit Model, inverse mill ratio (imr) which is necessary for calculating second stage is also calculated and will be cited in equation (10). In next stage, by use of ordinary least squares (OLS) influential variables on amount of willingness to pay is checked through calculation of below regression equation.

$$Y_i = \beta' X_i + \delta\ imr + U_i \quad (10)$$

In the second stage dependent variable values are changed into the model before change in the first stage and the observations whose dependent variables are below sensor edge are omitted from calculation process. Annual recreational value per family is equal to sum of product of meaningful independent variable in their coefficients in linear regression model. We can calculate recreational value of each hectare of Darakeh per year through below relation with regards to average of willingness to pay tourists.

recreational value of each hectare = (number of tourists × average of tourist's willingness to pay) ÷ (Area of recreational zone of Darakeh)

(11)

In present study, simple random sampling has been used with regards to traits of studied statisticals population and research requirements.

Required sample size has been calculated with confidence coefficient at 95% based on Cochrane formula [26].

$$\frac{t2s2}{d2} = \frac{\left(\frac{1}{96}\right)2.\left(\frac{1}{18}\right)2}{\left(\frac{0}{15}\right)2} = 238 = 240 \quad (12)$$

In which n_0 is sample size, t is acceptable confidence coefficient which is gained by assumption of normal distribution of targeted trait in table of t student, s^2 is variance of people's willingness to pay. d is desirable probable accuracy that is half of confidence distance.

RESULTS AND DISCUSSION

In order to estimate recreational value of Darakeh we interviewed with those individuals who were financially well off and could easily make decision at the time of being exposed to the suggestion of paying entrance fee. 24 questionnaires were omitted due to incorrect comprehension of questions (WTP) and deficiency of questions and statistical analysis of studied variables were done by 216 questionnaires.

In the next part, the reasons of responses of sample population were assessed by contingent valuation Method in order to gain a reliable estimate of recreational value of mountainous zone of Darakeh. The reasons of unwillingness of tourists to pay for entrance fee to enter Darakeh are presented in table no. 1. 34% and 19% of protesting responses are consequent of sense of public ownership of nature and not accepting responsibility for paying entrance fee. Real zero responses were also respectively affected by lack of enough facilities in respondent's viewpoint and dominant motivation of income limitation (25%).

Since zero protesting responses are not a suitable index of real valuation of individuals and are not consistent with contingent valuation behavior, zero protesting responses were omitted from 216 correct responses and tourists' willingness to pay were evaluated by 161 reliable response in both situations (current facilities and hypothetically provided facilities which were important for respondent)

From 161 reliable responses, 58% (94 people) and 81% (130 people) were ready to pay entrance fee respectively in current facilities and hypothetically provided facilities.

Reasons for individual's willingness to pay for Darakeh showed that the motivation of most respondents for paying entrance fee was returning the income resulting from entrance fee to themselves through better quality services and environmental conditions improvement.

Results of econometrics estimation by Tobit model for two studied situations are presented in tables No. 2 and 3.

Variance analysis test was used in this research for checking colinearity. The achieved results of this test showed that there colinearity between all kinds of pollution in workplaces and residential places, colinearity between number of annual visits and previous visits, using green environment and amount of all kinds of pollutants in the environment of respondents. Therefore when checking the influence of mentioned factors on individuals' willingness to pay, the influence of one of variables has been checked as independent value and other variables are omitted from estimation process.

Doing Box-Cox test and with regards to problems such as second power of correlation coefficient of Tobit model and number of meaningful coefficients, linear form has been used as a desirable function form for Tobit model. In estimated models r^2 is equal to 0.63 and 0.57 which shows high ability to explanation of independent variables in Tobit Model.

Tobit specification provides the possibility of checking decisions related to willingness to pay entrance fee in groups who are willing to pay and in groups who are not willing to pay.

For example, (Table No. 2) in case of 10% increase in the zone facilities, average of willingness to pay will increase for 15.3%. 7.1% of this amount is related to tourists who were willing to pay beforehand and 8.3% is related to tourists who were not willing to pay that it is expected that they will be willing to pay by improving facilities of zone.

Despite income level and number of family members which have meaningful effect on amount of willingness to pay in both situations, age variables and number of visits in improved conditions and home type variables and the amount of people are influenced by the workplace in primary conditions have meaningful influence on willingness to pay entrance fee. In other words, because in current situation, Darakeh doesn't have much desirability for the people who live in villas or work in less polluted workplaces their willingness to pay for recreational use of zone is meaningfully less than opposite groups (who live in apartments and are exposed to much pollution in their workplaces).

Variety of facilities will cause to increase zone desirability and lack of meaningful difference in willingness to pay for all groups (apart from home type and pollution amount of workplace). With comparing elasticity amounts in both situations we can say that with improvement in environmental conditions, increase in income level and number of family members respectively create more increase and less decrease in amount of willingness to pay in comparison with primary conditions.

Heckman two stage model has been used to identify and separating variables which have influence on the decision on willingness to pay and the amount of entrance fee.

Table 1: Reasons of respondents' unwillingness to pay in order to use recreational facilities of Darakeh in current situation

Response status	Reasons of unwillingness to pay	Number	Percentage
Zero protesting response	Public is the owner of nature and pricing it has no meaning. On the other hand, byy paying entrance fee nature is not for the people anymore and it will be confiscated to the advantage of government.	41	34
	When we pay tax to government or municipality, it is their duty to give services and no entrance fee should be received.	11	9
Real zero response	With regards to current weak facilities, there is no reason to pay entrance fee.	36	30
	With regards to weak economic condition of majority of people, receiving entrance fee causes people to visit the zone less than usual or to choose cheaper recreational places.	31	25
Zero response without reason	They didn't bring any reason for not responding about suggested entrance fees.	3	2
Total		122	100

Source: Research findings

Table 2: Estimation results of Tobit model for willingness to pay for recreational use of Darakeh

Variable	Normalized coefficient	Statisticals t	Expectation elasticity	Realized elasticity	Total elasticity
Age (year)	0.0064	1.33	0.170	0.110	0.280
Education (year)	0.014	0.44	0.130	0.102	0.232
Respondent's income (IRR 1000)	0.00281	1.97	0.240	0.190	0.430
Number of family members (person)	-0.150	-2.08	-0.790	-0.450	-1.240
Home type (Apartment=1, Villa=0)	0.430	3.55	0.280	0.230	0.510
Air pollution amount in workplace (Percentage)	0.130	1.88	0.330	0.290	0.620
Geographical change of workplace (hours of working in unstable environment)	-0.0000042	-1.22	-0.043	-0.105	-0.148
The score of Darakeh facilities in respondents' viewpoint	0.0317	2.04	0.830	0.710	1.530
Fixed coefficient	-0.680	-0.84	-	-	-

r^2=0.62

Source: Research findings

Table 3: Estimation results of Tobit model for willingness to pay for recreational use of Darakeh (On the condition of providing considered facilities by respondent)

Variable	Normalized coefficient	Statisticals t	Expectation elasticity	Realized elasticity	Total elasticity
Age (year)	0.011	2.020	0.290	0.250	0.540
Eduacation (year)	0.0192	0.066	0.031	0.027	0.058
Respondent's income (IRR 1000)	0.00713	3.460	0.350	0.260	0.610
Number of family members (person)	-0.11	-2.330	-0.300	-0.320	-0.620
Home type (Apartment=1, Villa=0)	0.16	0.670	0.020	0.019	0.039
Air pollution amount in workplace (Percentage)	0.035	0.490	0.074	0.069	0.143
Geaographical change of workplace (hours of working in unstable environment)	-0.00000167	-0.520	-0.0084	-0.0078	-0.020
Number of visits	0.0301	1.860	0.0730	0.0790	0.152
Fixed coefficient	1.48	3.690	-	-	-

R^2= 0.57

Source: Research findings

Table 4: First stage: Estimation results of Tobit model for willingness to pay for recreational use of Darakeh

Variable	Coefficient	Statisticals t	Elasticity in average	Total elasticity	Final effect
Gender	0.197	0.89	0.019	0.011	0.028
Age (year)	0.019	1.84	0.380	0.310	0.012
Eduacation (year)	0.0453	1.21	0.0048	0.0042	0.000275
Number of family members (person)	-0.410	-2.93	-0.560	-0.530	-0.140
Respondent's income (IRR 1000)	0.00039	2.16	1.110	0.916	0.000154
Home type (Apartment=1, Villa=0)	0.520	3.03	0.085	0.071	0.310
Geaographical change of workplace (hours of working in unstable environment)	-0.0078	-2.04	-0.153	-0.144	-0.00308
Air pollution amount in workplace (Percentage)	0.018	4.01	0.460	0.370	0.00342
The score of Darakeh facilities in respondents' viewpoint (from 20 score)	0.570	3.13	0.690	0.630	0.220
Fixed coefficient	-1.920	-1.80	-1.710	-1.520	-

Correct prediction percentage: 89.1% McFadden R^2: 0.52 D-W= 1/94

Log-likelihood Function= -97/264

Log-likelihood (0) = -128/49

Log-likelihood Ratio Test= 62.45 With 9 D.F P-value=0.000

Source: Research findings

Table 5: Estimation results of Tobit model for willingness to pay for recreational use of Darakeh (On the condition of providing considered facilities by respondent)

Variable	Coefficient	Statisticals t	Elasticity in average	Total elasticity	Final effect
Gender	0.280	0.650	0.00827	0.0175	0.0129
Age (year)	0.027	2.110	0.460	0.430	0.0152
Education (year)	0.00384	0.530	0.00264	0.00236	0.000159
Number of family members (person)	-0.230	-3.130	-0.340	-0.280	-0.073
Income (IRR 1000)	0.00051	3.770	1.430	1.220	0.000191
Home type (Apartment=1, Villa=0)	0.0175	1.010	0.00398	0.00209	0.014
Geographical change of workplace (hours of working in unstable place)	-0.000247	-1.140	-0.0162	-0.0158	-0.000411
Air pollution amount in workplace (Percentage)	0.0311	2.023	0.640	0.621	0.00255
Number of visits	0.0375	2.720	0.0257	0.0253	0.0129
Fixed coefficient	-4.610	-2.190	-1.386	-1.262	-

Correct prediction percentage: 85% McFadden R^2: 0.58 D-W= 2/03

Log-likelihood Function= -125/05

Log-likelihood (0) = -185/023

Log-likelihood Ratio Test= 119.93 With 9 D.F P-value=0.000

Source: Research findings

Table 6: Second stage, estimation results of linear regression model for amount of entrance fee for recreational use of Darakeh

Variable	Coefficient	Statisticals t
Age (year)	10.900	0.96
Eduacation (year)	21.800	1.06
Number of family members (person)	-586.300	-3.94
Income (IRR 1000)	0.096	2.11
Home type (Apartment=1, Villa=0)	1600.200	2.67
Home area (sq m)	-0.830	-1.19
Geographical change of workplace (hours)	-0.860	-0.98
Amount of use of flowers and plants at home (percentage)	5.200	2.14
Air pollution amount in workplace (Percentage)	22.000	3.07
The score of Darakeh facilities in respondents' viewpoint (from 20 score)	151.200	2.23
Number of visits	-100.100	-1.93
Inverse mill ratio	2472.700	7.68
Fixed coefficient	1900.290	3.19
R^2= 0.61		
D-W=2.08		
JARQUE-BERA NORMALITY TEST=3.1 With $X_{2,0.05}$= 5.99		

Source: Research findings

Table 7: Second stage, estimation results of linear regression model for amount of entrance fee for recreational use of Darakeh (On the condition of providing considered facilities by respondent)

Variable	Normalized coefficient	Statisticals t
Age (year)	51.50	2.10
Education (year)	14.10	0.73
Number of family members (person)	-461.10	-3.83
Income (IRR 1000)	0.15	2.40
Home type (Apartment=1, Villa=0)	281.10	1.02
Home area (sqm)	-0.21	-0.66
Geographical change of workplace (hours)	-0.13	-0.62
Amount of use of flowers and plants at home (percentage)	4.40	1.96
Air pollution amount in workplace (Percentage)	0.41	0.28
Number of visits per year	53.20	2.07
Inverse mill ratio	5111.30	3.97
Fixed coefficient	6310.80	2.39
R^2= 0.57		
JARQUE-BERA NORMALITY TEST=2.6 with $X_{2,0.05}$=5.99		

Source: Research findings

Results of estimation of Probit model by use of maximum likelihood approaches have been presented in tables No. 4 and 5. After doing Box-Cox test and with regards to matters such as statisticals resulting from likelihood ratio ttest, specification coefficient, correct prediction percentage and number of meaningful variable, linear form has been selected as desirable functional form for Probit Model.

With regards to the value of total elasticity both situations, income level is the most influential explanatory variable in assessing probability of individuals' willingness to pay. With regards to table No. 4 each 10% increase in facilities of Darakeh will increase individual's decision on willingness to pay for 6.3%. Therefore facilities improvement will cause to increase meaningful increase of age variables, family members, income level and individuals' compliancy from workplace pollution on the probability of willingness to pay entrance fee. Also in current situation decision on willingness to pay entrance fee for individuals who live in apartments and work in stable and fixed workplaces has a meaningful difference with opposite groups (who live in villas and work in unstable workplaces) Facilities improvement also meaningfully increase probability of paying entrance fee for each more visit by tourists.

Results of second stage estimation are Heckman two stages model by ordinary least squares which have been presented in Tables No. 6 and 7.

Meaningfulness of inverse mill ratio states that influential factors on decision about willingness to pay are not the same with determinant factors of amount of willingness to pay and this a confirmation on using Heckman two stage model. Also the presence of inverse mill ratio in linear regression model eliminates variance inconsistency of primary model and allows using linear model.

In both situations income level, family members and amount of using flowers and plants at home have meaningful influence on the amount of entrance fee (the stage of action after decision). In the primary conditions, willingness to pay in visitors who live in apartment is IRR 1,602 more than those who live in villas. Twice increase (100% increase) in the amount of pollution in workplace, increases amount of entrance fee for IRR 2,200.

While improving facilities and increasing desirability of this zone cause to decrease meaningful gap between entrance fee in different groups (Home type and different amount of air pollution)

In primary situation in which there is lack of various facilities, tourists would like to pay IRR 100 less for each extra visit per year. But in case of improving environmental conditions, respondents are ready to pay IRR 53 more for each visit in order to use different facilities of zone.

Estimation results of Heckit two stages model show that in both situations economic indexes of income level and family have meaningful influence on respondents' willingness to pay both in first stage (decision on willingness to pay) and in second stage (action after decision). Amount of respondents' attention to keeping flowers and plants at home are variables whose meaningful effect on the amount of entrance fee (the stage of action after decision) is checked in both situations.

By use of estimated parameters of linear regression model and means of meaningful independent variable in the mentioned model, means of each respondents' willingness to pay per year in order to use recreational facilities of Darakeh is respectively IRR 3363 with current facilities and IRR 8128 in case of providing desired facilities.

With regards to average of tourists' willingness to pay total number of tourists in 2009 (1,200,000 people) and area of Darakeh (equation (16)) in 2009 has been estimated almost equal to IRR 50 million in current condition and IRR 120 million in case of providing desired facilities.

Results Summary and Suggestions: Results showed that in current situation from 216 correct responses, 52 respondents have had protesting opinion about paying entrance fee in order to enter the zone and 67 respondents don't like to pay entrance fee in order to use recreational facilities of the zone because they think its facilities are not enough and there was dominant motivation of income limitation too. By assumption of improving environment condition, 36 people added to the people who were willing to pay and respectively 94 and 130 tourists (from 101 correct reliable responses) were ready to pay entrance fee in order to enter Darakeh in current situation and in case of providing desired facilities.

Tobit specification showed that if facilities level of the zone increase 10%, average of willingness to pay will increase 15.3%. 7.1% of this increase in average of willingness to pay is for the tourists who were willing to pay beforehand and 8.3% is related to those individuals who were not willing to pay, but it is expected that they will be willing to pay in case of improving facilities of the zone.

Meaningful of inverse mill ratio in linear regression model showed that influential factors on the decision of willingness to pay are not the same as influential factors of amount of willingness to pay in both situations. But in both situations, economical indexes such as income level and number of family members have meaningful influence on amount of respondents' willingness to pay in both first stage (decision on willingness to pay) and in second stage (action after decision).

In 2009, average of willingness to pay entrance fee of each tourist was respectively IRR 3363 and IRR 8128 and recreational value of each hectare of Darakeh was respectively IRR 50 million and IRR 120 million in current situation and in case of providing desired facilities.

With regards to gap between recreational value of each hectare in both situations and the fact that majority of positive responses of tourists (47%) is affected by their expectation of improving environment conditions and improving welfare, hygienic and safety facilities, correct planning and programming for increasing hygienic, welfare and safety facilities and expanding training and education regarding protection of natural environment will have very important influence an increasing recreational value of each hectare of Darakeh.

It is necessary that authorities pay more attention to keeping natural recreational zones like Darakeh by correct programming. This issue is of more importance in metropolises like Tehran in which majority of residents are exposed to many kinds of pollution and shortage of green environment. It is also necessary that construction in Darakeh be done in a way that doesn't cause to decrease recreational quality of the zone and change the landscape of there.

REFERENCES

1. Mobarghei, N., 2008. Presentation and implementation of spatial valuation model for forest ecosystem services by use of geographical information system, Doctrine thesis, Faculty of environment university of Tehran. (in Farsi).
2. Bohm, P., 1972. Estimating Demand for Public Goods. An Experiment. European Econom. Rev., 3: 111-30.
3. Dahlberg, A., 1974. Geografisk rorlighet: Sociala och economiska effecter. (Geographic mobility: social and economic effect) Department of economic university of Umea Sweden (in Swedish).
4. Hanemann, W.M., 1991. Willingness to pay and willingness to accept. How much can they differ?. American Econom. Rev., 81: 635-47.
5. Bateman, J. and Willis, K.G. Ed., 1999. Valuing Environmental Preferences Theory and Practice of the Contingent Valuation Method in the US, EU, and Developing Countries. Oxford University Press.
6. Joens, G.E., B. Davies and S. Hussain, 2000. Ecological Economics An Introduction. Blackwell science. London.
7. Heal, G.M., E.B. Barbier, K.J. Boyle, A.P. Covich, S.P. Gloss, C.H. Hershner, J.P. Hoehn, C.M. Pringle, S. Polasky, K. Segerso and K. Schrader-Frechette, 2005. Valuing Ecosystem Services. Toward Better Environmental Decision-Making. The National Academies Press,Washington, D.C.
8. Spash, C.L., 2005. Economics of the environment and development Ed Pushpam Kumar, Ane Book Publication, New Delhi.
9. Lee, C. and S. Han, 2002. Estimating the use and preservation values of national parks tourism resource using a contingent valuation method. Tourism Management, 23: 531-540.
10. Costanza, R., R. Degroot, M. Grass, B. Hannon, K. Limburg, S. Naeem, R.V. Oneil and J. Paruelo, 1997. The value of the world ecosystem services and natural capital nature, 387: 253-60.
11. Garrod, G. and K. willis, 1997. The recreational value of tropical forests in Malaysia, Journal of world forest resource management, 8: 183-201.
12. Yakhshaki, A., 1974. An introduction to Iran national parks and jungles. Tehran University publications. (in Farsi).
13. Majnounian, H., 1977. Economic assessment method of parks and recreational places, Environmental Studies, 9: 1-13 (in Farsi).
14. Khorshiddoust, A.M., 2005. Contingent Valuation in Estimating the Willingness to pay for Environmental Conservation in Tabriz, Iran. Environmental Studies, 30: 12-21.
15. Khorshiddoust, A., 1997. The role of pricing methods and economic analysis in environment assessment Environmental Studies, 20: 93-102 (in Farsi).
16. Amirnejad, H., S. Khalilian And MH. Assareh, 2006. Estimating the Existence Value of North Forests of Iran by Using a Contingent valuation Method. Ecol. Econom., 58: 665-675. (in Farsi).
17. Emami Meibodi, A. and M. Ghazi, 2008. Estimating the recreational value of Saee Park in Tehran by contingent valuation Method, Quarterly of Iran Economic Researches, 36: 187-202. (in Farsi).

18. Kavousi Kalashemi, M., H. Shahbazi and A. Malekian, 2009. Estimation of recreational value of recreational places by Heckman two-stage model, Case study of Mohtasham park in Rasht, Agricultural economics magazine, 1: 137-149. (in Farsi).
19. Technical and engineering consulting organization of Tehran, 1996. Investigating environmental power of northern Tehran valley, Tehran (in Farsi).
20. Venkatachalam, L., 2003. The Contingent Valuation Method. A Review Environmental Impact Assesssment Review, 24: 89-124.
21. Walsh, R.G., J.B. Loomis and R.A. Gillman, 1984. Valuing option, existence and bequest demands for wilderness. Land Econom., 60: 14-29.
22. Mc Donald, J.F. and R.A. Moffitt, 1982. The uses of tobit analysis. Rev. Econ. and Stat., 62: 318-3.
23. Maddala, G.S., 1983. Limited-dependent and qualitative variables in econometrics. Cambridge University Press, Cambridge, MA.
24. Amigues, J., C. Boulatoff and B. Desaigues, 2002. The Benefits and Costs of Riparian analysis habitat preservation: a willingness to accept / willingness to pay contingent valuation approach. Ecol. Econom., 43: 17-3.
25. Heckman, J.J., 1979. Sample selection bias as a specification error. Econometrica, 47: 153-161.
26. Tajdari, Parviz, 2007. An introduction to randomized sampling, Ana publications (in Farsi).