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An Estimating on of the Economical Value of Arsanjan Bonab Forest Park, Iran

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Abstract: Using of amusement places always has been important for humankind. Therefore, assessment of value for this promenaded and usage of nature is necessary for future programming in management of natural resources. For this reason, this research will discuss an assessment of the promenaded value of Bonab Forest Park and determines a visitor's Willingness To Pay (WTP) for promenaded benefits obtained. In this study, two techniques are used for Contingent Valuation (CV) $ Travel Cost (TC) method by Dichotomous Choice (DC). For determination of visitor's willingness to pay simple average method was employed. Results indicate that 94.3% of visitors are willing to pay for promenaded values at the Bonab Forest Park. The mean value for willingness to pay for the value of the park is 0.38 $ for each person per month. Annual value for promenade in this park was calculated 3439.3 $ per hector. Other important results in this research show that forest park has promenaded value significantly and on the other hand, we can increase the usage, protection and numbers of tourists.

Key words: Promenaded value, contingent valuation, travel cost, arsanjan, Iran

INTRODUCTION

Humankind needs the nature differently and because of necessity of protection and duration of nature is important. There for thought and meditation of multi side's usage should be replaced by regularly policy and plenty of attempts. By comparison, changing financial value of bioenvironmental effects and national effects in forest will not be comparable. Among promenaded Places, forest parks have special importance and can appoint financial value and validity in these places by method of evaluation. Only we will realize a little value of Unknown Ocean. Forest ecosystem provides economical benefits for humankind including observable and unobservable. We can divide these values to direct value, indirect value, elective value and nature value. Promenaded Value is part of direct value including using of forest for promenade, free time, amusement, walking, traveling in mountains in forest and aesthetics.

Many attempts have been done for appointing rate of obtained benefits of visitors in this forest promenaded regions. These actions are important for analysis of benefits and expensive of managing plans in forest parks. Among them, we can mention the research that promenaded value of Madagascar forest is estimated by TC procedure. (Travel Cost) between 360 between 468 $ per hectare (Maille and Mendelsohn, 1991). This value for forest in the United States (Montana) is obtained on basis of contingent valuation procedure (CV), 108 $ for each trip. Promenaded value for forest areas in East of America has been researched by CV procedure and estimated 10.43$ for each family per each year, too (Krieger 2001).

Costanza *et al.* (1997) researched sum of values in the world that they were bio environmental services and ecologic of 17 ecosystem and they stated promenaded value in tropical forest 112 and 36 $ per hectare, respectively. By survey of promenaded value in five national park, which were in Southern Korea, rate of this value showed 10.54 $ for every family per every year averagely that it used of CV method (Lee and Han, 2002).

Another survey in Southern Korea researched public value of forest, which were in Seoul. The result showed visitor's willingness to pay for protective programs, which were suggested, was high and financial value was estimated 3.77 billion Korea (2.9 millions $ US). Being of high for protective value in city parks was proved in rest

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of the world and this value was stated 12 $ for levisian (Lorenzo *et al*., 2000).

Increasing of afforestation is for other aims, which are used in bioenvironmental services. For example, in research of Smailes and Smith (2001) falor national forest in Adlid Hills was estimated by use of techniques included Travel Cost. Annual rate in 96/97 was earned promenaded Value and whole of woods, delivered to mamufactors that they were between 1: 3.5. One thousand questioners were sent to special address and names in order to evaluate of city crucibles in East of Australia, forest field and Hart field, researched by Pepper *et al*. (2005), too. The results represented that average of willingness to pay for protection of these crucible was 21.60 $A for one person per one year. Overgeneralization of this problem for all of city resulted 16.6 millions. Annual average of willingness to pay for one person is 4.35 $ A and they are 3.3$ millions for all of city.

A research with this topic importance of forest features for willingness to pay was collected by respondents of contingent valuation method that they used of similar questioners and similar time periods in 27 forest of Irland. This research showed that forest features concern to visitor's willingness to pay strongly. It means that natural resources and qualify indicators for promenaded play an important rule for visitors.

Iranian researches show that few researches are applied on basis of promenade values. The first time, promenade value of Sisangan park was researched by Yakhkeshi 1974 in TC method, that has been estimated 0.96$ per hectare.

Nahrli (1995) researched promenade value of IilGoli in Tabriz by Clawson that it was estimated 171 $ per every day. Meamariani (1999) and Mirzaee (2000) estimated annual promenade value for national park in Golestan and pelangdareh in Qom-in western south- 72$, 8.94 per hectare by TC method. Amirnejad (2004) researched forest park in Sisangan-Nowshahr by contingent valuation method and annual promenaded value earned 272 $ per hectare. So, survey for evaluation of national resources in West of Iran has not been done. That they have not industrial forest. As a result of this research did in Arsanjan in areas of zagros forest. That aim was value for forest park, which was named Bonab.

MATERIALS AND METHODS

The study area: There is a forest park in Western North of Arsanjan-Fars, which its distance is 7 km to Arsanjan and its named Bonab. This place is the center of Iran (Fig. 1). Land-measurement of this park is 50 (ha), geographical longitude is between 53 and 15 to 53, 20 min and geographical latitude is between 29, 55 to 30, 10 min. Average of altitude of sea is 1670 (m) and average of gradient is 2 or 3%. When we pay attention to plants, we see *Amygdalus scoparia* Spach., *Pistasia atlantica* Desf., *Acer monspessulanum* L. and *Thuja orientalis* Linnaeus, *Amygdalus lycioides* Spach. and *Amygdalus orientalis* Duhamel. The most common kinds of plants are *Amygdalus* sp., *Astragalus* sp. and *Pistasia atlantica* var. *mutica*. Rate of average for annual raining in this region was estimated 380 mm that metelogy station is in Aliabad kamin (one of agriculture educational centers) where is the nearest station to the raining and snowing in this region have not suitable dispersion. Be cause of being near 7 km to city and rural region 50 km and another city Z, (saadatshahr) it has good position and people in trust in green environment and park culturally.

Methods: Applied procedures in this research are TC (travel cost) and CV (contingent valuation). This method was used for research because aim of visitors is picnic and free time in Forest Park (Bonab) value of park is earned by accounting of petrol cost and amortization for vehicles. Evaluation method depended on second technique, which was used in this research. In this survey, we used of binary selective question are for measuring WTP (willingness to pay). Therefore, DDC question are for interviewing and rate of visitors, WTP for in interview was designed to assign promenade value of Bonab forest park and to provide of correct information too announce them of market position, completely. This question are had two parts. The first part included economical-social position of people. In this part, T.R and K.A got information about got information about age, sex, job, place of living, education and numbers of family and rate of respondent's income (Krieger, 2001).

Second part related to questions about rate of visitor's payment. In this part T.R and H.R carried out experiments, three suggestion prices have been represented interrogatively which they were 2.1, 1.07 and 0.53 $. In first question, middle suggestion price (1.07 $) was asked in this state: could you pay 1.07 $ of income monthly for each person of family as entrance for protecting and managing of forest park? If the respond was positive for suggestion price, higher price (2.1 $) was suggested. Additionally, Maximum of WTP was asked, too. For estimating of WTP, we used WTP simple average method so; by adding quantities, WTP suggested by people and average of WTP was earned by divided. Quantities of WTP were accounted in each region separately (Amirnejad, 2004; Meamariani, 1999).

K. A., S. S and T. R., perform, Land-measurement of park: (number of visitor's × average of WTP) = promenade

Fig. 1: Position of researched region in Iran and Fars country

value of each hectare in Bonab park. 12 × average of numbers of persons in family × average of WTP = average of promenade value in each family annually (Meamariani 1999).

Numbers of persons who are in the car and they enter to the park price of entrance for visitors are selected as the most logical select and real payment. Assignment of prices and correct value depends on survey method. Interviewing is usually the most applied and useful instrument which is face to face. Numbers of necessary sample in this research are 10% of numbers of visitors during 2 days, which are account (numbers of visitors during days + numbers of visitors during holiday) and questioners are provided and used for these people (Yakhkeshi, 1974). Questioners are completed and analyzed with S. S, T. R. and K. A on basis available information during days on July, June and August in 2007.

RESULTS AND DISCUSSION

Regard to research purpose, we interviewed with people who have independent income monthly. Numbers of visitors were 45545.3 during year that these numbers were about 911 persons per hectare.

The most visitors are persons who have high education that related to university groups and the lowest groups are illiterate persons. Monthly income for 5.8% of visitors < 129 $ and 19.5% of them were between 129 and 214.6 $ and 63.2% between 214.6 and 537$ and 11.5% of them were 537$. 42.5% of visitors are businesspersons, 35.6% employees, 4.6% farmers, 1.1% workers, 1.1% retirements and 1.1% free. 21.8% of visitors are in age between 21 and 30, 73.5% are between 31 and 50 and 4.6% more than 50 years old.

The 66.6% of people did not accept the first suggestion and they did not agree with paying 1.07 $ monthly, but 33.3% of people agreed it. People who did not agree (66.6%) were placed in lower levels that were about 375 did not accept 0.53$ and about 2% accept to pay Max 0.75 $ of price and 35% accepted to pay Max 0.53 $. About 30% did not accept the second suggestion that 6.5% of them did not accept to pay nothing, 5.5% → 0.1 $, 3.5% → 0.32 $, 3.5% → 0.43 $ and 11% → 2.1 $ monthly for each person in family. Distance and No. of visitors are shown in Table 1.

For continuing the research, area of park divided to 3 zones, which their distances were 30 km and rate of value was measured for each zone. Average of willingness to pay was accounted for zone A 0.75$, for zone B 0.8$ and for zone C 0.94 $ and average of WTP for trinity zones was 0.38 $ for each person and average of annual value

Table 1: Distance and numbers of visitors

Distance	No.	Percentage
Until 30 km	7	8
Until 60 km	25	28.7
Until 90 km	30	34.5
Until 100 km	16	18.4
>100 km	9	10.4
Sum	87	100

Table 2: Numbers of visitors and cost for staying places

	Zone			
Results	A	B	C	Sum
No. of visitors in questioner	390	55	32	477
Average No. of visitors in new condition on a day	102.2	14.4	8.4	125
number of visitors in staying places on a day	195.63	27	16.8	239
Average of consuming expense for each person in new condition ($)	2.65	2.6	7.6	12.85
No. of visitors in common condition in each year	37247	5246.8	3051.5	45545.3
No. of visitors in staying places in each year	714045	9855	6132	87392
Rate of consuming expense in common condition in a year ($)	98912.3	13640.5	23222	135775
Rate of petrol expense in common condition in a year ($)	2408.7	534	644.3	1195.7
Rate of consuming expense in a year with being staying places considering petrol expense ($)	1896210	25622.4	46674	1968506
Rate of consuming expense in a year with being staying places, without considering petrol ($)	1896203	25621	46672.3	1968497

was (12×4.5×0.38 $) 20.52 $ for each family. Rate of promenaded value for park was 136970.7 (135775+1195.7) by using of TC method during one year (Table 2).

In another part of research, visitors were asked about tendency of staying for a day. If visitor accept it, his cost would be double except petrol. General cost was earned of expense of a day×No. of persons. This number in this research would be except of considering the expense of petrol (1968496.5 $) (Table 2). Finally, we can increase promenaded value of park as compared with promenaded of common condition by staying cost, which will be 1832721.5 $ (Table 2). This number is difference of rate of consuming cost in common condition and staying equipments for a year. Table 3 shows numbers of visitors and cost for staying places that aim is measuring of consuming cost in park that they have public vehicles.

Consuming expense has been accounted by accounting of numbers of persons and numbers of times for visiting the park in new condition. Important point is zone C that no one comes to the park even with vehicle. This consuming expense for three zones increase 296493.2 $ during year (Table 3, 4).

We asked of visitors whether they accept to pay the expense as entrance to the park. The results showed that 78.6 of respondents in a region accepted to pay suggestion prices in the park and all of people in B and C regions (100%) accepted to pay the suggestion prices as

entrance. Rate of visitors in every region were accounted in consuming expense for each person on a day and consuming expense of petrol for each person that earned general expense for each region. This rate for B and C regions didn't change, but this rate reduced for A region be cause a few of people accepted to pay the expense and rate was 79638.5 $ (Fig. 2).

General cost in getting entrance conditions were discounted from general cost in common condition for showing difference on reducing value of the park when entrance expense was gotten from the visitors C = 0, B = 0 and

$$A = 101321 - 79638.5 = 21682.5\ \$$$

This rate of general cost was discounted without getting the entrance expense for accounting decrease of general cost when the entrance expense was gotten of people and this comparison was done between two numbers in three regions.

$$34991.3 - 28853.2 = 6138.1\ \$$$

In general, sum willingness to pay in three regions was 28853.2$.

Finally, annual economical evaluation was accounted. Park in normal position was accounted by sum of rate in paid WTP in three regions, general consuming expense in three regions, expense of petrol in three region for whole of functions which was estimated 171962.1 $ (34991.4+135775+1195.7) and evaluation of each hectare for forest park was estimated 3439.3 $ and 9 $ per day per hectare. However, annual evaluation of function for potential evaluation, without considering paid WTP equals 136970.7 $ and 2739.40 $ per hectare and 7.5 $ per hectare per day (Fig. 3).

Annual economical value of park were earned 34991.4 $ for all of park, 699.8 $ in hectare and 58.3 $ in hectare/month by using of CV method. General promenaded value was accounted 1084915 $ and finally, decrease of Bonab forest park was estimated 62400 $ in whole of park and 1248 $ in hectare, in case entrance expense was gotten (Table 2).

This survey pays attention to determine of economical value for Bonab forest park in Arsanjan and measures the agreement of people for paying the expense as entrance. In this research, leader of family was asked questions as independent of annual income. Important point is for position of the interviewed persons that 42.5% of them are executives and it shows these persons have more free time and then, they have more time for using of nature. On the other hand, these persons have more

Table 3: Accountings of numbers and expense with public vehicle in region A

No. of visitors on a week	General population of visitors	General consuming expense with public vehicle ($)	Petrol expense amortization with public vehicle ($)	Sum
One time	55442	147230.6	3585.3	15081.9
Two time	59021	157.2	381.7	538.9
Three time	42980	114136.8	2779.4	116916.2
sum		261524.6	6746.4	268271

Table 4: Accounting of numbers and expense with public vehicle in region B

No. of visitors	General population of visitors	General consuming expense ($)	Amortization $+ petrol expense	Sum
One time	6677.8	17360.8	679.7	18040.5
Two times	6772.8	17607.8	689.3	18287.1
Three times	0	0	0	0
Sum	13450.6	34968.6	1369	36337.6

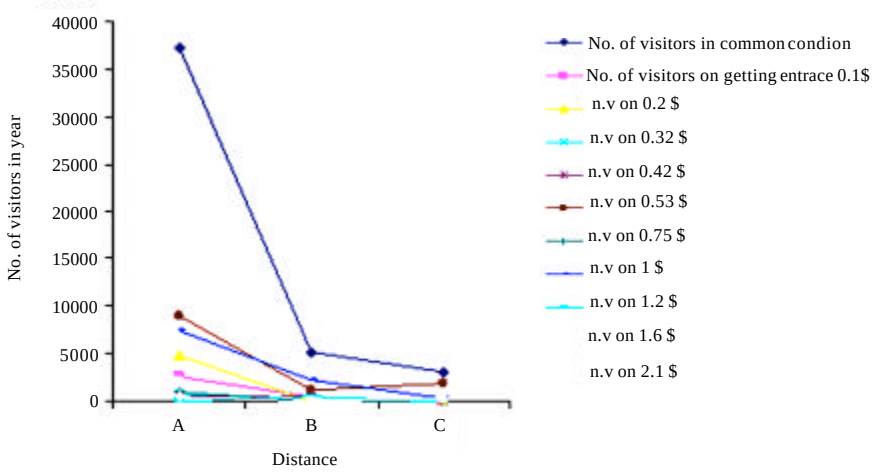

Fig. 2: Increasing of promenaded with being of public vehicle

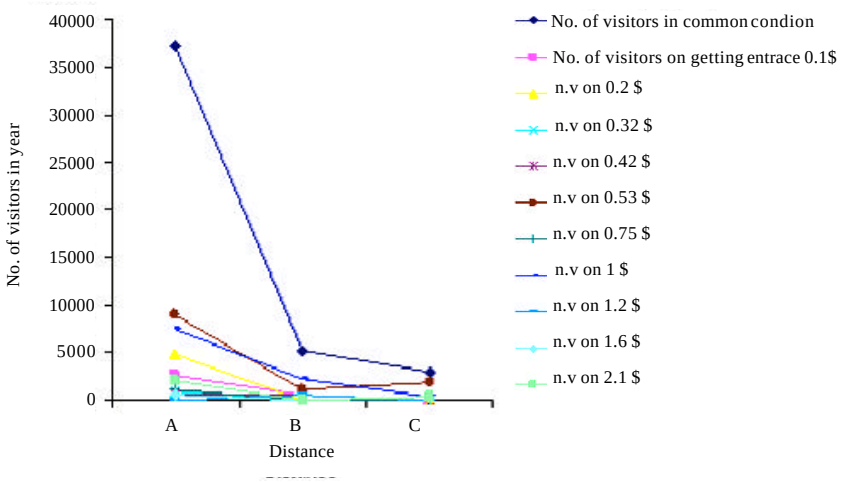

Fig. 3: Distance of WTP in case getting entrance in three regions

income that it affects on position positive funny usage of park. Another group is employees that they work hard during week and they need relaxing in nature.

As a result, they consider these parks for vacations. Farmers work in nature and farm, so they do not need funny parks for relaxing. Finally, low percentage of people who are retired and free need promenaded park, because they have low income and they are old people. On the other hand, age of persons reverse walking and picnic.

The rate of education has direct relationship with person's thought of nature, importance of forest and picnic. In distribution of income monthly, persons, who have income 214.6-537 $ in month, have more percentage and in another group, income is 129-214.6 $ and it shows direct relationship of income monthly (regarding to job) with walking and picnic in forest. The results show that distance from park has reversal connection with visiting the park. If the distance becomes more, numbers of visitors will reduce (Table 1). There is some topic in other researches (Yakhkeshi, 1974; Maille and Mendelsohn, 1991; Garrod and Willis, 1997; Meamariani, 1999). People of the region (area) accept to pay the expense, although they have ordinary income and this shows people's generosity, naturalism and though which related to natural resources.

Among these suggestions, we understand that they accept to pay other expenses in different aspects that they guarantee future of park. General sum of willingness to pay for trial regions equal 34991.4 $ during one year. In case, consuming these expenses in Bonab forest park can protect o natural attractive and increase them and reforestation by native species and they result beautiful appearance for park and increase the guards for protecting of park that they prevent firing and dangerous.

Table 5: Comparison of visitor's willingness to pay in regions

Features	A	B	C
Visitors willingness to pay in common condition $	3	0.44	0.30
Sum of Visitors willingness to pay in case entrance expense was gotten $	2.3	0.44	0.30

Questions were asked of people to show the differences of visitor's willingness to pay in case they pay entrance. And the results show that the most of decrease for expense of payment related to region A and then region C and at last region B. we can express that why willingness to pay decrease in region A that people of this region love the nature and they think that nature belong them and their city (Table 5) and the nature is one of the God-given gift, then they should n t pay the expense for the gifts. The suggestion was numbers of people in the region increase WTP and tries to pay the expense for protecting and managing the park. In return, all of people use of the region gratuitously and it does n t effect on restrict for usage of park for people who have low income. The rate of general decrease of WTP is 773.4$. This decrease of expense shows that the people don t agrees with paying the expense as entrance. Numbers of people express disagree. They say that these expenses are consumed for governmental expenses 62400 $. Providing vehicles for coming and going will increase funny value for park and this expense is accounted in the value of park, then coming and going of people will become easier. Therefore, there is a point that we can t only consider economical thought and activity, but we should consider ecological limitations, too. By providing this position number of visitors in crease to go to the park and they cause to destroy the nature, too. Therefore, we should consider bioenvironmental condition and other point and decide about forest park carefully. The results express

that numbers of visitors and expenses in crease in staying places. This development effects on development of funny value of the park. As mentioned in the results, rate of value for forest park is 904$ per a day for each hector. That this value is in concord with Mirzaei s results in pelangdareh (Qom).

We can understand that equality of dry condition and similarity of climate between two regions are the reason for this agreement and composition. Of course, rate of value for a forest park in the North is more than this forest park. In researches for the north of Iran is expressed 93$ (Yakhkeshi, 1974) and 72 $ (Memariani, 1999) per hectare. This increase can have two reasons: 1: the best climate in the north of Iran. 2: the best possibilities for funny usage of the north. Climate conditions and possibilities are seen in other countries, in case in two regions of America has been expressed funny value 10.4$ (Krieger, 2001), 108$ (Maille and Mendelsohn, 1991) per hector for forests. Even we can observe this difference in researches, witch related to Costanza *et al.* (1997) and value of each hector is 112$ for tropical forest and 36$ for moderate forest. As seen in the results, many of visitors accepted to pay regular rate of expenses for protection of park monthly that it cause to increase value of each hector of park that it is 2787 $ per hector. This development of value has been observed in other researches by giving expense monthly. For example, Amirnejad (2004) expressed of forest park in Sisangan (North of Iran) 272 $ and Sharifi (1989) expressed the expense 579 $ for this park. Yakhkeshi (1974) expressed expense 9.3 $ with accounting of consuming expense without getting expense monthly. Although development of expenses in Bonab forest park is high, interesting of people to Bonab forest park can be an important reason for having a nice forest park, but researching for this topic needs to a long time.

Finally, we can suggest possibilities for promoting the park regarding to people's Interest for having a suitable park. We should show biological gifts in Iran to other countries and appear real value for protection of these natural resources, too. In the mean time, we can suggest forest parks for dry regions in Iran regarding to high value for Bonab forest park in Arsanjan.

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