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The Estimation of Economic Value of Wetland Ecosystem Protection and Recreational Services: Case Study of the Kanibrazan International Wetland

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Abstract

Based on the assessment of the tourism areas, one can choose between using or protecting a wetland based on the economic efficiency criterion and manage wetlands in pursuit of sustainable development goals. Therefore, the present study was conducted based on systematic sampling method for estimating the willingness to pay of the visitors by using contingent valuation method for the Kanibrazan wetland with a Logit model approach in 2017. Results showed that educational variables, gender, household size, income, age, and suggested price have a significant effect on the likelihood of paying people to visit the Kanibrazan wetland. The results showed that 90% of the people are willing to pay for recreation in the Kanibrazan wetland. The average willingness to pay for each person was estimated 38,217 Rials. Therefore, given the high recreational value of the wetland and the views of tourists, it is necessary for planners and authorities to pay more attention to both tourism development and increase the number of visitors and take advantage of the private sector and local community involvement in managing this recreational area.

1. Introduction

One of the factors behind the growth and prosperity of the economies of the countries is the tourism industry, which has now made significant progress for some countries. Environmental resources play a major role in the development and dynamism of many forms and types of the tourism industry, including ecotourism, rural tourism, adventure tourism and recreational areas. Therefore, it is essential that their economic value be determined and prior to the implementation of any plan of tourism projects, environmental assessment is essential and necessary [1].

In the meantime, wetlands are a safe haven for living creatures and suitable for plant growth and provide a variety of services to the human community that directly and indirectly affect their well-being [2]. The economic value of a wetland is the total value of consumable and non-consumable value, so that its value is related to direct or indirect human utilization of goods and services of wetlands. The tourist value is one of the direct values of the wetland ecosystem, which includes the use of wetlands for recreation, leisure, hiking and aesthetics [3].

Determining non-market values is important for protecting environmental goods such as habitats and landscapes. Identifying the preferences and values that people place in order to protect a recreational place is a guide to land management decisions. Limited studies have been carried out in the field of determining the economic value of different wetlands in Iran. Among them, in recent years, we can name the studies of Jalili Kamjo et al (2015), Azizi and Seyedan (2014), Ghorban Nejad et al (2014) and Kavosi Kalashmi and Pasban (2012) [4 to 7]. But the lack of useful studies for the Kanibrazan wetland continues to exist. Therefore, the present

study tries to determine the factors influencing the willingness to pay and determine the economic value of the recreational value of the Kanibrazan wetland by studying the demographic characteristics of the visitors. In addition, in this study, we tried to survey the barriers of tourism development in the wetland by polling the visitors.

The Kanibrazan Wetland includes 927 hectares of body of water in a 4010 hectares catchment area. This wetland is located 30 km north of Mahabad. The wetland is in fact part of the vast wetland of Lake Urmia. This Wetland is located between the villages of Khorokhore, Qaredagh, Bafravan and Qala Hassan Khan. Its ecosystem is one of the most important biodiversity focal points in the northwest of the country. This is an important area, especially for its rare birds. So that, there are species such as white headed duck, marbled duck, flamingos and pelicans. Based on the study of wildlife in the region, 75 species of aquatic and 105 species of non-aquatic, 12 species of reptiles, 5 species of amphibians and 4 species of fish have been identified in the region. Therefore, the purpose of this study is to estimate the value of recreation and the factors affecting the visitors' willingness to pay in the Kanibrazan wetland.

The purpose of this article is to identify and introduce the services and functions of Kanibrazan Wetland. Since preparing green national accounts requires estimating the value of ecosystem services in the environment, therefore, this study has estimated the value of recreational and conservation services in the Kanibrazan Wetland, which could be a guide for other aquatic ecosystems. Also, determining the total economic value of the wetland can indicate the importance of financing in the ecosystem in question. Because financing to maintain the functions can maintain the estimated economic value.

2. Materials and methods

In most cases, economists assume that the dependent variable is a set of continuous values. But there are several cases in which the decision-maker's behavior is summarized in the form of a limited set. The models that are used for such purposes are called models with qualitative dependent variables [8]. Regarding the inconsistent dependence of the dependent variable in these models, this kind of econometric models are referred as discrete regression models [9]. The simplest of these is the model in which the dependent variable is dual (zero and one). In the meantime, contingent valuation method (CV) is a non-marketable and flexible valuation method widely used in cost-benefit analysis and environmental impact assessment. The CV method attempts to determine the willingness to pay of individuals (WTP) under certain hypothetical market scenarios. In the CV method, referring to individuals is needed to determine the economic value of goods and environmental services. For this reason, the CV method is often called the stated preference method. At the first glance, this method seems simple. Only a few people are asked how much they are willing to pay for certain goods. To use this method, not only economic theories are needed, but also several other systems and rules in the sociology, psychology, statistics and surveys are needed [10].

In the present study, the dependent variable for valuing recreational value is acceptance or rejection of the proposed amount for recreation in the Kanibrazan wetland. This variable is obtained by answering the question of whether the person accepts the proposed offer for recreational value or not. Therefore, the dependent variable is an imaginary one which is 1 or 0. In these cases, the regression models with qualitative variables are the suitable models. In general, for the evaluation of regressions that have a dual dependent variable, linear probability models, Logit, Probit, and Tobit are used. In this research, Logit regression model has been used to study the effect of different explanatory variables on the amount of people's WTP due to the extensive use of this model in studies all over the world and so this model will be examined further.

The Logit model is based on the logistic cumulative probability. Based on this model, the probability of a person's participation in the desired activity (for example, acceptance of the proposed price) is calculated from equation (1), which shows this relation to what is known as the logistic equation [9]:

$$P_i = F(Z_i) = F(\alpha + \sum_{i=1`}^{n} \beta_i X_i) = \frac{1}{1+e^{-Z_i}} = \frac{e^{Z_i}}{1+e^{Z_i}} \qquad (1)$$

In the above equation, P_i is the likelihood of accepting the willingness to pay from the individual number *i*, *F* is the functional relation, α is the y-intercept, β_i are the parameters of the estimated model, X_i explanatory variables as a set of individual socio-economic characteristics, *i* visitor's number, *n* total number of observations and Z_i indicates The visitor's reaction. The reaction index is a random variable that if the value is greater than a certain limit Z^*_i , then the individual is willing to accept the proposed price, otherwise (s)he will reject.

In equation (1), probability of P_i with X_i and the coefficients of α and β_i is a nonlinear equation. This feature limits the use of ordinary least squares method to estimate coefficients. To solve this problem, the following conversions can be done to convert (1) to a linear expression. If P_i is the probability of occurrence of an event or possessing the desired attribute, then (1 - P_i) is the probability of non-occurrence of the desired. Which can be shown as (2):

$$1-P_i=\frac{1}{1+e^{z_i}} \tag{2}$$

By dividing equation (1) by the equation (2), equation (3) can be obtained as follows:

$$\frac{P_i}{1-P_i}=\frac{1+e^{z_i}}{1+e^{-z_i}}=e^{z_i} \tag{3}$$

In equation (3), the ratio (P_i/1-P_i) indicates the probability of occurrence of the incident (the likelihood of a willingness to pay) to its alternative, namely, the probability that the accident will not occur (the likelihood of unwillingness to pay). Now, if the logarithm of equation (3) is taken from the sides, the equation (4) is obtained:

$$L_i=Ln(\frac{P_i}{1-P_i})=Z_i=\alpha+\beta_i X_i \tag{4}$$

In the above equation, L is the logarithm ratio of likelihood of success to nonsuccess? This relation can be estimated using the maximum likelihood method (ML).

In the Logit model, the relative effect of each descriptive variable X_i on the probability of acceptance of the proposed price by derivation of the model relative to the explanatory variable can be calculated in relation (5).

$$\frac{\partial P_i}{\partial X_i}=\frac{\beta_i e^{Z_i}}{(1+e^{Z_i})^2} \tag{5}$$

In which P_i is the probability of occurrence of the event of the desired state (the probability of willingness to pay of the individuals), X_t is the dependent variable and the vector of the explanatory variable (Jaj et al., 1988).

According to the type of the explanatory variable, there are two separate methods for calculating the marginal effect in the Logit model:

1. If the X_k is a quantitative variable, the change in the probability of success of the dependent variable (Y_i=1) is defined by the change of one unit in X_k, called the final effect, as equation (6).

$$ME=\frac{\partial P_i}{\partial X_k}=\frac{e^{(\beta' X)}}{(1+e^{(\beta' X)})^2}.\beta_k \tag{6}$$

2. If X_k is a dummy variable, the final effect for this variable is the change in the success probability of the dependent variable (Y_i =1), as a result of the change of X_k from zero to one, while other variables are kept at a constant value of X^*. The amount of the marginal effect of the explanatory variable can be calculated from equation (7).

$$P(Y=1|X_k=1,\quad X^*)-P(Y=1|X_k=0,\quad X^*)=ME_D \tag{7}$$

The elasticity of the explanatory variable X_k in the Logit model can be obtained from equation (8) (Jaj et al., 1988).

(8) $$E^{l}=\frac{\partial(B'X_k)}{\partial X_k}.\frac{X_k}{(B'X_k)}=\frac{e^{B'X}}{(1+e^{B'X})^2}.B_k.\frac{X_k}{(B'X_k)}$$

The elasticity for each explanatory variable states how much a 1 percent change in X_k will lead to change in the success probability of the dependent variable(Y_{it}=1).

In order to determine the model for WTP measurement, it is assumed that a person accepts the proposed amount as a special tax to determine the value of a recreation on the basis of maximizing his utility under different circumstances. In the dual choice method, individuals are assumed to behave according to the following utility function [11]:

$$U(Y,S) \qquad (9)$$

In which U is the function of indirect utility, Y is individual income and S is a vector of other socio-economic factors of the individual. In order to determine the model for measuring WTP, each visitor is expected to pay a sum of his income for using the environmental resource as the proposed amount (A), which has utility for him. The utility of the use of environmental resources is greater than the state which he does not use the environmental resources, which is shown in the following relation [12]:

$$U(1,\ Y-A;S)+\varepsilon_1 \geq U(0,Y;S)+\varepsilon_0 \qquad (10)$$

In which ε_0 and ε_1 are random variables with zero mean which are distributed randomly and independently of each other. The difference in utility (ΔU) due to the use of an environmental source is:

$$\Delta U=(1,Y-A;S)-U(0,Y;S)+(\varepsilon_1-\varepsilon_0) \qquad (11)$$

The structure of the double bounded dichotomous choice questionnaire in assessing the willingness to pay of the individuals has a dual choice dependent variable, which requires a selective qualitative model. Usually, Logit and Probit models are used for qualitative selection methods. Therefore, in this research, Logit model was used because of the simplicity of computing and extensive use in international studies to examine the effect of different explanatory variables on the amount of visitors to determine recreational value. Based on the Logit model, the probability (Pi) that the person accepts one of the proposals, is expressed as follows [12]:

$$P_i=F_\eta(\Delta U)=\frac{1}{1+\exp(-\Delta U)}=\frac{1}{1+\exp\{-(\alpha-\beta A+\gamma Y+\theta S)\}} \qquad (12)$$

Which $F_\eta(\Delta U)$ is a cumulative distribution function with a standard logistic difference and includes some socio-economic variables such as income, proposed amount, age, gender, household size and education in this research. β, γ and θ are measurable coefficients that are expected to be $\beta \leq 0$, $\gamma > 0$ and $\theta > 0$ [13].

There are three methods for calculating the WTP amount: The first method, called the average WTP, is used to calculate the expected WTP value by numerical integration in the range of zero to infinity. The second method, called the average total WTP is used to calculate the expected value of WTP by numerical integration in the range from $-\infty$ up to $+\infty$ and the third method, known as the average partial WTP, is used to calculate the expected WTP value by numerical integration in the range of zero to the maximum bid (A). Among these methods, the

third method is better because it maintains the stability and compatibility of the constraints with the theory, statistical efficiency, and aggregation capability. Therefore, the average partial WTP has been used in this research. The parameters of the Logit model are estimated using the Maximum Likelihood method, which is the most common technique for estimating the Logit model. Then, the expected value of WTP by numerical integration in the range of zero to the maximum bid (A) is calculated as follows:

$$E(WTP) = \int_0^{MaxA} F_\eta(\Delta U)dA = \int_0^{MaxA} \left(\frac{1}{1+\exp\left[-(\alpha^* + \beta A)\right]}\right)dA \quad , \alpha^* = (\alpha + \gamma Y + \theta S) \tag{13}$$

That E(WTP) is the expected value of WTP and α* is the modified y-intercept, which is added by the socio-economic term to the y-intercept (α) of the original source $[\alpha^* = (\alpha + \gamma Y + \theta S)]$.

The population under study is the visitors of the Kanibrazan wetland, which is determined by the Cochran formula of the total sample size. The required data and statistics were collected by completing the questionnaire by asking the visitors in person. Initially a pre-test was designed and completed by visitors. Then, using the Cochran formula and the data obtained from the pre-test, the sample number reached to 156 people. To determine the sample size, the Cochran formula is used as follows:

$$n = \frac{Nt^2 pq}{Nd^2 + t^2 pq} = \frac{(300000 * 1.96^2 * 0.885 * 0.115)}{(300000 * 0.05^2) + (1.96^2 * 0.885 * 0.115)} = 156$$

Where N is the size of the population (the number of tourists), t is an acceptable assurance coefficient obtained from the t table (at a level of 95%) assuming that the distribution of the desired attribute is normal, d is half of the confidence interval, p is the percentage of the probability of the willingness to pay, q is the percentage of probability of the unwillingness to pay and n is the sample size. The sampling method is systematic sampling. Questionnaires were completed by people in the fall of 2017 in the Kanibrazan wetland.

Therefore, simple random sampling method was used for collecting information. In this study, a double bounded dichotomous choice questionnaire was used to measure the visitors' willingness to pay. Based on this method, the bid amount should be less or greater than the initial bid. Which offers a higher price to (yes) answers and a lower price to the people who answered (no). In this section, three suggested prices to the amount of 40,000, 30,000 and 50,000 Rials were presented in related questions. The initial value is chosen through pre-test. Then, using the contingent valuation method, we examine the tourism value of the Kanibrazan wetland.

3. Results and Discussion

The results of the study were studied in three different sections. The first section examines the demographic characteristics of respondents. Then, in the second section, the prioritization of the wetland functions and the consideration of the willingness to pay for the tourism function of the wetland has been investigated. Finally, in the third section, the recreational value of the Kanibrazan wetland is estimated based on the Logit model.

Part I: Individual characteristics of the selected sample on the Kanibrazan wetland

According to Table 1, the average age of the respondents is 36 years, the average education is 14 years, the average size of households is 3, and the average monthly income is 7980 thousand Rials. The age of the oldest and youngest respondents was 70 and 22, respectively, the highest and lowest number of family members were 5 and 2 respectively, the highest and lowest education was 22 (PhD) and 2 (primary) years respectively. The maximum and minimum monthly income of individuals is 23000 and 4000 thousand Rials, respectively.

Table (1): Demographic characteristics of the respondents

variables	mean	maximum	minimum	Standard deviation
Age of respondents	36	70	22	16.5
Years of study	14	22	2	5.4
Monthly income (Thousand Rials)	7980	23000	4000	2490
Household size	3	5	2	0.96

Frequency distribution of the level of education of the sample

The educational status of the visitors of the Kanibrazan Wetland is given in Table (2). Most visitors of the Kanibrazan Wetland have a relatively good level of education, so that, 65 percent of the visitors having a high school diploma or higher. A higher percentage of the households are with a diploma education (26.3%).

Table (2): Educational level of visitors from Kanibrazan wetland

Educational Level	Basic	Less than High school	High school	College	Bachelor	Master or higher	Total
Percent	14.1	23.1	26.3	9.6	17.3	9.6	100

Frequency distribution of occupation of the selected sample group

Table (3) shows the sample status of the study in terms of the occupation group. In terms of job, 35 (22.4%) were public employees, 32 (20.5%) private sector employees, 26 (16.7%) were self-employed, 22 (14.1%) were housewives, 21 (4 / 13%) retired, 10 (6.4%) faculty members and 4 (2.5%) physicians. Therefore, it is noticeable that the public and private sector employees and those who are self-employed have the highest frequency in the sample.

Table (3): Frequency distribution of the visitors' occupation

job	doctor	lecturer	Government staff	Private sector employee	retired	housekeeper	labor	self-employment	total
percent	2.5	6.4	22.4	20.5	13.4	14.1	12.9	16.7	100

Frequency distribution of people's marital status

As Table 4 shows, 77 percent of the sample was married, and 23 percent of the respondents were single.

Table (4): The frequency distribution of the marital status of individuals

Marital status	Married	Single	Total
Percent	77	23	100

Distribution of the gender

Table 5 indicates that 64 percent of the sample was male and 36 percent of the sample were female.

Table (5): Distribution of the gender

Gender	Male	Female	Total
Percent	64	36	100

Other demographic characteristics of respondents

Table 6 also describes the respondents' characteristics in terms of how they communicate with the wetland and the importance they attach to it. In addition, their environmental protection attitudes have also been studied.

Regarding the way of knowing and obtaining information of the Kanibrazan wetland, the presence of the visitors was the most important, followed by the National TV. The results showed that the visitors enjoyed an average of 52 hits. So that the minimum (10-50) and the maximum limit (60-100) are about 50.4% and 49.6%, respectively.

Table (6): Demographic characteristics of respondents in relation to the importance of protecting the wetland

	Feature	Frequency		Feature	Frequency
Type of relation	Main income	13.2	Usage of the wetland	Yes	79.1
	Secondary income	86.8		No	20.9
How they heard about the wetland	TV	27.1	Importance of wetland for families	Very high	44.2
	Magazine	1.6			
	Newspaper	0.8		High	45
	Friends and family	21.7		Neutral	8.5
	Personal visit	48.8		Low	2.3
A part of environmental NGOs	Yes	38	Participating in environmental projects	Yes	52.7
	No	62		No	47.3
What is the importance of the wetland?	Tourism	35	What was the effect of sightseeing in your pleasure?	Low (10-50)	50.4
	Environmental	65		High (50-100)	49.6

Part II: Prioritizing the functions and examination of the willingness to pay for the tourism function of the wetland

Also, respondents are asked about the priority given to the functions of the wetland, the results are presented in Table (7).

Table (7): Prioritizing the Functions of the Kanibrazan Wetland(1 is the lowest and 10 is the highest)

Advantages	**Rank (frequency)**										**Point**
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	
Conservation of biodiversity	0.8	-	-	3	-	15.5	17.8	37.2	20.2	5.4	986
Regional weather balance	-	-	0.8	0.8	6.9	29.5	26.4	34.9	0.8	-	887
Preventing soil erosion and creating dust	-	-	-	10	4.6	19.4	23.3	35.7	6.2	0.8	892
Flood control	7.8	17.8	21.7	27.1	11.6	11.6	2.3	-	-	-	466
Water supply	4.6	28.7	18.6	29.5	3.1	14.7	-	0.8	-	-	446
Economic resources (e.g. hunting birds)	17	38	17.8	14.7	-	11.6	5.4	-	-	-	404
Recreation and tourism	-	-	-	3	-	5.4	20.1	36.4	27.9	6.9	1030
Increased income from tourism	-	-	-	-	-	-	22.5	45.7	30.2	1.6	1046
The value of the presence of wetlands in the region	-	0.8	2.3	8.5	1.6	15.5	19.4	27.1	20.1	4.6	934

As can be seen from Table 7, among the above, the highest scores of 1046, 1030, and 986, respectively, are attributed to an increase in revenue from the location of tourism, recreation and tourism, and the conservation of biodiversity.

Table (8) shows the priority of each function that were questioned. It should be noted that the average duration of each visit was approximately 4 hours averaged. The highest and lowest amount of time to visit the wetland was 1 and 24 hours, respectively. Also, the average number of family members who visits the wetland as a touristic place is 5 people. The highest and lowest of them are 2 and 9 people, respectively.

Table (8): Investigating and Prioritizing the Importance of Functions and Values of the Kanibrazan Wetland in terms of Local Communities in the Wetland

Functions and advantages	Average	Standard deviation	Coefficient of variation	Priority
Increased income from tourism	8.11	0.763	0.094	1
Recreation and tourism	7.98	1.218	0.152	2
Conservation of biodiversity	7.66	1.371	0.178	3
The value of the presence of wetlands in the region	7.24	1.736	0.239	4
Preventing soil erosion and creating dust	6.91	1.403	0.203	5
Regional weather balance	6.88	1.068	0.155	6
Flood control	3.61	1.512	0.418	7
Water supply	3.46	1.490	0.430	8
Economic resources (e.g. hunting birds)	2.81	1.536	0.546	9

Determination of the willingness to pay for the tourism function of the Kanibrazan wetland

The willingness to pay of the respondents is presented in Table (9)[1]. 56 people (36%) did not accept the first proposal and did not want to pay 40,000 Rials of their income as entrance for the Kanibrazan wetland. When the lower offer (30,000 Rials) was submitted, 16 (10.2%) did not accept the second proposal, while 40 (25.6%) accepted it. Those respondents who accepted the first proposal were placed in the higher bid group who are willing to pay 50,000 Rials of their income as their entrance fee. 65 (41.6%) did not accept the above proposal, and 35 (22.5%) accepted the offer. The responses to the three proposed entrance fee for the Kanibrazan wetland is presented in Table (9).

Table (9): Responsiveness status for three proposed amounts for calculating the value of the Kanibrazan wetland

State of acceptation		First Offer (40,000 RIALS)	Lower Offer (30,000 RIALS)	Higher Offer (50,000 RIALS)
Accepted the offer	Number	73	40	35
	Percent	64	25.6	22.5
Rejected the offer	Number	56	16	65
	Percent	36	10.2	41.6
Total	Number	129	56	100
	Percent	100	35.8	64.1

Table 10 shows the reasons for the unwillingness to pay of the respondents. Based on this, 19% of the group was unable financially, 47.6% of them due to poor welfare and recreational facilities and 33.4% of the group believed that the government was obliged to provide expenditures for the conservation and provision of recreational facilities in the Kanibrazan wetland.

Table (10): Distribution of the reasons for the unwillingness to pay of the respondents in the Kanibrazan wetland

Reasons	Percentage
Financial inability	19
The government should pay the cost of wetland conservation and providing tourist facilities	33.4

[1] It should be noted that in this section only 129 questionnaires (due to complete answer to this part of the questions by respondents) have been used to determine the economic value of the recreational potential of the Kanibrazan wetland.

Poor recreational facilities of the wetland	47.6
Concerning about the non- spending of these funds on the wetland conservation	-
Total	100

It should also be noted that in Table (11), the opinion of individuals on how to finance the costs of the wetland management for tourism development was questioned. According to the results, 50% of people believed that the management fees should be shared jointly through visitors and government payments. In the meantime, 32% of people believed that it should be provided through entrance fee and 18% of them stated that governments were obliged to pay for the management of the wetland.

Table (11): How the cost of managing the wetland should be provided

Title	Percentage
By visitors and marketing	32
By the government	18
Both	50

Payments for parking fee

Considering that one of the visitors' dissatisfaction with the wetland is the lack of parking around the site, in this section we identified the amount of payment for parking from local communities and those who use vehicles to visit the Kanibrazan wetland. Accordingly, the results presented in Table (12) indicate that the most popular amount for payment is 20,000 Rials, and the lowest amount is 25,000 Rials. The average payment was also 13,992.2 Rials.

Table (12): Cost of parking for the Kanibrazan wetland

Amount of payment(Rials)	Frequency (Percentage)
5,000	14
10,000	27.1
15,000	24.8
20,000	33.3
25,000	0.8

Part III: Estimation of Logit Model (Estimating Economic Value of the Kanibrazan Wetland)

In this section, the results of estimating Logit model have been analyzed. In order to investigate the existence or non-existence of a co-linear model, the main components analysis was used. The results of this test showed that there is no correlation between the explanatory variables used in the co-linear model, so that the correlation coefficient between two independent variables was not more than 50%.

In order to investigate the existence or non-existence of heterogeneity of variance in logistic models, the statistic (called LM2) have been used. The value of the statistic LM2 in the fitted model is 4.6 and since the probability value (P-value) of this statistic is equal to 0.23, the assumption of the existence of the equation of variance is accepted in the model (Whister, 1999). To assess the general significance of the regression estimates, we used likelihood ratio (LR) statistic. The magnitude of the likelihood ratio (LR) in degrees of freedom of 6 is equal to 206.98 which is at a one percent significance level, so the total estimated model is statistically significant at 1% level. The correct prediction value obtained in this model is 98%. Since the acceptable amount of prediction for the Logit and Probit models is 70%, the model is reliable for the next analysis.

As Table (13) shows, the estimated coefficients for explanatory variables are the number of years of study at the level of 10%, for the variables of cooperation in environmental projects, monthly income, suggested price, age and gender at the level of five percent is statistically meaningful. Proposed price variables and age have a negative effect, and variables such as the number of years of study, gender, cooperation in environmental projects and income of respondents have a positive effect on the willingness to pay of the visitors to recreational use of

the Kanibrazan wetland. These results are consistent with the results of the study of Amirnezhad in 2006, Khodavardizadeh in 2008 and Sattout et.al in 2007 [14 and 15].

Table (13): Logit Model Estimates

Variables	Coefficients	The statistics of t	Probability	Weight total stretch	Final effect
Gender	2.50	2.89	0.046	0.055	0.71
Income	1.67	2.64	0.016	0.58	0.0068
Cooperation in environmental projects	2.90	2.87	0.004	0.07	0.87
Educational level	1.57	1.76	0.077	0.25	0.88
Amount of payment	-0.001	-2.58	0.009	-0.052	-0.0005
Age	-0.114	-1.81	0.059	-0.1	-0.04
y-intercept	-9.52	-2.44	0.015	-	-

Table (14): Results of the willingness to pay estimate

	Average	Meaningful level	Upper bound	Lower bound
WTP	38,217	0.04	55,410	-12,990

The magnitude of the marginal effect on the two dummy variables of gender and cooperation in environmental projects is 0.71 and 0.87, respectively. The value of the marginal effect of the gender variable indicates that the likelihood of the willingness to pay of women is 71% higher than of men. Similarly, the likelihood of willingness to pay of people who collaborate on environmental projects is as much as 87 percent more than other people. The marginal effect of the two variables of age and price suggests that by increasing one unit of these variables, the visitor's willingness to pay for recreation in the Kanibrazan wetland decreases by 4% and 0.05%, respectively. The marginal effect of the two variables on the level of education and income shows that the increase of one unit of these variables leads to an increase in the willingness to pay of a visitor 88 per cent and 0.68 per cent.

Using both Kerensky and Rob methods, both the willingness to pay and the confidence interval for willingness to pay were estimated. In the Kerensky and Rob tests, the zero-assumption is the zero or negative tendency to pay, so according to the significant level, the zero assumption is not accepted and the willingness to pay is a numeric value greater than zero, and the average willingness to pay is 38,217 Rials.

The results showed that the willingness of every visitor to pay a visit to the Kanibrazan Wetland was around 38217 Rials. To assess the willingness to pay of people, the environmental condition of the wetland and the attractions of the wetland was also studied. Accordingly, a five-step Likert scale is used. Based on data analysis, it was discovered that the majority of tourists and local communities believed that the environmental condition of the wetland is in an inappropriate position and is at the risk of destruction.

There are few studies evaluating wetland services and functions. Also, since the economic value is highly dependent on wetland functions, therefore, the tendency willingness to pay in the contingent valuation method is highly dependent on wetland services and therefore varies between studies. In the study of Amirnejad et al (2009) for Anzali wetland average willingness to pay for conservation of wetland was calculated 8460 Rials per visitor. The corresponding number for Parishan Fars wetland in Khosravi and Salarpour (2009) study equals 18321 Rials and for Gomishan wetland in Fatahi and Fatahzadeh (2011) study and Miankaleh wetland in Amirnejad et al. (2010) study were 72850 and 6878 Rials per visitor respectively. Also, Oujda et al obtained conservation and wildlife value in the Yaqui River Delta, Mexico, at approximately $ 6.6 per participant, and Hammett et al., for the quantum wetland in Taiwan, have estimated the total wetland at $ 200 million to $ 1.2 billion [16 to 21].

However, due to the high potential of tourist attractions in the wetland and considering the assumption of improvement of infrastructure conditions and recreational facilities, the study of the recreational value of the Kanibrazan wetland under different scenarios using a percentage of the population of the city of Mahabad and the number of the tourists of West Azerbaijan Province is shown in Tables (15) and (16). It should be noted that since the annual amount of visitors in the wetland varies from 3 to 10 thousand people, and also considering the population of the city of Mahabad (based on the latest census of about 236,849 people), the number of visitors to

the Kanibrazan wetland are about 1-4% of the population of the city of Mahabad. In addition, according to the latest information of national tourists of a 2014 survey, the annual number of tourists in West Azerbaijan Province is about 2,496,789 visitors. Therefore, the annual recreational value of the Kanibrazan Wetland is calculated according to the following equation:

(Average willingness to pay per person * Number of visitors) = Value of the recreation of the Kanibrazan wetland

The results showed that according to the annual visit of about 3 to 10 thousand people from the Kanibrazan wetland, its recreational value has been calculated around 115 and 382 million Rials, respectively. It is also anticipated that, given the high potential of tourist attractions in attracting visitors in the Kanibrazan wetland and increasing investment in building the necessary infrastructure, an effective step could be taken to increase the number of tourists in the region. Therefore, assuming 10, 30, 50 percent of the population of the city of Mahabad visit the Kanibrazan wetland, it can be expected to make 905, 2,715 and 4,525 million Rials annually, from tourism in the Kanibrazan wetland.

Table (15): Economic value of annual recreation of the Kanibrazan wetland based on increase of tourist percentage (percent of population of Mahabad city)

Scenario	1%	4%	10%	30%	50%
No. of visitors (x 1,000)	3	10	23,685	71,055	118,425
Annual economic value of tourism (Million Rials)	115	382	905	2,715	4,526

Table (16): Economic value of annual recreation of Kanibrazan wetland based on tourism growth scenarios, as a percentage of tourists from West Azerbaijan Province

Scenario	1%	5%	10%	30%	50%
No. of visitors (x 1,000)	24,968	99,872	249,679	749,037	1,248,395
Annual economic value of tourism (Million Rials)	954	3,817	9,542	28,626	47,710

In addition, if only 10% of all tourists from West Azerbaijan Province visit the Kanibrazan wetland, the annual income will be equal to 9542 million Rials. From where it can be invested in the implementation of the wetland conservation projects as well as the expansion and improvement of tourism infrastructure.

Therefore, based on the recreational value calculated on the Kanibrazan wetland, there will be a potential increase in annual revenue from 4,526 to 47,710 million Rials.

Conclusion

Inferential results showed that educational variables, gender, household size, income, age, and suggested price have a significant effect on the likelihood of willingness to pay of people who want to visit the Kanibrazan wetland. In addition, the suggested price variables and age have a negative effect on the willingness to pay, and the variables of gender, education, interest in environmental protection and income have a positive effect on the willingness to pay of the visitors. The results showed that 90% of people are willing to pay a sum for recreation in the Kanibrazan wetland. The average willingness to pay for each person for the Kanibrazan Wetland was estimated to be around 38,217 Rials.

It should be noted that although the payment of entry is not an appropriate backbone for the construction and maintenance of recreational areas, receiving entry will increase the visitor's sensitivity to the health of the recreational facilities or the cleanliness and health of the facilities and make them sensitive to poor management practices or inappropriate behaviors of others such as hurting recreational structures, safeguarding the trees, disposing of garbage, wasting drinking water, etc., and provides a platform for participatory management in the region.

The results of the study showed that the existing facilities of the Kanibrazan wetland are inappropriate for attracting tourists, so that the majority of the visitors are not satisfied with the status of recreational facilities, health facilities, parking lots, and places intended for families. However, given the high potential of this region in attracting tourists in the event of improved amenities, the number of tourists and their willingness to pay will increase. Therefore, considering the high recreational value of the wetland and the views of tourists and the high potential of this region to increase the tourist, it requires planners and authorities to increase the number of visitors to this area, and grant the management of this recreational area to private sector and local divisions. Also, at the expense of tourists, the expansion and creation of appropriate amenities for families, improving health facilities, improving the status of transportation, informing, guiding tourists and advertising about the attractions of the wetland through brochures, booklets and Compact disc, must be done in order to enhance the welfare of visitors which will surely increase the number of tourists and provide a suitable accommodation for the greater private sector investment in ecotourism activities related to the Kanibrazan wetland.

Taken together, due to the wide range of natural areas and the inability of governments to cover and protect all these natural resources, the need to use the financial contributions of the people to protect and prevent their destruction is evident. Therefore, according to the findings of the study as well as the conditions in the study area, we will continue to provide recommendations and solutions for the conservation of the Kanibrazan wetland as well as its sustainability:

1. Policies for recreational activities and tourism in the Kanibrazan wetland should be maintained by evolving environmental standards, protecting and preventing their destruction.
2. Considering the positive and high-effect of the number of years of study of the people and consequently the high level of information on the Kanibrazan wetland on their willingness to pay, It is recommended that the development of the level of information and awareness of the people in relation to the areas examined be taken into consideration by policy makers and planners in various ways, such as mass media, brochures and effective advertising, and also they make the necessary investments in this regard.
3. Therefore, considering the great recreational value of the Kanibrazan wetland, the views of tourists and the high potential of this region in terms of attracting tourists, it is recommended that in order to increase the welfare of tourists and increase the number of visitors, following actions must be done by the responsible authorities:

   Build some toilets, creation of enough campsites, creation of supermarkets, availability of guidance, distribution of brochures and guidebooks among visitors. Also, it is necessary to develop policies of recreational and tourism activities by maintaining environmental standards and creating mechanisms for returning income from ecotourism to target areas
4. The estimated recreational value is a justification for investment and protective measures to prevent environmental threats such as the wetland water loss, which should be considered by authorities and planners.

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