

Compensatory Payment to Hunters to Protect Biodiversity of the Fereydun'Kenar Wetland

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Abstract

The main reason for the decline and extensive change use of wetland resources is often the lack of proper calculation of the environmental (non-market) values of wetlands in development decisions. Fereydun'Kenar area has a local management system. Due to the condition of the wetland, protecting biodiversity of ecosystems, especially migratory birds, it is not possible managing the wetland without the participation of the local communities, therefore, in this study; we used a price tool to Estimate reduced income and attract predator's participation. For this purpose, a choice model was used to estimate the ecosystem value of Fereydun'Kenar wetland as a value that the operators favor for the benefits of the wetland and also to estimate the reduced income we used a conditional logit model. Then, this calculated income was used as an Incentive to engagement of predators and landowners. The results of the Logit model for each region, show that willingness to accept of the hunters in Sorkh-Rood, Ezbaran and Fereydun'Kenar area are 2386217, 2547214, and 3542100 Rial respectively. The variable coefficient of the wildlife habitat and the cost of payment for all three regions is one percent significant and positive. This means that there is a positive and significant impact on the willingness or marginal utility of predators. In other words, by improving the wildlife habitat status or increasing shelter, and as a result of a decrease in the level of hunting, the desire to get hunters to avoid hunting increases. However, with the improvement or shortening of the hunting season, the final utility of predators is reduced, which means that there is a negative impact on the willingness of people to hunt in the Fereydun'Kenar area of Mazandaran province.

Key words: choice experiment, Migratory Birds, Fereydun'Kenar Wetland, willingness to accept.

JEL Classification: C21, Q2, Q28.

1. Introduction

Wetlands are an example of valuable natural resources in Iran that have suffered greatly in recent years due to neglect and worthlessness. People who use the

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benefits of a wetland do not realize the important role it plays in their lives until the wetland is destroyed. Also, many policymakers may not realize the economic value of natural resources and inadequate policy-making would destroy that resource, which would not only create huge costs for the economy but also drive the country away from sustainable development (Jiang *et al.*, 2015). Therefore, unless the existential value of a resource such as the wetland is identified, it is unnecessarily used and misapplied. One of the factors threatening wetlands has been land management practices over the past four decades, which have altered the use and loss of natural wildlife habitat and consequently reduced the population of aquatic birds (Ottavall & Smith 2006). High hunting, destruction and encroachment on fishing grounds, climate change, agricultural activities, exploitation of resources on the environment and the threat of biodiversity and extinction of rare species of wetlands, drought, land use change, Environmental pollution and so on are the perils that wetlands face (VanKooten *et al.*, 2014; VanKooten *et al.*, 2016; Manton *et al.*, 2016; Berezowski *et al.*, 2018).

Proper management of Fereidunkarn wetland complex with regard to catching and fishing tendency in the area and the long time range of catching and catching rate is essential for maintaining ecosystem stability conditions. This region is characterized by its species density and diversity and its fishing methods. Most importantly, it is the only extinct species of Siberian endangered species in the country, along with other migratory bird species each year. They spend the winter in the camps of the region.

Land ownership in this wetland area is private, and its benefits include both private and social sectors. In management planning and resource extraction, only private interests are taken into account in decisions. Whereas, the private interests of the owner must be provided in a manner that does not harm the public interest. In the present study, the amount a farmer is willing to receive to contribute to ecosystem biodiversity conservation programs by reducing the level of hunting is calculated.

2. Methodology

In this study, the selection test method was used to estimate non-market wetland values. The selection test is a set of stated preferences methods, multivariate validation, and selection modeling. In this method, there are several sets of choices. Each of these sets contains two or more options. Respondents are asked to choose their preferred choice. Each option is described by a number of attributes or characteristics of the commodity, and these attributes themselves have different levels. Usually one of these characteristics is the price characteristic which has a base state (Saleh Nia, *et al.*, 2014). This test has a χ^2 distribution and is used for bound and non-bound models. The statistic for this test is shown below (Isa Zadeh, *et al.* 2012).

$$\tau = (\hat{\beta}_r - \hat{\beta})'(\hat{V}_r - \hat{V}^{-1})(\hat{\beta}_r - \hat{\beta}) \approx \chi^2(m) \quad (1)$$

The coefficients obtained for the traits can be used to estimate the equilibrium and the exchange performed by the respondents among the traits. The price characteristic, in interaction with other attributes, measures respondents' willingness to pay according to the following relationship for the gain or loss of different levels. This value is also called the implied price (Saleh Nia, et al., 2014); The reason for using implicit price in this logit model is that it is not possible to divide the coefficients (Greene, 2012; Jalili Kamjou, et al., 2014).

$$IP_{product-attribute} = - \left(\frac{\beta_{product-attribute}}{\beta_{monetary-attribute}} \right) \quad (2)$$

3. Findings

According to information in Table 10, hunters are willing to receive 23.86 million Rial for the size of the sanctuary area, which is statistically significant and reliable. This means that every farmer is willing to receive such a sum during a hunting season and give part of his land to wetland conservation programs, that is, not to hunt on the land he owns. Also, these sums for Barazid and Fereydun'Kenar are 25.47 and 49.50 million Rial, respectively. However, the tendency to get hunted for the duration of hunting in Sorkh-Rood and Ezbaran is not significant. Accordingly, the total amount received per hunter per hunting period was estimated to be 23.86 million Rial for the Sorkh-Rood and 25.47 million for the Ezbaran; That is, if hunting time is reduced, the utility of each Beneficiary will decrease in these areas. In the Fereydun'Kenar area, the willingness to hunt for a hunting period is estimated at 14.07 million Rial. Because this feature has a positive sign, it does not mean that predators are willing to receive, that is to say, to calculate the total willingness to hunt, the tendency to receive for the duration of the hunt should be deducted from the willingness to hunt for the size of the shelter. According to this account, the total amount of each hunter for non-hunting in the Fereydun'Kenar area of Mazandaran province is calculated to be 35.42 million Rial. Finally, the average willingness to catch fishermen in the study area is about 25 million Rial, which can be used as the value of the ecosystem services for each predator in the next stages, i.e. each predator will use the value of the wetland ecosystem value equivalent to 25 Million Rial and is willing to discontinue using this amount.

Table 1: Results of conditional logit model estimation by selection test method

characteristic	WTA	Criteria (%)	The significance level
Sorkh-Rood Hunting place			
extent	- 2386217	100	Meaningful
period	535707	4.45	meaningless
Summation (10 rials)	2386218	--	--
Ezbaran Hunting place			
extent	-2547214	100	Meaningful
period	-53172	4.45	meaningless
Summation (10 rials)	2547214	--	--
Fereydu'n Kenar Hunting place			
extent	-4949898	100	Meaningful
period	1407797	3.51	meaningless
Summation (10 rials)	3542101	--	--

Source: Research findings

4. Conclusion

Based on the results of the research, three factors: the sanctuary size, the length of the hunting period and the cost of compensation are effective on WTA of hunters for lack of hunting. With shorter hunting, the number of days of unemployment will be eaten up, which means less hunting and less income. Instead, increasing the sanctuary size means better living conditions for birds and less competition for food and nesting as well as more security, which indirectly reduces the number of deaths of these birds and increases the storage of this Species and, consequently, more hunts. On the other hand, with the increase in the area or number of catches or ponds in farms, the money received for participation in the program will also increase. Therefore, it can be seen that financial and income motivation is the most important concerns of exploiting communities and owners of wetlands. Therefore, according to the owners and local people, because of the land ownership and the free availability of biological resources, it is also believed that, if this service is not available, there will be no bird in these areas; they will have the self-made license, which will be maximum have the impression of these resources. That is, in fact, the lack of awareness of the values of an environmental source for the current and future generations, which confronts the exploiter with a huge calculation error in the cost-benefit of wetland resources and even its own resources. Other issues in this area are the existence of monopoly and speculation in the market for the sale of birds,

which gives great profit to the traders. In some cases, the power of these monopolists is so high that even the cited organizations do not have access to these individuals and their daily sales offices. Therefore, it seems that we are faced with the weakness of the legislation and enforcement of the laws. Even in some cases, we see the effectiveness of these people's power over regional laws. Although it was pointed out that in order to implement any plan for the management and protection of the wetlands, we need to consider the participation of the public, but it should be noted that the attraction of participation in balancing with the estimation of the expectations of other strata and exploiting sustainable development and well-being Biodiversity and wetland ecosystem. That is, both the social interests and the private interests of individuals in these plans should be met as far as possible. It seems that one of the most effective means of generating profits from these resources is negotiation and direct agreement with landowners.

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