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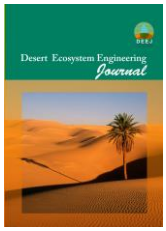

Estimating the conservation value of man-planted forests (Case study: Isfahan Iron and Steel Factory)

Ahmad Fatahi Ardakani[*1], Mohammad Hosein Iran Nezhad Parizi[2], Yadollah Bostan[3], Farshid Rostamzade[4]

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Extended Abstract

Introduction: Forests are the only ecosystems that offer all the classified services. However, such environmental services and functions are not provided freely, bearing seemingly latent economic values that are not fully considered within the framework of the market system. Moreover, these services are not sufficiently and quantitatively recognized in comparison to other economic services. In other words, the value of non-market services in natural ecosystems is far greater than that of goods. On the other hand, To streamline decision-making processes regarding the utilization of available resources, it is imperative to both quantify the quantifiable costs and benefits (exchangeable goods and services) and to incorporate non-market and intangible costs and benefits, which have primarily been considered from a consumptive standpoint, into the relevant economic framework and calculations Covering 31% of the land area, forests bear economic value and offer environmental services that must be valued through the economic valuation of biological resources.

More than half of the world's forests are being deforested in just five countries, that is, an estimated 10 million hectares per year between 2015 and 2020, indicating that six million hectares decrease per year compared to similar statistics recorded in the 1990s. Characterized by its geographical and climatic conditions, Iran also deals with the issue of forestry, with annual afforestation reducing the net amount of deforestation within the country, highlighting the necessity of development and estimation of the economic and environmental values of planted forests. As most of the studies conducted in the field of conservation value are mostly related to the past decade and few studies have addressed this issue in recent years, the present study sought to estimate the conservation value of the planted forests of the Isfahan Steel Mill Factory using the contingent valuation method.

Materials and methods: As one of the preferred methods, which is also applied in the current study, the Contingent Valuation Method can theoretically be used to evaluate the resources and continuity of the existence of what people care about, even if they never visit it in person. Moreover, the method includes the development of a questionnaire to select appropriate options and increase the accuracy of the results, thus preventing potential prospective deviations. The population of the study comprised the areas that were most affected by planted forests, including a collection of seven cities adjoining the factory with a population of 2 million people, among whom 384 people were selected through random sampling. Then, the relevant questionnaire was developed and administered to participants in seven regions in 2017-2018.

1. Associate Professor, Department of Agricultural Economics, Ardakan University; fatahi@ardakan.ac.ir
2. Assistant Professor, Department of Environment, Yazd University
3. PhD student in agricultural economics, Sari University of Agricultural Sciences and Natural Resources
4. Master's student, Agricultural Economics, Ardakan University

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In this method, proposed amounts as annual payments for individuals to protect the afforestation projects of Isfahan Steel Company were presented to the selected individuals. Given that individuals maximize their utility, the logit model follows the cumulative logistic distribution function**.**

The parameters of the logit model were estimated using the maximum likelihood method. It should be noted that predicting the effects of non-distributive variables on the probability of acceptance is of great significance in estimating logit models. The amount offered by an individual also bears special importance. After estimating the logit model, the expected value of the willingness to pay was calculated as the highest acceptance offer by numerical integration in the range of zero.

Results: The results of the study in terms of social, economic, and environmental characteristics of the respondents indicated that the average age of the respondents was 31 years, who provided more acceptable answers in terms of income due to their independence. In addition, 64% of the respondents were male, 54% were married, and only 5% were members of an environmental organization. On the other hand, 84% of the respondents assessed the significance of protecting the forests of the factory as high and very high, and after reading the information provided in the brochure, only 18% of the respondents stated that they knew all the information provided, suggesting a lack of sufficient information regarding the environmental activities carried out by the factory. Furthermore, 41 percent of the respondents were highly concerned about the destruction of forest plantations, and almost 50 percent of the respondents evaluated the percentage of possible damage to forestry as relatively severe. The variables of income, education, membership in environmental organizations, number of employed people, taxes, and the level of concern about the destruction of forestry were found to have a direct relationship with the proposed price. In addition,

The negative sign of the estimated coefficient for the proposed price variable is consistent with the current research theory and indicates that if the proposed amount for protection increases, the likelihood of acceptance in respondents' willingness to pay decreases.

Considering the elasticity of the proposed amount variable (0.7736), a one percent increase in the price offered to respondents decreases the probability of acceptance in their willingness to pay for the conservation value of afforestation by 0.77%. Additionally, based on the marginal effect of this variable (0.02059), a one-rial increase in the amount proposed to individuals decreases the probability of accepting a payment for conservation by 0.02%.

Furthermore, the annual conservation value of each hectare of Isfahan Steel plantation was equal to IRR 6048875. In other words, each family was willing to pay an average of IRR 193560.4 annually (according to the size of the household) for the protection of forestry.

Conclusion: This study has achieved promising results. First, the study showed that people in the study population were aware of the significance of forest resources. Second, the results indicate that there is a willingness to pay significantly for the improvement and development of such resources, providing justification for policymakers and officials to support the quality of the environment and natural resources and prevent the underestimation and trivialization of natural resources. It is recommended that future studies address different functions of planted forests and the effect of various parameters such as tax on willingness to pay for the protection of ecosystems and reduction of damages. In addition, the ecosystem enjoys various other values, such as water and soil conservation, carbon dioxide absorption and oxygen production, and purification of air pollutants, each of which needs to be carefully estimated.

Keywords: Biological Resources, Contingent Valuation, Logit Model, Planning Forest, Tax.