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Analysis of ecotourism-based wetland ecosystem conservation of Ramsar site: a case study from the southeastern part of Iran

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Abstract

Wetland ecosystem services, are one of the predominant tourist attraction worldwide. This study conducted a choice modeling method based on environmental attributes contributing to nature-based tourism for preserving the quality of the wetland ecosystem in Govater Bay and Hur-e-Bahu international wetland (GIW) in southeastern Iran. Besides inclusion in the Ramsar Convention on Wetlands, the GIW is particularly interesting as it hosts various valuable flora and fauna species, such as mangrove forests (*Avicennia marina*), migratory birds, dolphins, and turtles. According to the results, if the current condition of the GIW ecosystem continues, public participation will decrease shown by unwillingness of ecotourists to pay for environmental conservation purposes. It was also found that higher educated visitors are willing to pay more for GIW conservation policy options compared to less educated ones. Based on the visitors' opinion, the "Dolphin Observability (DO)" had the highest conservation (existence) value, followed by the natural landscape of Mangrove forest coverage (NW). Some suggestions and development strategies are delivered based on the empirical findings to improve the sustainability and conservation of the GIW ecosystem.

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Introduction

Wetland ecosystem services, are one of the predominant tourist attractions worldwide (Huybers and Bennett, 2000). Under the Ramsar Convention on Wetlands of International Importance, wetlands are defined as “areas of marsh, fen, peat land, or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six meters” (Barbier et al., 1997; Bureau, 2013).

The Mangrove forests or Mangroves are one of the most important and vulnerable ecosystems worldwide, found along sheltered coastlines prevalently in the tropical and subtropical areas that house a broad diversity of flora and fauna. These forests provide significant environmental and socio-economic advantages, such as ameliorating the devastating impact of natural disasters, carbon sequestration, conservation of biological diversity, coastal water enrichment, commercial production, and increased fisheries. In addition to the important functions mentioned above, mangroves have aesthetic, historical, and cultural values (Grasso, 2002).

Mangrove forests in Iran are found in the tidal zones of the Gulf of Oman and the Persian Gulf, covering three provinces of Sistan and Baluchistan, Bushehr, and Hormozgan. The most crucial mangrove forests of Sistan and Baluchistan are located in Govater Bay, and Hur-e-Bahu international wetland (GIW) Ramsar sites in the southeastern part of Iran. The estuarine wetland of the lower Sarbaz River is composed mainly of *Avicenna marina* species, called “Harra” in Persian. These dense forests are in the intertidal zones and comprise bushes and trees (Zahed et al., 2010; Bureau, 2013; Moradi et al., 2019).

Resource contributions in environmental economics are public goods, untradeable in the market. They have been divided into use (non-consumptive) values related to consumer surplus advantages from actual recreational (ecotourism) use and conservation (non-use) values pertinent to benefits from non-use satisfaction (Walsh et al., 1984). The latter also comprises three values, including option value which implies saving the recreation opportunity for possible future use, existence value indicating consciousness that natural resources are preserved, and bequest values pointing to the satisfaction of future generations with the handed down natural resources (Greenley et al., 1985).

The wetland ecosystem environments provide a broad range of services and opportunities for recreational activities, such as swimming, fishing, diving, cruising, kayaking, and enjoying the landscape, while also creating considerable intrinsic and cultural ecosystem service benefits (Thompson et al., 2017; Owuor et al., 2019; Dushani et al., 2021).

In recent years, natural resources, particularly wetland ecosystems, have been endangered due to aquaculture uses, fishing ports, dunes invasion, rising sea levels, livestock grazing on mangrove leaves, and using its wood for different purposes. Although the importance of conservation and protection of natural property, which are prudent economic decisions, has become increasingly more evident to human society than ever, conservation financing remains vague, especially in developing countries (Giri et al., 2011; McInnes et al., 2017; Dushani et al., 2021; Xu and He, 2022). (Balmford and Whitten, 2003).

Recreation services of natural ecosystems are directly connected to individual well-being and can substantially encourage public support for nature conservation efforts (Peng and Oleson, 2017; Goldsmith et al., 2018; Xu and He, 2022). Recreation is also among the valuable distinguished ecosystem service categories in literature. However, it is claimed that recreation is the most straightforward monetary translation of social utility because of the existence of market and non-market assessment approaches (De Groot et al., 2012).

Universally, the tourism industry, particularly ecotourism, has become one of the most remarkable economic sectors (Pforr, 2001; H-S, 2019; Schuhmann et al., 2019; Hou et al., 2020; Dushani et al., 2021; Xu and He, 2022). The principal concern of the tourism industry is to encourage the residents to be involved in related actions and emphasize the conservation of the natural ecosystem by educating the visitors on how to protect and respect the culture visited. Besides, well-educated, local people can play an influential, effective role in motivating tourists to look at their communities as more than a place for recreation (Goodwin, 2016; Schuhmann et al., 2019; Dushani et al., 2021). Some studies highlight that tourists are willing to pay more than the current fees for improved biodiversity and environmental quality, revealing that ecotourism can serve as a source of funding for the sustainable management of wetland ecosystems (Madani, 2013; Bostan et al., 2020; Hou et al., 2020; Dushani et al., 2021).

Conservation science is defined as the scientific study of ecological, social, and integrated socio-ecological phenomena to provide experimental knowledge for conservation objectives (Bennett et al., 2017; Valasiuk et al., 2018; Dushani et al., 2021). It can provide helpful input for practical conservation activities. Therefore, one of the crucial elements of conservation science is understanding user’s preferences and attitudes regarding conservation practices and environmental resources (Kareiva and Marvier, 2012; Bennett et al., 2017; Valasiuk et al., 2018; Dushani et al., 2021).

Environmental and natural resource management will be more successful if the stakeholders’ opinions and preferences are considered in the decision-making process (Silvano and Valbo-Jørgensen, 2008). Preference elicitation can offer insights for improving conservation policies and practices, addressing aspects such as the social influence of conservation, ecological consequences, the legality of conservation governance, and the acceptability of conservation management (Kareiva and Marvier, 2012; Bennett et al., 2017; Valasiuk et al., 2018; Dushani et al., 2021). Possessing a comprehensive knowledge of users' preferences for conservation is substantial to the conservation policy achievement (Dumitras DE, 2017; Whittington et al., 2017; Goldsmith et al., 2018; Ardeshiri et al., 2019; Bostan et al., 2020; Xu and He, 2022). Stakeholders such as ecosystem visitors, beneficiaries, and residential communities have practical knowledge that could be combined with scientific findings to increase the effectiveness of management decisions, leading to co-management, community-based, and collaborative management for more efficient wetland ecosystem management activities and fewer conflicts (Dumitras DE, 2017; Whittington et al., 2017; Goldsmith et al., 2018; Stephenson et al., 2018; Ardeshiri et al., 2019; Bostan et al., 2020; Xu and He, 2022). The managers of international environmental protected sites and other stakeholders need to conserve such areas to protect nature and wildlife effectively.

There is a conflict between tourist preferences for the natural ecosystems and the degradation of the natural habitat environment. According to a nature-based decision-making framework, sustainable tourism can be applied to obtain objectives such as conserving the environment, maximizing tourist utility, inspiring repeated visits, and achieving economic advantages. The analysis performed in the present study based on environmental indicators helps to improve and maintain the quality of the wetland ecosystem through nature-based tourism (Bishop and Romano, 1998; Goodwin, 2016; Bennett et al., 2017; Dumitras DE, 2017; Goldsmith et al., 2018; Ardeshiri et al., 2019; Bostan et al., 2020; Xu and He, 2022).

Therefore, based on the above discussion, knowledge of the economic value of natural resources and ecosystems in management decisions provides sustained protection and contribution of goods and services in the interest of current and future generations. Such economic value dominated the political agenda at the beginning of the third millennium. Given that environmental goods and services mentioned above are often non-market and without prices, their values must be evaluated by methods based on preference elicitation for environmental changes

(Glenk and Colombo, 2011; Dumitras DE, 2017; Goldsmith et al., 2018; Ardeshiri et al., 2019; Bostan et al., 2020; Xu and He, 2022). The environmental valuation techniques are classified into two main groups, including those that rely on revealed preferences (indirect methods) and stated preferences (direct methods). The choice experiment method (CEM) based on stated preferences is currently one of the capable methods for estimating the values of non-market and public goods. This technique creates hypothetical markets to elicit peoples' willingness to pay WTP for the provision of public goods or services, implying an improvement in their well-being (Carson et al., 2001; McInnes et al., 2017; H-S, 2019; Owuor et al., 2019; Schuhmann et al., 2019; Bostan et al., 2020). The choice experiment method (CEM) has been principally applied to model preferences for the evaluation of non-market goods or services, containing natural resource management (Goldsmith et al., 2018; Hou et al., 2020; Xu and He, 2022), which is becoming progressively widespread due to its flexibility (Hanley et al., 2009; Xu and He, 2022). The CEM can simultaneously determine preferences of multiple attributes of conservation policy, accordingly providing trade-offs between various conservation levels (Adamowicz et al., 1998; Bostan et al., 2020; Xu and He, 2022). The valuation of marginal willingness to pay (WTP) for conservation-related attributes may also be possible (Hanley et al., 2009; Xu and He, 2022). Generally, the use of DCEs in wetland ecosystem services has focused on assessing the advantages of environmental goods such as biodiversity, coral and mangrove cover, threatened species, environmental quality, and habitat values (Madani, 2013; Xu and He, 2022).

According to the Ramsar Convention on Wetlands and Migratory Species, the government is responsible to protect the study area. However, these efforts are insufficient for the best conservation, necessitating the engagement of the local community in conservation and restoration attempts. Given the lack of previous studies on the economic importance of the study area, the results of this investigation are expected to provide the baseline information for further studies, attracting public attention to conservation and restoration activities as complementary to government measures about the GIW ecosystem sustainability and conservation. In addition to its inclusion in the Ramsar Convention on Wetlands, the GIW case study is particularly important because it hosts various valuable aquatic species such as mangrove forest (*Avicennia marina*), migratory birds, dolphins, and green sea turtles (Zahed et al., 2010; Bureau, 2013; Moradi et al., 2019).

Accordingly, the present research used a choice experiment applying conditional logit to derive GIW recreationists' preferences and analyze the impact factors on the WTP of individuals for conservation and ecotourism in the study area. Finally, some suggestions and development strategies are provided based on the empirical findings to improve the sustainability and conservation of the GIW ecosystem.

Materials and Methods

Study area and data collection methods

The study area, Govater and Hur-e-Bahu International Wetland (GIW), at the edge of Govater Bay, is one of 24 designated wetlands registered in the Ramsar Convention on Wetlands in Iran. It has an area of 270 hectares (667.185 acres), located between latitudes (25° 1'- 25° 12') North and longitudes (61° 25'- 61° 46') East, in the northern end of Makkoran Sea (Gulf of Oman) and extreme southeast corner of the subtropical Sistan and Baluchistan Province of Iran, extending east towards the Pakistan border (Figure 1) (Zahed et al., 2010; Bureau, 2013; Jamnia et al., 2018; Moradi et al., 2019).

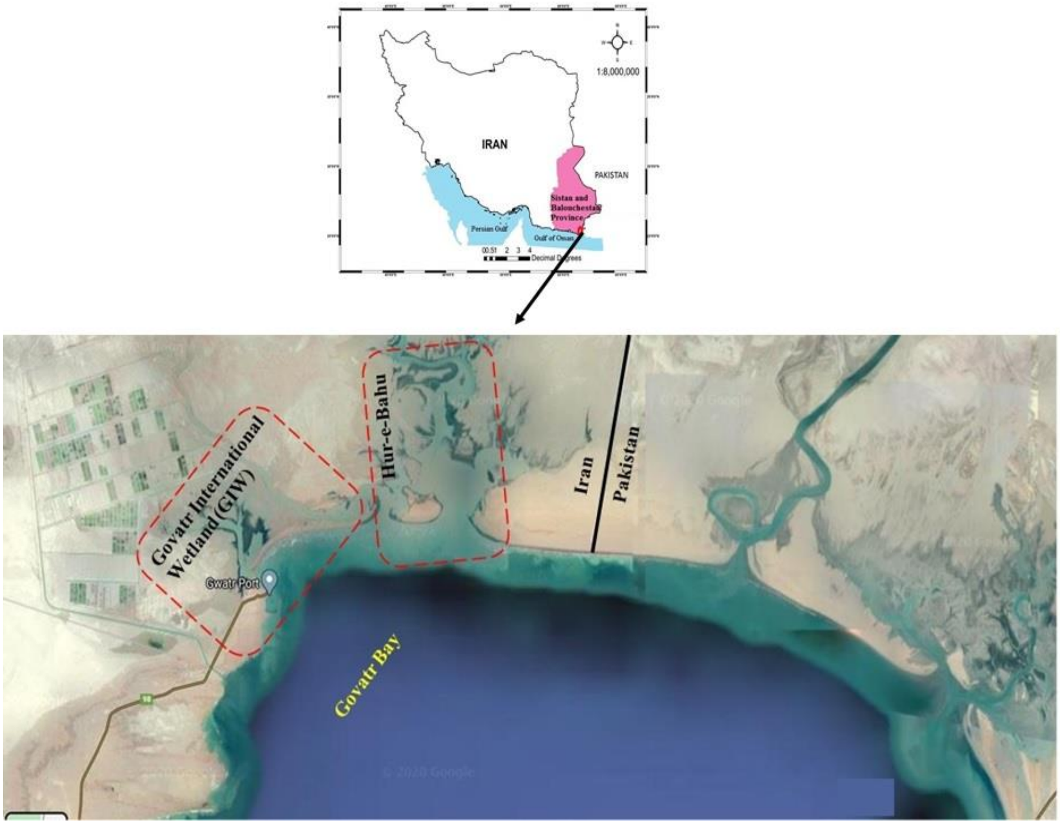

Figure 1. The map of the study area

The area is consisted of marine-coastal ponds, which are especially important for the tourism industry because of the ecological habitats, such as 200 hectares (494.211 acres) of mangrove forests (Avicennia marina), migratory birds, and aquatic species, particularly dolphins and turtles. It also hosts a considerable population of amazing migratory and aquatic birds during the winter that come for feeding and hatching. Furthermore, it is one of the diverse ecosystems by bringing together a varied set of aquatic plants and animals (Zahed et al., 2010; Bureau, 2013; Moradi et al., 2019).

Despite the costs, this study applied the direct face-to-face interview method to collect data because of its reliable eliciting estimates in conservation and ecotourism value and effectiveness in achieving higher response rates than other methods, such as telephone interviews, mail, etc (Hadker et al., 1997; Lee and Han, 2002; Bandara and Tisdell, 2004). Most visits to GIW are performed at the end of the solar year (Iranian year), known as "Nowrooz" strictly equivalent to February to March. Therefore, respondents, selected using random sampling from visitors of GIW, completed a total of 300 questionnaires from February to March 2022. All monetary values in this study are presented in US dollars based on the exchange rate at the time of the survey (1.00 US $ was approximately equal to 262,000 Rials (Iranian unit currency)).

Generation of Choice Option Cards

The questionnaire was organized into two sections, the first of which included the general socio-demographic information of respondents and the other included the relevant details about respondents' relationship with the area and environmental issues, while the second section contained choice experiment questions. The attributes and their levels (Table 1) are necessary for arranging the efficient choice experiment sets, which are determined in consultation with experts, along with a literature review and sample interviews.

Table 1. The attributes and their levels

Attributes	Levels	Number of levels	Description
Dolphin Observability	Status Quo (No change) Increase by 30% Increase by 60%	3	Seeing the number of Dolphins around the visitors' boat
Natural landscape Watching	Status Quo No change Increase Coverage by 20% Increase Coverage by 50%	3	Landscape created with Mangrove Forest
Facilities	Status Quo Status Quo (Desirable) Increase by 100% Increase by 200%	3	The lodging, overnight use, food and recreational facilities
Tourism Information Availability	Status Quo (No change) Increase by 100% Increase by 200%	3	Specialized information providing
Aquaculture Infrastructure	Status Quo (No change) Increase Decrease	3	Aquaculture activities development, which deteriorates the naturalness of the landscape
Payment for Ecosystem conservation trust fund (per entry per person)	Status Quo (Entrance free) 1US$ 2 US$ 3 US$ 4 US$ 5 US$	6	Professional payments for ecosystem conservation purposes

Source: Research findings

According to Table 1, the six attributes included Dolphin Observability (DO), Natural Landscape Watching (NW), Facilities (F), Tourism Information Availability (TIA), Aquaculture Infrastructure (AI), and Payment for Ecosystem Conservation Trust Fund per entry per person (CF). Three alternatives were presented for GIW ecotourism: option A, option B, and option C. Option C represents the current status, defined by the attribute levels currently experienced by respondents. After clarifying the attributes and their respective levels, the utility valuation criterion was employed to unveil visitors' preferences for sustainable ecotourism at GIW (see Table 1). The Choice Experiment (CE) assessment procedure was used to define the composition of preference selections for choice sets, providing a framework for the questionnaire and sampling designs. The potential combinations of various attributes and their levels yielded 1458 possible component combinations (3^5×6=1458). To streamline the process and create a practical questionnaire, a method to logically reduce the possible component combinations was necessary, drawing from efficient techniques in the literature (Hensher et al., 2005; Breidert, 2007; Hideo Aizaki and Nishimura, 2008; Silvano and Valbo-Jørgensen, 2008; H Aizaki et al., 2014; Goodwin, 2016).

As a result, 45 series of multiple-choice sets were derived based on orthogonal main-effect fractional factorial designs using a mix-and-match rotation method facilitated by R packages (H Aizaki et al., 2014; Goodwin, 2016; Bostan et al., 2020; Xu and He, 2022). Respondents were then prompted to choose an option from the generated choice sets based on their personal preferences. Table 2 provides a sample of the designed choice sets reflecting visitors' preferences for sustainable ecotourism at GIW.

Table 2. A representative choice set

Attributes	Choice set		
	Option A	Option B	Option C
Dolphin observability(DO)	Increase by 60%	Increase by 30%	No change
Natural Landscape Watching (NW)	No change	Increase by 20%	No change
Facilities (F)	Increase by 100%	Increase by 100%	Desirable
Tourism Information Availability (TIA)	No change	No change	No change
Aquaculture Infrastructure (AI)	Decrease	Decrease	No change
Payment for Ecosystem conservation trust fund per entry per person (CF)	3 US$	2 US$	Entrance free
Which of alternatives do you most prefer?	☐	☐	☐

Source: Research findings

Model Specification and Analysis

Choice experiment Method (CEM)

The choice experiment method (CEM), which is becoming progressively widespread due to its flexibility, has been principally applied to model preferences for the evaluation of non-market goods or services, containing natural resource management (Hanley et al., 2009; Goldsmith et al., 2018). This method enables researchers to model choice in obviously competitive, thus realistically emulating, market decisions. A choice design covers the choice classes composed of several alternatives, each defined as a combination of different attribute levels. The estimation of choice model parameters with maximal accuracy is defined as an efficient choice design (Lancaster, 1966; Eisazadeh et al., 2012; Barber et al., 2019; Xu and He, 2022). Based on general preferences, the results of choice experiment analysis assist policymakers, owners, and operators in decision-making to use land potential and change activities in the wetlands (Lancaster, 1966; Westerberg et al., 2010; Eisazadeh et al., 2012; Colen et al., 2016; Barber et al., 2019; Xu and He, 2022). The choice experiment method (CEM) includes a subset of the proposed preferred methods, multistate valuation, and choice modeling. It contains several choice series each of which comprises two or more options. The respondents were asked to choose their preferred option from the provided choice series. Several attributes or characteristics of goods and services with different levels depicted each option. Typically, the price of goods and services is selected as one of the option's attributes (Lancaster, 1966; Westerberg et al., 2010; Eisazadeh et al., 2012; Salehnia et al., 2015; Colen et al., 2016; Barber et al., 2019; Xu and He, 2022). CEM relied on the Lancaster Value Theory, proposing that the consumers' preferences are derived from the attributes of goods and services (Lancaster, 1966). In addition to the complete source value, this method also determines the inherent value of each attribute (Birol et al., 2006). This approach is used to evaluate the individuals' preferences to deal with the environment in the environmental context, leading to the overall value of the site, and rating of each characteristic of the environmental products based on the respondents' viewpoint. This theory assumes that each respondent has a random utility function and probability choices, choosing their desired options by maximizing their utility (Barbier et al., 1997; Louviere et al., 2000; Small et al., 2017; Xu and He, 2022).

Modelling of CEM

According to the above-stated context, since the components of the utility function of individuals are not directly visible, the random utility theory assumes that the utility function (U_{ni}) of an individual, n, derives from selecting an alternative, i, and can be divided into two components, including a visible deterministic (V_{nic}) and a random stochastic (ε_{nic}) component, which is unobservable (Street and Burgess, 2007; Cai, 2019). Therefore, the utility function is expressed as Equation (1):

$$U_{ni} = V_{nic} + \varepsilon_{nic} = \beta_n X_{nic} + \varepsilon_{nic} \quad (1)$$

where, ε_{ni} is an unobserved error random term assumed to be independent and identically distributed (IID) (Gumbel distribution) (Li and Zhi, 2016), implying independence of irrelevant attributes (IIA) and evaluated using the Hausman, McFadden (1984) test, V_{nic} is the deterministic component of utility that can be determined by the level of alternatives' attributes and socio-economic characteristics of individual n. Besides, β_n represents a vector of coefficients to be estimated, X_{nic} stands for a vector containing the attribute levels choice option, i, in c situation (Street and Burgess, 2007; Train, 2009; Cai, 2019).

The probability that an individual n will choose alternative i rather than j from a choice set, C, can be expressed as the probability that the utility associated with alternative i is higher than that of j, which is presented as Equation (2) (Street and Burgess, 2007; Train, 2009; Cai, 2019):

$$P[U_{ni} > U_{nj} \ \forall i \neq j] = P[(V_{ni} - V_{nj}) > (\varepsilon_{nj} - \varepsilon_{ni})]; \forall\, j \in C \quad (2)$$

Thus, assuming that the individual n chooses the option in any choice situation C, which returns the maximum utility U, discrete choice models are derived from the choice probability function (Equation (1)) and based on the conditional Logit Model (CLM, McFadden, 1974), which refers to as (MNL). The probability of the preferred option is expressed as Equation (3) (Street and Burgess, 2007; Train, 2009; Cai, 2019):

$$P[i \mid X_{nc}] = \frac{\exp(\beta X_{nic})}{\sum_{j=1}^{J} \exp(\beta X_{njc})} \quad ; \quad j = 1, 2, ..., J \quad (3)$$

The model is then estimated using the maximum likelihood procedure, formulated as Equation (4) (Louviere et al., 2000; Train, 2009; Liu and Wirtz, 2010; Haghjou et al., 2019):

$$\log L = \sum_{n=1}^{N} \sum_{i=1}^{T} d_{ni} \log[\frac{\exp(\beta X_{nic})}{\sum_{j=1}^{J} \exp(\beta X_{njc})}] \quad ; \quad j = 1, 2, ..., J \quad (4)$$

The model is then estimated using the maximum likelihood procedure, formulated as Equation (4):

where, d_{ni} is an indicator taking the value of one if the respondent n chooses option i and zero otherwise. N and T show the number of samples and the number of choice sets, respectively.

To estimate the relative importance of each attribute belonging to alternatives, it is assumed that the degrees of different attributes in the choice set remain the same. Therefore, the marginal willingness to pay (WTP) for the kth attribute can be calculated by Equation (5) as follows (Street and Burgess, 2007; Train, 2009; Cai, 2019; Haghjou et al., 2019):

$$MWTP = -[\frac{\beta_{non-monetary}}{\beta_{monetary}}] \quad (5)$$

The entire plots, analyses of the choice experiment models, and generalized Hausman and McFadden test for the hypothesis (IIA) examination (Hideo Aizaki and Nishimura, 2008; H Aizaki et al., 2014; Hothorn and Everitt, 2014; Hess and Palma, 2019), were completed using R version 4.1.3 (R Development Core Team, 2014).

Results and Discussion

Descriptive statistics of respondents

The detailed descriptive statistics of the main socio-economic characteristics of the interviewed respondents are shown graphically in Figure 2.

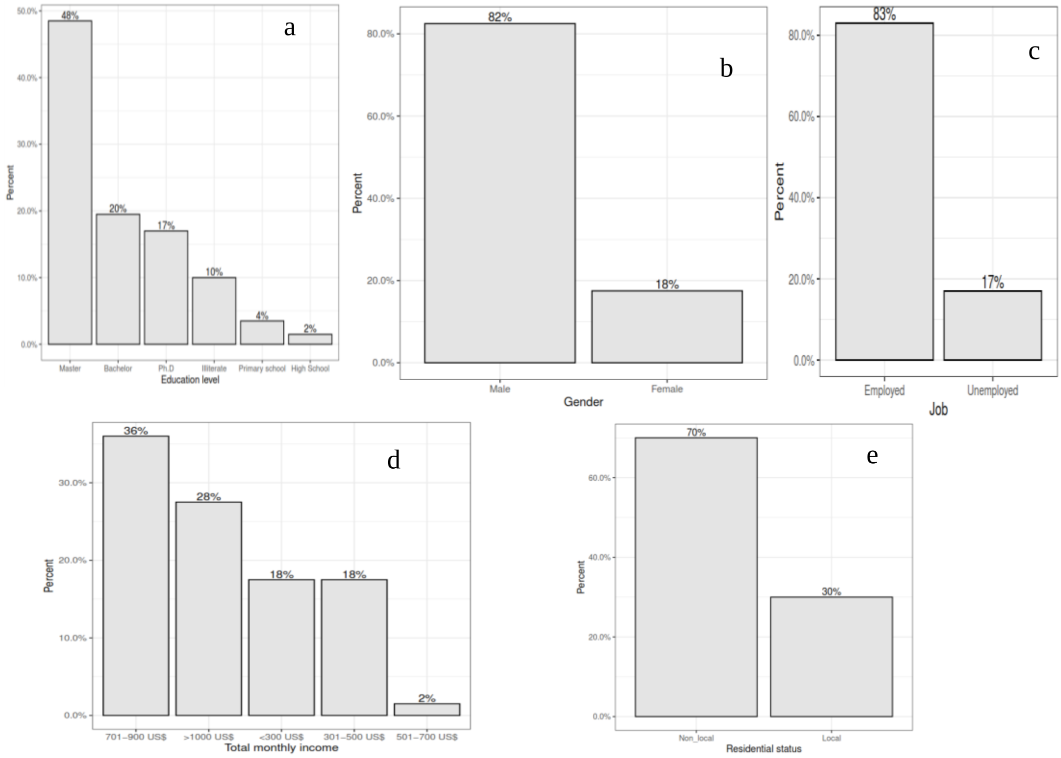

Figure 2. The summary of socio-economic characteristics of the respondents in percentages

According to Figure 2, 82% of respondents were males, and 12% were females. The majority of respondents had a master's degree, and a small percentage did not have university education. Also, 83% of respondents were employed and had jobs. Concerning residency, the majority of respondents (70%) were non-local. Regarding the total monthly income of the family, 36% of respondents were in the income range of 701-900 US$, 28% in the income range of >1000 US$, and the monthly income of the most significant proportion of respondents (64%) was >700 US$.

Choice Experiment Modelling Results

The statistically insignificant, principal, and interaction variables were excluded from the model estimation to obtain the best final model. Table 3 shows the estimation results of the final choice experiment conditional logit model (CLM), which best fits the available data.

Table 3. The results of Choice experiment based on conditional logit model (CLM)

Variables	Coefficient	Standard error	Z-test	p-Value
ASC	-0.42	0.06	6.89	< 0.001***
DO	0.55	0.02	26.95	< 0.001***
NW	0.22	0.02	10.31	< 0.001***
F	0.13	0.02	6.43	< 0.001***
TIA	0.08	0.01	4.29	< 0.001***
AI	-0.32	0.02	-15.65	< 0.001***
CF	-1.63	0.05	-29.04	< 0.001***
CF:TMI	0.11	0.009	11.66	< 0.001***
CF:RS	-0.05	0.02	-2.17	< 0.005**
CF:Edu	0.27	0.01	22.28	< 0.001***
Log-likelihood	-7232.1			
Adjusted McFadden R^2	0.267			
Likelihood ratio test (χ^2)	5311***			
AIC	14484.3			

Source: Research findings; ***, indicate statistically significant at the 1% level

Based on the estimated results presented in Table 3, the goodness-of-fit tests for the conditional logit model (CLM) were carried out, the results of which were significantly above the critical value. In this regard, the Adjusted McFadden R^2 test, with a value of 0.26, lies within the required range [0.2, 0.4] (Hauber et al., 2016), which confirms the goodness-of-fit of CLM. Therefore, the attributes selected in this study had the proper explanatory capability. The log-likelihood value and the likelihood ratio test of the selected model were - 7232.1 and $\chi^2 = 5311$, respectively. The Akaike Information Criterion was AIC = 14484.3.

As considered in Table 3, the coefficient of variables, such as Alternative Specific Constant (ASC), Aquaculture Infrastructure (AI), and Payment for Ecosystem conservation trust fund per entry per person (CF), was negatively significant at a 1% level. Similarly, the coefficient of the variable (CF: RS) that indicated the interaction variable of CF with Residential Status (RS) was negatively significant at 5% level. The negative coefficient of the ASC indicated that the visitors preferred the GIW conservation program options compared to the current ecosystem situation.

The statistically significant and negative coefficient of the variable (CF) relevant to Payment for Ecosystem conservation trust fund per entry per person indicates that as the amount of CF increases, the tourist utility decreases, which is consistent with the theory of utility.

The statistically significant and negative coefficient of the variable (CF: RS) suggests a significant difference in preferences between residential and non-residential visitors, indicating that non-residential visitors prefer GIW conservation policy options compared to residential visitors, which agrees with Depondt and Green (2006), and Madani (2013)

Besides, the coefficients of variables, including Dolphin Observability (DO), Natural Landscape Watching (NW), Facilities (F), and Tourism Information Availability (TIA), were positively significant at 1% level. Similarly, the coefficients of variables (CF: TMI) and (CF: Edu) that indicated the interaction variables of CF with Total Monthly Income (TMI), and CF with Education level (Edu) were positively significant at 1% level.

The statistically significant and positive coefficient of the variable (CF: Edu) suggests a significant difference in preferences between educated and uneducated visitors, indicating that educated visitors prefer GIW conservation policy options compared to less-educated ones, which is consistent with the results reported in Goodwin (2016).

Based on significantly positive coefficients of variables, such as DO and NW, and significantly negative coefficients of the variable AI, the tourists showed more inclination to the policy options favoring GIW ecosystem conservation.

According to the estimation of choice experiment conditional logit model (CLM) presented in Table 3, the results of mean marginal willingness to pay (WTP) with confidence intervals for all five studied attributes are summarized in Table 4.

Table 4. The mean marginal willingness to pay values for the Choice model

Attribute	Mean WTP	Confidence Interval	
		2.5%	97.5%
ASC	-0.257	-0.33	-0.183
DO	0.337	0.307	0.371
NW	0.136	0.109	0.165
F	0.08	0.056	0.106
TIA	0.051	0.051	0.028
AI	-0.201	-0.229	-0.174

Source: Research findings

As shown in Table 4, the mean WTPs are significant for attributes as mentioned above, indicating that changes in the status of all attributes affect the tourists' willingness to pay WIG per entry per person.

The negative sign of alternative specific constant (ASC) means that according to tourists' perception of features taken into account, the Status Quo option (SQ) or current condition of the GIW affects tourists' utility negatively. As a result, the current condition of the GIW ecosystem will worsen by the decrease in public participation through unwillingness to pay for environmental conservation purposes.

As shown here, the highest positive actual mean of WTP (0.337) is for Dolphins Observability (DO), indicating that tourists tend to pay an extra 33.7% for every US$ per entry per person as the status of Dolphin Observability improved by 1%. Therefore, dolphins have the highest conservation (existence) value in the GIW ecosystem. Similarly, the second mean of WTP (0.136) is for landscape created by Mangrove forest (NW), for which the tourists pay an extra 13.6% for every US$ per entry per person as the mangrove forest cover surface increases by 1%. Consequently, from visitors' viewpoint, the Mangrove forest coverage has the second conservation (existence) value in the GIW ecosystem.

Also, based on Table 4, any percent improvement in the situation and providing lodging, overnight use, food and recreational facilities (F), and specific information for tourists (TIA) affect the WTP of GIW visitors positively. Thus, tourists tend to pay an extra 8 and 5.1% for every US$ per entry per person to improve the attributes mentioned above.

The negative sign of WTP (- 0.201) for aquaculture infrastructure (AI) indicates that according to tourists' perception, any percentage improvement in the existence and development of aquaculture infrastructure affects tourists' utility negatively, reducing public participation through willingness to pay for environmental conservation purposes.

Figure 3 summarizes WTP details in the format of the innovative graph (Hintze and Nelson, 1998). The violin plot of willingness to pay (WTP) distributions is represented with mean plots for five different attributes that mainly affect the payments of GIW tourists per entry per person for ecosystem conservation based on establishing the trust fund.

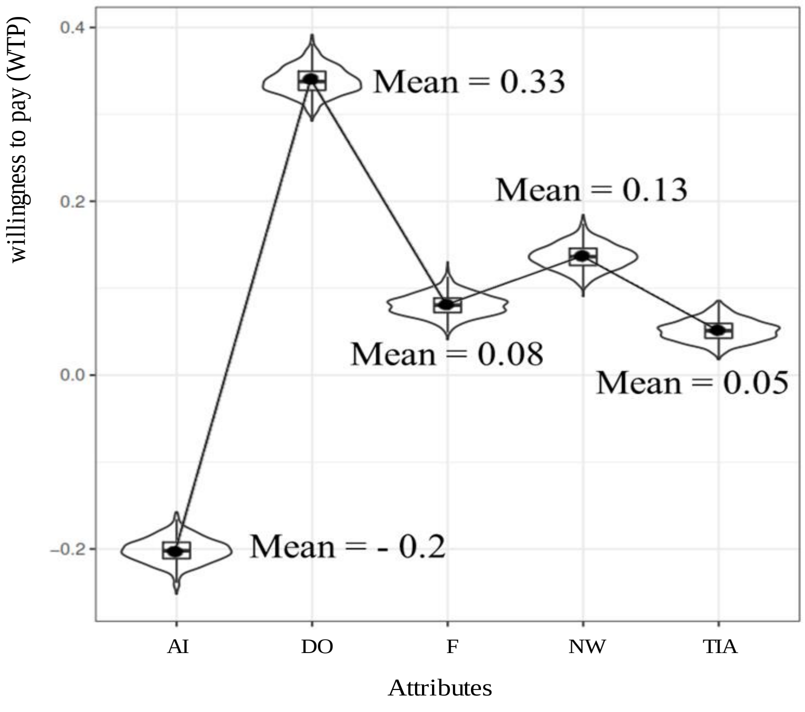

Figure 3. The violin plot of attributes willingness to pay (WTP) distributions with mean plots

As shown in Figure 3, four attributes, including Dolphin Observability (DO), Natural Landscape Watching (NW), Facilities (F), and Tourism Information Availability (TIA), appear to be somewhat positively skewed, with the skewness increasing by their status improvement, and positively affect the tourists' WTP for participation in the GIW conservation program. Nevertheless, the Aquaculture Infrastructure (AI) attribute, negatively skewed, with the skewness increasing by the expansion of their scope, negatively affecting the tourists' WTP for participation in the GIW conservation program as one of the causes of wetland ecosystem pollution and wildlife habitat destruction. The difference between mean and median values of GIW tourists' WTP was insignificant for all five attributes, revealing medians close to average values for all of them.

Also, based on the mean plot presented in Figure 3, the comparison of the mean shows that the tourists pay the most for WTP to see the dolphins (Dolphin Observability), followed by Natural Landscape Watching. In this regard, the tourists' WTP for facilities and tourism information availability are ranked from higher to lower, respectively.

According to the results shown in Figure 3, the size of box plots embedded in the violin plots is approximately equal for all five attributes. Therefore, all visitors have the same perception about the impacts of the studied attributes on the ecosystem conservation of GIW. For instance, all visitors (males and females) agree with increasing the payment per entry per person to the trust fund of GIW for ecosystem conservation programs to increase the possibility of Dolphin Observation. Besides, all visitors agree with decreasing the payment per entry per person to the trust fund of GIW for ecosystem conservation due to the expansion of Aquaculture Infrastructure, known as one of the causes of pollution of wetland ecosystems, destruction of wildlife habitat, and ignoring the wetland ecosystem conservation programs

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Conclusions

In this study, a best-fitted Choice Experiment Conditional Logit Model (CLM) was employed to analyze tourists' relative preferences for the delivery of ecosystem services. The model was based on environmental attributes contributing to nature-based tourism, aiming to preserve the quality of the wetland ecosystem. The analysis considered three distinct knowledge-based scenarios related to Govatr Bay and Hur-e-Bahu International Wetland (GIW) in the southeastern part of Iran. The results indicated that the visitors prefer the GIW conservation program options compared to the current ecosystem situation (Status Quo option). Also, non-residential and educated visitors prefer GIW conservation policy options compared to residential and less-educated ones, as confirmed by the finding of relevant studies. Consequently, based on significantly positive coefficients of variables, such as DO and NW, and significantly negative coefficients of the variable (AI), tourists were more inclined to the policy options favoring GIW ecosystem conservation. The results revealed that Dolphin Observability (DO) had the highest conservation (existence) value, followed by the natural landscape of Mangrove forest coverage (NW). Besides, the existence and development of aquaculture infrastructures and the current ecosystem situation (Status Quo option) are less attractive for most GIW ecosystem visitors, while providing lodging, overnight use, food, recreational facilities, and specialized information for tourists have more positive impacts on visits, indicating their willingness to pay for the GIW ecosystem.

These results can help decision-makers regarding sustainable management of GIW ecosystem conservation in the future. One of the focal industries in the GIW Ecosystems is the aquaculture sector, known as one of the causes of pollution of wetland ecosystems and destruction of wildlife habitat based on visitors' perception, negatively affecting their WTP for participation in the GIW conservation program. The obtained results will be helpful to facilitate decision-making for the development of the ecotourism industry in the GIW. Given the apparent potential of ecotourism for wetland ecosystems, contributing as a catalyst for the development of the rural economy, the relevant decision-makers and planners should consider the development of the ecotourism industry while protecting and preserving the natural ecosystem of GIW.

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