Journal of Sustainable Development; Vol. 8, No. 8; 2015
ISSN 1913-9063 E-ISSN 1913-9071
Published by Canadian Center of Science and Education

Users and Non-users of Wetland Area; Willingness to Pay and Demand Elasticity

Sara Kaffashi[1], Mad Nasir Shamsudin[1], Alias Radam[2], Khalid Abdul Rahim[2] & Mohd Rusli Yacob[1]

[1] Faculty of Environmental Studies, Universiti Putra Malaysia, Serdang, Malaysia

[2] Faculty of Economics and Management, Universiti Putra Malaysia, Serdang, Malaysia

Correspondence: Sara Kffashi, Faculty of Environmental Studies, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor, Malaysia. Tel: 60-14-236-6368. E-mail: sarakafashai@gmail.com

Received: April 1, 2015 Accepted: April 13, 2015 Online Published: September 27, 2015

doi:10.5539/jsd.v8n8p56 URL: http://dx.doi.org/10.5539/jsd.v8n8p56

Abstract

The present paper uses error component model to elicit respondents preferences and willingness to pay (WTP) for wetland conservation. The main objective of this research was to estimate the difference between preferences and WTP of respondents who are users of wetland and those who consider as non-users. The results of structural equation modelling (SEM) and error component logit model (ECM) showed significant difference between WTP and attitudinal factors of two groups. The results of SEM indicated that respondents' management concerns, income, and their employment status had positive and direct effect on their WTP. Results of ECM showed that user model is slightly better predictor of respondents' choice. The non-market values of the wetland for users are estimated approximately US$ 3.67 per household per month meanwhile this value for nonusers was about US$ 2.80. The overall results indicated that familiarity and previous knowledge on wetland has significant effect on respondnets' perception, attitudes and WTP. Results also showed that demand for better conservation and management of wetland is relatively price inelastic. This study conclude that improvement in Shadegan International Wetland management will bring higher utility for both users and nonusers society and hence will be supported by them.

Keywords: error component, Shadegan wetland, users and non-users, structural equation modelling, non-market goods, demand; elasticity

1. Introduction

Due to Millennium Ecosystem Assessment (MA) since rural people tend to be highly dependent, directly or indirectly, on the ecosystem services (e.g. food production, including agriculture, livestock, and hunting), they are also most vulnerable to changes in those services (MA, 2005). So, users of wetland can be defined as those who are getting utilization from one or more goods or services provided by wetland. There are several studies which address the effect of respondents' familiarity with the valued resource on their WTP (Alberini et al., 2003; Kniivilä, 2006; Bateman et al., 1997; Ghosh and Mondal, 2012). Literatures show that the use of resources at present or intention to use them in the future will increase respondents WTP (Kniivilä, 2006). It is worth noting that some of the immediate benefits of wetland destruction or conversion may be perceived as advantageous to local people, at least in the short term, and hence, economically justifies wetland's conversion. Yet the estimated total economic benefits of natural wetlands are usually more than converted wetlands. Therefore, any conversion in natural conditions of wetlands only draw a picture from current states of decision making that is neglected numerous social and economic benefits of wetlands (MA, 2005).

While, the motive of noon-users are mostly non-use values or partly option value of wetland. According to Bateman et al. (2006) including non-users in valuation would help to consider the concept of market in broader extent. Whitehead et al. (1995) research tried to distinguish respondents according to their knowledge with the resource in hand. They conclude that WTP of those groups without pervious knowledge about the assets are more biased compare to on-site users (Kniivilä, 2006). However, without proper recognition of wetlands' "nonuse" values and the values to the "non-users," estimating the actual total value offered by the wetlands might be biased downward.

Because of public good nature of wetlands goods and services, estimating their effect on people welfare and

hence calculating demand for them is difficult. To resolve this problem, economists have developed a variety of approaches for valuing natural assets such as revealed preference and stated preference methods. While, revealed preference techniques consider individuals' actual behavior in a relatively real market, stated preference methods are based on individuals' stated behavior (and their WTP) in a hypothetical situation. Stated preference techniques hence are useful for eliciting both use and non-use values, and indeed are the only methods for estimating non-use values.

The main objective of present study is to define and elicit the benefits that arise from improving Shadegan wetland conservation for households living in adjacent area of wetland. Considering the fact that Shadegan wetland's provided goods and services are mostly neither marketed nor used, it was decided to employ the choice experiment method CE in the present study to estimate users and nonusers' preferences concerning wetland conservation. Estimating respondents' WTP and how it will vary by changing in their income or price can provide another useful piece of information for future policy making regarding wetland. It can also help to understand the change in the consumer behaviour and quantity demanded for environmental goods and services (Khan, 2007). Estimating price elasticity of demand would be beneficial in predicting consumers respond under policy changes such as introducing taxes, entrance fee and etc.

2. Study Area

Shadegan wetland, with an area of 537,700 hectares is the largest wetland in Iran which is located in the coastal area of Persian Gulf (Figure 1). This wetland was designated as a Ramsar site in 1975. Sahdegan gradually became the largest wetland in the Middle East, in fact, with the demise of much of the Mesopotamian marshlands (UNEP, 2001; Pandam Consulting Engnieers [PCE], 2002; Kaffashi et al., 2011). From globally endangered species of birds, Thirteen of them such as the white-headed duck (*Oxyura leucocephala*), Marbled Teal (*Marmaronetta angustirostris*) have been observed in the wetland (Scott, 2001). Based on available information, about 244,000 heads of domestic animals use the wetland for grazing, more than 5,300 local families depend on the marshes' fish resources, and more than 300 families depend on hunting in the wetland during allowed seasons.

The degradation rate of Shadegan International Wetland has been accelerating during past decades. The threats to Shadegan Wetland ecosystem are not only because of the waste and sewage disposal of adjacent industries, but also are because of direct assaults and the consequences of the prolonged Iraq-Iran War and more recently the Persian Gulf "oil war". Moreover, poor management of water irrigation projects in the highlands and growing agriculture runoffs especially from aquaculture units and sugarcane plantation has deteriorated wetland's ecosystem and water quality. These problems besides the growing demand for municipal growth have made extensive environmental problems for Shadegan which needs urgent management attentions. Experience from past shows that Shadegan Department of Environment is unable to resolve the problems on its own and therefore national government and international organisations attention is needed before this valuable wetland turn into a real waste land.

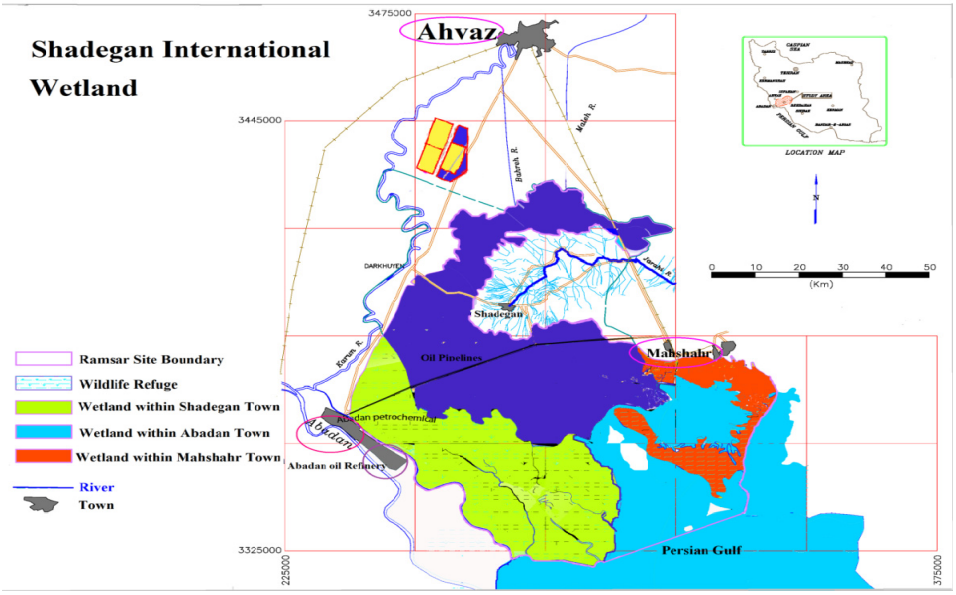

Figure 1. Shadega international wetland

Source: PCE, 2002

3. Theoretical Framework of Choice Experiment Method

The CE technique relies on both random utility theory and the characteristics theory of value to provide a utility theoretic interpretation of the discrete responses derived from respondents (Thurstone, 1927; McFadden, 1974; Manski, 1977; Lancaster, 1966). Using CE method has advantage of giving estimates of trade-offs between goods or services in the question and monetary value (Kaffashi et al., 2012). In choosing between different alternatives (e.g. *j* and *k*), the respondent is assumed to compare their utilities and then select the alternative with the highest utility to him- or herself.

$$Pij = Uim > Uin = (Yim+\varepsilon im) > (Yin+\varepsilon in) = P[(Yim-Yin) > (\varepsilon im-\varepsilon in)] \quad (1)$$

where U_{im} is individual *i* utility from selecting *m* choice, Y_{im} is a nonstochastic utility function, and ε_{im} is a random component.

The Multinomial logit model (MNL) assumes that the ratio of choice probabilities is not affected by the addition or eliminating of other options in the choice set. This assumption is called the independence of the irrelevant attributes (IIA)(Hensher et al., 2005). IIA is one of the limitations of the MNL in which, the violation of IIA estimates will cause biased estimates of the parameters. Among other restrictions of MNL model is its inability to capture individual unobserved alternative specific heterogeneity in choice (Nlogit5 manual).

To overcome limitations of MNL, more complicated models such as mixed logit model, latent class model, and error component models has been developed. The error component logit model in a repeated choice situation (panel data) with capability of capturing heterogeneity in preferences provides a method of incorporating a rich structure of individual specific random effects in the conditional logit and random parameters models (Nlogit5 manual). The specification of error component model can be found in Nlogit5 manual by Greene (2012).

The estimated parameters then can be used for welfare measures for a desired change in the wetland management. Welfare measure is represented by following formula:

$$CS = 1/\alpha\ [ln \Sigma\ exp\ (Yi1) - ln \Sigma\ exp\ (yi0)] = -1/\beta CV\ (Yi1-Yi0) \quad (2)$$

where βc is the value of the price attribute, V_0 indicates the indirect utility function before proposed scenarios and V_1 indicate the indirect utility functions after the proposed scenarios (Birol et al., 2006). In estimating the related utility following Hensher et al. 2005, distributional assumptions related to random parameters were taken into account.

3.1 Choice Experiment Design

To develop the questionnaire of current study, several focus group discussions conducted among the lecturers

and students of the Faculty of Environmental Studies, University Putra Malaysia. The second focus group was meeting with wetland managers and local authorities to identify the appropriateness of selected attributes and levels. We then conducted a pre-test on 30 households in order to detect the misinterpretation or clarity of questions. Conducting pre-test also helped us to finalise the bid vector and payment method. Every attribute and quality change in terms of attribute level was tried to describe carefully and with very simple terms and with the help of graphs and photos. Each attribute was set at one of the three levels. The minimum level was the "current condition" or "status quo," while the maximum level designated as best condition, historically: the highest level for each attribute thus was selected based on the historical condition of that attribute. For instance, birds' population (as biodiversity attribute) in the wetland is currently 50% of the historically high level 50 years ago. Hence, the minimum level set for the biodiversity attribute was 50% of birds' population (based on DOE of Khozestan province and several studies), the medium level was set as improving wetland management to 65% of the historic population, and a higher level was set at 80% of the historically high bird population. The price vector used in the design was based on Iranian national parks' entrance fees. During pre-test respondents didn't agree to pay as increased in water bill because of distrusting issue. The payment vehicle was assumed to be a hypothetical donation to improve wetland conservation. The resulting attributes and levels that were selected for this study are therefore as Figure 2:

Figure 2. Attributes and attribute levels used in the choice experiment method

* Exchange rates are based on 2009 rates

**status quo or current condition of Shadegan wetland

Natural scenery: Natural scenery is defined as an environment that is in its most natural states and undisturbed by land conversion or other constructions. The levels of natural scenery were as follows.

- Not satisfactory: allow naturalness of wetland to continue to degrade at present rate, no restrictions for industrial, agriculture and other kind of activities inside the wetland area.
- Less Satisfactory: only allow limited construction in wetland area which is close to petrochemical and industrial area, restoration of the destroyed part to its natural state.
- Satisfactory: clean environment, attractive natural scenery, prevention of all activities and construction inside wetland either in Ramsar zone or wildlife refuge, strict encounter with all industrial and agricultural activities which is affecting wetland directly or indirectly.

Water quality: physical, chemical and biological characteristics of Shadegan wetland with emphasize on nutrients, electrical conductivity, biological and chemical oxygen demand, water color, odor and phytoplankton bloom. Water quality in wetland was defined as follow:

- Unacceptable: polluted, stink and unclear water, increasing population of exotic fish, eutrophication and algal bloom water quality does not meet the standards.
- Moderately acceptable: unclear and moderately polluted water due to related water quality standards.
- Acceptable: very clear water, without odor, increasing native fish stock, amount of pollutant equal or less than wetland purification capacity and meet the standards of water quality.

Biodiversity: referred to the number of endangered, vulnerable, native and rare species which could be supported by wetland. The relevant levels were selected based on comparison with historical data of wetland:

- Low: 50% of historic population with no strict management and population of familiar, rare and endangered species continue to decline.
- Medium: Improvement in some essential condition of the wetland and mend ecosystem health until we have 65% of historic population.
- High: Improvement in wetland condition including restoration habitats, ecosystem health, prevention of pollution and diverse human activities until we have 80% of historic population.

Ecological functions: Shadegan Wetlands by "holding" heavy rain falls, preventing possible flooding downstream (Abadan and Mahshahr) and by retaining excess nutrients, some pollutants, and sediment, prevent diverse affect on whole ecosystem. The ecological functions viewpoint of wetland condition and how much they were affected by human activities can be categorized as below:

- Weak: allow further degradation of Shadegan wetland and losses in wetland functions until wetland has no more capacity for flood control, sediment and nutrient retention and other functions.
- Moderate: Improvement just those functions that have direct Impact on human like e.g. taking into account the minimum water level of wetland for fish stocks, or constructing water purification units for agricultural and industrial units' wastewater before direct discharge to the wetland.
- Perfect: at this level wetland authorities ensure to take care of all wetland functions and process in a way that ecosystem health in all aspects will be guaranteed

Conservation cost: Conservation cost is the amount of money that interests can participate in the form of donation to ensure better conservation of wetland.

- Current Condition: No conservation contribution.
- Suggested price for improvement in wetland conservation: Rilas 15000, 20000, 25000 and 30000.

The experimental design technique in SPSS software was used to obtain an orthogonal design. The fractional factorial design then consisted of just 10 options in five choice sets. Each choice set included two purposed options for improved conservation of the wetland, along with some yearly cost to households, plus the status quo at no cost. The choice of alternative A, B, or the status quo to answer each question yielded information about the value of each selected scenario to any given respondent (Kaffashi et al. 2012). Three unique options were presented in each choice set, distinguished by their attributes and associated cost.

3.2 Questionnaire Design

The first part of the questionnaire was the introductory script used to initiate contact with respondents. In the second section, respondents were presented with current condition of wetland and a scenario for improved wetland conservation. The questionnaire informed respondents that the quality of the Shadegan wetland has declined over the past 50 years, and is continuing to decline. Reasons of the wetland destructions were also explained. The CE questions in five-choice sets followed the scenario. In the third part of questionnaire we tried to gather information related to respondents' attitudes with regard to environmental policies in general and importance of Shadegan wetland conservation in particular. A five-point (Likert) scale ranging from "extremely important" to "not important at all" applied to measure theses preferences. In the last section of the questionnaire respondents were asked about their socioeconomic profile such as their gender, age, family size, education level, job, income level, and whether they are from rural or urban area.

3.3 Sampling and Data Collection

The populations targeted for this study was people living in cities, towns and villages around Shadegan wetland. A face-to-face method was applied to ask a series of questions to gather information about respondents' condition as user or non-user of wetland, their sociodemographic profile, attitude and willingness to pay. For purposes of this study, data from 550 respondents from Ahvaz, Abadan and Mahshahar cities and Shadegan town

and related villages were collected. A pre-test of the questionnaire was done in January 2009. The main field data collection was from February through April 2009. Based on the approaches described by Czaja and Blair (1996) and Sarantakos (1998), a simple stratified random sampling method was applied to collect the data. This way, we made sure that our sample is representative of the population in the study area. An investigation of respondents' answers to the willingness-to-pay questions indicated that 81% of respondents accepted to pay the offered amount while 18.9% did not. Estimation of models was carried out by Nlogit 5, SPSS (Version 17) and AMOS software.

3.4 Structural Equation Modelling

A structural equation modelling (SEM) using observed and latent variables was employed to estimate the factors influencing people WTP. SEM as a statistical tool can be used to discover the casual relations between multiple observed and latent constructs. Unobserved latent variables are those variables which cannot be estimated directly but are inferred from response to other observed variables (Schumacker and Lomax 2004). It is worth noting that SEM can take both direct and indirect relationships. This means some relation between variables might be improved by interconnecting them.

Three latent variables were extracted from three questions on respondents' attitudinal questions. These three latent variables were directed from 16 observed variables on answer to five-point (Likert) scaled questions ranging from "extremely important" to "not important at all." Cronbach's alpha reliability test examined the suitability of items to be entered into factor analysis. Cronbach's alpha with value higher than 0.7 threshold applied to assure the reliability of indicators (Voon et al., 2011). The multicollinearity problem is rejected based upon the correlation estimations. Factor analysis used Varimax rotation in SPSS software to enhance the validity of the latent structures. In the both models as Table 1 shows three constructed factors were extracted with the Eigenvalues more than 0.50.

Table 1. Results of factor analysis

Variables	Users model Factors			Nonuser model Factors		
	Management Concern	SIW Importance	Use value	Management Concern	SIW Importance	Use value
wildlife		0.828			0.710	
existence		0.585			0.522	
resource		0.538			0.529	
remediation		0.544			0.525	
IWM	0.892			0.783		
enforcement	0.996			0.836		
interpretation	0.946			0.815		
awareness	0.723			0.675		
endangered sp.		0.933			0.738	
habitat		0.873			0.746	
flora		0.508			0.522	
endemic plants		0.502			0.532	
bequest			0.591			0.565
human use			0.950			0.782
research			0.576			0.548
ecotourism			0.675			0.608

Extraction Method: Principal Axis Factoring. Rotation Method: Varimax with Kaiser Normalization

The first latent construct was established from 4 attitudinal structures associated with respondents' concern on wetland management. The second latent variable was constructed from 4 attitudinal variables related to

wetland's ecotourism value. The third latent structure was formed from attitudinal variables that measured the wetland importance view point of endemic or endangered fauna, flora, and other functions and services of wetland.

4. Results and Discussion

4.1 Respondents' Socioeconomic and Attitude Information

In this study respondents who were living nearby the wetland and using wetland resources (fish, hunting, water, etc) or had visited the wetland at least once before the interview were categorized as users. Whereas, those respondents who did not have any direct or indirect relation with the wetland or never visited it in the past were categorized as non-users. The user group consisted of 313 of the respondents who resided in proximity to wetland. The remaining 237 were categorised as non-users which existence value or future visit of wetland were important to them. Those questionnaire contained incomplete answers to valuation questions and those that are considered protest votes were eliminated. The analysis hence was conducted using 230 valid responses (43.39%) for non-users and 300 responses (56.61%) for users' models. Characteristics of this study's sample population can be seen in Table 2.

Table 2. Respondents' socioeconomic profile*

Variable	User		Non-user		Region demographics
	Frequency (%)	Mean	Frequency (%)	Mean	
Age (year)		34.11		35.13	30-34
Gender					
Male	52.2		50		52.49%
Female	47.8		50		47.51%
Education Level (years of study)		13.24		14.17	
Elementary school	4		7		
Secondary school	13.7		20		28.46%
High school	29.2		29.1		25.35%
College	17.0		13.5		28.54%
Graduate or post graduate	20.7		30.4		
	15.4				17.65%
Number of Household		5.23		5.23	5.35
Membership in NGOs					-
Yes	3.4		7		
No	96.6		93		
Employment status					
Currently unemployed	19.3				19.30%
Currently employed	72.0		7.4		80.69%
Retired	8.7		85.7		-
Student			6.9		-
Income (Rials)		5,289,264.9		558,194.85	In urban area: 9,432,000 Rials/month in 2010
Low (<3000000)	22		13.9		
Medium (3100000-6400000)	52.5		47.0		
High (> 6500000)	24.8		39.1		

* reported data are based on year 2009

The results demonstrated that the sample mirrored the country population. The gender distribution of 57.1% male and 42.9% female was observed in the sample. The average age was about 39 and ranged from 32 to 80 years old. Classification of respondents based on their education level (year of schooling) showed that 25% of them had university degree, 14.2% graduated from college, 30% had high school certificate, 18.2% had secondary school certificate, 11.6% had elementary school and 1% were illiterate. Moreover, the household income group of Rials 3100000-6400000 was the dominant group, which consisted of 47.8% of the total income group. From the standpoint of attitude, 40% of respondents reported that they believed environmental policies are very important or quite important when considered alongside other policies with which government is involved, such as education, health, law and order. When asked about their familiarity with environmental issues, a majority (68.9%) indicated themselves to be somewhat familiar, 3% very familiar, 25.2% not very familiar, and 3% not at all familiar with such issues.

4.2. Respondents Perception and Opinion on Different Values of Shadegan Wetland

Visitors' perceptions were studied to evaluate their satisfaction with the benefits provided by wetland. Respondents' perceptions were measured on a five point Likert scales from. Based on survey responses relative importance index (RII) was calculated to reflect the relative effectiveness of each aspect. The RII used to rank and cross compare relative satisfaction or importance of items (Sambasivan and Soon 2007; Zeng et al. 2007). The index was calculated as follows (Kometa et al., 1994, Nim and Alum 1995; Afroz et al. 2011; Adam et al. 2013):

$$RII=\sum(WiXi/Xi)\ \ (100\%) \tag{3}$$

Where:

W_i= the weight given to each factor by respondents, ranging from 1 to 5*;*

X_i= Frequency of answers to each factors

Table 3 presents calculated values of RII related to the perception of the households about different values of Shadegan wetland. The RII value has a range within 0 to 100, where closer to unit means higher perceived benefits. For user group the values ranged between 92.5 and 84.92. While, for non-users groups this value ranged from 87.5 to 79.22. The values were found within very important range ($62.5 \leq 1 < 87.5$) (Abd and McCaffer, 1997; Afroz et al., 2011). However, as Table 3 shows for almost all of the attributes users' value was higher than non-users.

Table 3. Perception on Shadegan international wetland

Survey question	User/nonuser	extremely important	very important	moderately important	unimportant	extremely unimportant	SI (%)
Familiar, rare and endangered species	user	74.1%	22.2%	3.3%	.4%	.0%	92.5
	nonuser	62.2%	27.8%	7.8%	2.2%	.0%	87.5
Providing habitat for birds/wildlife	user	66.7%	25.2%	6.7%	1.5%	.0%	89.41
	nonuser	53.0%	34.8%	10.0%	2.2%	.0%	84.5
Protection of flora	user	61.5%	26.3%	8.9%	3.3%	.0%	86.5
	nonuser	43.0%	37.4%	16.1%	3.5%	.0%	79.97
Protection of endemic plant species	user	66.7%	25.2%	6.7%	1.5%	.0%	89.41
	nonuser	53.0%	34.8%	10.0%	2.2%	.0%	84.65
Nutrient/pollution filtration rules	user	63.3%	21.1%	12.6%	3.0%	.0%	86.17
	nonuser	49.1%	30.4%	17.4%	3.0%	.0%	81.26
Human use of wetland	user	63.2%	23.0%	9.7%	3.7%	.4%	86.22
	nonuser	45.2%	37.8%	13.9%	2.2%	.9%	81.05
Research value	user	60.4%	23.3%	11.9%	4.4%	.0%	84.92
	nonuser	43.0%	35.7%	16.5%	4.8%	.0%	79.2
Recreation and tourism	user	71.9%	17.0%	6.7%	3.3%	1.1%	88.82
	nonuser	52.6%	32.2%	13.5%	1.7%	.0%	83.92

4.3 Results of Structural Equation Modelling

The SEM results with estimated path parameters are presented in Figures 4 and 5. The rectangle diagrams represent observed variables and ellipses ones are correspond to latent components. In order to estimate the impact of socio-demographic and attitudinal factors on respondents WTP a hypothetical model was established. Several models were calculated in AMOS. To improve the model fit, the highly insignificant variables were eliminated and covariance path was constructed to connect either error terms of latent variables or sociodempgraphic factors. The factors of constructed use value latent variable because of high insignificancy were eliminated. This was resulted in dropping this latent variable from the final model estimation.

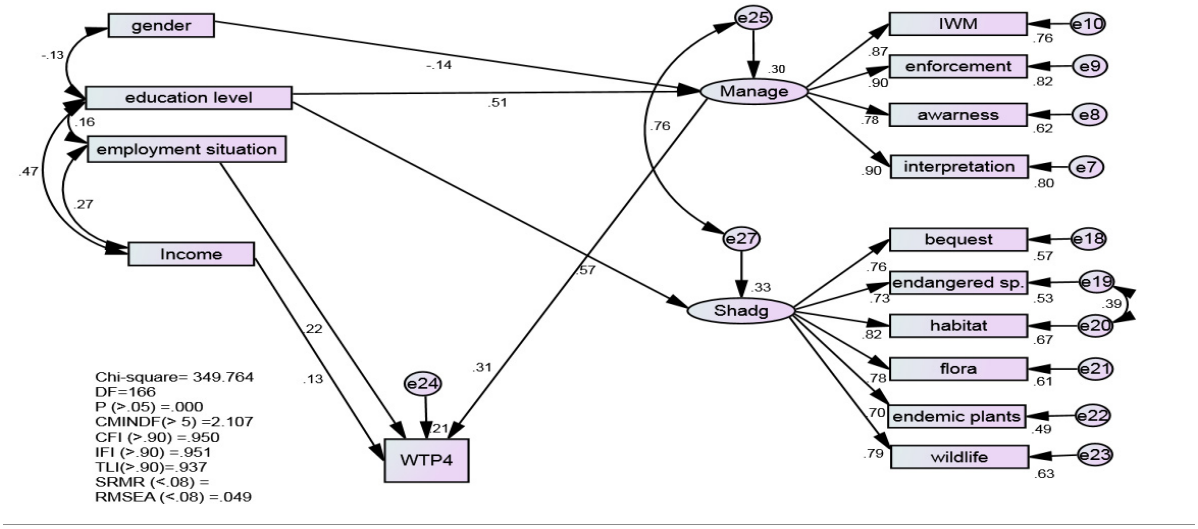

Figure 3. Results of user model. All path coefficients shown are completely standardized

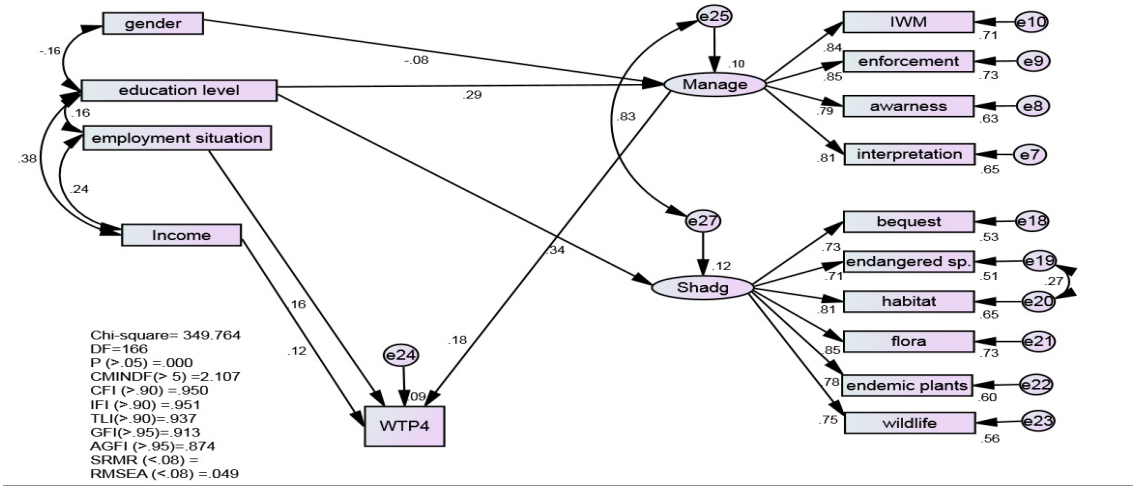

Figure 4. Results of nonuser model. All path coefficients shown are completely standardized

The results of both models show the positive and direct effect of management concern latent variable on WTP. View point of respondents' socioeconomic variables their income and employment have direct and positive effect on WTP. The results also show that gender has indirect effect on WTP through management variable. The

negative relation between gender and manage variables shows perceptions on wetland management improvement are more important to women than men. In both models education has positive and direct relation with both attitudinal factors which is in turn indirectly affect WTP.

Based on absolute, incremental and parsimonious fit indices, both models have an adequate fit. The normed chi-square index was 2.10 for both "users" and "nonuser" models (within the recommended interval of 1 to 3). The root mean square error of approximation (RMSEA) values was 0.05 that is lower than the threshold maximum value of 0.08. The incremental fit index (IFI) value of 0.95 and comparative fit index (CFI) value of 0.95 also denote that model has a fairly good fit (Toma et al., 2009). The chi-square difference test of 30.8 with 16 degree of freedom and p-value of 0.007 showed significant difference between users and nonusers models.

4.4 Results of the Choice Experiment

Results of the simple model are presented in Table 4. In the users' simple model, the positive sign of all attributes accorded with prior expectation. However, neither parameter of the level 2 improvement in biodiversity (BIO2) nor the ecological function (EF2 and EF3) were significant. The negative sign of variables EF2 and EF3 is reverse to a priori expectation. As suggested by Rolfe et al. (2000) and McConnell and Tseng (2000), we included socioeconomic attributes to estimate more accurate models of choice. Since sociodemographic variables remain the same for any given respondent regardless of whether he or she selects option A, B, or C for any given choice question, these variables enter into the model through interactions with the main attributes. The interaction variables comprising 11 sociodemographic factors interacted with three levels of each main attribute. In the EC logit model we nested option 1 and option 2 which represent the improvement in wetland in one class and option 3 or status quo in another class. As Table 4 shows pooled model fit data better than simple model. For instance, as Table 4 shows, the higher level of biodiversity is preferred to the medium level, or an acceptable water quality is preferred to a moderately acceptable quality of wetland water. The price attribute was significant at the 1% for both users and non-users with the expected negative sign. The negative sign implies that as the cost of conservation increases, respondents were less likely to contribute.

As Table 4 shows; in both user and non-user model gender, household size, age, income, education, and membership in nongovernmental organisations were the most important variables in the CE model. The interactions between gender and natural scenery (level 3), income with level 3 of water quality, and education with level 3 of biological diversity and level 2 of natural scenery are positive and significant. It implies that men, those with higher education and with the higher income were more concerned about higher levels of wetland attributes. These findings seem logic as high income education level could be attributed to affordability and better understanding of the situation respectively. Several other studies also found positive relationship between these variables. For example, positive impact of income on WTP is witnessed in studies by Westerberg et al., 2010; Ghosh and Mondal, 2012; Birol et al., 2006; Othman et al., 2004; Birol et al., 2011; Hanley et al., 2006; Oglethorpe and Miliadou, 2000; Bliem et al., 2012 and Nuva et al., 2011.The positive effect of membership in NGO on WTP also reported by Oglethorpe and Miliadou 2000; Pattison et al 2011. The negative interaction between number of people per household with the level 3 of natural scenery indicates that large families have lower WTP compare to small size families. Our results were similar to some other previous studies (Perez-Verdin et al., 2011; Hammitt et al., 2001; Pattison et al., 2011). The negative interaction between the level 3 of biological diversity and age was supported by the results of study conducted by Oglethorpe and Miliadou 2000. This negative sign indicated that older people are less willing than younger people to contribute to improving ecological functions of Shadegan wetland.

From three attitudinal variables resulted from factor analysis and included in model estimation only two of them to be found significant in user model. The perception towards improvement in wetland management was significant at the 1% level with expected positive sign. The factor representative of Wetlands' values also was significant at the 1% level with expected positive sign. It means that people who are more concern about wetland management and those with higher knowledge and appreciation about wetland have higher WTP.

Table 4. User and non-user simple and extended EClogit model

User Model						Non-user Model					
Simple Model			Extended Model			Simple Model			Extended Model		
Attribute	Coeff	t-ratio	Attribute	Coeff.	t-ratio	Attribute	Coeff	t-ratio	Attribute	Coeff.	S.E
			Random parameters						Random parameters		
NS2	7.28 *	1.44	NS2	1.18***	0.37	NS2	2.85	3.87	NS2	1.64***	0.02
NS3	2.98*	1.02	NS3	1.67***	0.25	NS3	0.77	1.30	NS3	2.38***	0.62
BIO2	1.10	.74	WAT2	1.18***	0.20	BIO2	0.41	0.84	WAT2	1.17***	0.09
BIO3	7.26*	2.73	WAT3	3.13***	0.52	BIO3	2.91**	2.39	WAT3	1.61***	0.54
WAT2	8.60*	1.72	EF3	1.97***	0.17	WAT2	3.06*	3.80	Non-random parameters		
WAT3	17.38*	3.79	Non-random parameters			WAT3	6.09*		BIO2	1.11***	0.44
EF2	0.69	0.56	BIO2	4.14***	0.93	EF2	-0.40	3.30	BIO3	6.59***	0.81
EF3	1.19	1.87	BIO3	8.16***	1.17	EF3	-2.08	-0.93	EF2	1.02	6.51
CV	-0.003*	0.87	EF2	0.43	1.31	CV	-.0008*	-2.31	EF3	2.18***	0.62
			CV	-.0019***	0.0003			-2.00	CV	-.0019**	0.005
			NS3_GEN[1]	0.21*	0.01				BIO3_EDU	1.73***	0.17
			NS3_HHS[2]	-0.41***	0.83				NS3_HHS	-0.33	0.12
			BIO3_EDU[3]	0.51***	0.09				NS2_EDU	1.22***	0.23
			WAT3_INC[4]	.005***	0.01				WAT3_INC	0.002***	0.001
			Management	1.84***	0.39				BIO3_AGE	-0.16***	.024
			Shadegan	1.48***	0.46				NS3_GEN	1.21***	0.48
			SigmaE01	2.93***	1.65				SigmaE01	4.37***	0.58
			SigmaE02	2.06***	1.36				SigmaE02	0.11	0.56
Number of respondents			300			Number of respondents			230		
Log likelihood function			-909.53			Log likelihood function			-678.34		
McFadden Pseudo R-		0.53				McFadden Pseudo R-		0.52			

* **significant at 1%, ** 5% and *10% level

1 gender

2 household size

3 education

4 household income

5 education level

6 respondent's age

In estimating the related utility following Hensher et al. 2005, distributional assumptions related to random parameters were taken into account. The welfare measure for improvement in Shadegan wetland conservation against status quo is estimated about Rilas 3414.25 (USD 3.67) for users and Rials 2632.82 (USD 2.8) for non-user model (based on 2009 rate). This shows the utility that people derive simply from improvement in the wetland condition and a change in their condition from the status quo. The results also indicate that users of wetland -as expected- have higher utility than non-users. The results could be improved by separating those non-users with prior knowledge about wetland which our study failed to do that. Our results are similar, e.g., with the findings of previous studies which found that user people with more knowledge and familiarity with wetland would pay higher value (Cameron & Englin, 1997; Meyerhoff & Dehnhardt, 2007; Silberman et al.,

1992; Martínez-Paz & Perni, 2011; Alberini et al., 2003).

The results also used to estimate point and cross elasticity's between alternatives. In a simple term elasticity measures the relationship between percentage change of variable (or program) and percentage change in quantity demanded, *ceteris paribus* (Hensher et al. 2005). In the user model the direct effect for management option 1 is calculated as -0.32 and for option 2 as -0.82, respectively. This suggests that 1% increase in option 1 price will decrease the probability of choosing this option by 0.32%. Accordingly, increasing of option 2 cost by 1% will decline the probability of choosing this option by 0.82%. Taking into account that price elasticity for both options are relatively inelastic (Hensher et al., 2005, pp 387). The price elasticity estimate for Non-user model was also relatively inelastic for both management options (-0.40 for option 1 and -0.78 for option 2). It means that introducing any trust found in the form of donation or admission fee or else will have small effect on respondents demand.

Simulation method in Nlogit5 was used to estimate "what –if" scenario. Selected scenario assumed 10% increase in conservation cost or CV attribute. Increasing price by 10% in user model will change the choice share of proposed management options 1 to 69.54% (down from 71.77%), management option 2 to 16.87% (down from 20.15%) and status quo to 13.57% (up from 8.06%). The same change in non-user model will change the share of management option 1 to 59.61% (down from 62%), option 2 to 19.76% (down from 24%) and status quo to 20.62% (up from 13.96%). Results can also be translated as 86% and 79% of choice for better management options in the user and non-user models respectively. We can conclude that any improvement in management would have an 80% of market share compare to status quo. We also tried to simulate the scenario of 10% increase in income and conservation cost together. Results showed that under this situation the share of wetland management options will increase to 91% (up from 86.4%) and 86% (up from 79%) in users and nonusers model, respectively. Overall results show that people are supportive to wetland conservation and since users are more related to wetland so they have higher share and participation in such programs.

5. Conclusion

The aim of this study was to estimate the differences between users and non-users of wetland area. Therefore, differences in their attitudes towards wetland conservation programs, their WTP and socio-economic characteristics were examined. Familiarity and personal experience with resource considered as increase respondents support and WTP. Hence, users suppose to have better perception and valuation basis compare to non-users of resource. Since most services provided by Shadegan wetland are not marketed, a hypothetical market situation was devised. The CE method was employed to compute people WTP. The sample was divided according to using or not using wetland area. The results showed that there are significant difference between user and non-users perceptions and WTP. Results of this study through SEM confirmed that as increased environmental knowledge in general has direct effect on people WTP. However, the estimated point and cross elasticity of between 0.32% to 0.82 % shows that any improvement in wetland management with imposing price up to Rials 35000 is relatively inelastic and would not have effect on respondents demand.

The findings of this study suggest that the economic value of Shadegan wetland is substantial and the community living nearby is generally supportive and willing to contribute to conservation programs. Such programs must involve all stakeholders, including policy makers, wetlands authorities, and the local community. While both socioeconomic and respondents knowledge on natural resources are important determinants of wetland conservation, government policies has key role in implementing relevant programs. Finding out how and when and in what degree the better environmental protection will occur is also depending on governmental policies. For example the results show that wetland authorities and policy makers could be benefited by providing educational and awareness programs among stakeholders. Results can also help the policy makers to understand from consequences of their present policies on the future value of wetlands services. Therefore, group of interest either can help better conservation of wetland either by affecting or encouraging international funding in wetland rehabilitation. In any case contribution of both locals and non-users of wetland in conservation programs for sure would bring better results. Specifically this kind of programs among users society can help the conservation of wetland by locals and even can be used to establish Shadegan wetland's nongovernmental organisation trust fund.

Aknowledgment

The authors wish to thank Mr. Hormoz Mahmoudi Rad, former general director of department of environment office in Khuzestan Province for facilitating data collection. Authors also thank 550 respondents of the questionnaire.

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