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Assessment of willingness to pay for management of inland waters in Southwestern Nigeria

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Abstract: This study assessed the wetland users' willingness to pay for sustainable management of wetlands. The study was based on respondents drawn across three Wetlands in Lagos, Ogun and Oyo states in Nigeria. Contingency Valuation (CV) technique was employed in assessing Willingness to pay for sustainable management of the Wetland. Tobit regression model revealed that years of education, income and location of the Wetland are the factors that influence respondent's Willingness to pay. This study recommends that formal education in Nigeria should be made to inculcate the wise use and management of Wetlands which they may not depend on for income generation.
Keywords: Contingent Valuation, Direct users, Iterative Bidding, Tobit regression, Wetlands.

INTRODUCTION

Economics is known to be concerned with the allocation of scarce resources in a way that the net benefits derivable by their uses are maximized over time (Olubanjo, 1999). These economic benefits are easily observable with respect to private goods: that is those that are purchased and disposed of in markets with determined prices. The case however is not the same for many natural resources such as the forests and Wetlands which provides valuable environmental services and benefits that are not exchanged in a market because they are public goods. As a result, most of these resources are often poorly managed and/or are explored in an unsustainable way. Thus, the quality of environmental services they provide including enhancement of biodiversity, climate regulation, nutrient recycling, and adding aesthetic value to the planet earth tends to decline over time creating environmental problems of un-imaginable proportions that now threatens both human and non–human life on the planet earth (Fernandez, 1999; Lockwood, 1998).

Wetlands – generally referring to marshes, swamps, floodplains, mudflats, estuarine and the littoral areas of large bodies of water - are among the Earth's most productive ecosystems (Barbier et al, 1997). They have been described both as "*the kidneys of the landscape*", because of the functions they perform in the hydrological and chemical cycles, and as "*biological supermarkets"* because of the extensive food webs and rich biodiversity they support (Mitsch & Gosselink, 1993). Wetlands perform a wide variety of functions that include flood control, ground water recharge, shore line stabilization and storm protection, climate moderation and also serve as habitat for living things, recreation, tourism and cultural values (Federal Ministry of Environment (FME), 2009; Bikangaga, 2007).

Globally, destruction of Wetland ecosystems is taking place at an alarming rate, with as much as about 50% of the World Wetlands already lost (O'Connell, 2003, RAMSAR, 2009). Most of these loses are due to human activities, including large scale diversion of water for irrigation, burning and exploitation of peat land, extensive drainage of marshes and pollution of lakes and rivers (RAMSAR, 2009). In Nigeria, the Baturiya Wetland was reported to be suffering from uncontrolled grazing by Fulani cattle and lopping of tree branches by the herdsmen, while uncontrolled fishing activities in the river system of Kirikasama/Nguru Wetland is causing heavy depletion of the fish stock in that Wetland (NEST, 1991). Furthermore, between the period 1986 and 2006, Wetlands, an important buffer against coastal floods had reduced significantly in coastal Lagos; Wetland loss of 38% to 100% has occurred in four coastal local government areas of Lagos (Adelekan, 2009). FME (2009) observed that the rising loss of Nigeria's Wetlands has resulted in the loss of countless species of animals and plants while the livelihood and culture of a large number of the people, most especially the local communities living around the Wetland, are being endangered. Moreover, the role of Wetland services for adaptation and mitigation to impacts of climate change is also being greatly challenged. Thus, there arises an urgent need for necessary safeguards and mechanisms to be put in place in Nigeria to maintain the ecological character of Nigerian Wetlands. Environmental valuation has been known as veritable tool for putting value on environmental goods and thus prevents their unsustainable use.

Environmental valuation involves the determination of monetary contribution that people are willing to pay in order to halt further degradation or reverse the damage that has been done on the environment. People's desire and consequent values expressed for such environmental improvement are popularly elicited through Willingness to pay (WTP). This approach is premised on the theoretical framework for the empirical valuation of consumer willingness to pay for improved quality in environmental goods. Based on the concept of utility maximization behavior of consumers, Othman et al. (2002), observed that Willingness to pay (WTP) is the amount of money a person would be willing to pay for higher level of environmental or commodity quality. They observe that WTP corresponds to the equivalent variation or equivalent surplus, which measures the amount of money a person is willing to give up to hold utility constant after there has been an increase in the price of a good that the person consumes. Similar views were expressed by Golan and Kuchler (1999), which pointed out that the use of WTP to determine consumers' welfare is a fundamental principle of the neoclassical theory. They noted that the WTP measures the resources individuals are willing and able to give up for a reduction in the probability of encountering a hazard that compromises their health.

Due to population and urban growth, conversion of wetlands to agricultural and other uses of the land, has led to the loss of wetland ecosystems functions. This has a negative impact on rural and urban livelihoods, especially on the poor who depend on the goods and service of wetlands as well as hampering the ability of the wetlands to contribute to the mitigation of climate change effects. It thus become imperative that various programmes that ensure the management of wetland is put in place. Against this background, it was pertinent to assess people's WTP to pay for sustainable management of wetlands which also is an indication of economic value people attach to them. The proposed study shall also be contributing to knowledge by applying non-market valuation techniques - Contigency Valuation (CV) and Willingness to pay (WTP). This, apart from contributing to increased knowledge of the suitability of the methodology, is expected to aid and improve wise use and management of Nigerian Wetland resources.

The broad objective of the study was to assess people's Willingness to pay for sustainable management of selected inland waters in Southwest, Nigeria. The specific objectives were to:

1. describe and compare the socioeconomic characteristics of various categories of Wetland service users in the study area;
2. determine the Wetland users' Willingness to pay for sustainable management of these Wetlands; and
3. examine the influence of various socioeconomic, attitudinal, location-specific, and other factors on the perceived value and Willingness to pay for sustainable management of the Wetlands;

2.0 Theoretical framework for wetland benefits valuation

According to consumer behaviour theory, one's response to increased cost is based on the perceived benefit of and perceived value derived from the product (Mahesh, 2005). Assessment of Wetland values is commonly based on the utility theoretic framework of consumer response to improvement in environmental services and system reliability, as illustrated, for example, by Vasquez, *et al.* (2009). In this study, it is assumed that each respondent seeks to maximizes an indirect utility function, V(Y, W, P, Z), which increases with income (Y) and positive attributes of (i.e. the perceived benefits of environmental services provided by) natural resources like Wetlands (W). Here W is a multidimensional vector of different attributes (e.g. quality, reliability) relevant to the sustainability of environmental services. Indirect utility, V decreases with prices of other goods (P), and is also affected by relevant socioeconomic characteristics (Z). Hence, the individual respondent will be willing to pay for environmental service improvements up to the extent that this payment does not decrease his utility below the original utility level. Thus, a respondent's maximum Willingness to pay (WTP) for any improvement (W1 or W2) in environmental services can be stated as follows:

$V(Y, P, W_0, Z) = V(Y - WTP_1, W_1, P, Z) = V(Y - WTP_2, W_2, P, Z)$

Where:

W_0 represents the status quo provision of environmental services,

W_1 represents improved quality of environmental services, and

W_2 represents some separate additional improvement in environmental services, such as system reliability.

A respondent's WTP for environmental services is, therefore, a function of these multidimensional environmental attributes, income, prices of other goods, and other relevant socioeconomic characteristics (Vasquez, *et al.*, 2009).

According to Othman et al. (2002), Willingness to pay (WTP) is the amount of money a person would be willing to pay for higher level of environmental or commodity quality. They observe that WTP corresponds to the equivalent variation or equivalent

surplus, which measures the amount of money a person is willing to give up to hold utility constant after there has been an increase in the price of a good that the person consumes. Similar views were expressed by Golan and Kuchler (1999), which pointed out that the use of WTP to determine consumers' welfare is a fundamental principle of the neoclassical theory. They noted that the WTP measures the resources individuals are willing and able to give up for a reduction in the probability of encountering a hazard that compromises their health. This can be assessed using tools such as the Contingency Valuation, Travel Cost, Hedonic Pricing, and so on (James, 2002).

Wide range of estimation techniques are employed in literature to estimate WTP models. Vasquez et al. (2009) observed that Cameron and James (1987) censored logistic regression approach is often used to directly estimate WTP models from referendum voting data, while Ordinary Least Squares (OLS) is used to estimate a WTP model from responses to open-ended question. Other commonly used estimation methods include the binary choice (Probit and logit) regression model (e.g. Athanasios et al 2006), multinomial logit (e.g. Mwakubo and Obare, 2009) and the Tobit regression (e.g. Mwakubo and Obare, 2009) methods.

Specific applications of contingent valuation method in the area of wetland studies include Athanasios et al. (2006). They used Contingency (Contigent) Valuation method to obtain the average WTP as € 211.30 for separate functions of the Wetland. A lesser WTP value of €125.82 was however interestingly obtained for all Wetland functions as a whole. In the study, a logit model was used to establish the determinants of WTP. Variables used include income, gender, bid age, education and residence measured as a dummy. However the first three were the only significant ones although gender was significant at a lower level.

The study of Bikangaga et al. (2006) estimated the Willingness –to-Pay for the conservation of Lake Nabugabo Wetland system. The Wetland has earlier been designated a Ramsar site in 2004. They estimated the values from two different folds / angles. They are the local council's willingness to invest; which was between 5 and 10% of the councils' annual budget if money was readily available and the other; Willingness-to-Pay at the community level. The study revealed that 50% of respondents were willing to contribute small amounts to Wetland conservation ($1–$2). The study also revealed an interesting correlation between the level of education and people's views on conservation of Wetlands. Over half of the community members who thought that conservation would deprive them of their original benefits had received no education or only primary school education.

In the study of Mwakubo and Obare (2009), the Willingness to pay for Wetlands conservation was obtained by using the Contingent Valuation method. This study used data from 600 households in the Lake Victoria watershed in Tanzania, Kenya, and Uganda. A multinomial logit model was used to determine variables that influence the perception of Wetlands degradation. The household perception of Wetland degradation (wetstatus) was found to be relatively low. The model results showed that although the perception of Wetland degradation is modest, it is influenced by attributes of social capital. A Tobit model was also used to establish the determinants of Willingness to pay for Wetland conservation and the imputed value of Wetland product extracts. Land size and ownership, education level and household size all influence households' likelihood to actively engage in Wetland resource exploitation and Willingness to pay for its conservation.

Bateman et al. (2006) contrasted applications of both the Contingent Valuation (CV) and Contingent Ranking (CR) methods as applied to a common issue, the valuation of improvements to the water quality of an urban river (the River Tame, running through the city of Birmingham, UK). The study is sequel to earlier experimental work, in which the CV design used ensures that respondents are fully aware of all impending valuation tasks prior to undertaking any one of those tasks. Such an approach they affirmed is directly comparable to the CR design for which full awareness of all options is a pre-requisite. However, their findings indicate that the CV responses exhibit strong internal consistency with expected relationships observed between values and theoretically expected parameters. External comparisons show that CR valuations are substantially larger than those elicited through CV (with protest votes excluded), and that the response rate for the CR survey is significantly higher than that for the CV survey.

Verbic and Slabe-Erker (2009) also estimated the economic valuation of the Landscape Development and Protection Area of Volcji Potok, which is an important Slovenian cultural landscape area with internationally recognized qualities. In the study, the classical Contingent Valuation with a closed-version of discrete choice method, where the protest responses have been removed was employed to estimate the Willingness-to-pay. The average was estimated as SIT 388, with the highest value of WTP as SIT 475. In addition, results indicate that households are willing to pay from 1.8% to 7.55% of reported household income above their current water

bill for safe and reliable drinking water services. They used a probit regression to model the determinants of Willingness-to-pay. Respondent's income, the frequency of visiting the Wetland and values of perceived benefit were discovered to be the factors that influence their Willingness to pay. Others include conscientious respondents, perception of damage in unplanned situation, heritage value, functional characteristic and protest all measured as dummies. While the coefficients of age, gender, household size and domicile status were not significant.

METHODOLOGY

This study was based on data obtained from a cross-section of 197 respondents drawn across 17 communities around three Wetlands in Lagos, Ogun and Oyo states in Nigeria. The Wetlands included in this survey are the Lagos Lagoon, Eriti in Ogun and Eleyele in Oyo states. The Wetlands of Lagos were included based on the extensiveness of Wetlands found in the state. Eriti Wetland was however included because of its use for Agricultural purposes and its consequent involvement in FADAMA programmes. Eleyele Wetland is also notable in Oyo state particularly as the major source of potable water distributed for household use upon treatment in the area.

Eriti Wetland is found in Obafemi – Owode local government area of Ogun State. It is characterized by swamp or flood plain and riparian vegetation surrounded by Ogun River and its tributaries. The Eriti village is located in the humid tropical rainforest zone on latitude 6°50'N and 7°50'N and longitudes 3°18'E and 3°32'E some 20 kilometers on the southern corner of Abeokuta, Ogun State capital. It shares western boundary with Ewekoro/Ifo Local Governments. It covers an estimated area of 156Km^2. The population of Eriti Wetlands Communities is conservatively put at over "6,000". Eriti Wetlands are surrounded with freshwater Wetlands and other villages. Eriti village seems to be the largest among the villages in the area in terms of number of houses and by extension the population of the people living there. It is within a walking distance on foot paths to other villages. These villages include: Isiba, Ogunpa, Ajegunle, Oluwo Oke, Itori, Iboko and Arowa, Isare etc.

The natural watershed vegetation upon which the livelihoods of many villagers are based is the flood, terrestrially flat plain and River Eriti, a tributary of Ogun River. It possesses rich alluvial soil useful in farming as a result of seasonal inundation and overflow of the River during rainy season. The water reserves are extensively used for dry season crop production by irrigation and residual soil moisture. Being an agrarian community, the villagers have been utilising these Wetlands over the years particularly for farming and other livelihoods such as fishing, fuel wood production, grazing of animals, hunting, logging and soil excavation for building and other constructions among others.

The Eleyele Lake is found in Ido Local Government area of Oyo state. It is the major source of portable water upon which the majority of the Eleyele and its environs depends as the Eleyele water works sources water from this Wetland. This is subsequently treated and distributed for household use. The lake is surrounded by communities such as Awotan, Ijokodo, Apete, Eleyele, Olopomewa etc.

Livelihood activities found around this Wetland include farming, fishing, artisanship, trading, civil service etc. The Wetland is used for dry season crop production by irrigation and residual soil moisture but it is predominantly used in the production of agricultural crops such as cassava, maize and edible leaves such as *Cochurous olitorius, Amaranthus gangeticus, Celosia argentinae etc* among others. It also supports fishing which the people in the area readily explore for consumption and sales. Tilapia is the most common fish type found in this water although others such as catfish, starfish etc are available but in very little quantity when compared with Tilapia.

Some sides of the Wetland are protected by trees *(Meligna Aboria*) which were planted by the Federal Ministry of Forestry after being cut down and burnt in 1993 during the political uproar that followed Chief M.K.O Abiola's death. The entire perimeter of the Wetland is however not protected thus giving room to encroachment on such unprotected areas.

Lagos state has extensive bodies of waters that are fed by several Rivers. The Lagos Lagoon is fed by Yewa, Ogun and Ona/Ibu Rivers while the Wetlands of Badagry are mainly suppoted by discharges from the Yewa River. The Oshun, Shasha and Oni flow into Lekki Lagoon, from where water escapes to the sea, either via Lagos Lagoon, or through the swamps to the East.

Major activities supported by these Wetlands include artisanal fishing, farming, fuel wood production, grazing of animals, hunting, logging and soil excavation for building and other constructions among others. Other non Wetland activities are also found around these Wetlands.

Multistage sampling technique was used in this study. Stage one involves the purposive selection of three Wetlands (Eleyele, Eriti and Lagos Wetlands). The second stage involves the random selection of eighteen communities close to the water bodies while the third stage involves systematic random selection of respondents from residential buildings and from

farm/ nonfarm enterprises. Communities surveyed around Lagos Lagoon included Ebute Afuye/ Chief in Epe, Foolu, Ise, Odofin and Ibeju in Ibeju-Lekki, Itoga, and Ikoga Zebbe in Badagry. Those surveyed around Eleyele Wetland are Eleyele, Ijokodo, Apete, Awotan and Olopomewa while the communities visited around the Eriti Wetland which is one of the tributaries of the Ogun- Oshun River are Eriti, Oluwo-Isale, Olorunda, Saare, and Mokoloki harbouring another Wetland which is also a part of the Ogun-Oshun River.

Primary data were used for this study. The data were collected through the use of personally administered questionnaire. The data consists of information on socioeconomic as well as demographic characteristics of the respondents. Other data obtained included data on direct utilisation of Wetland services, the number of years the respondent has been living, working or visiting the Wetlands, among others. Data were also collected on whether or not the respondents' were willing to support sustainable management plans for the Wetlands through direct payment as well as the amount they are willing to pay for such improvement.

The analytical techniques employed for this study included both descriptive and quantitative techniques. Contingency Valuation (CV) technique was employed in assessing the respondents' Willingness to pay for sustainable management of the Wetland. The process entailed presentation of the hypothetical management plan to the respondent. This includes investment in advocacy, education and public awareness restoration of the lost/degraded Wetland which will involve in-situ/ex-situ actions i.e. reintroducing of some lost species of both plants and animals to enhance biodiversity , research and site management planning including fencing, planting of trees round the entire perimeter of the Wetland, waste management and recycling systems, etc.); and provision of basic amenities such as water, roads, electricity (improved), health care centers, etc. with a view to enhance esthetic and tourism value of the Wetland.

Values were elicited using the iterative bidding game approach, where a respondent was asked a series of questions to iterate towards a best possible answer. Table 1 summarizes the iterative bidding procedure adopted, following Georgiou, *et al* (1993)

The sensitivity test and biases such as payment vehicle and hypothetical bias were combated by first obtaining the respondents preferred mode of payment as well the improvement plans they desire in the pilot study. These as well as educating them about expenditure on this desired change being unavailable for the satisfaction of other needs were carefully woven into the design of the CV so as to eliminate (minimize) errors that could arise from such which may lower the credibility of the survey.

RESULT AND DISCUSSION

Three main categories of Wetland service users were identified among the survey respondents. These include the Indirect Users; these consist of people that are only resident in communities around Wetlands. They are not engaged in any Wetland based livelihood activity but they enjoy the environmental services provided by the Wetlands. Direct users; this is the category of people that directly explore the Wetlands for their livelihood pursuit but do not live around them. Direct and indirect users; they are the set of respondents that both live around Wetlands and actively explore or depend on the Wetlands for their livelihood sustenance.

Table 1 presents the distribution of the three categories of respondents across the three Wetland covered by the study. An exploration of Table 1 shows that majority (94.7%, 74.2%, and 70.4%) of the respondents in Eleyele, Eriti, and Lagos Lagoon both live and pursue livelihood around all the Wetlands respectively. The same trend was also observed in the pooled data (74.6%) irrespective of the Wetland location. This showed that irrespective of their location, Wetlands are actively explored by their surrounding community in generating income. This substantiates the claim by several studies that Wetland community dwellers depend on Wetlands as source of livelihood. Also, the Table revealed 14.2% of the respondents come from outside the immediate environment of the Wetland (direct users) to pursue livelihood activities. This shows that it is not only the Wetland community dwellers that depend on the Wetland for livelihood sustenance; people come from outside the Wetland fringe communities to explore the various income generating potentials of the Wetlands.

Table 1: Distribution of Respondents by Location, type of Wetland Use and Main Occupation

Benefit type	Wetland			All respondents
	Eleyele	Eriti	Lagos lagoon	
Direct & Indirect users	18 (94.7%)	72 (74.2%)	57 (70.4%)	147 (74.6%)
Direct users	1 (5.3%)	16 (16.5%)	11 (13.6%)	28 (14.2%)
Indirect users	0 (0.0%)	9 (9.3%)	13 (16.0%)	22 (11.2%)
Occupation				
Farming	3 (15.8%)	53 (54.6%)	40 (49.4%)	96 (48.7%)

Benefit type	Wetland			All respondents
	Eleyele	Eriti	Lagos lagoon	
Fishing	2 (10.5%)	17 (17.5%)	8 (.9%)	27 (13.7%)
Fish farming	0 (0.0%)	2 (2.1%)	4 (4.9%)	6 (3.0%)
Sand mining	0 (0.0%)	9 (9.3%)	1 (1.2%)	10 (5.1%)
Artisan	12 (63.2%)	2 (2.1%)	9 (11.1%)	23 (11.7%)
Others	2 (10.5%)	14 (14.4%)	19 (23.5%)	35 (17.8%)
TOTAL	**19**	**97**	**81**	**197**

Source: Data from Field Survey 2010

Further evidence from the Table 1 indicates that about half (48.7%) of the people found around Wetlands are involved in crop farming. Farming was thus the major activity that these Wetlands were being used for although large proportions (63.2%) of the people found around the Eleyele Wetland were artisans. This may be due to the fact that part of this water body is found in a commercial area (Eleyele Motor Park) while around the Lagos Wetlands other non-wetland livelihood activities such as food vending, trading, transport services, civil service etc. constitute about 23.5% of the peoples occupation which shows that they don't only rely on the Wetland only for income generation.

Socioeconomic characteristics such as age, educational level, and gender among others have been identified among key determinants of Willingness to pay (Vasquez et al., 2009) for sustainable management of natural resources. Therefore, this study analysed the personal characteristics of the survey respondents across the different categories of Wetland users and the results were presented on Table 2.

As shown on the Table 2, majority of the survey respondents and by extension people resident and or pursuing livelihood activities around the selected Wetlands are economically active, aged between 31-50 years (54.5%) and mostly (90.4%) married. They are predominantly educated either to the primary (35.5%) or secondary (39.1%) school level, with as much as 12.7% of them having no formal education. In terms of gender, although both sexes are involved in Wetland related activities, the male folk however constitute the majority (73.6%). By religion, the Christians constitute a slight majority (59.4%) as against the Muslims (40.6%). Also, the Table reveals that majority (64.4%) of the respondents have spent at least 10years either residing and or pursuing livelihood activities around the Wetlands.

Table 2: Distribution of Respondents by Personal Characteristics

Description	Wetland Service User Category			
	Direct users	Indirect users	Direct & Indirect users	All respondents
Number of respondents	28 (14.2)	22 (11.2)	147 (74.6)	197(100.0)
Age Group				
Below 30	6 (21.4)	2 (9.1)	27 (18.5)	35 (17.9)
31-40	8 (28.6)	7 (31.8)	48 (32.9)	63 (32.1)
41- 50	7 (25.0)	8 (36.4)	29 (19.9)	44(22.4)
51-60	4 (14.3)	5 (22.7)	25 (17.1)	34 (17.3)
Above 60	3 (10.7)	0 (0.0)	17 (11.6)	20 (10.2)
Sex				
Female	4 (14.3)	10 (45.5)	38 (25.9)	52 (26.4)
Male	24 (85.7)	12 (54.5)	109 (74.1)	145 (73.6)
Marital Status				
Married	25 (89.3)	17 (77.3)	136 (92.5)	178 (90.4)
Single	2 (7.1)	3 (13.6)	7 (4.8)	12 (6.1)
Widow(er)	1 (3.6)	2 (9.1)	4 (2.7)	7 (3.6)
Educational Level				
No Formal education	2 (7.1)	4 (18.2)	19 (12.9)	25 (12.7)
Primary	9 (32.1)	5 (22.7)	56 (38.1)	70 (35.5)
Secondary	13 (46.4)	10 (45.5)	54 (36.7)	77 (39.1)
Tertiary	4 (14.3)	3 (13.6)	18 (12.2)	25 (12.7)
Religion				
Christian	19 (67.9)	14 (63.6)	84 (57.1)	117 (59.4)
Muslim	9 (32.1)	8 (36.4)	63 (42.9)	80 (40.6)
Years spent around the Wetland				
Less than 5	6 (21.4)	2 (9.1)	25 (17.0)	33 (16.8)
5-10	5 (17.9)	8 (36.4)	24 (16.3)	37 (18.8)
11-15	9 (32.1)	5 (22.7)	31 (21.1)	45 (22.9)
16-20	3 (10.7)	3 (13.6)	18 (12.3)	24 (12.1)
Greater than 20	5 (17.9)	4 (18.2)	49 (33.3)	58 (29.4)
TOTAL	28 (100.0)	22 (100.0)	147 (100.0)	197 (100.0)

Source: Data from Field Survey 2010

Several studies (Verbic and Slabe Erker, 2009; Athanasios et al., 2006) had also reported the influence of socio demographic factors on WTP. For this reason this study first use descriptive methods to analyze these factors and the results were presented in Table 3.

Table 3: Willingness to pay by socio-demographic factors

Socioeconomic factors	WTP/year (N)	Standard Error of WTP
All respondents	**2914.65**	**233.33**
Age group		
Less than 30	2732.17	572.20
31-40	3846.56	119.28
41-50	3284.21	528.79
51-60	2448.90	337.06
Greater than 60	3071.74	721.25
Gender		
Male	2865.66	429.75
Female	2931.65	293.87
Educational level		
No formal Education	4210.95	1136.80
Primary	2769.95	332.15
Secondary	2937.12	352.37
Tertiary	2454.16	682.64
Years Spent around the Wetland		
Less than 5	2684.99	644.03
5-10	2645.72	423.60
11-15	4876.70	1267.08
16-20	2306.76	415.30
Greater than 20	2911.39	756.22
Wetland Service User Category		
Direct Users	4554.32	1184.79
Indirect Users	2633.48	596.94
Direct & indirect Users	2817.84	253.00
Wetland Area		
Eleyele	4126.29	742.39
Eriti	1898.19	322.97
Lagos lagoon	2554.94	255.39

Source: Data from field survey 2010

From Table 3, an average respondent has a WTP value of N2914.65 per year; those aged between 31-40years have the highest WTP of N3846.56 when compared with the other age groups while the females report a higher WTP of N2931.65 when compared with their male counterpart (N2865.66). Also, those with no formal education indicated their interest of willing to pay the highest (N4210.95) when compared with their contemporaries. This of course may be due to their total dependence on the Wetland for livelihood support as their choice of paid jobs is limited and less likely to be as financially rewarding as Wetland activities. Those who have spent between 11-15 years around the Wetlands and the direct users (those who come from neighboring communities to eke a living from the Wetland) indicate the highest value of N4876.70 and N4554.32 respectively when compared with others in their group. Among the three different Wetlands, the Eleyele people supposedly have the highest (N4126.29) WTP. The mean willingness to pay for the management of wetlands in the south west Nigeria was N2914.65 per year.

The result of the Tobit model on Table 4 revealed that three variables influence the respondent's Willingness to pay (WTP). They are education in years at ($p<0.01$), income ($p<0.05$), sub urban ($p<0.05$) and urban location ($p<0.01$) of the Wetlands. The coefficients of years of education, income and location of the Wetland in suburban as well as in an urban area (with reference to a rural Wetland) were significant and negative except for the urban dummy which is positive. This means that as educational qualification and income increase the respondent's Willingness to pay for sustainable management plans for these Wetlands reduces while the location of Wetlands in a sub urban area reduces respondents WTP when compared with that of a Wetland user's located rural area. However, location of the Wetland in an urban area positively influences WTP. This suggests that urban Wetlands users are willing to pay a higher amount when compared with their rural counterparts. In a nutshell, the users of sub urbanely located Wetlands are willing to pay a lesser amount while those in urban Wetlands are willing to pay a higher amount when both of them were compared with their rural counterparts.

Table 4: Tobit Regression model of factors that Influence Willingness to pay (WTP)

Explanatory Variables	Regression Coefficient	t-ratio	Marginal Effect
Constant	19.185	2.5684	
Age	-0.3538	-1.1061	-0.2565
Age square	0.2755E-02	0.7889	0.1997E-02
Female dummy	0.4523	0.2489	0.3279
Years of formal Education	-0.3106*	-1.7834	-0.2252
Years spent in Wetland	0.4461E-01	0.7842	0.3234E-01
Total income	-0.1849E-05*	-1.8440	0.1333E-01
Wetland share of income	1.4022	0.8112	1.0166

Explanatory Variables	Regression Coefficient	t-ratio	Marginal Effect
Farming dummy	2.3966	1.4535	1.7375
Fishing dummy	-1.3011	-0.7524	-0.9433
Resource collector dummy	-1.7305	-0.8126	-1.2546
Others dummy	-0.8526	0.3829	-0.6181
Sub-urban dummy	-5.1171**	-2.4679	-3.7099
Urban dummy	4.8912**	2.7016	3.5461
LLF	-1260.8260		
Predicted F(1)	0.7668		
Squared Correlation	0.6683		

*NOTE: *** ** * implies that associated parameter is significant at p<0.01, p<0.05 and p< 0.10 levels respectively. LLF - Log Likelihood Function.*

SUMMARY, CONCLUSION AND RECOMMENDATION

The study was based on primary data collected from 197 individuals residing only, residing and pursing livelihood, or pursing livelihood only around the Wetland. The data consists of socioeconomic characteristics of the respondents; main activities carried out by the respondents around the Wetland as well their perception of various Wetland benefits. The data collected were analyzed by the use of descriptive and quantitative techniques. Frequency distribution tables, means and percentages were used to describe the socioeconomic characteristics of the respondents, the main activities carried out by the respondents. Contingency Valuation method was used to determine Willingness to pay while Tobit regression was used to determine factors that influence Willingness to pay for the sustainable management of Wetlands.

The study identified three categories of Wetland users; those that only reside around the Wetland without directly exploring the Wetland for income generation (indirect users), those both residing and having livelihood pursuits (direct and indirect users) and those not residing but having livelihood pursuits (direct users) based on the Wetland resources. The study revealed that a typical Wetland dweller is 74.6% likely to be direct and indirect service users i.e. both live and depend on the Wetland for income generation.

Analysis of the Wetland dwellers personal characteristics showed that they are economically active, aged between 31-50 years (54.5%) and mostly (90.4%) married having predominantly primary (35.5%) or secondary (39.1%) school level of education, with as much as 12.7% of them having no formal education with the male folk constituting the majority (73.6%) and the Christians a slight majority (59.4%) as against the Muslims (40.6%).

Further revelations in this study are that an average wetland user is willing to pay N2914.65 per year for management of wetlands. Years of education, income and location of the Wetland in suburban as well as in an urban area (with reference to a rural Wetland) are the factors that influence respondent's Willingness to pay. The higher their years of schooling and income the lesser they are willing to pay. The sub urban Wetland user is also willing to pay a lesser amount while urban Wetlands users are willing to pay a higher amount when both of them are compared with their rural counterparts.

The findings of this study are that Wetlands regardless of their location are being explored for various income generating activities. This if combined with conservational plans for these Wetlands will help enhance their functioning for this purpose and that of ecosystem balancing. An average Wetland user is willing to pay N2914.65 per year for wetland management. People with higher level of education and income are however willing to pay less for Wetlands sustainable management plans. Also, a farmer in a sub urban Wetland is likely to pay lesser amount when compared with one who only resides and do not eke a living from the Wetland in a rural or urban area. The main conclusion of this study therefore is that an average Wetland community dweller is willing to pay for the sustainable management plans of Wetlands.

This study therefore recommends that formal education in Nigeria should be made to inculcate the wise use and management of Wetlands so as to help the educated appreciate the need to support the wetland management which they may not necessarily depend on for income generation.

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