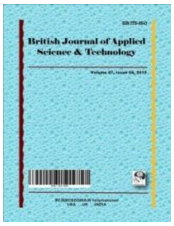

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Recreational Values and Factors that Correlate with the Use of Coastal Beaches in Cameroon: Statistical Reasoning in Psychometric Models

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Author's contribution

The sole author designed, analyzed and interpreted and prepared the manuscript.

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ABSTRACT

Coastal recreations in South Western Cameroon are a representative ecosystem critically important for global climate change, biodiversity and local livelihoods of indigenous communities. In order to increase awareness of the significance of these resources in the stability of ecosystem functions, a cross sectional survey applying statistical reasoning in psychometric models was used to estimate the recreational value and predict the factors influencing visitors' willingness to pay for such recreations, taking *Seme* beach as an example. The model development involved two major tasks: (i) the construction of data collection instruments (questionnaire) and (ii) the development of procedures for measurement. Binary logistic regression was conducted to isolate factors that correlate with visitors' willingness to pay for 180 visitors using age, gender, occupation, income, distance, education and family size as predictors. Overall, the mean willingness to pay was estimated at FCFA 1, 851.2 ($3.4)/household/month. The amounts visitors were willing to pay varied significantly amongst age groups, $\chi^2(8, N = 180) = 50.312$, $p = .000$; income groups, $\chi^2(12, N = 180) = 28.203$, $p = 0.005$; and educational attainment, $\chi^2(12, N = 180) = 22.584$, $p = .031$. Visitors residing closer to the area ($M = 6.23$, $SD = 0.94$) were significantly more willing to pay than those further away ($M = 5.87$, $SD = 1.29$), $t(178) = 2.71$, $p = .007$. A test of the full logistic model against a constant only model was statistically significant, indicating that, the predictors, as a set, reliably

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distinguished between acceptors and decliners of the offer χ^2 (2, N = 180) = 25.685, p =.005). Nagelkerke's R^2 of .783 indicated a moderately strong relationship between prediction and grouping. Prediction success overall was 71.1% (80.7% for decliners and 57.0% for acceptors). The findings could be a valuable asset to stakeholders with professional interest in outdoor recreation and ecosystem management, while identifying research needs for the future.

Keywords: Psychometric model; binary logistic regression; seme beach; recreational value; willingness to pay; value of money.

1. INTRODUCTION

Global economic growth over the past decades had been accompanied by decline in natural capital and the ability of ecosystems to sustain services. Inadvertently, humans alter environmental conditions to the advantage of global gross domestic product and disadvantage of the world's ecosystems, as they have been degraded, greenhouse gases emissions have been on the rise and biodiversity loss increasing. Recreation is one of the ecosystem's secondary values of a well conserved natural ecosystem, associated with the direct use individuals make of these natural assets. Growing concerns about the rapid decline of global biodiversity resources in in recent times have helped to increase awareness of the significance of these resources in the stability of ecosystem functions. Biodiversity resources form the basis for sustainable natural functions, and also provide potential for human use, which includes the opportunity for scientific research as well as recreational benefit, such as ecotourism [1]. Therefore, a good understanding of the characteristics of beach users and their recreational use values is of fundamental importance to formulate effective beach management policy. The economics of outdoor recreation [2], which deals with the supply of and demand for natural resources for recreational purposes is therefore important for the conservation and sustainable use of these resources.

In recent decades, Economists have traditionally used some surrogate market methods of the revealed preferences technique [3] such as the travel cost method [4,5] and hedonic pricing [6] for the valuation of different kinds of ecological systems. Stated preference techniques such as the Contingent Valuation (CV) Method [7,8], Choice Experiments [9] and conjoint analysis techniques [10] have been employed for similar valuations. The concepts in economic theory underlying CV methods are preferences characterized in monetary units (consumer surplus, compensating variation, willingness to pay), the Kaldor–Hicks compensation principle as a criterion for aggregating individual preferences into a social choice rule, and Samuelson's theory of optimal supply of public goods, developed in a stream of literature that has emphasized incentive-compatible mechanisms that blunt the 'free-rider' problem [11,12]. The CV method willingness to pay for non-market goods is based on the theory of rational choice and utility maximization [12]. It is a survey-based, stated preference, methodology that provides respondents the opportunity to make an economic decision concerning the relevant non-market good. Values of environmental goods or services are then inferred from the induced economic decision. CVM studies require precise questionnaires which must contain information about the willingness to pay for a certain environmental benefit, or willingness to accept compensation for a forgone benefit, or an incurred cost. In particular, the questionnaire defines:

- Environmental good that has to be valued by the respondent itself;
- The institutional context of its consumption (how is the externality "consumed" by respondents); and;
- The way of paying for it (privately, publicly).

Although it is not a perfect substitute for obtaining revealed preferences information and does not give all the necessary answers for environmental monitoring, it provides the individual with a hypothetical opportunity to purchase public goods in the absence of real market. Accuracy of conclusions is closely related to the construction of the questionnaire. The contingent valuation methods are used in several studies for estimating recreation value (e.g. [13,14]).

However, there are challenges associated with placing an economic value on the natural environment. Critics such as [15,16] suggest that some of the approaches are misguided as they

overlook the value of the natural environment for its own sake, citing its intrinsic value and contribution to our national heritage. No matter how much the punditocracy talks about intangibles such as "ecosystem services" and various bits of anecdotal evidence, in the end, it comes down to one simple question: can the results from these methods convince policy makers? Indeed, the logic behind ecosystem valuation is to unravel the complexities of socio-ecological relationships, make explicit how human decisions would affect ecosystem service values, and to express these value changes in units (e.g., monetary) that allow for their incorporation in public decision-making processes.

Though implicit in functional recovery, valuing recreational services of ecological systems have never been a central theme of restoration goals in the past in sub-Saharan Africa, where degradation is currently at its peak. Often policies are based on rough estimates with little empirical data to support them. In order to gain a better understanding of the actual and potential contribution of these ecosystems and the factors and processes at work in this field, scientific evidence is still needed to discern their economic and environmental significances. Our objective is to apply and evaluate psychometric modeling in recreational service valuation, and to isolate the factors influencing visitors' willingness to pay for coastal recreation using a statistical model. Key research objectives are:

1. Estimate the recreational value and predict the factors influencing visitors' willingness to pay for beach recreations, taking *Seme* beach of south western Cameroon as an example, and
2. Offer some policy recommendations to stimulate future debate and encourage further investment in the sector

It is hoped that the results will be a valuable asset to stakeholders with a professional interest in outdoor recreation including local authorities of the environment and forestry corps.

2. MATERIALS AND METHODS

2.1 Location

Seme beach (4° 0' 46" North, 9° 13' 13" East) includes a part of the Atlantic Ocean and protected section of Mount Cameroon in the city of Limbe (Vitoria), and about 15 km from Buea the headquarter of the South west Region. It is situated at the foot of Mount Fako. It is bounded to the East by Tiko, to the West by Batoke beach, to the South west by the Atlantic Ocean and to the North by Moliwe village (Fig. 1).

It is one of the most popular tourist destinations in Cameroon due to its neighbourhood with the historical and cultural city of Limbe (including the famous botanical garden and zoo). Visitors to *Semme* beach enjoy swimming in the sea as well as relaxation on its beautiful black beaches. There is fresh water in a small stream running through the area from which a natural pool has been created. Visitors always come into this natural pool to rinse off the salt that they get from the salty and warm sea. Horse riding services are provided at the Semme beach with Fulani guides for horse riding activities, given that the beach there is flat and extensive. Some people just enjoy posing on a horse for photographs. Clients also have games like lawn tennis and volley ball at their disposal for physical exercise.

Fig. 1. Study area (SEMME Beach, Limbe)

The open space besides the sea provides an excellent site for weddings and other social activities. *Semme* beach Hotel also has a water processing company nearby where water is processed and bottled. This water is sold to customers at the hotel and the beach. It is also sold and distributed. The hotel management plans and carries out tours all over the country, to Mount Etinde, Mount Cameroon as well as other regions of the south West, and the Western region around Bafoussam. These tours are organized and tailored according to the client's interest and time there are some tour guides that lead the tourists around.

2.2 Survey Design

This cross sectional study was conducted between March 5th and May 25th 2013. The period coincided with Palm Sunday, Easter and Pentecost. A total of 180 visitors were selected to form our sampling unit with a margin of error of ±3.8% points. In order to determine the sample size, 20 preliminary questionnaires were used. Then the variances of questions were determined. Sample points were made up of groups in the trip. At each sample point only one questionnaire was administered. This ensures that interviewing is not clustered around small areas with similar demographic and lifestyle characteristics. To ensure a balanced sample of adults, a quota is set by gender (male, female housewife, female non-housewife). A further quota was set within the female housewife demographic, presence of children and working status and within the male quota, working status. The quota sampling method used by the survey attempts to ensure that the results are representative of the population, aged 18 and over.

2.3 Data Collection

Both primary and secondary data were collected. Apart from literature consulted from existing publications and internet sources, staff records on the number of visitors and destinations were also used. Primary information was collected using structured questionnaire (closed and open-ended), aimed to collect information on the visitors' behaviour towards the environmental goods or services to be evaluated. The first part includes questions about respondent's socioeconomic information, for example, age, occupation; educational level, household size, household income, distance to recreation site from the respondent's residence (Table 1).

The second part of the questionnaire detects visitor' satisfaction with the river networks protection. Additionally, the third part, which contains the principal valuation questions, aims to evaluate the average willingness to pay (WTP). The contingent valuation scenario was presented to the respondents using the dichotomous-choice referendum format. The main valuation questions were:

1. Would you pay money to financially assist the government for the improvement of river networks, build riparian zones to protect them from degradation and make them proper places for recreation?
2. The third part of questionnaire is designed to know contingent behavior which includes questions to grade the existing services provided there in the site, to know the quality of beach, to find WTP on quality of beach as well as facilities available

1. Yes (Follow with Question 2) 0. No

Table 1. Variables under analysis in binary logistic model

Variable name	Type of variable	Variable definition
• Age	• Ratio/scale	• Age of visitor,
• Gender	• Nominal	• Gender of visitor (1= Male; 0= Female).
• Income	• Ratio/scale	• Income category of respondent
• Education	• Ratio	• Educational attainment of visitor
• HHSIZE	• Ratio	• Household size of visitor
• BID	• Scale	• 1000, 1500, 2000, 2500, 3000[1] and more
• Satisfy	• Binary/nominal	• Satisfaction with river network protection (1= Yes; 0=No).
• WTP	• Dichotomous	• Willingness to pay to access the site (1= Yes; 0=No).
• Distance	• Scale	• Travel distance

[1] *(US$ 1 ≈ 550FCFA)*

3. Considering your household expenditures, are you willing to pay (a bid amount) money (per month) from your household income for beach conservation if government may want to implement this program?

1. Yes 0. No:

$$y = \propto + \beta x_i + \varepsilon, \text{ with,} \quad (1)$$

$$y = \begin{cases} 0\,;\ if\ not\ WTP \\ 1\,;\ if\ willing\ WTP \end{cases}$$

Where:

- binary y is the dependent dependent variable,
- x_i *is* a continuous metric variable (vector of independent variables)
- $\propto$ is a constant and β, the regression coefficient

The number of bids, lowest and highest bids, and the bid intervals that was used, as well as the proportion of each bid that was presented to the respondents was determined from the focus group discussions. The chosen bids were randomly assigned to the respondents such that each bid is presented to an equivalent sub-sample. In this format, the visitors were asked to choose among six bid amounts (in FCFA): 1000, 1500, 2000, 2500, 3000 and more. The [17] 10-point scale querying respondents about the degree of certainty from their WTP was employed:

Please tell us how certain you are that you would actually answer

1	2	3	4	5	6	7	8	9	10
Not very certain					Very certain				

2.4 Data Analysis

2.4.1 Estimation of mean willingness to pay for beach recreation: Statistical model

Given that individuals simply respond with a 'yes' or 'no' response to a single dollar amount, the probability they would pay a given dollar amount is statistically estimated using a qualitative choice model such as a logit model [18]. The basic relationship is:

$$P = 1 - \left(1 + e^{[-\propto + \beta_1 bid + \beta_2 Dist]}\right)^{-1} \quad (2)$$

Where:

- P, is the probability of accepting by saying 'yes' to the bid price,
- Bid, is the bid price,
- E, is a constant (2.718…), and
- α and β's are coefficients to be estimated with logit statistical techniques.

The mean or expected WTP, $\mathrm{E}\,(\mathrm{WTP})$ otherwise known as consumer surplus, can be estimated as the area under the probability function, equation (3).

$$\mathrm{E}\,(\mathrm{WTP}) \cong \frac{1}{\beta_1} In(1 + e^{\alpha})\ ;\ \mathrm{WTP} \geq 0 \quad (3)$$

Where:

- β_1 is the co-efficient estimate on the bid amount, and
- α is either the estimated constant (if no other independent variables are included) or the grand constant calculated as the sum of the estimated constant plus the product of the other independent variables times their respective means.

Hence, an estimate of the non-use value of the ecological system will be:

$$\text{Non Use Value} = -\left(\frac{\beta_0}{\beta_1}\right) * \text{Total Population} \quad (4)$$

2.4.2 Predicting factors isolating willingness to pay for beach recreation

A binary logistic regression model [19] was used to isolate variables affecting the WTP. Logistic regression was chosen because the predictor variables are a mix of continuous and categorical variables. The basic formula is:

$$Logit(P(x)) = log\left(\frac{P(x)}{1-P(x)}\right) = \beta_0 + \beta x_1 + \beta x_2 + \cdots . + \beta_m x_m \quad (5)$$

Where:

- $\beta_0, \beta_1, \ldots, \beta_m$ are the regression coefficients
- $x_1, x_2, \ldots, x_m$ are the explanatory variables :
  - x_1 = Transport cost
  - x_2 = age of head of household (years)
  - x_3 = gender of head of household
  - x_4 = household monthly income
  - x_5 = Education
  - x_6 = Travel distance
- *Log* = $\log_e$ (= 2.71828…), natural logarithm
- p is the probability that an event occurs (WTP = 1)

- $\frac{p}{1-p}$ is the "odds ratio"
- $In\left(\frac{p}{1-p}\right)$ is the log odds ratio, or "logit"

Whereas *p* can only range from 0 to 1, *logit*(*p*) scale ranges from negative infinity to positive infinity and is symmetrical around the *logit* of 0.5 (which is zero). The Logits (log odds) are the β coefficients (the slope values) of the regression equation. The slope can be interpreted as the change in the average value of Y, from one unit of change in X. All data analysis were carried out using SPSS v 20.

3. RESULTS AND DISCUSSION

3.1 Sample Characteristics

Results of questionnaires indicated that, for the period under study, visitors came from five different zones. Details of population, number of visitors, and distance from the beach of visitors in comparison with the zone population are shown in Table 2.

In this sample size it was observed that 93(51.7%) were females and 87 (48.3%) were males of varying age groups, occupations, income levels and educational attainments (Table 3).

An age range of 25-<50 (42.8%) years indicate that majority of the visitors to Seme beach are in their active working ages. Education is one of the key variables influencing visitors' decisions of visiting and environmental restoration method. The nexus between increase in awareness with increase in age, level of education and willingness to pay for environmental services is understandable given that intangible ecological services are a difficult to understand phenomenon that can only be apprehended and understood with education and practical experience. Quite a large number of the

Table 2. Frequency of visitors from different zones

Zone	Distance (time) from beach	Population	Total visits/month	Number of visitors per 1000
0. Limbe	0.350 Km (1 minute)	84,223	65	0
1. Buea	32 Km (42 mins)	90088	33	3.66
2. Douala	76.4 Km (1 h 53 mins)	1.907.000	72	0.38
3. Tiko	22 Km (26 mins)	78885	52	6.59
4. Muyuka	48.1 km (56 min)	34296	23	6.71

Table 3. Socioeconomic characteristics of visitors

Socioeconomic characteristic	No. of respondents	Percentage (%)	% willing to pay
Gender			
- Male	87	48.3	78.2
- Female	93	51.7	82.8
Age			
- <25	68	37.8	76.5
- 25-<50	77	42.8	84.4
- >=50	35	19.4	80.0
Occupation			
- Private sector employee	79	43.9	82.3
- Civil servant	27	15.0	85.2
- Retired	57	31.7	82.5
- Student	17	9.4	58.8
Income			
- < 100 000	28	15.6	89.3
- 100 000-<300 000	61	33.9	77
- 300 000-<500 000	57	31.7	82.5
- >=500 000	34	18.8	76.5
Education			
- Secondary	42	26.3	78.6
- Undergraduate	44	24.4	86.4
- Graduate	46	25.6	73.9
- Postgraduate	48	26.7	83.3

respondents earn 100 000-<300 000 and 300 000-<500 000 FCFA per month. Wealth, indeed reflect ability to pay for ecological services. Thus, visitors with higher income and greater assets are in better position to support new technologies to combat ecological degradation.

3.2 Kinds of Recreation at Seme Beach

The questionnaire responses about the entertainment function of the outdoor recreation showed that 52% of the visitors preferred swimming (Fig. 2).

These results are associated with eco-environmental values as well as heritage value and cultural values of an ecological system. In addition beaches are habitat for benthic animals and microalgae living on or within the sand. They serve as refuge and forage area for fish, crabs and wading shorebirds.

With respect to the variety of ecological services provided by the system, as much as 15% of the males think that the services are poor (Fig. 3).

The 15% men who view the ecological services as poor would like to see the beach expand to include bird watching opportunities and improved fishing opportunities. The provision of these facilities could give rise to natural shoreline protection by forcing waves to shoal and break before reaching the upland. The beaches serve as refuge and forage area for finfish, blue crabs and wading shorebirds. They also provide unique ecological services, such as filtration of seawater. However, when the habitats leading to provision of such services are poor, the value of the system will automatically drop. *Seme* beach needs more kinds of tree species and flowers inorder to provide the kind of natural habitats a variety of birds, insects and butterflies would like to inhabit.

3.3 Willingness to Pay for Entrance Fees

The visitors were asked how much they are willing to pay (WTP) as entrance fee (the site is free access). Results show that 145 (80.6%) were willing to pay an amount higher than the entrance fees, and as the amount of fee increases, the frequency decreases. Of these, a few commented about the willing to pay an increase in general costs or a fee under certain circumstances. They expressed that they were truly uncertain about how to answer the question

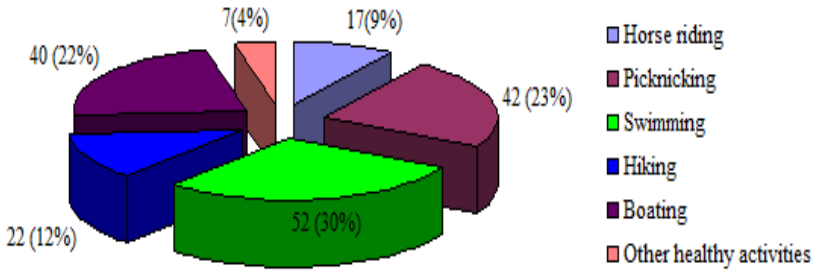

Fig. 2. Recreational services offered by seme beach

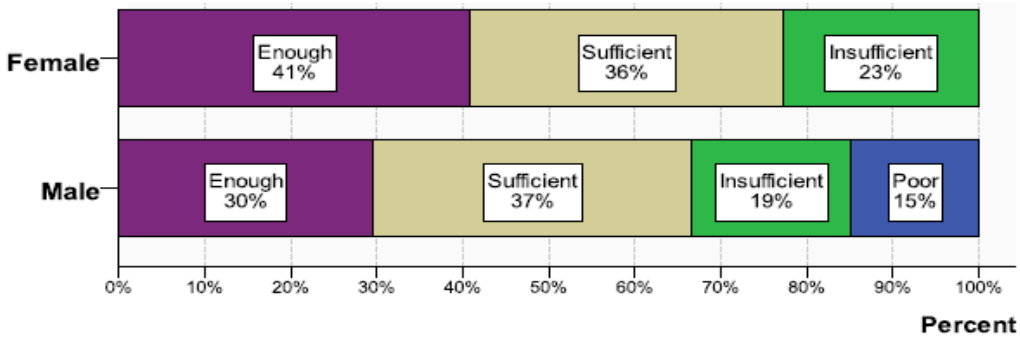

Fig. 3. Gender appreciation of the variety of ecological services provided by the beach

and that they might answer yes or no depending on the circumstance. This indicated that respondents gave thoughtful consideration to the questions and that this small number of individuals might rely on the perceived benefit from the fee, as noted in the [20] and [21] studies. However, unlike those studies, the respondents in this study seemed largely certain of their willing to pay a fee, irrespective of perceived benefit. The acceptance of the lowest bid (1000FCFA) was 29.66%, and that for the highest bid (3000FCFA) was 14.48% (Table 4).

The mean WTP for access fees was 1858.33±711.586 FCFA per visitor, with the median WTP of 1500FCFA. The amounts visitors were willing to pay varied significantly amongst age groups, X^2 (8, N = 180) = 50.312, p = .000; income groups, X^2 (12, N = 180) = 28.203, p = 0.005; and educational attainment, X^2 (12, N = 180) = 22.584, p = .031, but there was no significant difference in the amounts with respect to gender, X^2 (4, N = 180) = 2.086, p = .720. Visitors who were not willing to pay were asked a follow-up question to explore their reasons. A large majority (87.4%) argued that it is the responsibility of the government since the amount paid on the site already includes indirect taxes (e.g., value added tax).

3.4 Economic Value of Seme Beach

In simple regression model relating WTP as dependent variable and "BID" as independent variable, the key price coefficient, the BID amount, is negative (β_1 = −.000786) and statistically significant at the 1% level (Table 5).

The negative sign denotes that the higher the FCFA amount the respondent was asked to pay, the lower the probability that the respondent would be willing to pay for restoration of ecosystem services.

3.5 Estimation of Economic Benefit of the System

Using the formula in Eq. (2), mean WTP was calculated at the mean of the other independent variables. The resulting mean monthly willingness to pay per household was:

$$E(WTP) = 1.455 - .000786*BID$$

$$\widehat{WTP} = 1.455 - .000786 * \widehat{BID}$$

Where:

$\widehat{WTP}$ denotes the expected willingness to pay

Hence,

$$\widehat{WTP} \cong -\left(\frac{1.455}{-.000786}\right)$$

$$\cong 1851.145 \text{ FCFA/person/month (\$3.4)}$$

Hence the resulting mean monthly willingness to pay per household was 1851.145 FCFA per month, 95% CI [1748.74-1953.55], for the increase in ecosystem services at *Seme* beach. This is evidenced by median WTP being FCFA1500 nearly equal to the mean. The slight difference is probably because of the impact of high income earners who proposed higher bids.

On the other hand, the non-use value, taking the 180 interviewed visitors as total population was estimated at FCFA333206.1 (≈$606) between per month for the population of Limbe. The monthly WTP of $3.4 is significantly lower than the WTP determined elsewhere in similar studies involving CVM surveys (e.g. [22]). This might be because of the current state of the economy (economic instability), which is still currently in recovery following the economic crises of the late 80's. This could possibly cause recipients to be more conscious of spending extra money, especially for services which may not, in their opinion, directly affect them. While there is always a lingering concern whether households would actually pay the mean WTP estimated from CVM responses, the respondents indicated they were quite certain of their WTP responses.

3.6 Factors Influencing WTP

A logistic regression analysis was conducted to predict the willingness to pay for the visitors to the beach using age, education, gender, occupation, travel cost and household size as predictors. The final statistical model was:

$$[\log(yes)/(1\text{-}yes) = \beta o + \beta_{1*}(age) + \beta_{2*}(gender) + \beta_{3*}(income) + \beta_{4*}(household\ size) + \beta_{5*}(occupation) + \beta_{6*}(distance) + \mathcal{E}$$

where 'yes' is the dependent variable and records if a person was or wasn't willing to pay the amount asked during the interview. The number 1records a yes vote, and 0 records a no vote. Bid, specifies the increase in water bill the person was asked to pay.

A test of the full model against a constant only model was statistically significant, indicating that the predictors as a set reliably distinguished between acceptors and decliners of the offer χ^2

(2, N = 180) = 25.685, p =0.005 < .05). Nagelkerke's R^2 of .783 indicated a moderately strong relationship between prediction and grouping. Prediction success overall was 71.1% (80.7% for decline and 57.0% for accept. The Wald criterion demonstrated that age (p = .002), education (p =.039), distance (p = .008), income (p = .015), and gender (p = .023) were statistically significant at the 5% level, but household size (p = .214) and Occupation (p = .095) did not add significantly to the model (Table 6).

The Wald Chi-Square statistic tests the unique contribution of each predictor, in the context of the other predictors, that is, holding constant the other predictors. The odds ratio for age indicates that when holding all other variables constant, the age group 25-= <50 is 1.076 times more likely to pay for outdoor recreation than the other groups. The findings contradict the conclusions of some authors (e.g., [12] and [23]), but in agreement with others (e.g., [24] and [25]).

We further infer from the table that graduates were 2.673 times more likely to pay visits to beaches than other categories of visitors. This coefficient is expected. Though other studies such as [26] point to the contrary, the findings here are consistent with values obtained on previous elsewhere (e.g. [24], [27-28]). This is probably because educated people are usually more aware of environmental issues and engage in conservation activities, thus, it is expected that a higher level of education would indicate a higher awareness about natural resources, which would result in a higher WTP.

The odds ratio for gender indicates that when holding all other variables constant, a man is 3.5 times more willing to pay than is a woman. The outcome supports the findings of [29] and [30] who found a positive relationship between male gender and WTP for similar ecosystem services. However, contradictory results had been found elsewhere, for example, [26] found at Podyji National Park in the Czech Republic that women tend to be willing to pay higher admission fee than men do. This suggests that other confounding variables related to a country's institutional structure might be important in this case.

Table 4. Descriptive statistics of WTP distribution

			Bid					Total
			1000	1500	2000	2500	3000	
Willingness to pay	No	Count	4	19	8	1	3	35
		% within bid	8.5%	29.2%	25.8%	7.7%	12.5%	19.4%
	Yes	Count	43	46	23	12	21	145
		% within bid	91.5%	70.8%	74.2%	92.3%	87.5%	80.6%
Total		Count	47	65	31	13	24	180
		% within bid	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 5. Expected willingness to pay per visitor per month

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B)	
								Lower	Upper
Step 1[a]	Bid	-.000786	.149	.008	1	.000	.996	.746	1.36
	Constant	1.455	.408	12.687	1	.000	4.282		
a. Variable(s) entered on step 1: Bid.									

Table 6. Variables in the equation

		B	S.E.	Wald	df	Sig.	Odd ratio/Exp(B)
Step 1[a]	Age (2)	.073	.233	.099	1	.002	1.076
	Educ (3)	-.701	.577	37.891	1	.000	.496
	Gender (1)	1.25	.0759	20.59	1	.023	3.490
	Income	.071	.205	0.89	1	.015	1.074
	HHsize	-.266	.214	1.545	1	.214	.766
	Occupn (1)	-.405	.144	7.951	1	.095	.667
	Distance	-.244	.092	7.121	1	.008	.783
	Constant	-1.676	3.336	.253	1	.615	.187

[a] *Variable(s) entered on step 1: Age, Education, Gender, Income, Occupation, HHsize, Occupation, Travel cost, Distance*

Although significant, the effect of income was much smaller than that of gender, with a unit increase in household income being associated with the odds of willing to pay for beach recreation increasing by a multiplicative factor of 1.074. The effect of income on WTP has been extensively debated over a long period and the solution is still unclear. However, a substantial number of studies on outdoor recreation have found that low-income earners are more sensitive to price changes than high-income earners [30,31]. In a similar study by [24] in Sikkim India, the authors reported income level of the respondents as important determinants of WTP. This confirms the conclusion of [12] that visitors' WTP depends chiefly on their income level, irrespective of the purpose. The insignificant coefficients on household size (HHsize) and occupation (Occupn) variables are a bit unexpected and not consistent with previous studies correlating place identity and fee support.

The relationship between geographical distance and the willingness to pay for preservation and improvement of particular environmental goods are generally thought to be negative. Various studies including [32] and [33] also have found this relationship to be negative and argued through empirical analysis. According to them the more away the respondent resides form the area, the less likely he/she would be willing to pay for improvements or conservation of it. Although these arguments are logical, it is difficult to accept this relationship to be universal, probably because environmental goods in different countries have different surrounding environments and various judgment work behind their preservation.

Univariate analysis further indicated that that men were significantly more likely (willing) to pay for beach recreation than were women, X^2 (1, N = 180) = 15.68, p < .001; that those who are willing to pay were significantly more educated (M = 5.67, SD = 1.27) than those lower levels of education (M = 7.01, SD = 1.27), t(178) = 7.47, p < .001, that those who are willing to pay were significantly higher income earners (M = 6.23, SD = 0.94) than those with low incomes (M = 5.87, SD = 1.29), t(178) = 2.71, p = .007, and that the omnibus effect of scenario fell short of significance, X^2 (4, N = 180) = 7.44, p = .11).

4. CONCLUSIONS

The study estimates the economic value of *Seme* beach and predict factors influencing visitors willingness to pay for ecosystem services it provides. The results presented here show that the willingness to pay for outdoor recreation such as beaches is constrained socioeconomic factors including age, distance from the recreation service, education, and income of households. Creating a model that predicts the willingness to pay for the environmental good with reasonable explanatory variables, having coefficients with the expected signs provides the reason to suggest that the study has measured the desired construct. The implication of this study is important as a guideline to assist the decision-makers in terms of welfare measures such as recreational benefits especially considering the importance of our natural resources in order to meet developmental needs and other economic activities. This kind of study depicts how environmental valuation exercise can be a useful tool which is able to estimate the recreational benefits in supporting the decisions whether or not a particular natural resource is to be scarified for alternative uses or economic motives. Most of the findings are intuitive and consistent with the existing literature on beaches recreational determinants; however, some of the results may indicate unique preferences that derive from either the specific geographical context of the study or as an artifact of the sampling process. Such deviations are important for further research. For *Seme* beach, the result of this study provides an economic ground for its management's effort as well as the policy makers' decision to continue maintaining and improving the area as a beach. The result of this study may also be incorporated in the economic analysis for determining the viability of conserving the area in the long run.

Drawing from this study, our recommendations are:

(a) That areas providing ecosystem services such as *Semme* beach need to be prioritized and well managed in order to monitor and curb environmental degradation,
(b) Governments should invest in natural resources by allocating a budget for conservation of ecological sites,
(c) There should be empirical data of ecosystem services and their benefits before natural policies are put in place,
(d) Finally, *Semme* beach management can use the estimated recreation benefits obtained from revealed and expressed willingness to pay for improved

ecosystem services of the site to increase access fees and improve on facilities which seem to attract visitors most, together with other activities at the site. Since fishing and bird watching seem not to be well developed, an effort to attract lovers of such activities while constantly improving on the existing ones may pay off in the long run. Sustaining and expanding this economic activity requires that state and local authorities manage coastal resources in a manner that caters to multiple use preferences while maintaining the quality and quantity of natural resources.

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COMPETING INTERESTS

The author has declared that no competing interests exist.

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