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Assessment of Public-Private Participation in Sustainable Management of Urban Forest Ecosystem Services in Nigeria

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Abstract
This study was conducted to empirically assess the prospect of public-private participation in sustainable management of urban forest ecosystem services in Ekiti State, Nigeria. A multistage sampling technique was used to select a total of one hundred and twenty respondents for interview. Information was collected on socio-economic characteristics of the respondents, willingness to pay for ecosystem services, willingness to contribute towards establishment of urban parks, and ecosystem services usage pattern. Descriptive Statistics was used to describe the socio-economic characteristics of the respondents. Probit regression model was used to analyze the relationship between respondents' socio-economic characteristics and their willingness to pay for ecosystem services (urban forest creation). The contingent valuation method was used to determine the level of monetary participation of the respondents. Result of data analysis shows that 87 respondents representing 72.5% are willing to pay for ecosystem services. Also 71 respondents representing 59.17% are willing to contribute towards the maintenance of urban forest ecosystem services. The minimum amount respondents are willing to contribute is ₦100 while the maximum amount is ₦2000. Educational qualification, household size and marital status were important variables that influenced the willingness to pay for ecosystem services.
Keywords: Public-private participation, Sustainable management, Urban forest Ecosystem, Contingent valuation method (CVM).

1.0 Introduction

Natural ecosystems with plants and animals within them provide human with services that would be very difficult to duplicate and often impossible to place an accurate monetary value.
Ecosystem services are the life sustaining benefits which we receive from nature. They are direct and indirect contribution of ecosystems to human well being (TEEB, 2010). Thus indirect processes on ecosystem functions are not ecosystem services, but intermediate ecological components. For instance, recreational angling is seen as a benefit with multiple inputs in which the water body and the target fish population are the final services. The food web and water purification land uses on which the fish depends on are the intermediate components because they are not directly related to the benefits. The Total Economic Value (TEV) conceptual framework views ecosystem goods as values which are assessed through the ways in which ecosystem services support people's own consumption. Boyd and Banzhaf (2007) provide an alternative approach of ecosystem services as ecological components (including ecological structure directly consumed or enjoyed) to provide human well being. This concept encompasses maintenance of biodiversity and life support functions which include waste assimilation, cleansing and recycling (Daily, 1997; Nordberg 1999). Also are; the delivery, provision, production and/or maintenance of a set of goods and services that people perceive to be more important but are often taken for granted. Example of such goods includes sea, forage, biomass, fuels, pharmaceuticals, industrial products, intangible aesthetic and cultural benefit.

Ecosystem services tend to fall into the categories of pure services and open access, this means that they tend to have property rights, ambiguous entitlement, structure and a prohibitive transaction costs (Kremen, 2005; Blaine et al. 2003). It then follow that no one owns or has exclusive access to these services and others cannot be excluded from using or benefiting from them. Therefore, little incentive exists for beneficiaries to manage ecosystem services sustainability (Farber *et al.*, 2006). The unique feature of most of these services emanating from nature are although acknowledged by the people, yet they are unaccounted, unpriced and therefore remain outside the domain of the market. The missing ecosystem services market adds to this problem because most of the vulnerable segment of the society primarily in the developing country depends on those services directly for their livelihood.

Ecosystem services are so fundamental to life and so on large scale it is hard to imagine that human activities can destroy them. Urban forest ecosystem services are often threatened through growth in scale of human enterprise (that is population size per capital consumption) and effects of technologies to produce goods for consumption. They are also threatened by a mismatch between short term needs and long term needs. Human activities that

disrupt ecosystem services include pollution, deforestation, urban sprawl, destruction of wetland soils. Ecosystems are little understood and too sophisticated for us to reproduce even with the most advanced technology, yet the important roles of these natural services are not being recognized adequately in economic markets, government policies on land management practices. John *et al*. (2009) stated that the primary role of ecology will become more expensive and will be well justified by its help in solving societal problems especially in maintaining ecosystem services.

Misplaced priorities of government fund coupled with little or no direct monetary benefits of urban forest ecosystem services is obviously constraining government expenditure on sustainable management of urban forest ecosystem services. Funding of reforestation projects is fast becoming a low priority issue of government in most states of Nigeria (Popoola, 2004). Alternative source of funding should be employed for sustainable management of forest ecosystem. Value added to urban ecosystem services creates closely linked market opportunities to the extent of sustainability in the management of urban forest ecosystem services. This is usually carried out by the government and in recent time some corporate organizations have equally join them. Considering the fact that urban residents do harbor desire for recreation opportunities, nature appreciation and aesthetic environment, it is necessary to evaluate the willingness of individuals to contribute to the creation and sustainable management of urban forest ecosystem services. This study however aims to empirically evaluate the prospects of public-private participation in sustainable management of urban forest ecosystem services.

2.0 Analytical Framework

The contingent valuation method is used to estimate economic values for all kinds of ecosystem and environmental services. The method has great flexibility, allowing valuation of a wider variety of non-market goods and services than is possible with any other non-market valuation technique. It can be used to estimate both use and non-use values, and it is the most widely used method for estimating non-use values. It is also the most controversial of the non-market valuation methods. The contingent valuation method involves directly asking people, in a survey, how much they would be willing to pay for specific environmental services. In some cases, people are asked for the amount of compensation they would be willing to accept to give up specific environmental services. It is called "contingent" valuation, because people are asked to state their willingness to pay, contingent on a specific hypothetical scenario and description of the environmental service. The contingent valuation method is referred to as a "stated preference" method, because it asks people to directly state their values, rather than inferring values from actual choices, as the "revealed preference" methods do. It circumvents the absence of markets for environmental goods by presenting consumers with hypothetical markets in which they have the opportunity to pay for the good in question. The hypothetical market may be modeled after either a private goods market or a political market.

The fact that contingent valuation is based on what people say they would do, as opposed to what people are observed to do, is the source of its greatest strengths and its greatest weaknesses. Contingent valuation is one of the only ways to assign naira values to non-use values of the environment—values that do not involve market purchases and may not involve direct participation. These values are sometimes referred to as "passive use" values. They include everything from the basic life support functions associated with ecosystem health or biodiversity, to the enjoyment of a scenic vista or a wilderness experience, to appreciating the option to fish or bird watch in the future, or the right to bequest those options to your grandchildren. It also includes the value people place on simply knowing that giant pandas or whales exist.

However, the fact that the contingent valuation method is based on asking people questions, as opposed to observing their actual behaviour, is the source of enormous controversy. The conceptual, empirical, and practical problems associated with developing naira estimates of economic value on the basis of how people respond to hypothetical questions about hypothetical market situations are debated constantly in the economics literature. CVM researchers are attempting to address these problems, but they are far from finished. Meanwhile, many economists, psychologists and sociologists, for many different reasons, do not believe the dollar estimates that result from CVM are valid. More importantly, many jurists and policy-makers will not accept the results of CVM. Because of its controversial nature, users must be extremely cautious about spending money on CVM studies and about using the results of CVM studies.

3.0 Methodology

3.1 Study Area

This study was conducted in Ekiti State, Nigeria. The state is located between longitude 4^0 45^0 and 5^0 46^0E of the Greenwich meridian and latitude 7^0 25^0 to 8^0 5^0N of the equator. It is situated in the South of Kwara and Kogi States, as well as East of Osun state. It is bounded in the East and in the South by Ondo State. Ekiti State has 16 Local Government Areas. According to the 2006 national census, the state has population of 2,385,212 (NPC, 2006) and covers a total area of 5,43500sqkm. The state is mainly an upland zone rising above 250 meters above the sea level. Ekiti state has generally undulating land surface with a characteristic landscape that consists of old plains broken by steep sided out-crops, dome rocks that may occur singularly or in groups or ridges. Temperature in the state varies between 21 and 28 Degree Celsius with high humidity tropical forest exists in the south while guinea savanna occupies the northern peripheries.

3.2 Sampling techniques

A multistage sampling technique was used to select respondents for the study. In the first stage, 6 Urban towns with urban forest were purposively chosen for the study. The name of the urban towns are Ado, Omuo, Ikere, Ido , Ikole and Efon- Alaaye while in the second stage, 20 respondents were randomly selected from each of the selected urban town. In all a total of 120 respondents were selected for interview.

3.3 Data collection

A pre-tested structured questionnaire was used to obtain information from the respondents in the selected urban towns. Data collected from the respondents include socio-economic characteristics such as age, sex, marital status, household size, ownership of house, primary occupation etc. Also, information was collected on respondents' willingness to pay for ecosystem services and their willingness to contribute toward urban forest ecosystem generation.

3.4 Analytical technique

Descriptive statistics, contingent valuation method (CVM) and Probit regression model were employed to analyze the data generated.

3.5 Descriptive statistics

This was employed to identify and categorize the socio-economic characteristics of respondents, and their ecosystem services usage patterns using the mean, frequency counts and percentages.

3.6 Probit Regression model**.**

This was employed to determine the factors influencing individual's willingness to pay for ecosystem services thus, willingness to contribute toward urban forest creation.

The Probit regression model used in this study is stated as follows:

$Q = F(X_1\beta + \varepsilon_i)$

Where Q = Individuals' willingness to pay for ecosystem services (willingness to contribute toward urban forest creation which takes value of 1 for willingness to pay or contribute and 0 otherwise).

β = Vector of respective parameter

ε_i = Independent distributed error term

X_i = Vector of explanatory variable

The explanatory variable are;

X_1 = Gender (male =1, female = 0)

$X_{2.}$ = Age (years)

$X_{3\,=}$ Educational qualification (years)

X_4 = Household size

X_5 = Primary occupation (civil servant =1, others = 0)

X_6 = Ownership of house (owner =1, tenant =0)

X_7 = Type of house(face to face=1, others=0)

X_8 = Marital status (married=1, 0 otherwise)

3.7 Contingent valuation method (CVM)
The contingent valuation method (CVM) was used to evaluate the monetary value range that the respondents are willing to pay for urban forest ecosystem services by directly asking questions from respondent on how much they are willing to contribute, mode, and the frequency of such contribution.

4.0 Results and Discussion

4.1 Socio-Economic Characteristics of the Respondents
The socio-economic characteristics of the respondents considered in this study include, Age, Marital status, Primary occupation, Ownership of house, Education qualification, Type of house and Household size.

Table1: Socio-Economics Characteristics of the Respondents

Variables	Frequency	Percentage
Gender		
Male	53	42.2
Female	67	55.8
Age		
< 30	64	53.3
31 - 40	26	21.7
41 - 50	23	19.2
51 - 60	6	5.0
> 60	1	0.8
Marital Status		
Single	59	49.2
Married	57	47.5
Widow(er)	2	1.7
Divorced	2	1.7
Educational Status		
No- Formal Education	5	4.2
Primary Education	5	4.2
Secondary Education	27	22.5
Tertiary	82	68.3
Others	1	0.8
Household Size		
< 3	66	55.0
4 - 7	50	41.7
8 - 11	3	2.5
> 11	1	0.8
Primary Occupation		
Civil Servant	39	32.5
Others	81	67.5
Housing Ownership		
Tenant	70	58.3
Landlord	50	41.7
Type of House		
Duplex	10	8.3
Flat	73	60.9
Face to Face	37	30.8
Tree/Flower Planting		
Dislike Tree/Flower Planting	38	31.7
Support Tree/Flower Planting	82	68.3

Source: Field Survey, 2012

Table 1 shows that most of the respondents (53.3%) are below the age of 30years and only one respondent representing 0.8% is above 60 years of age. 55.8% of the total sample are women while the remaining 53 respondent representing 44.2% are male. Thus, majority of respondents are female. The majority of the respondents interviewed were single, 59 respondents representing 49.2% are single while 57 respondents

representing 47.5% are married, and 2 respondents representing 1.7 are divorced or widowed. It is seen that the majority (95.8%) of the respondents are literate and only a total of 5 respondents representing 4.2% have never been to school. This could be because the study was carried out in Ekiti State which is reputed educational tenacity. Majority (96.7%) have household size below 7. A total of 39 respondents representing 32.5 are civil servants while 81 respondents representing 67.5% are self employed. In addition, 58.3% of respondents were tenants while 41.7% were house owners. This shows that in the study area, landlords are fewer than those people that rented houses. Also, respondents that lived in houses built in the form of duplex were just 8.3% while the majority (60.9%) lived in flats and about 30% stayed in face to face houses. Most (68.3%) respondents supported the idea of trees/flower planting while just 31.7% did not. This shows that, in the study area, people love having trees/flower around their houses.

4.2 Ecosystem Usage Pattern

Table 2 shows the result of ecosystem services usage pattern distribution among the respondents. It is shown that 30.8% believed that trees and flower can serve as protection again wind, serving as wind breakers, 22.5% of respondents planted trees and flower for aesthetic pleasure, 26.7% planted for nature appreciation, 20.8% planted for shading, 2.5% planted for Noise Abatement, 11.7% planted for the purpose of lowering air temperature around the house, 6.7% planted for glare and reflection control, 24.2% planted for the purpose of having fresh air around the house and 9.2% planted for the purpose of flood abatement. In all, it shows that people have diverse opinion on the usefulness of trees and flowers around the living areas. The result reveals that, most of the time, people in the study area use trees as wind breakers around their homes.

Table 2: Ecosystem Usage Pattern

Usage Patterns	Frequency	Percentage
Protection against wind	37	30.8
Aesthetic pleasure	27	22.5
Nature Appreciation	32	26.7
Shading	25	20.8
Noise Abatement	3	2.5
Lower Air Temperature around the house	14	11.7
Glare and Reflection control	8	6.7
For fresh Air around the house	29	24.2
Flood Abatement	11	9.2
Total	**120**	**100.0**

Source: Field Survey, 2012

4.3 Establishment of Urban Forest Parks

Table 3 shows the result of respondents view and understanding of why urban forest parks should be established. From the table, 7.5% believe that parks should be established for visitation, 4.2% believe that park should be established to increase government's revenue, 25% believe that park should be established for recreational purpose, 28.3% believe that park should be established for aesthetic pleasure, 3.3% for shading, 3.3% for nature appreciation, 2.5% for tourism, 6.7% for fresh air, 0.8% for nature resource conservation, 5.8% for protection against the wind, 0.8% for ecosystem assessment, 1.7% for glare reflection. However, some respondents representing 10% of the respondents are undecided about the purpose of establishing urban forest parks.

Table 3: Distribution of Respondents by Purpose of Establishing Urban Parks

Purpose of Establishment	Frequency	Percentage
Visitation	9	7.5
Government Revenue	5	4.2
Recreation	30	25.0
Aesthetic Pleasure	34	28.3
Shading	4	3.3
Nature appreciation	4	3.3
Tourism	3	2.5
Fresh air	8	6.7
Resource Conservation	1	0.8
Protection against wind	7	5.8
Ecosystem Assessment	1	0.8
Glare Reflection	2	1.7
Undecided	12	10
Total	**120**	**100**

Source: Field Survey, 2012.

4.4 Maintenance of Urban Parks

Table 4 shows the response of the sampled population on the way and manner by which the urban forest should be maintained. From the table, 29.2% believe that park should be maintained through voluntary contribution, 22.5% goes for special tax/levy, while 45.8% goes for outright commercialization of such parks and 0.8 is undecided. This implies that the majority of the people in the study area are in support of full commercialization of any established urban park in order to maintain it.

Table 4:Distribution of Respondents on the Maintenance of Urban Parks

Maintenance of Urban Parks	Frequency	Percentage
Voluntary Contribution	35	29.2
Special tax/levy	27	22.5
Commercialization	55	45.8
All of the above	2	1.7
Undecided	1	0.8
Total	**120**	**100.0**

Source: Field Survey, 2012

4.5 Willingness to Payment for Ecosystem Delivery.

Figure 1 shows the distribution of respondents according to their willingness to pay for ecosystem services. From the figure, 27.5% are not willing to pay for ecosystem services, and they believed that such services are nature's gifts, while 72.5% of the respondents are willing to pay for ecosystem services of recreational facility. This is an indication that people are ready to pay for the services of the urban parks if established.

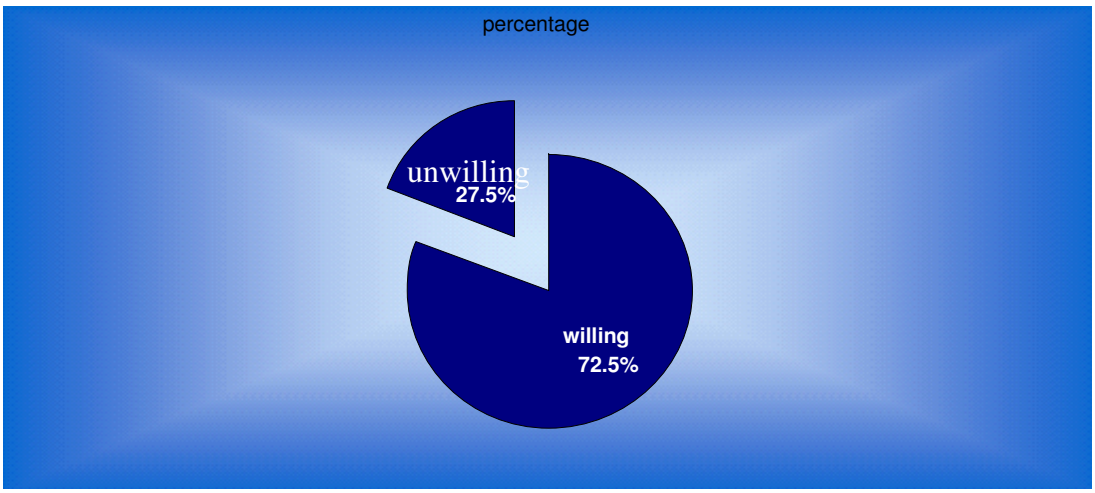

Fig 1: Attitude to Payment for Ecosystem Delivery.

4.6 Amount Willing to Contribute Toward the Maintenance of Urban Parks.

Table 5 shows the amount respondents are willing to contribute toward the maintenance of urban parks. The minimum amount the respondents are willing to contribute is ₦100 while the maximum amount the respondents are willing to contribute is ₦2000. The average amount is ₦600. The table shows that 15.8% are willing to contribute ₦100 – ₦500, 16.7% are willing to contribute ₦501 – ₦1000, and 12.5% are willing to contribute ₦1001 – ₦1500 while 14.2% are willing to contribute ₦1501 – ₦2000. Consequently most respondents are willing to contribute between ₦501 – ₦1000 to maintain urban park ecosystem services. Nevertheless most of the respondents are not in support of tax enforcement.

Table 5: Distribution of Respondents by the Amount Willing to Contribute

Amount willing to contribute	Frequency	Percentage
₦100 – ₦500	19	15.8
₦501 – ₦1000	20	16.7
₦1001 – ₦1500	15	12.5
₦1501 – ₦2000	17	14.2
Total	**71**	**59.16**

Source: Field Survey, 2012. Total < total sample; some respondents are not willing to contribute at all.

4.7 Frequency of Contribution

Table 6 below shows the mode of contribution of respondents towards maintenance of urban parks. From the table, 3.3% are willing to contribute weekly towards urban parks, 15% are willing to contribute monthly, 6.7% are willing to contribute quarterly while 35% are willing to contribute annually towards the maintenance of urban parks. Consequently, most of the respondents are willing to contribute towards the maintenance of urban parks annually. However, some respondent are undecided about the mode of contribution towards urban parks.

Table 6: Distribution of Respondents by Mode of Contribution.

Mode of Contribution	Frequency	Percentage
Weekly	4	3.3
Monthly	18	15.0
Quarterly	8	6.7
Annually	42	35.0
Undecided	48	40.0
Total	**120**	**100.0**

Source: Field Survey, 2012.

4.8 Factors Influencing the Willingness to Pay for Urban Forest Ecosystem Services

Table 7 shows the result of the Probit regression analysis showing the relationship between the respondents' socio economic characteristics and their willingness to pay for ecosystem services. From the table, gender, age, household size and type of house all show negative relationship with willingness to pay for ecosystem services. Consequently, an increase in the number of each of these variables will lead to a decrease in the probability of willingness of the respondents to pay for ecosystem services and vice versa. However, educational qualification, primary occupation, ownership of house and marital status show positive relationship with willingness to pay for ecosystem services. Consequently, an increase (a decrease) in these variables will lead to an increase (a decrease) in the probability of willingness to pay for ecosystem services in the study area.

Table 7:Factors influencing the willingness to pay for urban forest ecosystem services

Variables	Coefficient	Standard error	P>/z/
Gender	-0.441	0.279	0.115
Age	-0.003	0.025	0.899
Educational qualification	0.597 **	0.248	0.016
Household size	-0.158*	0.092	0.088
Primary occupation	0.481	0.335	0.151
Ownership of house	0.058	0.316	0.855
Type of house	-0.385	0.270	0.155
Marital status	0.691**	0.295	0.019

Source: Data Analysis, 2012. Note *indicates significance at 10% and ** at the 5% level

The result further shows that most of the female respondents are willing to pay when compared with their male counterparts. Also, as the age of respondents increases probability of willingness to pay decreases. As the educational qualification of respondents increases the ability and willingness to pay for the urban forest ecosystem services increases. The negative sign on the household size signifies that large household size inhibits the willingness to pay while the civil servants are ready to pay for the services. Those people that owned houses are willing to pay when compared with the tenants. Also, people that live in face to face buildings are not willing to pay while those that live in duplex and flat types of houses are willing to pay for the services. The probability of willingness to pay is higher among the married respondents than the singles. Therefore, the main determinants of willingness to pay for ecosystem services in the study area are the educational qualification, household size and marital status which are significant at 5%, 10% and 5% levels of significance respectively.

5.0 Conclusion and Recommendations

This study focus on assessment of public-private participation in sustainable management of urban forest ecosystem services in Ekiti State, using the contingent valuation method (CVM). A multistage sampling technique was used to select 120 respondents. Result of data analysis shows that 72.5% are willing to pay for ecosystem services. Also 59.17% are willing to contribute towards the maintenance of urban forest ecosystem services. The minimum amount respondents are willing to contribute is ₦100 while the maximum amount respondents are willing to contribute is ₦2000. The average amount is ₦600.

Equally, 45.8% of the respondent believed that urban parks should be maintained by commercialization while 29.2% believed that such urban parks should be maintained by voluntary contribution. Also 22.5% of the respondents believe that such parks should be maintained by special tax/ levy. Educational qualification, primary education, ownership of house and marital status positively influenced the willingness to pay for ecosystem services, while five of the socio-economic factors have a negative influence on the willingness to pay for ecosystem services by respondents. In addition, the main determinants of willingness to pay are educational qualification, household size and marital status.

Based on the findings of the study, it was found that most of the respondents are willing to pay for ecosystem services and also willing to contribute to urban parks establishment although most of the respondents are of the opinion that ecosystem services should be maintained through commercialization. Equally, most respondents show positive attitude towards creation and maintenance of urban forest ecosystem generation.

According to the findings of this study, the following recommendations are made:

- More urban forest parks should be established by the government since most of the respondents are willing to pay for ecosystem services through commercialization. This will add to revenue base of government.
- Most house owners desire aesthetic environment and are willing to plant trees, government should assist more citizen to own houses as this will contribute to creation of urban forest ecosystem services.

References

Blaine, W.T, Lichtkoppler, F.R. and Stanbro .R (2003): An assessment of Resident's willingness to pay for green space and farmland preservation conservation Easement using the contingent valuation method CVM. Journal of Extension 41(4) http://www.joeorg/2003 august1az.shlml.

Boyd, B. and Banzhaf F. (2007): Systemic Insights into the Management of Ecosystem Services. Ed. New York.

Farber, R Costanza, D.L. Childers, J. Erickson K, Gross, M. Grove (2006): The value of ecosystem services Linking hub.elsevier.com/retrieve.

Kremen, C. (2005): Managing Ecosystem Services what do we need to know about their Ecology? Ecology letters 8:468 – 479.

Popoola, A. (2004), Self Funded Instructions and Ecosystem Services in Agricultural Grassland:Assessment of Grassland Ecosystem Conditions www.fs.fed.us/rm/pubs/rmr_gtr135

TEEB (2010): The Ecological and Economic Foundation ch/http://www. Teebwe Ecological and tabid/29426/Default as px.