Global Scientific and Academic Research Journal of Economics, Business and Management
ISSN: 2583-5645 (Online)
Frequency: Monthly
Published By GSAR Publishers
Journal Homepage Link- https://gsarpublishers.com/journals-gsarjebm-home/

APPLICATION OF CONTINGENT VALUATION METHOD FOR VALUATION OF ENVIRONMENTAL GOODS: MATTERS ARISING FROM VALUING A COMMUNITY SWAMP IN AKWA IBOM STATE, NIGERIA

BY

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Article History

Received: 01/03/2024
Accepted: 09/03/2024
Published: 12/03/2024

Vol –3 Issue – 3

PP: -23-28

Abstract

There has been an increasing consciousness of the need to estimate the values of environmental goods to the society, especially since the advent of oil exploration activities and their attendant damage to the environment. The attention however has been more on the market goods than on the non-market goods largely because of man's tendency to prefer current benefit to future benefit. Also working against the non-market goods is the difficulty in getting a very effective method of valuing them. The use of Contingent Valuation Method (CVM) has been preferred to other methods by many scholars. This study aimed at applying the method to value a swamp with a view to finding out its appropriateness or otherwise. The study adopted a survey design and used a structured questionnaire as the primary source of data collection while the natives of the community constituted the population of the study. Findings revealed that the natives though drew no significant and immediate benefits from the swamp would rather that the swamp remained than being acquired for a wayleave purpose. It also revealed that each of them would be willing to pay an average of ₦1,844 monthly for its preservation. This itself is the major challenge in the use of the CVM, people saying they would pay as much as ₦1,844 monthly to preserve a swamp they admitted was not of substantial benefit to them. The study recommends a search for a reliable method

Keywords: *Application, contingent valuation method, environmental goods, matters arising, swamp.*

1.0 Introduction

Before the emergence of environmental problems occasioned by many factors like low environmental education (Aniagolu, 2019) and oil-related development activities; oil spills, refinery operations, and transportation (Udoudoh, 2021). The environment and economy were seen as being distinct and separate. An asset that was economic was also distinguished from an asset that was environmental. The former was considered to have value as it was traded openly and its price reflected the prevailing balance between supply and demand. However, environmental assets such as fauna and flora were generally seen as free gift of nature without value because no market existed for them (Ogunba, 2013).

With the advent of environmental issues and the awareness of the importance of environmental assets, the need for valuation of these assets was brought to the fore. According to Ogunba (2013), "the variety of valuation techniques which property valuers use, drawn from the field of finance are however suited only for the valuation of economic property, which means that other means have to be found to value non-economic environmental goods". Among the various methods that have been developed to use in valuing environmental goods is the Contingent Valuation Method (CVM). This analytical survey technique according to Mondal (2022), "relies on hypothetical situations to place a monetary value on goods and services. It elicits information on willingness to pay or willingness to accept compensation for an increase or decrease in some usually non-marketed goods or services". This method puts directs questions to individuals to determine how much they might be willing to pay for environmental resources or how much compensation they would be willing to accept if they were deprived of the environmental good or

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resource. This is more effective when the respondents are familiar with the environmental goods or services and have adequate information on which to base their preferences.

2.0 Literature Review

2.1 Meaning and Categories of environmental Goods

Environmental goods according to Greaves (2003) are generally a subset of general class of goods called "Public Goods". He explained that a public good is non-rivalrous in consumption. Ogunba (2013) took a broader view of environmental goods to include bio-physical, socio-cultural, and health assets which encompass intangibles such as human health and safety, the existence and preservation of flora, fauna, ecosystems and biological diversity: soil, water, air, and landscape. Egbenta (2012) opined that environmental goods consist of two categories goods and non-market goods. He opined further that market goods have a market price while non-market goods do not have a market price. Power (2013) classified environmental resources for purposes of environmental valuation under:

- Mineral Resources: Energy and fuel wood resources, Metals, Construction Materials, and Fertilizer materials which serve as raw materials in many industrial processes and are good sources of energy.
- Energy Resources: Solar Energy, Atmospheric Resources, Petroleum resources, Wind Energy, Coal, and Peat Resources.
- Water/Aquatic Resources: Surface water, Saltwater, Groundwater, Brackish water which are the primary sources of water for domestic, agricultural, and industrial uses.
- Timber/Forest Resources: Tropical rain forests, Savanna grassland and vegetation, Monsoon vegetation, Desert vegetation. These are resources that are derived from forests woodland and different forms of vegetation. These are very important for man, animals, and plants.
- Soil (Land) Resources: Sand, silt, clay, gravel, humus materials which provide the source of all minerals used by man and provide nutrients for plants existence.

2.2 Services Provided by Environmental Goods

Environmental goods provide essential services to man. These services have been identified by different research groups /scholars. Egbenta (2012) for instance summarized the services into:

- The basic source of raw materials and inputs that support economic activities.
- The sink which absorbs and recycles wastes (normally at a little or no cost to the society).
- The essential support functions (such as blocking of harmful ultra-violet rays by the stratospheric ozone layer.

Esara (2019) noted that the environmental goods and services especially in the Niger Delta region of Nigeria are at risk because of the activities of the Oil Companies. Udoudoh (2008) had earlier observed that the challenges of sustaining environmental goods/services in Nigeria had a lot to do with political factor.

2.3 Reasons for Valuing Environmental Goods

Ogbonna (2019) opined that the growing world attention on environmental issues has increased the importance of the practice of monetary valuation of the environment as well as its body of knowledge. Egbenta (2012) deduced the following reasons and justification for valuation of environmental goods:

Utilitarian Value: This is based on the economic benefits of the environment. Valuing environmental goods demonstrates that it is a source of utility to the people.

Ecological Value: The justification for this is based on the benefits of the non-market goods to the society in general. That is, the environmental goods are essential for the life-supporting functions though they may not be beneficial to an individual directly.

Aesthetic Value: This has to do with human appreciation of the beauty of nature.

Moral and Ethical: This has to do with the belief that some aspects of the environment have the right to exist and that it is the moral duty of man to allow them to continue or help them exist.

2.4 Peculiar Challenges in the Valuation of Environmental Goods

Freeman (2003) observed that valuation of environmental goods suffers some peculiar difficulties as a result of the following:

a. **Non-Market Goods**: most environmental goods such as clean air and water are not traded in the market.

b. **Non-Rival Goods**: environmental goods unlike other goods can be enjoyed by everyone in the same way as radio and television without reducing the amount available for everyone else.

c. **Non-Exclusive Goods**: People cannot be excluded from enjoying most environmental goods and the cost of trying to exclude them is prohibitive.

d. **Inseparable Goods**: it may be impossible to separate economic benefits that result from one conservation practice undertaken at one site from another undertaken at another site.

a. Basic Methods of Valuing Environmental Goods

Over the years, many approaches have been advanced for estimating the monetary worth of environmental goods. Mondal (2022), Ogungba (2013), Akujuru (2001), Otegbulu (2019), Adeyemi (2012) have all written copiously on the various methods that environmental goods can be valued with. The basic methods may be summarized under market-based and non-market-based techniques as follows:

- **Market-Based Techniques**

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i. **Market Price Method:** This method estimates economic values for goods/services that are bought and sold at commercial markets. The approach involves the estimation of consumer surplus and producer surplus using market price and quantity data. The equation is given thus: Economic Value = Consumer Surplus + Producer Surplus

ii. **Productivity Method**: This is used to estimate economic values of goods and services that contribute to the production of commercially marketed goods. It is also referred to as the Net Factor Income or Derived Value Method.

iii. **Hedonic Pricing Method**: This method estimates economic values of goods and services that directly affect market prices of some other goods. The method is based on the assumption that people value the characteristics of an environmental good rather than the good itself.

- **Travel Time/Travel Cost Method**: This method is used in estimating the economic use values associated with ecosystems or sites that are used for recreation. The method assumes that the value of a site is reflected in how much people are willing to pay to travel to visit the site.
- **Damage Cost Avoided, Replacement Cost, and Substitute Cost Method**: These methods estimate economic values based on costs of avoided damage resulting from lost ecosystem system services, cost replacing ecosystem services, or costs of providing substitute services.
- **Non-Market Based Techniques**

i. **Contingent Valuation Method:** This is used to estimate economic values for virtually any environmental good or service. It is the most widely used method for estimating the non-use or passive value. Contingent Valuation Surveys directly sk people (prospective consumers) what they are willing to pay for a benefit and prospective suppliers what the are willing to accept in compensation for tolerating a cost.

ii. **Contingent Choice Method**: This method also estimates economic values for virtually any environmental good or service. Also known as Choice Modelling or Conjoint Analysis, it asks people to make choices based on a hypothetical scenario. However, it differs from CVM because it does not directly ask people to state their values in Naira.

iii. **Benefit Transfer Method**: The method estimates economic values by transferring existing benefit estimates from studies already completed for another location or issue.

- **Other Methods**

Mondal (2022) added other methods like:

i. **Dose–Response Method**: This requires information on the effect that a change in a particular chemical or pollutant has on the level of an economic activity or a consumer's utility.

ii. **Human Capital or Foregone Earning Approach**: The Human Capital Approach values the environmental attributes through their effects on the quantity and the quality of labour. The loss earning approach focuses on the impact which adverse environmental conditions have on human health and the resultant costs to society in terms of income lost through illness, accidents, and spending on medical treatment.

3.0 Study Area and Research Methodology

The study area is Nung Urom Isor Community Swamp located at Nung Urom Isor Village in Ukanafun Local Government Area of Akwa Ibom State. Ukanafun is located between latitudes $4^{0}46^{1}$ and $5^{0}01^{1}$ North and longitudes $7^{0}29^{1}$ and $7^{0}45$ East and on the South-Western part of Uyo, the Akwa Ibom State Capital. The area has a flat terrain except at Esa Obot and Nkek Idim where there are noticeable geographical features like valleys and hills (Etuk, 2005).

3.1 Population of the Study

The study population comprised all the adult male and female indigenes of the community who had come out for enumeration of crops and economic trees exercise for the wayleave of the Natural Oilfield Services Limited (NOSL) proposed construction of Gas Pipeline. A total of 287 indigenes were identified and this formed the population of the study.

3.2 Sampling Technique and Sample Size

The study made use of Purposive Sampling Technique. The choice of this technique was informed by the fact that the researchers were looking for individuals in the population that had certain relevant characteristics like formal education and good knowledge of the swamp. With this technique, a sample size of 45 was obtained.

3.3. Technique for Data Analysis

Data from the field are presented with the help of descriptive and simple statistical tools and analyzed using Relative Importance Index (RII).

$$RII = \frac{\Sigma a_i n_i}{\Sigma xj}$$

Where: i= response category index

xj = the sum of j factors 1,2,3 …….N

ai = constant expressing the weight given to the ith response.

ni = the variable expressing the frequency of the ith

4.0 Data Presentation and Analyses

Table 1 gives the biodata of the respondents.

Table 1: Biodata of Respondents

Variable	Category	Frequency	% of Respondents
Gender	Male	29	64.4
	Female	16	35.6
	Total	45	100

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Age of respondents	18 – 25 years	2	4.4
	26-35 years	13	28.9
	36-45 years	21	46.7
	46 years & above	9	20.0
	Total	45	100
Educational Levels of Respondents	FSLC	0	0.0
	SSCE	28	62.3
	ND/NCE	11	24.4
	HND/BSc	4	8.9
	MSc	2	4.4
	PhD	0	0.0
	Total	45	100
Occupation of Respondents	Civil/Public Servant	7	15.6
	Business	21	46.7
	Farmer	15	33.3
	Others	2	4.4
	Total	45	100

Table 1 reveals that there were more male respondents than the female. It also shows that majority of them were middle-aged. The highest level of education attained by most of them was SSCE. The table also reveals that many of them were into one business or the other. Having possessed the requisite educational training and the necessary exposure as observed by the researchers, the respondents were in a good position to give the needed pieces of information to help in achieving the aim of the study.

4.1 Results and Discussion on the Benefits of the Swamp to the Community

Table 2 shows the result of the Relative Importance Index (RII) on the benefits of the swamp of the community.

Table 2: Benefits of the Swamp to the Community

Options	Weights					Total	RII	Ranking
	5	4	3	2	1			
Removes pollutants from water	12 60	29 116	4 12	0 0	0 0	45 188	4.17	3rd
Improves quality of nearby water bodies	11 55	28 112	4 12	0 0	0 0	45 185	4.11	4th
Helps to control flood by absorbing much of it before it reaches nearby farms and developments	21 105	22 88	2 6	0 0	0 0	45 199	4.42	2nd
It is the habitat of many useful shrubs, trees, and birds	28 140	17 68	0 0	0 0	0 0	45 208	4.62	1st
							4.33	

The greatest benefit of the swamp to the community as shown in the Table 2 is that it is the habitat for many useful shrubs, trees, and birds. The second major benefit is that it helps to control flood by absorbing much of it before it reaches the community's farmlands and other developments/facilities of the community. The options that ranked 3rd and 4th are not considered as their respective RII is below the average score of 4.33.

4.2 Results and Discussion on the Disadvantages of Having the Swamp in the Community

Table 3 shows the result of the Relative Importance Index (RII) on the disadvantages of having the swamp in the community.

Table 3: Disadvantages of Having the Swamp

Options	Weights					Total	RII	Ranking
	5	4	3	2	1			
It takes up space for farming	21 105	24 96	0 0	0 0	0 0	45 201	4.47	3rd
Provides a breeding ground for mosquitoes and other insects	23 115	22 88	0 0	0 0	0 0	45 203	4.51	2nd
It is the habitat for snakes, frogs, and other annoying reptiles and amphibians	39 195	6 24	0 0	0 0	0 0	45 219	4.87	1st

The greatest disadvantage of having the swamp as revealed by Table 3 is that the swamp is the habitat for snakes, frogs, and other annoying reptiles and amphibians. Next to that is the fact that the swamp is the breeding ground for mosquitoes and other insects. The table also reveals that the swamp had taken up space that should have been used for farming.

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4.3 Results and Discussion on whether or not the Community Would Want to Lose the Swamp

All the respondents expressed their desire to preserve the swamp for future generations. They believed the swamp was a gift from nature and that there might be greater benefits from it in the nearest future.

4.4 Results and Discussion on What the Respondents Would be Willing to Pay to Preserve the Swamp

Table 4 shows what the respondents would be willing to pay to preserve the swamp in the community.

Table 4: Amounts Respondents Would be Willing to Pay Monthly to Preserve the Swamp

Amount (₦)	Frequency	Percentage
100 - 500	4	8.9
600 – 1,000	3	6.7
1,100 – 1,500	5	11.1
1,600 – 2,000	23	51.1
2,100 – 2,500	5	11.1
2,600 – 3,000	2	4.4
3,100 – 3,500	0	0.0
3,600 – 4,000	0	0.0
4,100 – 4,500	0	0.0
4,600 – 5,000	3	6.7
Total	45	100

From Table 4, respondents who would be willing to pay between the amount of N1,600 and N2,000 (both amounts inclusive) were the majority commanding a percentage of 51.1%.

Table 5 below is aimed at producing the mean score of the distribution

Class Interval X	Frequency F	Midpoint x	fx
100 - 500	4	300	1,200
600 – 1,000	3	800	2,400
1,100 – 1,500	5	1,300	6,500
1,600 – 2,000	23	1,800	41,400
2,100 – 2,500	5	2,300	11,500
2,600 – 3,000	2	2,800	5,600
3,100 – 3,500	0	3,300	0
3,600 – 4,000	0	3,800	0
4,100 – 4,500	0	4,300	0
4,600 – 5,000	3	4,800	14,400
	∑ = 45		∑ = 83,000

$\ddot{x} = \sum fx / \sum f = 83,000/45$

$\therefore \ddot{x} = 1,844$

This implies that the mean amount the respondents would be willing to pay for the preservation of the swamp is ₦1,844 monthly. This will translate to ₦22,128 per annum.

Valuation (using the Contingent Valuation Method)

Annual sum/indigene ---------- ₦22,128

x total no. of indigenes---------- 287

Capital Value ---------- ₦6,350,736.00

5. Discussion of Findings, Conclusion, and Recommendation

Findings of the study agree with the position of Ogunba (2013) on the occurrence of bias especially with respect to people being asked to evaluate such an environmental good as swamp. It is a bit easy to give an accurate estimate of how much people would pay for it compared to being asked how much they would be willing to pay to preserve it. It is unbelievable that people in such a remote community that are involved mainly in subsistence farming would be able and willing to pay each person, the sum of ₦1,844 monthly which sums up to ₦22,128 annually for a non-market good such as the swamp.

Another shortcoming in the use of this method is that people generally exhibit a tendency to pay much less to preserve an item than they are willing to accept as compensation for it loss What this means is that the natives of Nung Urom Isor would have quoted a far higher sums of money if the question was on how much they would be willing to accept as compensation for the loss of the swamp.

Contingent Valuation Method is a survey-based technique used to estimate the value of public goods and services not traded in markets such as clean air, natural parks, and cultural heritage. CVM has been widely used in policy areas such as environmental protection, biodiversity conservation, and healthcare to estimate the economic value of public goods and services and inform policy decisions. However, the findings above have revealed some shortcomings in its use which reflect that it is not a reliable approach to valuation of non-market environmental goods.

This study recommends a search for a more reliable method for use in valuing non-market environmental goods bearing in

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mind that even though the non-market goods may not be traded in the market, they nonetheless have benefits that impact positively on man and the environment and as such possess economic values.

References

1. Adeyemi, A. (2012). Economic valuation of biodiversity: Valuing the benefits of biodiversity. In *Professional Lecture Notes on Estate surveying & Valuation*. A Publication of NIESV Bauchi/Gombe Branch
2. Aniagolu, C. (2019). Examination of variable environmental assets. A Paper presented at a One Day Mandatory Continuing Professional Development (MCPD) Seminar organized by the Nigerian Institution of Estate Surveyors and Valuers, Akwa Ibom State Branch on the theme: " *Environmental Assets Valuation Potentials and Administration for National Development"* . Held at the Akwa Ibom State Civil Service Auditorium.
3. Egbenta, I. R. (2012). Why value environmental goods? *Tropical Environment, Jornal of the Faculty of Environmental Studies, University of Nigeria, Enugu Camppus*. 11(1).
4. Esara, E. (2018). Environmental degradation issues in the niger delta of Nigeria – Wither Estate Surveyor and Valuer. A Paper presented at a One Day Mandatory Continuing Professional Development (MCPD) Seminar organized by the Nigerian Instituion of Estate Surveyors and Valuers, Akwa Ibom State Branch on the theme: " *Environmental Assets Valuation Potentials and Administration for National Development*" .Held at the Akwa Ibom State Civil Service Auditorium.
5. Etuk, U. S. (2005). *The voyage to Ukanafun.* MEF (Nigeria) Ltd., Uyo.
6. Freeman, A. M. (2003). *The measurement of environmental and resource values: Theory and methods*. 2nd Edition. Washington DC.
7. Graves, P. E. (2003). Valuing public goods. *Challenge: The magazine of Economic Affairs*. 46 https://spot.colorado.edu/~gravesp/GravesRevtext.htm
8. Mondal, P. (2022). Methods used for the environmental valuation (with diagram). *Your Article Library*. www.yourarticlelibrary.com/economics/evironmental-economics/methods-used-for-the-environmental-valuation-with-diagram/39686
9. Ogbonna, I. O. (2019). Assessment of environmental valuation practice in Nigeria. *The Estate Surveyor and Valuer*. 42(2).
10. Ogunba, O. A. (2013). *Principles & practice of property valuation in Nigeria.* Atlantis Books, Ibadan.
11. Otegbulu, A. C. (2019). Emerging models in environmental assets valuation. A paper presented at a One Day Mandatory Continuing Professional Development (MCPD) Seminar organized by the Nigerian Institution of Estate Surveyors and Valuers, Akwa Ibom State Branch on the theme: " *Environmental Assets Valuation Potentials and Administration for National Development*" .Held at the Akwa Ibom State Civil Service Auditorium.
12. Power, J. (2013). Measurement and valuation of environmental assets. *Australian Bureau of Statistics*, Centre of Environment Statistics, Australia.
13. Udoudoh, F. P. (2008). Environmental pollution and degradation in the niger delta region: A case to ponder. *International Journal of Environmental Sciences* 4(1), 1-5.. https://www.irdionline.com
14. Udoudoh, F. P. (2021). Real estate and challenges of sustainable development in niger delta, Nigeria. A Paper delivered at a Conference organized by the Faculty of Social Science, Akwa Ibom State University, Obio Akpa Campus on the theme: " *The State and Development Challenges in Africa in the 21st Century* held at the Lecture Theatre of the Campus

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