

An Examination of the Strengths and Weaknesses of Environmental Valuation Methodologies in Nigeria

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Abstract: This paper tries to examine the strengths and weaknesses of Environmental Valuation Models used in Nigeria in order to equip valuers in Nigeria with the requisite tools that should be employed while carrying out their valuation functions. The major models considered are the Contingent Valuation Model (CVM), the Hedonic Price Method (HPM) and the Travel Cost Model (TCM). The paper adopted the Descriptive Research Methodology and data was collected mainly from secondary sources, especially documents of Federal Ministry of Environment and National Environmental Standards and Regulations Enforcement Agency (NESREA) of Nigeria. The strengths and weaknesses of the HPM, CVM and TCM models including their general principles were discussed in details. It was recommended amongst other things that the models should be adapted by all professional bodies associated with valuation of environmental goods and services in Nigeria; that the models should be taught in all departments in tertiary institutions in Nigeria that are involved in valuation of environmental goods and services and that further research should be carried out to find out how these models could be adapted to local challenges.

Keywords: Environment, Valuation, Methodology, Pollution, Environmental Protection, Environmental Valuation, Environmental Pollution.

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I. Background of The Study

Agukoronye (1994) stated that the United Nations Conference on Human Environment (UNCHE) held in Stockholm was convened to evolve intensified action at national and international levels to limit and where possible eliminate the impairment of the human environment. Ikwuegbu (2002) asserted that in the final documents of the conference, the interaction of environment and development was formally recognized, notably in several principles of the Stockholm Declaration. Aniagolu (2009) pointed out that 10 years after the Stockholm Declaration the World Commission on Environment and Development (WCED) was formed as an independent body to re-examine the critical issues in Environment and Development. According to Sarrie *et al* (1991), the report of the commission was made public in 1987 and its conclusion is that "our common future is Sustainable Development and Environmental Management.

Esara (2016) recalled that Sustainable Development is the development which addresses the needs of the present generation without compromising the ability of future generations to meet their own needs. This concept relies heavily on three values for its success namely; social, economic and environmental values. Hence, sustainable development requires simultaneous, multidimensional efforts about the consequences of actions in a cause-effect pattern on the connection among environmental, economic and social concerns in choice of action. Ating (2014) concluded that the key elements of sustainable development are: (a) proper assessment of the environmental, economic and social factors (b) consideration of expanded temporal and special horizons (c) inter-generational equity and (d) the need for multi-disciplinary consideration.

Again, Esara (2016) opined that Environmental Management as a concept is both a process and a system. As a system it is regarded as the institutional settings responsible for stimulating supporting and implementing the environmental management process. Also as a process, it is the interaction between relevant stakeholders and organizations to articulate societal preferences & goals and transforms them into actions to influence environmental quality in a desirable manner. Straton (2006) therefore concludes that the objectives of environmental management would include (a) to reduce negative environmental externalities arising from projects (b) to provide environmentally friendly public goods and services (c) to improve sectorial allocation or

spatial natural resource allocation between production, consumptive and non consumptive uses to control environmental degradation and (d) to reallocate natural goods and services across time for successive generation.

Lead (1997) then advised that the issues of sustainable development and environmental management can only be achieved if the System Approach is adopted since no profession, no matter how well trained in techniques can claim an exclusive expertise in them. Akujuru (2005) then pointed out that one of the best tools for achieving both sustainable development and environmental management is environmental valuation. It is against this background that this paper tries to discuss the various environmental valuation methodologies and to bring out their strengths and weaknesses.

II. Statement Of The Problem

According to Baum and Mackmin (1989), the Estate Surveyors concept of value is from a strictly economic perspective based on the premise that legal interests on land are exchanged for money and are scarce resources. Ogumba (1999) buttressed this by stating that this economic concept of value has therefore evolved within the framework of the specialized market that has evolved for the exchange of the property rights. Hence, valuers view market value as a price stuck between a willing and informed buyer and seller in conditions approximating to that of a perfect competition. Kalu (2002) pointed out that in some special circumstances, Estate Surveyors and Valuers view value as the replacement cost of property, especially where there is no active market for the property being valued. Aniagolu (2009) made it very clear that from the Environmental Management point of view, these concepts of value have been seriously criticized.

From the Environmental Management point of view, the concept of Total Economic Value (TEV) comes in. TEV according to World Bank (1998) is an economic concept that states that good and services are composed of various attribute some of which are measurable in concrete terms while others may be difficult to quantify. Hence, TEV is the sum total of direct use value, indirect use value and the non-use value. Markandya and Richardson (1992) pointed out that with the recent global environmental concern a new branch of economics has emerged namely environmental economics.

Environmental economists have over the years developed models for valuing environmental goods and services. Esara (2016) enumerated them to include but not limited to Hedonic Price System, Contingent Valuation Method and Travel Cost Method. This paper tries to point out the strength and weaknesses of these environmental valuation methodologies.

III. Aim And Objectives Of The Study

The aim of this study is analyze the common environmental valuation methodologies in use in Nigeria and to determine their strengths and weaknesses. In order to achieve this aim this work will pursue the following line of objectives.

- a. To determine the environmental valuation models in use in Nigeria and to present their common principles.
- b. To present the strengths of these models.
- c. To equally present their weaknesses for better performance in the future and
- d. To suggest strategies for better result when these methods are used in Nigeria.

IV. Research Questions

In order to address the salient issues in this work, the following research questions have been put forward.

- a. What environmental valuation models are in used by Environmental managers and valuers in Nigeria?
- b. What are the strengths of these models?
- c. What are the weaknesses of these models and
- d. What strategies could be adopted for achievement of better results?

V. Scope Of The Study

The study is delimited to South Eastern Nigeria comprising Enugu, Imo, Abia, Anambra and Ebonyi States of Nigeria. A preliminary survey that was conducted also shows that the major methodologies used in the study area are the Hedonic Price Method, the Contingent Valuation Method and the Travel Cost Method. Hence, this study is also limited to these methods.

VI. Methodology

This work adapted the Descriptive Research Method. Osuala (2007) opined that descriptive research is that research which specifies the nature of a given phenomenon. It gives a picture of a situation at hand and it begins with an understanding (description) of the problem at hand. Also Odoziobodo and Amam (2007) stated that descriptive research is interested in finding the meaning and getting an understanding of the present

conditions, beliefs, attitudes, uses, etc about a particular phenomenon or its attributes. The major sources of data for this paper are documents of Federal Ministry of Environment and the National Environmental Standards and Regulations Enforcement Agency (NESREA).

VII. Literature Review

7.1 The Concept of Environmental Valuation:

Markandya (1992) narrated that between 1950's and 1960's, economists believed that they had solved the problems of production, unemployment, per capita income, etc. They then turned attention to economic growth. They wanted to know what a long term equilibrium would look like especially if such equilibrium would be subject to fluctuations and instability. The very strong intellectual effort that followed ignored the issue of sustainability of some very important inputs to economic growth. Markandya and Richardson (1992) further stated that as people became richer, they found that the supply of produced goods were becoming scarce (relatively), but their demand was rising constantly with increasing income. This pointed to a very important issue that economists have ignored which is Environmental protection. Aniagolu (2009) pointed out that the need for environmental protection has been recognized by many countries of the world. However, the problems are what should be protected? Who should protect? What should be paid to protect? And what methods should be adopted in protecting? Economists needed to answer these basic questions.

Markandya (1992) opined that economists at first believed that all was needed was to impose the right taxes and all would be well. But with the recent global attention on the environment and the climate change outcome, a new branch of environmental economics has emerged viz: Environmental Valuation. Ating (2014) asserts that Environmental valuation is simply a process of assessing the monetary values on environmental goods and services especially of those which have no easily known market prices. Following from the above definition Otegbulu (2011), pointed out that Environmental Valuation is based on the theory that individuals may be willing to pay some amount of money to improve or protect a given level of environmental quality or conversely to accept compensation for a decline in quality.

7.2 Basis of Valuation of Environmental Goods

According to the Royal Institution of Chartered Surveyors (RICS, 2008) a basis of valuation typically describes the nature of an assumed transaction, the relationship and motivation of the parties and the extent to which the asset is exposed to the market. Basis of valuation as such is the foundation, the pillar or the resting platform upon which a method of valuation rests. In Nigeria, the Nigerian Institution of Estate Surveyors and Valuers' (NIESV) Valuation Standards and Guidance Notes on Property Valuation (2006) in section 4.1 recognizes only two bases of valuation open market value and depreciated replacement cost of the property. Surprisingly, the valuation standards and guidance note did not make mention of environmental goods and services. However, Esara (2016) opined that for some goods and services, the market provides prices that are reliable reflections of the values society places on them but for other goods and services, the market prices do not exist or at most captures them partially. Consequently, the appropriate basis of valuing environmental resources is Total Economic Value (TEV). World Bank (1998) therefore concludes that the main idea behind TEV is that any environmental good or service comprises various attributes some of which are concrete and easily measured while others may be difficult to quantify. Otegbulu (2011) equally concludes that TEV is the sum total of these components and not just the value of those that can be measured. Hence Otegbulu (2011), summarised TEV under the following equation:

$$\begin{aligned} \text{TEV} &= \text{DUV} + \text{IUV} + \text{NUV} \\ \text{Where TEV} &= \text{Total Economic Value} \\ \text{DUV} &= \text{Direct Use Value} \\ \text{IUV} &= \text{Indirect Use Value and} \\ \text{NUV} &= \text{Non Use Value.} \end{aligned}$$

7.3 Methods of Valuing Environmental Resources:

According to Turpie et al (2010) there are three main groups of Environmental Valuation methods that are used to value environmental goods and services. Esara (2016) mentioned and further broke them down into the following:

- a. Market Value Approaches: These methods are best used when one can conveniently determine the value of environmental goods in the open market place. They include the following, Market approach, Production Function approach, Restoration Cost or Replacement Cost approach, Damage Cost Avoided and Defensive Expenditure approaches.
- b. Surrogate Market Approaches: Surrogate Market is a concept used in determining the value of environmental goods when one cannot directly estimate the market prices of those goods. Examples of methods that make use of surrogate markets are the Hedonic Pricing and the Travel Cost Methods.

- c. Simulated Market Approaches: This is a market that tests customers behavior when they are exposed to a simulated market situation to gauge the consumers reaction to a product, service or marketing mix variations. Under these approaches we can identify contingent valuation method, conjoint valuation methods and Benefits Transfer Method.

VIII. Data Presentation And Analysis

8.1 Presentation of Data on Environmental Valuation Models Used in Nigeria

8.1.1 Hedonic Price Method (HPM)

OECD (1989) opined that the hedonic price method to benefit estimation anticipates a market in which good or factors of production are bought and sold. They observed that environmental factors are frequently attributed to these goods and services. According to Markendya (1992) economists have long recognized that the value of a piece of land is related to the stream of benefits to be derived from that land. She observed that land is heterogeneous in nature, hence, different locations have different attributes and environmental conditions. Hence Earnhart (2001) asserts that HPM tries to value environmental attributes associated with housing locations by estimating consumer preferences for these attributes, ie. Linking trade-off between environmental attributes and housing prices. Markendya (1992) finally observed that with statistical techniques, the HPM to benefit estimation tries to (a) identify how differences in environmental condition of a location can affect property values in that area or put in another way, how much a property value differential may be due to a particular environmental difference between properties. (b) infer how much people are willing to pay for an improvement in environmental quality and what the social value of the improvement is. Breakshire, Thayer, Schalze and Darge (1982) felt that a multiple regression technique in which data involving properties describing variables, neighbourhood variables, accessibility variables and environmental variables could be used to identify the property price effect due to differences in pollution level. However, McConnel (1985) pointed out that HPM as described above may result in an over-estimation of benefits due to improvement or underestimation of the cost of deterioration. Harison, Mandeville and Stillman (2000) feels that the variables mentioned above are closely related and may result in data bias.

Again, OECD (1989) opined that “Ceteris Paribus” (all things being equal) as the pollution level between an area decreases property values within the area rises but at a declining rate. Figure one explains further.

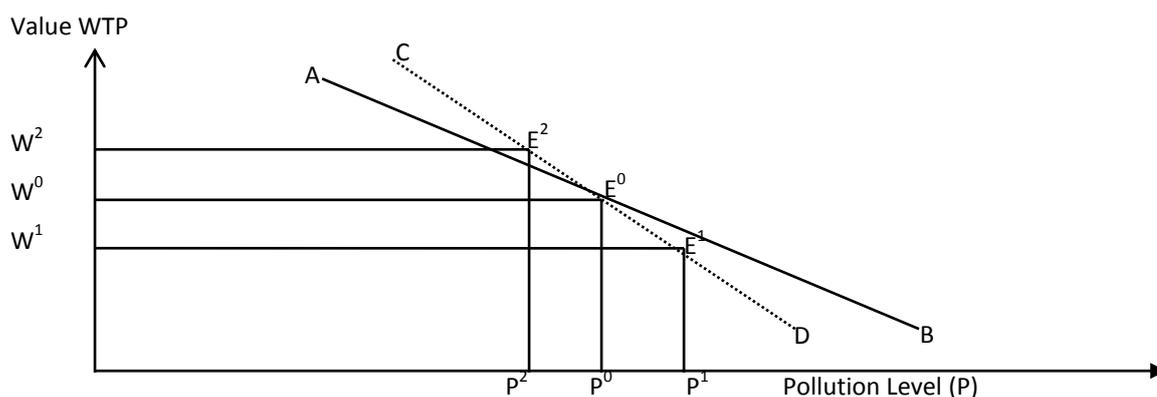


Fig. 1: Typical Relationship between Pollution and Property Values
Source: Markandya (1992)

AB is an individual or household demand for environmental quality. It shows that as the pollution level decreases, property values increases. Hence, for pollution level P^0 , the household willingness to pay for that unit of environmental quality is W^0 . But such willingness to pay is a point on the households demand curve and other such points are indicated by the broken line CD. Hence, E^0 is the equilibrium point. If pollution level increases to P^1 ceteris paribus the willingness to pay will move down to W^1 . Similarly, if pollution level decreases to P^2 , property values also increase to W^2 .

Horowitz (1985) however foresees some difficulties. First, sellers of properties receive bids in sequence and have to either accept or reject them. Hence, a property may not be sold to the highest bidder. This and other related features of the property market show that the choice of a buyer is faced with other uncertainties apart from pollution levels. Second, even when the property market works well, the problem of market segmentation creates mobility problem of moving from one market segment to another. Third, a more complicated problem arises when we come to understand that there are ways of mitigating the effect of environmental pollution other than by moving location. The use of filters, double glazing, etc are other

mitigation measures. Finally, lack of knowledge of health risks of certain forms of environmental pollution will inevitably lead to an under-estimation of social benefits of reducing pollution.

8.1.2 Contingent Valuation Method (CVM)

This method basically asks people what they are willing to pay for a benefit and/or what they are willing to receive by way of compensation to tolerate a cost (Aniagolu, 2009). Esara (2016) expanded this to include willingness to pay (WTP) to secure a benefit, willingness to accept (WTA) to forgo a benefit, willingness to pay (WTP) to prevent a loss and willingness to Accept (WTA) to tolerate a loss. Hence, in CVM, respondents are expected to make personal valuation of the environment by saying what is the maximum, they would be willing to pay for an environmental improvement or the minimum they would be willing to accept for a decline in environmental quality, if a market existed for the good in question.

According to Ating (2014) the CVM makes use of questionnaires to elicit valuations or bids from respondents, which are close to those that would have been reached if an actual market exists. Aniagolu (2009) pointed out that in designing a contingent Valuation Model, professionalism must be taken into consideration so that difficulties presented during design and implementation would be taken care of. Markandya (1992) enumerated three broad methods as follows: (a) simple questions in the questionnaire: what is your WTP or WTA? (b) the use of interacted procedure, where the interviewer starts with a given figure and asks the respondent whether the WTP is equal to or more or less than the figure (c) simple presentation of impact and WTP or WTA and the respondents are simply asked whether he or she is willing to pay that sum or willing to accept the sum. In other words, the respondents are expected to answer Yes or No.

Kramer *et al* (1994) and Taping (1998) warned about the biases encountered in the use of CVM as follows:

- a. Hypothetical Bias: is a potential bias in CVM that arises because CVM surveys seek to elicit hypothetical bids of goods, for which in many cases, actual markets exist.
- b. Strategic Bias: Is a potential bias in CVM that arises from respondents perceived payment obligation and his/her expectation about the provision of the good. It arises from individuals desire to influence the outcome of the study.
- c. Information Bias: This arises from the type and amount of information provided to respondents. In other words, these biases arise from the formal design rather than these arising from context of the actual choices involved. A good example is the starting point bias.
- d. Policy or Vehicle Bias: arises from the choice of the “vehicle” or instrument of payment used in the approach. Such “vehicle” includes changes in local taxes, entrance fees, surcharges on bills, etc.
- e. Operational Bias: May be described in terms of the extent to which the actual “operating condition” in the CVM approximates to actual market conditions. This has led researchers to suggest various “Reference Operating Conditions (ROC) which should be met.

8.1.3 Travel Cost Method (TCM):

Esara (2016) opined that the TCM of benefit estimation is based on an extension of the theory of consumer demand in which special attention is paid to value of time. According to Markandya (1992), this method is used for the valuation of recreational facilities, cultural sites, tourism developments and the valuation of benefits of fuel, wood supply. Navrund and Mungatana (1994) pointed out that time is valuable. Little wonder then that most businessmen would always say “Time is money”. Hence, McConnell (1992) stated that the underlying idea of this method is to use information on the amount of money and time that people have to spend in getting to recreational site to estimate their willingness to pay for facilities on that site.

Maille and Mendelson (1993) stated that the objective of TCM is to estimate the demand curve of each site and then value the increase in welfare as a result of improvements carried out on the site. These improvements are expected to result in a shift in the demand curve and perhaps in a change in price. Markandya (1992) is of the view that the price is not just measured in terms of what one has to pay to enter the site but also in terms of the time taken to get there and the cost of getting there. Nortton-Griffitts and Southey (1995) opined that the following will be needed in estimating the benefits accruing from the site when using TCM:

- a. Data on Travel Cost and Travel Time: The cost of visiting a site consist of the entry fee, transportation cost plus the opportunity cost of the time taken for the journey and the time spent at the site. In most studies this cost is (i) calculated using the actual wages or (ii) calculated using one third of the wages and (iii) calculated with the proportion of the wage left to be determine by the estimation procedure.
- b. Data on Household Characteristics: The main household variable that TCM includes in the analysis is income. This because economic theory suggests that as income increases, so does the willingness to pay for recreational facilities. Other variables include the age of the head of household, measure of education and some measures of the subjective strengths of preferences for the particular kind of recreation being offered.

- c. Data on Recreational Facilities: Such data include variables such as land area, shore miles, pool elevation and the number of multipurpose recreational area on the site. Specific data may include variables such as temperature, PH, dissolved oxygen, turbidity, climate, etc.
- d. Specification of the Demand Relationship: The effect of the facilities on the demand curve for services on a site is measured first by determining the number of visits to the site as a function of household characteristics only.

$$\begin{aligned} \text{Thus: } & V_i = a_0 + a_1 T_{ci} + a_2 INCI, \\ \text{Where: } & V_i = \text{The number of visits to site by respondents} \\ & T_{ci} = \text{The total travel cost of respondent "I" to the site} \\ & INCI = \text{The income of respondent I} \\ & a_0, a_1, \text{ and } a_2 = \text{Coefficients to be determined for each site} \end{aligned}$$

Second, the statistical issues involved in the estimation of TCM are complex and cannot be discussed in details without a prior understanding of econometric model such as Random Utility Models. However, the following points are worthy to be noted: first number of visits as well as length of visit should be determined. Ignoring the later would lead to biases. Second, for treatment of the number of visits, there should be continuous variable specification and discrete variable specification. Finally, in any data set where we have information on the number of respondents who actually visited the site, it is necessary that we get corresponding information on those who have not visited the site, failure to do these results in biases too.

8.2 Strengths of the Valuation Model:

8.2.1 Strengths of the Hedonic Price Method:

Riethergen-Mchaken (2000) pointed out that one major advantage of HPM is that it has potential for high income in urban and semi urban areas. However, VanZyl, Store and Lieman (2000) listed the following advantages of HPM:

- (i) HPM can help identify distortions that have been created in the property market
- (ii) The inclusion of environmental variables to measure environmental quality to improve the analysis
- (iii) HPM is relatively straight forward
- (iv) HPM is able to accurately predict the value of a property using regression analysis based on the particular characteristic of the asset.
- (v) Finally, the method has the potential to estimate the value of visual amenities and other qualities of natural landscape that might be present in the environment.

8.2.2 Strengths of the Contingent Valuation Method:

Again, Riethergen-McCracker (2000) discussed the advantages of CVM as follow:

- (i) The method is most reliable if strict procedures are followed and pretesting is carried out.
- (ii) CVM is the only method available to a researcher who is looking for non-use values.
- (iii) CVM figures usually includes consumer surplus.
- (iv) CVM gives net values, hence there is no need to deduct cost
- (v) CVM is best used to quantify environmental benefits that have no market and whose value simultaneously incorporates multiple components.
- (vi) CVM focuses on ex ante valuation.
- (vii) CVM involves direct estimation of willingness to pay and willingness to accept.
- (viii) CVM allows for valuation of a variety of different environmental goods.

8.2.3 Strengths of Travel Cost Method (TCM):

VanZyl *et al* (2000) enumerated the advantages of TCM as follows:

- (i) TCM closely mimics the more conventional empirical techniques used by economists to estimate economic values based on market prices.
- (ii) TCM is based on actual behavior – ie what people actually do rather than stated willingness to pay – ie what people say they would do in a hypothetical situation.
- (iii) TCM is relatively inexpensive to apply
- (iv) TCM makes use of on-site surveys hence it provides opportunity for large number of people to pick interest and participate.
- (v) TCM results are relatively very easy to interpret and explain.

8.3 Weaknesses of the Valuation Models

8.3.1 Weaknesses of the Hedonic Price Method (HPM)

Abelson (1995) analyzed the weaknesses of HPM as follows:

- (i) HPM relies on highly developed property market which is non-existent in developing countries of the world.
- (ii) Isolating the explanatory variables used in HPM is usually very difficult.
- (iii) Variables used in the analysis should be reflective of sociological and cultural circumstances.
- (iv) A broad spectrum of variables should be included in the analysis to improve accuracy and comprehensiveness of the method.
- (v) Special treatment must be given to unusual circumstances that affect the property market in developing countries such as military dictatorship.
- (vi) HPM requires more data about the environmental resources and these are not usually available.
- (vii) Finally, HPM application requires that the environmental resources values should be reflected in surrogate markets.

8.3.2 Weaknesses of Contingent Valuation Method (CVM)

Some of these weaknesses of the CVM include:

- (i) People find it difficult to separate environmental values from wider values. This is referred to as embedding problem.
- (ii) CVM has quite a number of biases such as starting point strategic hypothetical, information, policy or vehicle and operational biases
- (iii) CVM also has credibility problems
- (iv) Low income or standard of living is a very big constraint on WTP or WTA
- (v) CVM equally has ethical issues especially in developing countries
- (vi) Finally, there is the controversy over whether people would actually pay the amounts as stated in interviews.

8.3.3 Weaknesses of Travel Cost Method (TCM):

Also VanZyl *et al* (2000) enumerated the weaknesses of TCM as follows:

- (i) TCM assumes that people perceive and respond to changes in travelling, the same way they would respond to changes in gate fees and admission charges / prices.
- (ii) Most simple models of TCM assume that individuals take a trip for a single purpose – to visit a specific recreational site. Thus if a trip has more than one purpose, the value of the site may be over-estimated: it may be difficult to apportion the travel cost among the various purposes.
- (iii) Defining and measuring the opportunity cost of time or the value of time spent travelling may be problematic. This is because the time spent travelling could have been used in other ways without an opportunity cost. This should be added to the travel cost or the value the site could be under estimated. However, there is no strong consensus on the appropriate measure of individual persons wage rate, or some fraction of the wage rate and the value chosen can have a large effect on benefit estimates. In addition, if people enjoy travel itself and travel becomes a benefit, not a cost, then the value of the site will be over-estimated.
- (iv) In TCM, the availability of substitute sites will affect values. For example, if two people travel to sites of the same distance, they are assumed to have the same value. However, if one person has several substitutes, but travels to this site because it is preferred, this person's value is actually higher. Some of the more complicated models do not account for availability of substitutes.
- (v) In TCM, those who value certain sites may choose to live nearby the site. If this is the case, they will have very low travel cost/time but high values for the site that are not captured by the method.
- (vi) Interviewing visitors on site can introduces biases to the analysis
- (vii) Finally, standard travel cost approaches provide information about current conditions, but no information on gains or losses from anticipated changes in resource condition.

IX. Recommendations

This work has discussed the three important environmental valuation models that are used in Nigeria to value environmental goods and services namely the HPM, the CVM and the TCM models. In order to develop, popularize and maintain a sustainable use of these models, the following recommendations are put forward: first, these models should be accepted by the Nigerian Institution of Estate Surveyors and Valuers (NIESV), the Estate Surveyors and Valuers Registration Board of Nigeria (ESVARBON) and Environmental Management Association of Nigeria (EMAN). These are professional bodies in Nigeria that are saddled with the responsibility of determining the value of environmental goods and services. Second, these models should be taught in all tertiary institutions in Nigeria that offers courses in Estate Surveying and Valuation & Environmental Management. The curriculum of such institution should be adjusted to include Environmental Valuation and by implication HPM, CVM and TCM. Third, further research should be carried out on the

implementation / application of HPM, CVM and TCM in Nigeria in particular and Africa in general so that the models could be adapted to local situations in undeveloped countries of the world. Fourth, governments at Federal, State and Local levels should enact laws to ensure that these models are implemented at all levels to avoid either over valuation or under valuation of environmental goods and services. Finally, the ministry of environment at all levels should equally ensure that practitioners in Nigeria must not value environmental goods and services with economic models that are based on demand and supply of goods alone but should ensure that HPM, CVM and TCM are properly adapted by these practitioners.

X. Conclusion

The world has recently understood the interplay between planned development and environmental degradation. With the recent world focus on environmental issues of global warming, ozone layer depletion and the effect of greenhouse gases have become a very challenging concern to the extent that stakeholders have seen environmental valuation as a very important tool for valuing environmental goods and services. In the face of contentious issues such as time, cost, budget, research, laws etc. one may be tempted to abandon environmental valuation but when it is understood that environmental valuation is not inimical to development, it is only then that environmental valuation can be seen as a corrective strategy against wrong and unsustainable development. Environmental valuation should therefore be embraced by practitioners if man and nature must continue to co-exist in this world.

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