PUBLIC PERCEPTION AND WILLINGNESS TO PAY FOR URBAN VEGETATION RESTORATION AND MANAGEMENT IN ABEOKUTA, OGUN STATE

Shittu A. M., Kehinde M. O., and Dare A M.

Department of Agricultural Economics and Farm Management,
Federal University of Agriculture, Abeokuta,
P.M.B. 2240, Abeokuta, Ogun State, Nigeria
mojisolaolanike@gmail.com;
+2348032364137

ABSTRACT

The study assesses perception and willingness to pay (WTP) for urban vegetation restoration and management in Ibara housing estate and its surrounding areas in Abeokuta, Ogun State. A total number of 120 respondents were selected through a systematic random sampling technique. Descriptive statistics was used to describe the socio-economic characteristics of the respondents; WTP was assessed by contingent valuation method while influence of various factors on the urban dwellers' WTP was analysed within the framework of a generalised Double Hurdle model that nest the Tobit. Mean WTP for the management plan of the urban vegetation restoration is ₦375.83. Perception results showed that majority (94.0%) of the respondents-perceived trees to provide shades while about 59.2% and 44.0% perceived as herbs and means of reducing pollution. Regression results revealed that the likelihood of supporting urban vegetation restoration was higher among female-headed households but declined with household size. WTP rose with income, declined with increase in formal education and in early years, but rose significantly in later years. Similarly, WTP was significantly lower among traders than civil servants but was significantly higher among people in profession practice & services. This study, therefore concludes that participation and willingness to pay for urban vegetation restoration and management in the study area were influenced by various socio-economics factors.

Keywords: Perception, Urban Vegetation Restoration, Willingness to pay, Double Hurdle Model, Nigeria

INTRODUCTION

Forest Ecosystems play crucial role in the sustenance of a long and healthy life as well as clean environment. Forests play crucial role in sequestering carbon from the atmosphere, hence, help to remove greenhouse gases (GHGs) from the atmosphere thereby checking global warming (IUCN, 2008). Other ecosystem services provided by forest include climate and water cycle regulation, formation of soil, recycling of nutrients, photosynthesis and pollination of plant.

Generally, about 1.6 billion people depend on forest products as their means of livelihood which generate food and cash for the populace (FAO, 2015). Besides, many

developing countries rely on fuel wood to make available up to 90% energy requirements (FAO, 2011). The role of forest in carbon sequestration as well as in rendering other ecological services makes it prominent resource that cannot be underrated. A nation endowed with large and various kind of forest resources has great advantages with respect to economic development when such resources are abundantly available (FAO, 2011).

Therefore, development in Nigeria depends on having a clear understanding as to the nature of the forest itself with respect to how it can be managed and harvested in a sustainable manner (Oriola, 2009). This is crucial because people, most especially rural dwellers from the time immemorial treat forest as inexhaustible (Ladipo, 2010) but recently everyone now realized that forest is at the verge of going out of existence if nothing is done to curb the unsustainable use.

Besides, there are growing evidences all over the World of massive deforestation and forest degradation, leading to drastic loss of forest ecosystem benefits. Globally, an estimated 6.8 million hectares of forest cover were lost annually between 1990 and 2010; of which 3.7 million hectares were lost in Africa (FAO, 2011). Associated with this massive deforestation is loss of income and livelihood opportunities as well as the attendant global warming that results from emission of GHGs. Deforestation and decomposition of biomass left after logging was reported to accounts for about 17% of global GHG (Kissinger, 2016; IPCC, 2007), and loss of biodiversity (IUCN, 2008). Other notable consequence of deforestation and forest degradation is the emergence of urban heat islands: a situation in which air temperatures is higher in the urban areas than their rural environs, causing heat-related illnesses, mortality, and poor water quality, among others (Rajagopalan *et al*., 2014; EPA, 2011).

In Nigeria, Ogun State in particular, deforestation and forest degradation pose a serious problem, with forest loss occurring at a rate of 3.3% per year over the past three decades (Chakravarty *et al*., 2012). Between 1990 and 2005, the country was reported to have lost over 6 million ha or 36% of its forest cover (Chakravarty *et al*., 2012). These figures give Nigeria the highest deforestation rate in the world, with the problem closely linked to an excessive reliance on a slash and burn farming system and increased forest products harvesting for fuelwood as well as other timber and non-timber forest products. Unfortunately, unsustainable harvesting of the timber and non-timber forest products is the leading cause of deforestation and forest degradation. The solution, therefore seems to be in providing incentives for private land owners to embrace reforestation and forest conservation while promoting a paradigm shift from the slash and burn systems to other environmentally friendly farming systems like Agro-forestry.

Compounding the problem is the fact that most environmental services of forests are enjoyed without people being conscious of the benefits. Moreover, most forest ecosystem services such as uncontaminated air and water, ecotourism, healthy wildlife populations are public goods, they are not traded in markets and are also difficult to value. Hence, forests are most commonly associated with, and valued based on, the tangible goods (timber, food, fibre, fuel,

herbs, games and other non-timber forest products (NTFPs) they provide (IUCN, 2008). As it is evident from the foregoing, there is need to promote "wise use" of existing stock of forest resources which involves sustainable use for the benefit of humanity in such a way that is consistent with the upkeep of the natural properties of the ecosystem and require an understanding of the total economic value, and promoting increased knowledge of full range of ecosystem benefits provided by forest ecosystems (Hale and Butcher, 2011). Likewise, aggressive reforestation programmes, promoting agro-forestry in rural areas and tree planting cum urban vegetation management in the cities is of utmost importance.

Non-market valuation is a valuation method used to value environmental goods and services (Nuva *et al*., 2009). This method identifies and calculates the monetary value of all economic benefits that a society derives from environmental resources (Pascual *et al*., 2012).

Consequently, the total benefit derived from a public good is the addition of the benefits derivable to consumers of the public goods. Thus, the benefits derived by an individual are commonly assessed using Contingent Valuation (CV) method –which is used for estimating the value of non-market goods. This method aims to construct a hypothetical market for a commodity in a survey setting and thereafter generate the Willingness to Pay (WTP) or Willingness to Accept (WTA) for the respondents in the study location.

This study, therefore, attempt to assess public perceptions of urban vegetation in the study area, quantify the value attached to a proposed community-based tree planting by respondents through their WTP for their management (i.e., maintenance of trees to ensure they perform the required ecological functions better) and lastly examined the influence of various factors on the urban dwellers willingness to pay.

MATERIALS AND METHODS

Theoretical Framework

Ecosystem services are public goods and vital to the support of life, but there are no relevant markets where these values are expressed Tao (2012). Even where prices exist for environmental goods and services that have a direct use value, some people may be willing to pay more than this price (say, for access to clean water). In both cases, there is a gap between value that is expressed by WTP and price. Because of the public attributes, a non-market valuation method is required when estimating their non-use values to avoid a situation where every user or consumer exploit a shared resource by depleting it to the extent that demand overwhelms the supply, thus making the resource not available to some or all the users. This situation is commonly known as the tragedy of the commons.

Previous literatures (Baker and Ruting, 2014; Riera, *et al*., 2012; Kjaer, 2005) classified non-market valuation methods into two groups –revealed and stated preference methods. The former is represented by the travel cost method and the hedonic pricing method, which has been mainly useful to the observation of preferences revealed by actual market behaviour and also represents real-world evidence on the choices that

individuals exercise. On the other hand, Stated Preference (SP) methods consist of two main categories –choice experiment and Contingent Valuation Method (CVM). These are commonly used to value non-market sources and services, and also used to estimate the total ecosystem services value Zhang *et al*., (2003). This characteristic has extensive potential as it implies that SP can be used to value hypothetical but realistic goods and interventions (Kjaer, 2005). Irreplaceable merits inherited from CVM studies showed that it doesn't require an explicit linkage between the economic market price and non-market goods. Consequently, researchers can discover the maximum willingness to pay of respondents for improve environmental quality and conservation of natural resources which can indirectly reflect the values placed on the resources (Tao, 2012).

Valuation of non-market goods using contingent valuation have been widely demonstrated. The study of Tilahun *et al*., (2011) which focus on contingent valuation analysis of rural households' WTP for frankincense forest conservation. They used discrete choice contingent valuation method to assess the factors influencing rural households' WTP and willingness to contribute labour (WTCL) for *Boswellia papyrifera* forest (BPF) conservation in Ethiopia. The standard probit, bivariate probit and interval data models were used for modelling respondents' WTP and WTCL. Their key findings suggest that household income was the most important factor affecting WTP while number of household labour was the most important factor affecting WTCL. They estimated mean lower bound annual WTP of US$ 4.68 and WTCL of 7.03 days per household.

Closely related to this is the study of Yacob *et al*., (2009) which applied dichotomous choice survey design-contingent valuation method (CVM) to investigate the WTP of the visitors for ecotourism resources in two selected marine parks in Peninsular Malaysia. Their main objective was to estimate the value of ecotourism resources by using environmental economic tools which focuses on contingent valuation method of WTP. They estimated the visitor's WTP responses for conservation the marine parks for ecotourism within the framework of logit and probit regression. The results showed that in Pulau Redang visitors WTP for conservation were about RM7.8 and RM10.6 per year for local and international visitors while in Pulau Payar, the local and international visitors WTP were about RM7.30 and RM8 respectively.

METHODOLOGY

This study was conducted in Ibara housing estate and its surrounding areas in Abeokuta, Ogun state. Abeokuta – the state capital of Ogun state in southwest Nigeria is located on the east bank of the Ogun river near a group of rocky outcrops in a wooded savannah; 77 km north of Lagos by railway. According to National Population Commission of Nigeria (2006), Abeokuta had a population of 449,088 which is approximately half a million. The main occupations of the residents are civil servants, private sector employees and traders. Abeokuta is also blessed with Olumo rock, an ancient monument which is a home to several caves

and shrines. It serves as tourist centre for both young and old coming from far and near.

Ibara housing estate is a Government Reserved Area where the inhabitants are mostly elites, because of the nature of the residents, they place high value on environmental benefits of trees. Ibara housing estate being one of the oldest in Abeokuta was selected using a purposive sampling technique. The estate is surrounded with trees such as Gmelina and Neem which make the environment calm and untroubled as well as giving it a fresh fragrance. Primary data were collected using questionnaire which was administered on residents and also those who obtain their livelihood within the area. A total number of 120 respondents were selected through systematic random sampling technique and all of them were receptive.

Analytical Technique

Descriptive statistics was used to describe the socio-economic characteristics of respondents; WTP was assessed by contingent valuation method while influence of various factors on the urban dwellers' WTP was analysed within the framework of a generalised Double Hurdle model that nest the Tobit.

Specification of Generalized Double Hurdle Model

Cragg (1971) developed two tier-model (general double -hurdle model) which nests the usual Tobit model. Unlike the Tobit model, the decision to acquire and how much to acquire if acquisition occurs are determined by different vectors of parameters. Double hurdle model assumes that a consumer makes two decisions with respect to purchasing an item. It means that a consumer has to overcome two hurdles before recording positive expenditure or purchased is realized after two hurdles are cleared (Yimer, 2011; Newman *et al*., 2003). The first hurdle involves the decision of whether or not to purchase the item (participation decision). The second hurdle concerns the level of consumption the consumer chooses (consumption decision). Thus, each decision process requires two different latent variables: A Probit model to determine participation and a Tobit model to determine the expenditure level (Crowley *et al*., 2012; Yimer, 2011; Blundell and Meghir, 1987). According to Wooldridge (2002), the participation and expenditure equation are written respectively as:

$$y_{1i}^{*} = X_{1i}\beta_1 + u_{1i}$$

$$y_{2i}^{*} = X_{2i}\beta_2 + u_{2i}$$

Where:

y_1^* is a latent variable associated with whether or not a household is willing to make financial contribution towards the urban vegetation management plan y_1 .

$y_1 = 1$ if $y_{1i}^{*} > 0$, and $y_1 = 0$ if otherwise.

y_2^* is a latent variable associated with the WTP value offered by the household y_2 . The actual WTP offered, $y_2 = y_1^*$ if $y_1^* > 0$ and $y_2^* > 0$; otherwise $y_2 = 0$.

X_j is the vector of explanatory variables hypothesized as the determinants of the WTP decision embodied in the j^{th} equation $j = 1, 2$.

u_1 , u_2 are stochastic residuals assumed to be $BVN\ 0, \Sigma$.

$$\Sigma = \begin{bmatrix} \sigma_1^2 & \sigma_{12} \\ \sigma_{21} & \sigma_2^2 \end{bmatrix}$$

$$= \begin{bmatrix} \sigma_1^2 & \frac{\sigma_{12}}{\sigma_1\sigma_2}\sigma_1\sigma_2 \\ \frac{\sigma_{21}}{\sigma_1\sigma_2}\sigma_1\sigma_2 & \sigma_2^2 \end{bmatrix}$$

$$= \begin{bmatrix} 1 & \rho\sigma \\ \rho\sigma & \sigma^2 \end{bmatrix}$$

The model reduce to a Tobit if all respondents are willing to pay $y_1 = 1$, and a zero offer $y_2 = 0$ is allowed.Heckman (1979) model is established if it is assumed that all cases of $y_2 = 0$, are respondents that place no value on urban vegetation i.e., if $y_1^* > 0$, then $y_2^* > 0$.Cragg(1971)Independent Double Hurdle (CIDH) is the case if Heckman assumption is relaxed, but $\rho = 0$ is assumed.

RESULTS AND DISCUSSIONS

Socio-economic Characteristics

Table 1 presents the socio-economic characteristics of the respondents. The average will pay is 0.8333, depicting that larger percentage of the respondents indicated to pay certain amount through the iterative bidding process. The mean WTP of the respondents is thus ₦375.83, which tells how much of all other goods and services the respondents are willing to give up to embrace the management plan of the urban vegetation restoration. At an average, the income of the respondents is ₦51,667, this indicates they have high level of income which might inform the reason for their positive WTP for management plan of the afforestation.

The average age of the respondents in the study area is 39 years, hence showing that most of the respondents belong to the active working age group. Table 1 also reveals that majority of the respondents are male with an average of 0.7333. The household size is at an average of four in the study area indicating that majority of them have a small family size. The average year of schooling is 12years suggesting that most of the respondents have at least secondary education and they are likely to be aware of the environmental benefits of trees.

Table 1: Descriptive Statistics

Variable	Mean	Standard Deviation
Will Pay	0.8833	0.3224
WTP	375.83	316.16
Income ₦/month	51667	50741
Age (Years)	38.750	12.159
Gender Dummy Female =1	0.2667	0.4441
Year of Schooling	12.700	4.5032
Household Size (number)	4.6333	2.0901
Artisan	0.2000	0.4017
Trader/Business	0.1833	0.3886
Other Occupation	0.2167	0.4137

Source: Data Analysis, 2014

Respondents' Maximum WTP for Management of Trees

Table 2 revealed that 88.3% of the respondents were willing to pay for monthly management of trees. The respondents were offered amount ranging from a maximum of above ₦500.00 to a minimum of below ₦100.00. Though, the mean WTP for management of trees was ₦365.69 thus implying high level of respondents' commitment to urban trees management.

Table 2: Maximum Willingness to Pay

Max WTP	Number of Respondents	Percent
Zero	14	11.7
Below 100	4	3.3
101 – 200	28	23.3
201 – 300	10	8.3
301 – 400	18	15.0
401 – 500	32	26.7
Above 500	14	11.7
Total	**120**	**100.0**

Source: Data Analysis, 2014

Respondents Perception towards the Services of Trees and Afforestation

Table 3 reports the results of the perceptions of the respondents on the perceived ecosystem service functions of urban vegetation restoration and management in Abeokuta. The results revealed that all the respondents (100%) were aware of the ecosystem service functions of trees in the study area. It was also discovered from the result that 94% of the respondents perceived trees as a means of providing shades while 67.5% see trees as a source of cool breeze, hence this informed the availability of fresh air in the locality. On the other hand, some (65.0%) of the respondents perceived trees as method of beautifying the environment while 40.3% of the respondents perceived those trees to support recreation and tourism activities.

Table 3: Perception of Urban Forest Benefits

Description	Yes %
Awareness	100
Recognized benefits	
Provision of Shades	94.2
Provision of cool breeze	67.5
Beautify environment	65.0
Supply of Herbs	59.2
Purify the air/reduce pollution	43.7
Support of Recreation and Tourism	40.3
Serve as Wind Breaks	33.7
Support Urban Vegetation	**93.3**
Willing to Pay Some Amount	**88.3**

Source: Data Analysis, 2014

Moreover, about 44% of the respondents perceived trees to reduce environmental pollution, 34% perceived them as wind breaks while 59% of the respondents perceived trees as a good supply of herbs. All these imply that trees are of immense benefits to the urban dwellers in the study area.

Likewise, majority of the respondents (93.3%) are of the opinion that urban vegetation (afforestation) is germane in order for the residents to be continual beneficiaries of the accrue recognized benefits. In addition, about 88.3% of the respondents are willing to pay some amount for the management plan of afforestation, therefore showing the economic value and the extent they are willing to go to embrace urban vegetation restoration (afforestation).

Influence of Various Factors on the Urban Dwellers Willingness to Pay

The generalized Double Hurdle model was used to assess the influence of various factors on respondents WTP for urban vegetation restoration and management which is shown in Table 4. The explanatory variables that were significant are gender dummy include household size under participation while income (₦/month), age, age squared, education, trader/business and other occupation were significant under willingness to pay.

The coefficient of gender dummy was positive and significant at 5% while that of household size was negative and significant at 1% respectively. The coefficients of income, age squared, and other occupation were positive and significant at 1%, 5% and 10% respectively. However, the coefficients of age, education, and trader were negative and significant at both 1% and 5% respectively. Participation and WTP decisions are separate i.e., influenced by a different set of variables but dependent.

Table 4: Regression Result Showing the Influence of Various Factors on Respondents WTP

Description	Participation		Willingness to Pay	
	Parameter	t-value	Parameter	t-value
Constant	1.357	4.72***	1067.661	4.82***
Income (₦/month)	0.00000034	0.57	0.0047	10.29***
Age (years)	-0.012	-0.93	-29.948	-3.01***
Age square	0.00008	0.59	0.2535	2.44**
Gender Dummy (Female = 1)	0.1321	2.04**	25.4572	0.51
Education (Schooling Years)	0.0067	0.97	-11.038	-2.07**
Household size	-0.049	-2.93***	-12.354	-0.96
Artisan	-0.0899	-1.074	32.2062	0.52
Trader/Business	0.122	-1.58	-173.6408	
Other Occupation	-0.0472	-0.58	108.5046	1.72*

Source: Data Analysis, 2014

***, **, * Statistical significance at 1%, 5% and 10% respectively

Participation result in Table 4 shows that female-headed households were likely to cross the first hurdle as the probability of supporting urban vegetation restoration was higher among female-headed households when compared to their male counterparts. This may be because women value the environmental benefits that accrued from urban vegetation restoration than men. However, households with fewer members enhanced significantly participation in urban vegetation restoration, this can be attributed to the fact that smaller household size reduces the family responsibility, thus, this suggests that family planning policies that will have an impact in reducing household size will increase the probability of a household participating in urban vegetation restoration.

As expected, WTP rose with income signifying that an increase in household income, *ceteris paribus* implies increased WTP for urban vegetation restoration, thus combating deforestation in the study area. Households are therefore encouraged to engage in multiple livelihood activities which will provide streams of income to enhance their WTP.

Ironically WTP declined with an increase in formal education, this might be attributed to the fact that most educated people believe in the flooring pattern that does not give room for anything green in their vicinity. They claimed that having trees in their surroundings litter the environs with leaves dropping as well as promoting the presence of snakes and other harmful organisms, therefore, they prefer to use interlocking tiles or get everywhere plastered with cement. This study thus suggests that symposium with respect to restoring vegetation in urban areas should be organized by both government and non-governmental organization in schools, markets, ministries, and on media to arouse the interest of the populace.

Similarly, WTP also tends to decline in early years, but rose significantly in later years, this implies that the urban vegetation restoration is less valued by the youth this may be because of their tight schedule in ensuring that they get ends meet but as they grow older more value was placed on the vegetation restoration in the urban area, this might be because of the experience they have gathered over time in relation to the urban forest benefits. Again, WTP was significantly lower among traders than civil servants because urban vegetation restoration does not provide any economic benefits which they were interested in, they must have calculated what they stand to gain hence, the reason for their low WTP but it was significantly higher among people in profession practice and services.

CONCLUSIONS AND RECOMMENDATIONS

This study shows that all the sampled urban households were aware of all the ecosystem services that the tree provides and their disposition tends towards paying for their management. This study found out that urban forest is mostly associated with the provision of shades, cool breeze and herbs provision, air purification, tourism as well as wind-breaks.

This study therefore, recommends that

- Family planning policies that will have an impact in reducing household size will increase the probability of a

household participating in urban vegetation restoration.

- Urban households are encouraged to engage in multiple livelihood activities to provide streams of income that will enhance their willingness to pay for vegetation restoration.
- Priority should be given to the organisation of symposium vis-a-vis restoration of vegetation in urban areas by both government and non-governmental organizations in government parastatals, schools, markets, and on media to arouse the interest of the populace.

REFERENCES

Baker, R. and Ruting, B. (2014). Environmental Policy Analysis: A Guide to Non-Market Valuation. Productivity Commission Staff Working Paper, Canberra.

Blundell, R., and Meghir, C. (1987). Bivariate Alternatives to the Tobit Model. *Journal of Econometrics* 34:179-200.

Chakravarty, S., Ghosh, S. K., Suresh, C. P., Dey, A. N., and Shukla, G. (2012). Deforestation: Causes, Effects and Control Strategies, Global Perspectives on Sustainable Forest Management. Clement A. Okia (Ed.), ISBN: 978-953-51-0569-5, InTech, Available from: http://www.intechopen.com/books/globalperspectives-on-sustainable-forest management/deforestation-causes-effects-and-control-strategies

Cragg, J. (1971). Some Statistical Models for Limited Dependent Variables with Application to the Demand for Durable Goods. *Econometrics* 39: 829-844.

Crowley, F., Eakins, J., Jordan, D. (2012). Participation, Expenditure and Regressivity in the Irish Lottery: Evidence from Irish Household Budget Survey 2004-0. *Economic and Social Review*, 43(2):199-225. http://www.esr.ie/vol43_2/ESRTOC 43_2.htm

EPA, A. (2011). Inventory of US greenhouse gas emissions and sinks: 1990-2009. US Environmental Protection Agency, Washington, DC.

FAO. 2015. Forests and poverty reduction. Available online at: www.fao.org/forestry/livelihoods/en/ Rome, Italy.

FAO. (2011).Reforming Forest Tenure: Issues, Principles and Process. *FAO Forestry Paper*, pp. 144. Rome, Italy

Hale, J. and Butcher, R. (2011). Ecological Character Description for the Barmah Forest Ramsar Site. Report to the Department of Sustainability, Environment, Water, Population and Communities, Canberra (DSEWPaC).

IPCC (2007). Fourth Assessment Report, Climate Change. Synthesis Report: Summary for Policymakers. Intergovernmental Panel for Climate Change. Geneva, Switzerland. 5pp

IUCN (2008). Private-Public Partnerships can achieve Sustainable and Equitable Development. Available online at:

(http://cmsdata.iucn.org.public_partnership.pdf).

Kissinger, G. (2016). The Link Between Reducing Deforestation and Forest Degradation and Biodiversity Conservation. Prepared by Lexeme Consulting for WWF Norway.

Kjær, T. (2005). A Review of the Discrete Choice Experiment-with emphasis on its application in health care. Denmark: Syddansk Universitet.

Ladipo, D. 2010. The state of Nigeria's forests. Available at: http:/ /adreview.org/2010/04/the state-of-Nigeria's forest.

National Population Commission. (2006). NPC (2006). Federal Republic of Nigeria Official Gazette, 96(2).

Newman, C., Henchion, M., and Matthews, A. (2003). A double-hurdle model of Irish household expenditure on prepared meals. *Applied Economics 35*(9):1053-1061.

Nuva, R., Shamsudin, M.N., Radam, A., and Shuid, A. (2009). Willingness to Pay towards the Conservation of Ecotourism Resources at Gunung Gede Pangrango National Park, West Java, Indonesia. *Journal of Sustainable Development* 2 (2):173-186.

Pascual, U., Muradian, R., Brander, L., Gómez-Baggethun, E., Martín-López, B., Verma, M., Armsworth, P., Christie, M., Cornelissen, H., Eppink, F., Farley, J., Loomis, J., Pearson, L., Perrings, C., Polasky, S., McNeely, J.A., Norgaard, R., Siddiqui, R., David Simpson, R., Kerry Turner, R. and Simpson, R.D. (2012). The economics of valuing ecosystem services and biodiversity. In The Economics of Ecosystems and Biodiversity: Ecological and Economic Foundations (pp. 183-256). Taylor and Francis. DOI: 10.4324/9781849775489.

Oriola, E. O. (2009). Forestry for Sustainable Development in Nigeria. *International Journal of African Studies* Issue 1:11-16.

Rajagopalan, P., Lim, K. C., and Jamei, E. (2014). Urban heat island and wind flow characteristics of a tropical city. *Solar Energ*,107:159–170.

Riera, P., Signorello, G., Thiene, M., Mahieu, P., Navrud, S., Kaval, P., Rulleau, B., Mavsar, R., Madureira, L., Meyerhoff, J., Elsasser, P., Notaro, S., De Salvo, M., Giergiczny, M., andDragoi, S., (2012). Non –market Valuation of Forest Goods and Services: Good Practice Guidelines. *Journal of forest economics* 18(4):259-270.

Tao, Z., Yan, H., and Zhan, J. (2012). Economic Valuation of Forest Ecosystem Services in Heshui Watershed using Contingent Valuation Method. The 18th Biennial Conference of International Society for Ecological Modelling. *Procedia Environmental Sciences* 13:2445-2450

Tilahun, M., Mathijs, E., Muys, B., Vranken, L., Deckers, J., Gebregziabher1, K., Gebrehiwot, K., and Bauer, H. (2011). Contingent Valuation Analysis of Rural Households' Willingness to Pay for Frankincense

Forest Conservation. Paper prepared for presentation at the EAAE 2011 Congress Change and Uncertainty Challenges for Agriculture, Food and Natural Resources.

Wooldridge, J.M. (2002). Econometric Analysis of Cross Section and Panel Data. The MIT Press Cambridge, Massachusetts London, England.

Yacob, M.R., Radam, A., and Shuib, A. (2009). A contingent valuation study of marine parks ecotourism: The case of Pulau Payar and Pulau Redang in Malaysia. *Journal of Sustainable Development* 2(2): 95.

Yimer, S. (2011). Determinants of Food Consumption Expenditure in Ethiopia. *International Journal of Economic Resources* 2 (5):151-165.

Zhang, Z., Xu, Z., and Cheng, G. (2003). The Updated Development and Application of Contingent Valuation Method (CVM). *Journal of Advances in Earth Science* 18(3): 454-463.