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Contingent Valuation Analysis of Households' Willingness to Pay for Environmental Safety in Ogbomoso North and South Local Government Areas of Oyo State, Nigeria

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ABSTRACT Urbanization is changing the nature and severity of environmental problems in some Nigeria's emerging cities. This paper analysed the factors influencing willingness to pay for some environmental problems and estimated the mean willingness to pay in Ogbomoso North and South Local Government Areas of Oyo state. Data were collected with structured questionnaires administered to 140 randomly selected households. Descriptive and inferential statistics were used for data analysis. The results show that average willingness to pay per household per month were ₦1000.6, ₦260.8, ₦626 and ₦299.1 for air-related, human-habitat-related, water-related and land-related environmental problems, respectively. It was recommended that policy instruments to increase people's income will accelerate eradication of urban environmental problems. Also, environmental education can be disseminated through market women and other functional unions in the form of talk-shop, workshop and lectures.

INTRODUCTION

Environmental problems have not just received attentions from international communities; they have been subjects of concern to policy makers in many developing countries since the past few decades (Millennium Ecosystem Assessment 2005). In Nigeria, environmental challenges arising from the process of urbanization emanated from the technologies and institutional changes that are necessary for a successful transformation of the economy from a largely agrarian rural setting to a civilized one (Mabogunje 1968; Lanrewaju 2012). No doubt, incessant pressure on the environment from externalities that result from domestic and industrial pollutants constitute serious constraints to environmental conservation and sustainable development. Therefore, harmonization of the goal of environmental conservation in line with the drives for economic transformation through public policy enforcement and regulatory activities is a *sine qua non* for ensuring perfect stability of the fragile ecosystems (Millennium Ecosystem Assessment 2005).

The environment is a global concept which is generally seen as the conditioning circumstances and influences affecting the development of an organism or group of organisms. Man is divinely mandated to interact with his environment in order to satisfy his needs of food, shelter, and clothing. At the beginning, man's activities were limited by what the environment could offer; that is, the environment was dictating what man can do. But as population pressure increases, man has seen the need to exact his use of environmental resources beyond the capacity that environment can conveniently accommodate. Due to persistence of environmental degradation and pollution associated with activities of man, it is now emphasized that adequate consideration of the fragility of environmental resources is a necessary step for man to retain his usage of and existence on the planet earth (Agunwamba 1998; Imam et al 2007; Oyeniyi 2011).

Urbanization in Nigeria predates the European colonial legendary because a system of urban culture had existed and flourished before the 15th century during the era of African Empire. Among the earliest cities to be developed were Kukawa, Kano, Iseyin, Ife, Oyo, Zaria, etc. Some of these centres were strategically important for administrative and commercial purposes. Specifically, estimated population for each of these cities was put at about 60,000 (Mabogunje 1968). Many other urban areas later emerged during the colonial era as a result of socio-economic

and administrative factors. Thus, the Nigerian urban centres were classified as first, second and third class cities while places of lesser urban culture like Maiduguri, Benin, Ondo etc. were the third rated township (Jiboye 2011).

However, the rate of urbanization in Nigeria as in many other third world countries is very high especially as from the 1950's. The urban population has been estimated to be growing at about 9% per annum and it was projected that by the year 2000, about half of the projected population would live in urban areas (Olotuah and Bobadoye 2009). This unprecedented growth in urban population has led to expansion in the size of the Nigerian cities, with drastic changes in land allocation for residential, commercial, industrial and educational activities (Galtima 1988). This is further aggravating the dimensions of environmental and health hazards resulting from illegal housing structures, traffic congestions, drainage blockages, waste accumulation and disposal hurdles and noise pollution, among others.

Abiodun (1998) argued that one of the most urgent problems confronting African cities today is how best to plan and manage the environment. Scholars in the philosophy of development agree that environmental management is much more than the control of nuisance, rather it means a philosophical orientation entailing the conception and planning for a liveable environment.
To ensure environmentally sustainable development in urban centres, the searchlight should be focused on the subsystem of the broader environment. Arthur and Simeon (1984) worked on noise pollution and found that urban dwellers are conscious of noise pollution.

According to a United Nations (1995), urban population concentration is increasing at a rapid rate. Recently, the world ratio of urban to rural population was 1.7. The report also noted that approximately half of the urban population of developing countries is presently located in 394 cities with populations exceeding 500,000. The effect of urbanization on urban services is further illustrated in the report of 1993 where it was pointed out that more than 60 million people lacked even the most rudimentary sanitation services in Africa and 48 million did not have access to water supply. Based on a report by the United Nations (2007), Nigeria's annual rate of urban population growth rate was 5.8 percent, while the population grew at the rate of 2.8 percent. The implication is that urban population has increased to 62.66 million which is about 43 percent of total population.

Solid waste disposal is a very serious problem facing most urban centres in developing countries today. Rapid urbanization has in no small measure contributed to waste generation and sanitation problem in our cities. According to Adedibu (1983), a rapid urbanization along side the rising rates of industrialization has created greater concentration of wastes than the cities' system can absorb. Also, as third world countries turn to be affluent in living, more wastes are generated than ever before. These wastes and their products are the causes of a great deal of environmental problems. Unfortunately, methods of solid waste disposal are not well defined, while management of the wastes is grossly inadequate (Agunwamba 1998; Jiboye 2011).

The urban transport problems have manifested in many cities of the developing countries. This is as a result of the rapid growth of these cities and the concomitant problems associated with such growth. Urban growth coupled with increasing urban population result in greater demand for transport provision. However, efforts to provide adequate transport facilities are uncoordinated and poor (Lanrewaju 2012). Also, there are limits to the volume of traffic a town can accommodate. Within these limits, the city exhibits serene environment comparatively free from undue noise and air pollution but as soon as these limits are exceeded, the city's traffic is thrown into chaos. Traffic noise constitutes environmental nuisance although to a lesser extent. Highway traffic accounts for 50 percent of unwanted sound in the city and creates irritations, dissatisfaction and disturbance to urban residents (Misiliu et al 2010).

The objective of this study is to determine the factors influencing households' willingness to pay for environmental safety in Ogbomoso and estimate the average willingness to pay. Findings from the study will assist government and other stakeholders in the area of environmental conservation to understand the mechanism for address several environmental challenges that are befallen the town. It will also ensure that efforts to introduce market based approach for addressing waste disposal and other pressing environmental problems are well designed and targeted. In the remaining parts of the paper, brief exposition on the contingent valuation approach,

the methodology used for study, results and discussions and conclusion have been presented.

Contingent Valuation Method

Contingent valuation is a method for estimating the value that a person places on a good that does not have existing market. The approach asks people directly their willingness to pay (WTP) in order to obtain a specified good rather than interfering them from observed behaviours in regular market places. Contingent valuation method (CVM) has been successfully used for commodities that are not tradable in regular market places or when it is difficult to observe market transactions under the desired conditions. Many applications of the method deal with public goods such as improvement in water or air qualities, amenities such as national parks and private non-market commodities such as reductions in the risk of death, days of illness avoided or days spent hunting or fishing. In the United States, contingent valuation has formed the basis for a significant amount of policy making (Alberini and Cropper 2000).

Recently, the World Bank, the United States Agency for international Development and some other donor agencies have developed interest in contingent valuation method as a means of assessing the demand for sanitation services, improvements in water supply, the benefits of establishing national parks and the cost/benefits of restricting land use to reduce tropical deforestation in developing countries. Majority of these studies posed willingness to pay questions using dichotomous choice approach by asking the respondents whether or not they would purchase the specified commodity at some stated prices. This approach is preferred over alternative approaches because it reduces the cognitive burden placed on the respondents and mimics the behaviour of people in regular market places. When follow-up questions were used to obtain more precise information about the respondents' willingness to pay some amount, the analysts usually take cognizance to examine whether mean willingness to pay would change with each new round of information as a result of strategic behaviour on the part of respondents. Similarly, internal validity of the WTP responses can be checked by regressing WTP on socio-economic variables and showing that WTP correlates in predictable ways with socio-economic variables. Carson (1991) suggested that WTP should be used whenever the individual might incur benefits from the proposed policy. However, even when the individual might incur benefits from the proposed policy, there are some scenarios under which the respondent may not overstate willingness to accept values (Cropper and Osborn 1998).

In early applications of the CVM, respondents were often asked open-ended questions about their WTP. An open-ended question might be worded as follows. "what is the most you will be willing to pay for …? And it is intended to elicit a point estimate of the respondent's WTP. The iterative binding approach (Randall et al. 1974) starts by querying individuals at some initial dollar value and keeps raising (or lowering) the value until the respondents decline to pay the respondents WTP. However, this approach has been virtually abandoned because it tends to result in starting point bias; an effect such that the final WTP amount at the end of the bidding game is systematically related to the initial bid value. Another disadvantage of the approach is that repeated questioning may annoy respondents causing them to say "yes" or "no" to a stated amount in the hope of quickly terminating the interview.

A more precise interpretation that was formalised by Cameron and Huppert (1988) is that the chosen amount is a lower bound for the respondent's WTP, the upper bound being the next highest amount on the card. In this situation, WTP is not directly observed. Statistical models can be fit that allow one to obtain the parameters of the distribution of WTP and to make a prediction about a respondents expected WTP amount. The payment card approach has been criticized on the grounds that respondents might limit the announced WTP to the values listed on the card but recent research by Rowe et al. (1996) shows that this needs not be a concern provided that dollar values listed on the card are not truncated from above. The payment card approach remains a popular way of eliciting WTP.

The most widely used approached to eliciting information about the respondents WTP is the so-called dichotomous choice format. A dichotomous choice payment question asks the respondent if he would pay $X to obtain the good. A frequently used wording of the payment questions is whether the respondent would vote in favour of the proposal plan or policy if ap-

proval of the plan would cost his household $X (in the form of extra taxes, higher prices of products etc.). There are only two possible responses to a dichotomous choice payment question ("yes" and "no"). The dollar amount $X is varied across respondents and usually termed the bid value. The dichotomous choice approach mimics behaviours in a regular markets (at least, in western countries), where people usually purchase or decline to purchase a good at the posted prices. It also closely resembles people's experience with political markets and proposition on a ballot. The dichotomous choice approach has also been shown to be incentive compatible provided that respondents understand that provision of the good depends on the majority of votes and the respondents own vote in itself cannot influence such provision, truth-telling is in the respondent's best interest (Hoehn and Randall 1987).

It is important to note that the dichotomous choice does not observe WTP directly at best, we can infer that the respondents' WTP amount was greater than the bid value (if the respondent is in favour of the programme) or less than the bid amount (if the respondent votes against the plan) and form broad intervals around the respondent's WTP amount. Mean WTP is estimated by fitting special statistical models of the responses. To improve the precision of the WTP estimates, in recent years, researchers have introduced follow-up questions to the dichotomous choice payment question (Hanemann 1991).

To illustrate, consider a respondent who states he is not willing to pay $10 for the proposed plan. The follow-up question might ask him if he could pay $5. If the respondent's answers "no" to both question, it is assumed that the WTP falls between 0 and $5. If the respondent's answers "no" to the initial question and "yes" to the follow-up question, it is assumed that his WTP amount falls between $5 and $10. The bid level offered in the follow-up question will be greater than that offered in the initial payment question if the answer to the initial payment question is "yes". Cropper et al. (1999) suggest that most of the statistical efficiency gains in the estimation of mean WTP came from the first follow-up question. In choosing the bid level to be assigned to the respondents in the follow-up questions, it is important that the follow-up bid be sufficiently different from the initial bid. Some recent studies (Alberini et al. 1997) examine WTP for government programmes; find that the mean willingness to pay estimated after the follow-up questions can be lower than that implied by the responses to the initial payment question.

In the last few years, the contingent valuation method has been applied extensively to the valuation of environmental quality and to a variety of public programmes in developing countries. It can be used to estimate WTP to avoid the illnesses typically associated with contaminated drinking water or unsafe food. Finally, contingent valuation could be used to estimate WTP for reductions in the risk of developing cancers and other long-term ailments associated with applying pesticides to crops with consumption of pesticide-laced produce or with the exposure to pollutants in the air, soil and groundwater. A formidable obstacle to the use of contingent valuation for mortality risk reductions is that respondents must grasp the concept of probability and refer to events with very small probabilities of occurring, a task that even in the United States and UK has proven extremely hard and that might be prohibitive in countries with relatively low levels of literacy. One of the earliest applications of contingent valuation to estimate willingness to pay for public health programmes was that conducted in Ethiopia by Swallow and Wondyalew (1994). The study questioned people about their willingness to contribute cash and/or labour to the monitoring of a tsetse fly control programme.

MATERIAL AND METHODS

Description of the Study Area

Ogbomoso lies between latitudes $8^0$07'N and $8^0$30'N, longitude $4^0$04' and $4^0$15'E. It is one of the most important towns in Oyo state. Ogbomoso is located in the Northern part of Oyo state comprising five local government areas which are Ogbomoso south, Ogbomoso North, Orire, Surulere and Ogo-Oluwa. The town comprises of Ogbomoso North and Ogbomoso South Local Government Areas. It lies in the derived Savannah region and it is a gateway to the Northern part of Nigeria from the south. It is 57km Southwest of Ilorin (capital city of Kwara state) 53km Northeast of Oyo town, 58 km northwest of Oshogbo (capital city of Osun state) and 104 km northeast of Ibadan (capital of Oyo state).

Sources of Data

The data for this study were collected from 140 randomly selected respondents. The sampling was done using multi-stage sampling method. At the first stage, each of the 20 wards in the LGAs were selected. At the second stage, households in the wards were interviewed. Since cost and time constraints limited the amount of questionnaires to be administered to 140, they were roughly proportionately distributed to the two LGAs based on the population at ratio 90:50. Therefore, 10 respondents were interviewed from each of the wards in Ogbomoso North except the last two wards where five households were interviewed from each of the wards. In Ogbomoso South Local Government area, 5 households were interviewed in each of the wards. The bids that were offered to the respondents are presented in Table 1.

Table 1: Hypothetical bid offers

Initial offer (₦)	*Higher bid (₦)*	*Lower bid (₦)*
80	100	60
180	200	150
100	150	80
150	180	100
200	240	180
240	280	200
280	300	340
300	340	280
340	360	300

Source: Field Survey 2006

The respondent was first asked whether he/she was willing to pay the initial offer, if the response is affirmative, the offer then put at him was the higher bid, however, if he/she declined to pay the initial offer, the lower bid was then introduced to him/her.

Analytical Methods

Descriptive and inferential statistics were used to analyse the data. The descriptive methods that were used include frequency distributions and percentages. Logit regression is the inferential statistics that was used for data analysis. The dependent variable (willingness to pay) is binary in nature (1 or 0). Suppose the probability of observing a value of one is expressed as:

$$\Pr(y_i = 0 / x_i, \beta) = 1 - f(-x_i'\beta) \quad 1$$

Where f is a continuous, strictly increasing function that takes a real value and returns a value ranging from zero to one. The choice of the function f determines the type of binary model. It follows that:

$$\Pr(y_i = 0 / x_i, \beta) = f(-x_i'\beta) \quad 2$$

Given such a specification, we can estimate the parameters of this model using the method of maximum likelihood which is given by:

$$l(\beta) = \sum_{i=0}^{n} y_i \log(1 - f(-x'\beta) + (1 - y_i)\log(f(-x_i'\beta) \quad 3$$

Specifying y as 1 or 0 yields a number of advantages. It implies that the expected value of y is simply the probability that $y = 1$

$$E(y/x_1\beta) = 1Pr(y=1/x_1,\beta) + 0.Pr(y_2=0/x_2,\beta) = Pr(y_2=1/x_2,\beta) \quad 4$$

The Logit model is expressed as:

$$\Pr(y_i = 1 / x_i, \beta) = 1 - (e^{-x_i'\beta/(1+e^{-x_i'})}) = e^{-x_i'\beta/(1+e^{-x_i'})} \quad 5$$

This is based on the cumulative distribution function for the logistic distribution.

The likelihood ratio (LR) statistics jointly tests the null hypothesis that all slope coefficients except the constant are zero and is computed as $-2(l(\beta) - 1(l(\beta))$. This statistics is used to test the overall significance of the model. The number in parentheses is the degree of freedom, which is the number of restrictions under test. The probability of the likelihood ratio statistics (p) is asymptotically distributed as a χ^2 variable with degree of freedom equal to the number of restrictions under test. The McFadden R-Squared is the likelihood ratio index computed as $1-l(\beta) / 1(l(\hat{\beta}))$ where $l(\hat{\beta})$ is the restricted log likelihood. As the name suggests, this is an analogue to the R^2 reported for linear regression models. It lies between zero and one.

The dependent variable [*Willingness to Pay (WTP)]* was specified as 1 if a respondent's answered "Yes" and 0 if "No". The independent variables that were included are gender (male=1; female=0), age (years), marital status (married = 1; otherwise=0), household size, Owned house 1 if a respondent owns his/own house and 0 otherwise, rented house 1 if a respondent rents house and 0 otherwise, inherited house 1 if a respondent inherits house and 0 otherwise, government employee (1 if a respondents is a government employee and 0 otherwise), private business (1 if a respondent is a private worker and 0 otherwise), faming (1 if a respondent is a farmer and 0

otherwise), monthly income (₦) and educational attainment (years).

Computations of Mean and Total Willingness to Pay

Mean willingness to pay is calculated using the formula below:

$$MWP = \frac{\ln(1 + e^{\alpha^*})}{Bid} \quad 6$$

Where α^*= Adjusted Intercept

$$\sum (mean_k + coefficicent_k) = constant +$$

Total Willingness to Pay (*TWP*) is the product of the mean willingness to pay (*MWP*) and the total number of households in Ogbomoso (*TH*).

That is: *TWP* = *MWP* x *TH*

Where *TH* = 38909 based on 2006 population census.

RESULTS AND DISCUSSION

Socio-economic Characteristics of the Respondents

Table 2 shows that 62.9% of the respondents were males and 37.1 percent were females. Also, 77.9% of the respondents were married, while 22.1% were still single. This means that most of the people interviewed were married. Results show that 31.4% of the respondents owned their houses, 51.4% lived in rented apartments, 11.4% were living in official residence, 12.9% inherited their houses and respondents with other forms of ownership accounted for 2.9%. This shows that majority of the respondents did not own their personal houses. Specifically, willingness to pay can be negatively affected by this finding because of lack of absolute financial commitment to the property. The table also shows that 42.1% of the respondents were government employees, 18.6% were private salaried workers, 2.9% had their privately owned businesses, 5% were merchants, 29% were labourers, 20.7 were farmers, 5% were unemployed, while the remaining 2.9% engaged in other jobs. The fact that the majority were government workers should likely enhance willing to pay due to expected high value for environmental safety.

Table 2: Frequency distribution of household heads' socio-economic characteristics

Socio-economic characteristics	*Frequency*	*Percentage*
Gender		
Male	88	62.9
Female	52	37.1
Married	109	77.9
Single	31	22.1
Ownership of House		
Owned house	44	31.4
Rented	72	51.4
Official residence	2	1.4
Inherited	18	12.9
Others	4	2.9
Occupation of Head		
Government employee	59	42.1
Private salaried worker	26	18.6
Private owned business	4	2.9
Merchant	7	5.0
Labour	4	2.9
Farmers	29	20.7
Unemployed	7	5.0
Others	4	2.9

Source: Field Survey 2006

Factors Influencing WTP for Environmental Safety

Air-related Environmental Problems

The problems considered under category A of the environmental problems were smoke from burning refuse, industrial smoke, smoke discharge from kitchens, dusty air and bad odour in the neighbourhood. The results show that the LR-stat of 9.4 (p=0.23) and McFadden R^2 of 0.09 implies that the model has very low predictive power. Table 3 also shows that household size; education and age were statistically significant ($p<0.10$) in explaining willingness to pay. This

Table 3: Logit regression model for air-related environmental problems (Category A)

Variable	*Coefficient*	*z-statistics*	*Probability*
Constant	4.177355	1.426385	0.1538
Bid 'A'	0.001733	0.384642	0.1005
Household size	0.272282	-1.909702*	0.0562
Education	-0.316550	-1.799208*	0.0720
Age	0.097055	2.122984**	0.0338
Income	1.99E-05	0.588086	0.5565
Rented	-0.262165	-0.395028	0.6928
Faming	-2.606716	-1.435520	0.1511

LR-stat (7df): 9.395681

Note: significant. at 10%, ** at 5%, *** at 1%.Prob-LR: 0.225482

McFadden R^2: 0.09

Total Observation: 140Obs. with Dep=0:16Obs. with Dep=1: 124

means that household size has a positive impact on the willingness to pay and as it increases, willingness to pay increases. Education has a negative impact on willingness to pay for air-related environmental problems. This implies that as educational level increases, willingness to pay decreases. Age, on the other hand has a positive impact on willingness to pay, implying that as age increase, willingness to pay also increases.

Human Habitat Environmental Problems

The problems that were considered under Category B were household insect pest, household rodent pest, bushy/untidy environment and illegal structure/urban slums. Table 4 shows that the LR-stat of 10.164 (p=0.07) and McFadden R^2 of 0.09 implies a less than average fit which shows low predictive power of the model. However, household size has a positive impact on willingness to pay (0.221171) and it is significant at 5% while gender also has a positive impact on willingness to pay and it is significant at 10%. This means that as household size increases, willingness to pay increases and vice-versa. Also, since gender is significant and its coefficient positive, it means male headed households were more willing to pay for environmental problems of category 'B' than the female headed ones.

Table 4: Logit Regression for human habitat environmental problems (Category B)

Variable	*Coefficient*	*z-statistics*	*Probability*
Constant	2.393267	1.826607*	0.0678
Bid 'B'	0.004012	0.899177	0.3686
Education	-0.088585	-1.300218	0.1935
Household size	-0.221171	-2.198998**	0.0279
Income	4.67E-05	1.509876	0.1311
Gender	0.915354	1.803558*	0.0713

Water-related Environmental Problems

The problems that were considered under Category C were water related (flooding, erosion, poor water drainage and water pollution). The R^2 of 0.25 and its significance measured by the Prob-LR (0.035) implies a moderate fit of the equation. From Table 5, the parameter of Bid was statistically significant (p<0.10), although with negative sign. It shows that as the bid increased, willingness to pay for environmental problem decreased. Education was with positive sign and shows that willingness to pay increases as the educational level of the household heads increased. Income has a negative impact on willingness to pay, while farming as occupation moves in the same direction as willingness to pay.

Table 5: Logit regression for water-related environmental problems (Category C)

Variable	*Coefficient*	*z-statistics*	*Probability*
Constant	-4.151179	-1.366934*	0.0647
Bid 'C'	-0.011213	-1.847350*	0.0647
Education	0.392932	2.175079**	0.0296
Income	-9.29E-05	-1.918894*	0.0550
Own house	3.141093	2.039311**	0.0414
Rent house	2.255700	1.691883*	0.0907
Farming	6.434830	2.688054***	0.0072
Household size	0.257163	1.325164	0.1851
Gvtdum	1.780063	1.474348	0.1404
Pvtdum	2.144211	1.582334	0.1136

LR-stat (9df): 17.96454
significant. at 10%, ** at 5%, *** at 1%.
Prob-LR: 0.035587
McFadden R^2 0.25
Total Observation: 140Obs. with Dep=0: 10Obs. with Dep=1: 130

Land-related Environmental Problems

Category D comprises of improper disposal of water and faeces, industrial waste and traffic congestion. The R^2 of 0.16 signifies a fair predictive power of the model. Table 6 shows that the parameter of Bid D had positive sign and statistically significant (p<0.01). It shows that increase in the values of the bids will increase the willingness to pay. Education had a positive relationship with willingness and statistically significant (p<0.10). This shows that an increase in the years of education will also increase willingness to pay.

Table 6: Logit regression for land-related environmental problems (Category D)

Variable	*Coefficient*	*z-statistics*	*Probability*
Constant	1.956481	1.549840	0.1212
Bid 'D'	0.008432	-2.705779***	0.0068
Education	0.090935	1.791294*	0.0732
Household size	-0.201803	-2.348040**	0.0189
Inherited house	2.290149	2.457818**	0.0140
Rented	0.155924	0.337771	0.7355

LR-stat (4df): 29.31217
* significant. at 10%, ** at 5%, *** at 1%.
Prob-LR: 1.91E-05
McFadden R^2: 0.16
Total Observation: 140Obs. with Dep=0: 48Obs. with Dep=1: 92

Household size parameter is with negative sign and statistically significant ($p<0.05$). This shows that an increase in household size will reduce willingness to pay. The parameter of those that inherited dwelling house had positive sign and statistically significant ($p<0.05$). It means that people who were bequeathed houses were more willing to pay for those land related environmental problems.

Estimated Willingness to Pay

Table 7 shows that the people in the study area were willing to pay an average amount of ₦1000.60 and the total amount the people will be willing to pay per month is 38,935,665.48 for the air related problems (Group A). Again, for Group B, the mean willingness to pay was ₦260.80 and the total willingness to pay was ₦79,227.20. For Group C, the mean willingness to pay was ₦626.00 and the total willingness to pay was ₦24,357,034.00. For Group D, the mean willingness to pay was ₦299.10 and the total willingness to pay was ₦11,632,681.90 for air and water related problems individuals will be willing to pay more since the two problems meant much to them unlike the human habitat and land related problems in which the people are wiling to pay ₦260.80 and ₦299.10 respectively.

CONCLUSION

The main focus of this study was to determine households' willingness to pay for urban environmental safety. The general conclusion from this is that various urban environmental problems exist across the study area, though in different forms and different scale for different areas even though some are common to all areas, these problems are as a result of negligence and lack of proper planning both by governments and individuals. Some people believed it is the sole responsibility of government to provide these services. Majority of the respondents were willing to pay for eradication of urban environmental problems, though at different prices (bids) and according to their level of income, household size, level of education, marital status, age type of occupation and their house ownership status. To a very large extent, government still remains a major stakeholder in terms of provision of certain environmental goods as well as guideline to ensure strict compliance with environmental rules.

The following recommendations are made on the basis of findings from this study. The respondents' monthly income has a positive relationship with WTP in one out of the four categories of environmental problems, while education has positive relationship in three out of four, household size also has positive relationship in three out of four. Thus eradication of urban environmental problems (increase in consumption of environmental goods) could be accelerated through a policy instruments that will increase peoples' income reasonably. Similarly, environmental education, which could be in the form of talkshop, workshop, lecture, symposium or conference, could be organized at the political ward level, churches, mosques, co-operative unions societies and at secondary school levels. Information could also be disseminated through unions like the national road transport workers, market women, carpenters' association and other stakeholders.

Government should redeem her name by providing major infrastructures for the people they are ruling like roads. Also, the people concerned should embark on self-help projects like digging of wells or boreholes to prevent water borne diseases, since they know that government cannot bear all the responsibilities.

Table 7: Mean and total willingness to pay environmental problems

Categories	*Categories of environmental problems*	*MWTP (₦)*	*TWTP (₦)*
Air Related (A)	Smoke from burnt refuse industrial smoke, smoke from kitchens, dusty air and bad odour in the neighbourhood.	1000.60	38,935,665.48
Human Habitat Related (B)	Household insect pest, Household rodent pest, Bushy/untidy environment, Illegal structure/urban slums	260.80	79,227.20
Water-Related (C)	Flooding, erosion, poor water drainage, water pollution	626.00	24,357,034.00
Land-Related (D)	Improper disposal of water and faeces, industrial waste, traffic congestion	299.10	11,637,681.90

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