International Journal of Economy, Energy and Environment
2024, Vol. 9, No. 3, pp. 77-89
https://doi.org/10.11648/j.ijeee.20240903.12

Research Article

Empirical Review on Determinants of Willingness to Pay for Natural and Environmental Resource Valuation: Meta-Analysis

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Abstract

Even if natural and environmental resource plays detrimental role prosperity of nations, measuring their value is highly problematic. Lack of realistic markets data to estimate its value for the goods and services necessitates the use of nonmarket valuation techniques. The meta-analysis was carried out to see the mean size effect of certain demographic, socioeconomic and institutional factors on willingness to pay of natural resources conservation and improvement. The empirical analysis review was done on about 57 published articles for total of 116 observations. The data synthesis was done from published articles include coefficients of explanatory variable and standard error, model used, value measured, study region, sample size and publication from the year of 2002 up to 2019 year. The data analyzed in excel sheet and SPSS software. The study countries were Ethiopia, Uganda, Kenya, Guinea, Nigeria, Malaysia, USA, Iraq, China and India. The result confirmed that measurement errors and heterogeneity of case studies, interviewed resulted difference in willingness to pay estimate. The result implied inverse relationship between willingness estimate and environmental resource valued and study destination [Eat Africa]. The meta-analysis indicated mean size effect of willingness to pay defined as function of income, age, bid value, occupation, sex, knowledge, and education level of respondents. The empirical analysis result showed that increasing awareness, enabling to expand income earning believed to increase the willingness to pay value.

Keywords

Contingent Valuation, Natural and Environmental Resource, Market, Mean Size Effect, Meta-Analysis, Willingness to Pay

1. Introduction

1.1. Basic Concepts and Definitions of Valuation

Valuation methods are particularly useful for extending the reach of cost-benefit analysis and to include non-market environmental impacts in the assessment of development projects. There are various methods have been developed to estimate the total economic value of environmental resources, including both marketed and non-marketed benefits. These include valuation using market prices, surrogate market price, the production function method, stated preference and cost-based techniques [25]. Market Price-based, surrogate market and production function approaches all depends on market prices for estimating revealed preference on estimate the value goods and services provided by of environmental

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Received: 25 January 2024; **Accepted:** 8 February 2024; **Published:** 20 August 2024

resource. But, the stated preference approach asks consumers to state their preferences in terms of hypothetical markets. In stated preference approach data on the value of an environmental benefit is obtained by asking questions to consumers on their willingness to pay for it or their willingness to accept as compensation for losing the benefit [12].

Determining the value of environmental and natural goods and services that have benefits for human populations is often highly problematic. Lack of realistic markets and market failures to estimate its value for the provisioning of these goods necessitates the use of nonmarket valuation techniques [13]. There is increase in demand of continuously in awareness among the policy makers and officers on the use of economic valuation studies as input to decision-making for sustainable environmental maintenance. The economic valuation play detrimental role decision-making processes [46].

The contingent valuation method is defined as a direct method in that it involves asking a sample of the relevant population questions about their hypothetical Willingness to pay or Willingness to accept information. The Contingent valuation method is known as one of the few ways to measure and estimate total economic value of natural and environmental resources. A contingent Valuation technique encompasses both Use and non-use values of resources. It is also referred a stated preference method. It is called as contingent valuation' due to its imaginary scenario put to respondents [45].

Contingent Valuation Methods is known as estimation procedure that does not require Marshallian and Hicksian demand curves. With the CVM, the value of a good is estimated by multiplying the average WTP or WTA for that good in a sample of households by the number of households in the relevant population [53]. The study report by [7] implied that the assessment of peoples' reaction towards changes of our natural environments and resources can be a useful supplement to decisions about the proper husbandry of our natural environments and resources. Contingent valuation is defined as a survey-based method used for placing monetary values on environmental goods and services not bought and sold in the marketplace [42].

In stated preference estimation willingness to pay or accept can be used to place an economic value on costs and benefits of an environmental resource where no market price exists. Individuals are asked how much they are willing to pay for some specified environmental resource such as conservation of a threatened species of wildlife or improved water quality. If they are willing to pay a substantial portion of their incomes to buy water from door to door seller due to convenience and time saving, instead of getting the water from wells that indicate a need to extend reliable water supply to the communities by the stakeholders [35].

Without market information, other strategies must be considered to develop measures of economic tradeoffs that involve passive use value. The contingent valuation done appropriately can provide a reliable basis for estimating what the public is willing to trade off to obtain well defined public goods that produced from environmental and natural amenities [43]. When properly implemented, contingent valuation surveys can estimate the maximum willingness to pay for individuals, allowing the value of the environmental goods and services to be measured [13].

1.2. Importance of Contingent Valuation Methods

The main use of contingent valuation method is to offer inputs to analyses of changes in the level of provision of public goods and services or damages for environmental commodities which have the kind of non-excludability and non-divisibility [45, 48]. A CVM study used to examine the ex-ante value obtained from a project reducing air or environmental pollution for a specific area by asking the respondents to elicit how much they would be willing to pay for the reduction in air pollution. The CVM is applicable to both private and public goods. In the case of private goods, market data are available to estimate demand and supply curves and consumer surplus. This is not the case for public goods. For this reason, most applications of the CVM deal with valuation of changes in the price, quantity and quality of public goods, especially changes in environmental quality [53]. The water quality function of Marine and coastal ecosystems as non-marketable goods and services was valued sing contingent valuation techniques [21].

The CVM method has been used to estimate the value of improving water quality, increasing visibility by reducing air pollution, protecting groundwater, presenting endangered species of crop, fisheries, animals, forest and others, reducing congestion and increasing the harvest success in big game hunting, reducing the likelihood of oil spills, and enhancing fish, wildlife and wilderness resources [53]. A contingent valuation methodology was applied to estimate economic value of old-growth forests and critical habitat units to the public that rare and unique ecosystems demand to be protected for current and future generations [29].

The study report by [14] informed that the empirical application of Contingent valuation for use and non-use motives of threatened and endangered species are important and indispensable that explained and measured by willingness to pay. The contingent valuation method can be a useful tool to guide decision makers regarding policy purposes and natural resources management of protected area in developing countries [51].

Contingent Valuation technique was applied for undertaking a groundwater valuation for the wetland, with high biological, recreational, landscaping and agricultural values [31]. Contingent valuation techniques referred as important tool for forest resource valuation because forest ecosystems present bundles of goods and services that cannot be easily separated and revealed in the market [40]. Under-valuation of forest ecosystems can bias land use policies in directions that are not

consistent with optimizing society welfare. By careful application of contingent valuation technique and thereby improving the understanding of the economic importance of the structure, health, and extent of forest ecosystems, more informed forest policy and management decisions can be made.

There are several attributes of the natural and environment resources from which individuals obtain satisfaction and benefits. But their value cannot be capture by revealed market information. This forces to adopt Contingent valuation technique for measuring non use values. Some of common none use value in environmental and natural resource include the value of wilderness of the forest for genetic conservation, future generation preservation and the like. It also reported that the existence of increasing use of the contingent valuation method for its promotion of promoting enduring awareness environmental resources that the economic value of the natural environment goes beyond what can be captured by direct and/or indirect observations of market information [3].

Undertaking comparative analyses using interdisciplinary teams of ecologists, economists, and social scientists can pay significant role in valuation of resources. Use of the contingent-valuation technique in biodiversity maintenance policies can provide useful information for alternative conservation strategies if questionnaires are carefully prepared, respondents are adequately informed, and the underlying factors that influence willingness to pay are identified [9]. This study by [17] finds that inclusion of debriefing questions can be used to get rid of impurities of willingness-to-pay estimates in contingent valuation studies.

Natural and environmental resources own multifunctional value for human welfare, but because of the nonmarket and open access and public nature of many of the goods and services produced, both markets and governments fail to optimize their production proportionate with their economic and ecological importance. Despite the recent increased demand of nonmarket environmental valuation in the literature, the incorporation of nonmarket values into public resource decision making has been limited due to institutional and technical barriers. To address these gaps, Meta-analysis was conducted a case study to identify factors affecting mean size effect of willingness to pay for improvement and conservation for values of resources interims of ecosystem, forest, water, land and biodiversity values [19].

1.3. Statement of the Problems

Meta-analysis is defined as analysis of analysis that takes empirical estimates from a sample of studies published, statistically relates them to the characteristics of the studies, and asks whether the reported differences can be attributed to differences in locality, topic matter, or methodology. Meta-analysis would use this cross section of contingent valuation studies as a basis for isolating and quantifying the determinants of non use value. Once these determinants have been specified and linked to specific policy contexts, it may be possible to transfer estimates from one circumstance to another by finding the value consistent with the new context without incurring the time and expense of conducting new surveys each time [52].

The livelihood of human and agricultural production and productivity in developing countries highly linked with functionality environmental and natural resources. However in relation lack of market information, technical valuation gaps and government failure it could not bet possible to account for value of natural and environmental resource that can be used as basic input for policy formulation and sustainable utilization of the resource. The non marketability character of environmental resource in combination with technical difficulty, lack of update information in the area complicated the policy development toward the resource conservation, improvement and optimal utilization. Some of major benefits of natural and environmental resources can be manifested in multifunctional ways such as ecosystem services, forest and water value, land value and biodiversity that interlinked to one another and necessitated updating. The Value of these resources estimated by willingness to pay or willingness to accept concept and defined as function of demographic, social, economic and institutional factors of stakeholders. To sort out most important variables, recommend scientific pathway for upcoming studies, it is timely to carry out Meta-analysis study in factors affecting willingness to pay for natural and environmental goods and services valuation. The target of the paper was for generation information on willingness to pay for conservation and improvement of ecosystem service, land, forest and fishery value and biodiversity factors and the mean size effect of socioeconomic, institutional and demographic factors over mean estimate of willingness to pay.

1.4. Research Questions and Objectives of WTP Meta-Analysis

1.4.1. Research Questions of WTP Meta-Analysis for Natural and Environmental Resource

1) What is the impact of study specific characteristics such as choice of functional form, number of observations, study regions, resource valued and year of article publication variable on mean of willingness to pay for the resources valuation?
2) Do differences exist in relation to willingness to pay across study periods, model type used and sample size, resource valued and the region?
3) Which respondents' socio-economic variables influence the mean size effect of willingness to pay estimate?

1.4.2. Objectives of WTP Meta-Analysis for Natural and Environmental Resource Valuation

1) To identify factors affection mean size effect of willingness to pay for the resources
2) The see the relation between mean of willingness to pay

and certain characteristics of econometrics in the regression

3) To identify major environmental and natural resources valued by willingness to pay

1.5. Theoretical Basis for Willingness Pays in Contingent Valuation Approach

Willingness to Pay refers to the amount a consumer is willing and able to pay for a particular quantity of a good or service [48]. Under contingent valuation approach the two major non use values are estimated by using WTP. The option value of environmental and natural resource relates to willingness to pay to guarantee the availability of the service for future use by the individual. The quasi-option value also relates to willingness to pay to avoid an irreversible commitment to development now, given the expectation of future growth in knowledge relevant to the implications of development. Asking about WTP for an environmental improvement implies that the individual is entitled to the existing level satisfaction and asking about WTA compensation for deterioration [45].

Willingness to pay is referred as the standard measure of benefits of environmental goods and services by sticking value to it. The Willingness to pay is measured by the demand price at the margin. The benefits or avoided damage costs of natural and environmental good and services should be measured by eliciting individuals' willingness to pay for incremental changes in environmental quality. From a project to improve environmental quality total benefits is measured by the sum of society's willingness to pay and it is the area under the relevant range of the demand curve for an environmental good or the marginal damage cost curve [3].

The estimates Contingent Valuation determined by question ordering, the inclusion or exclusion of questions regarding recreational budgets, choice of willingness to pay format, payment vehicle and respondent type [24].

Hicksian' measures monetary utility from utilization of environmental and natural resource change associated with a price change. The two measure of satisfaction were the compensating variation that deal with the change in income that would 'compensate' for the price change and the equivalent variation, which defined as the change in income that would be 'equivalent' to the proposed price change [45].

The estimate of Willingness to Pay and or Willingness to Compensate is one of the main theoretical constructs underlying nonmarket valuation of public goods and common goods. The other theoretically equivalent way to define consumer surplus is in terms of the expenditure function. An expenditure function indicates the minimum expenditure or minimum amount of income needed by a household to achieve a particular level of utility when prices and quantities are at certain levels [53].

Willingness to pay and willingness to Compensate for changes in the price, quantity or quality of a resource can be measured by compensating surplus, compensating variation, equivalent surplus and equivalent variation. The compensating for surplus and equivalent surplus for households are entitled to their current levels of satisfaction and public resource management policies deal with potential benefits relative to current levels of satisfaction, the surplus measures are more relevant to policy analysis than are the variation measures [53].

Willingness to pay pertains to a] paying a lower price or receiving a higher quantity or quality of the resource or b] avoiding a higher price or lower quantity or quality of the resource. Willingness to accept compensation pertains to a] forgoing a lower price or higher quantity or quality of the resource or b] tolerating a higher price or lower quantity or quality of the resource [53].

Many contingent valuation studies have found that respondents tend to report much higher values for questions that ask what compensation the respondent would be willing to accept to give something up than for questions that ask for the willingness to pay for an incremental improvement in the same good or service. Economic theory suggests that differences between WTP and WTA should be small, but experimental findings both in environmental economics and in other microeconomic studies have found large differences [52].

If the entity valuing the changes in price, quantity or quality is a firm, then WTP and WTC are estimated by changes in profits. There is no difference between firms WTP and WTC for change in quantity and quality. Willingness to pay is typically different from WTC for households because the value of changes in resource price, quantity or quality depends on the assignment of property rights [53].

Some of the major causes that have attributed the discrepancy between willingness to pay and willingness to accept include a psychological endowment effect, market context, characteristics of goods valued and moral context of valuation [52]. The empirical studies have shown that WTA is usually substantially larger than WTP due to the diminishing marginal rate of substitution along an indifference curve.

The assignment of property right for environmental resource determines the choice of using which concept in environmental valuation. If someone or an organization owns the right to the resource, asking how much compensation they would take to give it up is the appropriate question. If the respondent does not have the right, using WTP to estimate the value of acquiring it is the right approach [52]. The Willingness to pay is the appropriate measure in the situation where an agent wants to acquire a good; while Minimum willingness to accept compensation is the appropriate measure in a situation where the sampled respondent is being asked to voluntarily give up a good [42].

2. Factors Affecting WTP in Valuation

The major factors forced farmers to engage in deforestation

degradation of environmental resource comprised of socio-demographic, production factors constraint, policies and governance, experience of wood extraction for fuel wood and construction [28]. The study finding by [33] found that household income and labor as detrimental factor affecting WTP whereas number of household is the most important factor affecting Willingness to compensate for forest conservation. The research finding report by [20] showed that the estimate of Contingent valuation by income effects was higher when 'progressive' payment vehicles were used and tended to be lower when cost distribution and institutions were well defined, when the choice was formulated as a policy referendum, or when 'passive-use' goods were involved. The study result by [11] indicated that estimate of households' willingness to pay for the conservation of church forest influenced by the respondents' annual income, social position, membership to the informal institution and size of the land near to the institution and dependency ratio.

The study result by [4] implied that household willingness to pay for forest restoration intervention activities defined as function of area needs to consider, monthly income, initial bids, land holding, sex of household head, farmers perception, educational level, ownership type and access to extension services. The study by [18] implied that the involvement of local people and awareness creation regarding natural resource increase value for conservation of natural resources and leads to sustainable optimal utilization.

The study report by [16] showed that the estimate of Willingness to pay for improved sanitation among rural households influenced by age of respondents, income, gender, household size and distance to the environmental quality. The study finding by [55] indicated that Willingness to pay for Urban Park Service functions was mainly affected by satisfaction of the services and goods and WTP value was mainly affected by education level and income of the respondents.

Livestock ownership and income size, slope of land, perception about soil erosion problem, and the frequency of extension were known to accelerate the likelihood of farmers Willingness to pay for implementation of improved soil conservation practices [6].

The study finding by [47] revealed that WTP for improved water service provision determined by household income, family size, water source, age of the respondent and bid value. The determinant of household willingness to pay for improved water services comprised of household income and the connection charges to the alternative source [2].

The study findings by [36] willingness to pay for non-timber forest of community forest determined by wealth category, occupation, number of years of schooling and number of females in a household positively and significantly influence willingness to pay. The study result by [50] showed the WTP for forest conservation was a function of gender, age, education level, income, bid price and distance from the forest.

The respondent's prior participation on eco-active tasks and experience, knowledge on the specific environmental quality and type employment the individual engaged known to affect the willingness to pay for Watershed Management [1]. The mean estimate of willingness to pay for improved water management depends on age, bid value, income, house ownership and expenses related to the resources [30]. The study report by [26] showed that household income, number of children, perception of existing water quality, and awareness of environmental issue were economic determinants of willingness to pay for water quality and supply enhancements.

This study by [38] revealed that farmer's WTA for ecosystem services determined by education, occupation, acquired skills, land use practice, perception, income, and individual's interest which significantly determined. The WTP is shown to consist largely of the value placed on the naturalness of the species, implying that the symbolic nature of the endangered species like panda might be a potential instrument for greater biodiversity conservation [5]. Awareness creation, mass media propagation, field level demonstration, distribution of pamphlets, explaining the importance of the conservation of biodiversity at different level of communities were factors known to realize the significance of conserving forest biodiversity [49].

The study report by [56] pointed out that respondents WTP for threatened Bird defined as function of age and knowledge to endangered species and emotion to response to encountering an endangered bird.

3. Methodology

3.1. Procedures in Analyzing Data in Meta-Analysis for WTP Determinants

Calculating Standard Error [SE]

The Standard error estimate can be calculated by using the formula SE= $\frac{\sum[\bar{x}-\mu]}{\sqrt{n}}$, but since its value was already estimated by reviewed article through statistical procedures and it directly copied from the papers. The Standard errors are can be also simplified derived equations for different types of studies. Since we are using rates, we can use SE=$\frac{es}{\sqrt{nes}*n}$, where es is size effect and n number of subjects.

Computing variance [Var] and individual study weights [w]

This formula is simple: Var = SE^2. In Excel it was calculated by squaring the estimated standard error, Var=squarer of SE.

It is indispensable to calculate the weight of different independent variables that significantly affect the willingness to pay estimate. The Meta-analysis demands synthesized data for weight each study with the inverse of its variance, that can be estimated by Wi= $\frac{1}{\sqrt{Var}}$ =$\frac{1}{\sqrt{se2}}$

Computing each weighted effect size [w*es]; *w*es² and w² and M**

This is computed multiplying each effect size that equals to

coefficients by the study weight. Therefore *WiYi=Wi*Yi*, where *Wi* is the weighted effect size and *Yi* the value of coefficients over study results. These two important variables estimated by just multiplying the calculated results. This is to mean that w*es and $w^{2.}$ From these values the Mean size effect calculated by the formula:

$$M^*= \frac{\sum Yw}{\sum w}$$

where y is the value of coefficients and w is the weight.

Calculating Variance, Standard Error and t value

The variance estimated by formula $Var = \frac{1}{\sum w}$ and from this Standard error can be calculated by excel sheet SE=SQRT [Variance]=*SQRT* $[\frac{1}{\sum w}]$. To test its significance, the t value calculated by $t=\frac{M^*}{SE}$

Empirical model

The mean of willingness to pay for natural and environmental resource valuation defined as function of sample size, model used, study region, environmental resource valued and year of publications. The empirical model of the meta-analysis regressed using *multiple linear regression* procedure. The mathematical expressions of defining the Mean willingness to pay for resource conservation and improvement function can be written as:

$$Y = f(n, x_{1,}, x_{2,} x_{3,} x_{4,})$$

Where n is the sample size for the specific study, x_1 is the model type [defined as 0 if Probit and 0 otherwise, x_2 is the year of the publications [labelled as 0 if the study was done from 2001 up to 2014 and 1 if done from 2015 up to 2019], x_3 referred to study region [labelled as o for East Africa and 0 otherwise], x_4 refers to environmental resource valued [labelled as 0 if ecosystem services and 0 otherwise.

3.2. Data Source, Types and Analysis

The data gathered from different articles published and found in the Google. The empirical review data created and inserted in Excel 2007 and SPSS version 20. The data collected from articles published since 2002 to 2019. The data synthesized from the articles were the one that published in eleven different countries from the world. The major country where the study carried comprised of Ethiopia by 8 articles, USA with 3 articles and Nigeria by 3 articles. The other countries from each only one article used for empirical review were China, Guinea and India, Kenya, Ghana, Uganda, Malaysia and Iraq. The major explanatory variables included in the different article were income, age, sex, distance, land use, knowledge, training, bid value, family size, extension access, occupation, social position, resource type in the vicinity, dependency ration, membership on the resource use group, work, earlier contribution, marital status, duration or year, perception over the resource and political perception. The minimum and maximum amounts of respondents interviewed were 117 and 828 respectably. The mean size effect of certain variables defined as function of income, age, bid value, family size, education level, and occupation, sex and knowledge level on the resource. From the models used 54.3% articles used probit model, 26.7% used Logit model and 19% used Tobit model.

4. Results and Discussions

4.1. Natural and Environmental Resource Valued in Different Article

The contingent valuation approach applied to measure preference using willingness to pay of the environmental resource in different forms. The proportion of environmental and natural resource values estimated in relation to the number of explanatory variables significantly affected their willingness to Pay include ecosystem service 38%, water 28%, forest 14%, biodiversity 9% and land, fish 3% 7%. The major environmental and natural resource valued estimated in the reviewed article were ecosystem service, forest ecosystem, drinking water improvement, forest conservation, biodiversity conservation, environmental resource restoration, ecological improvement, improved sanitation, improved irrigation access and fishery resource conservation. The descriptive analysis result indicated that the area of concentration and study focus varied for different resources.

Table 1. *Natural and environmental resources valued in the articles reviewed.*

Natural & Environmental Resource valued	Frequency	Percent	Cumulative Percent
Biodiversity	11	9.5	9.5
Ecosystem service	44	37.9	47.4
Fish	4	3.4	50.9
Forest	16	13.8	64.7
Land	8	6.9	71.6

Natural & Environmental Resource valued	Frequency	Percent	Cumulative Percent
Water	33	28.4	100.0
	116	100.0	

4.2. Econometrics and Mean Size Effect Analysis

4.2.1. Mean Size Effect Analysis

Table 2. Factors affecting mean size Effect of Estimate of WTP for the resources.

Variables	Mean Size Effect value	Odds Ratio	Standard Error	t values
Income	0.00005	1.00	0.0001	4.45
Bid amount	-0.04***	0.96	0.002	-23.16
Education level	0.10	1.11	0.01	9.91
Distance	-0.0005	0.99	0.0004	-1.15
Family size	-0.05	0.95	0.06	-0.73
Gender	-0.005***	0.99	0.001	-4.99
Occupation	-0.08*	0.92	0.05	-1.65
Age	0.37***	1.45	0.004	100.68
Knowledge	8.73***	6185.73	2.25	3.87

The significance level indicated by ***, ** and ** for 1%, 5% and 10% significant respectively.

The Meta-analysis result indicated that the estimate of mean willingness to pay for conservation and improvement of natural and environmental resource depends on socioeconomic, social and institutional factors. From independent variables income earned, education level, occupation, age and knowledge through training promotes the estimate of willingness to pay for the resource improvement and conservation. The estimate of willingness to pay for environmental resource inversely related to initial bid amount, distance from the resource, family size, occupation experienced.

Income: The analysis result of parameter estimate referred income known to have direct and promoting effect of estimate of willingness to pay for the resource. The result implied that through increased income from the economy, it is possible to adopt conservation and improvement of natural and environmental resources. The study in line with [51] that stated the Mean WTP per visitors from different destination in relation their income and general awareness on the value. The monthly income is key determinant of WTP [27] for internal preferences and caring externalities for improved health services.

Bid amount: The estimated value for parameter [-0.005] referred extent of bid given for the respondent during survey owned reduced effect on the value of the willingness to pay. This pointed out that bid value has significant and decreases the preference of the environmental value for community. The result also showed that scientific, decentralized and realistic initial bid value has to be given due attention in environmental valuation process. The study report by [57] specified that the households requested with higher starting bid values are less likely to pay for improved rural water supply.

Education level: The value of independent value education level [0.102087] indicated that the specific value variable increase the level of willingness to pay for the resources. Increasing education level one more increases the estimate of willingness to pay for about 10%. The result indicated that through time by improved education access and capacity development, it is possible to promote environmental resource conservation and improvement. The study is also supported by [13] that justified higher levels of education found to be directly related with higher willingness to pay estimates.

Gender: The demographic variable gender related indirectly with the estimate of willingness to pay. The result showed that preference of environmental and natural resource depends on sex of the respondents. In relation access and utilization of the resource, males and female respondents valued differently. The result is in line with that stated there is significance difference between male and female respondent interims of willingness to pay for natural resource improve-

ment [23].

Age: The age of respondents known to increase the value of willingness to pay for conservation and improvement of natural resources. The Meta-analysis result showed that experience of living with for years enabled the respondent to increase the value of environmental resource. The result conceded with the finding of [47] that revealed that age of the respondent have significant effects on WTP for improved natural resource provision. The study report also supported by [34] that indicated older respondents were willing to pay for sustainable forest management higher amount than younger respondents.

Training and knowledge: The explanatory variable termed access to training and knowledge known to have positive effect in mean size effect of willingness to pay. The study result indicated that increasing access to training and improving awareness for respondents known to have increasing effect of mean size of willingness to pay estimate. The finding is in line with [8] that stated participation on training in natural and environmental conservation issues and on environmental activities had a positive contribution to the WTP of respondent [18].

Occupation: The estimate value [-0.08] for the independent variable referred major activity of the respondent called occupation implies that the movement of the respondent from commonly doing activity to other own to have the likelihood of decreasing willingness to pay for natural and environmental resources. The movement made by respondents away from doing major tasks of related to valued resource known to have the likelihoods of decreasing the mean willing to pay estimate by 8%.

4.2.2. Econometric Analysis of Factors Affecting Willingness to Pay

Table 3. *Model summary of Environmental resources Valuation by WTP.*

Model Summary				
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	.511[a]	.262	.228	49.379

a. Predictors: [Constant], sample size, environmental resource valued, year of publication, continent where the study done, model used for data

The coefficient of determination value estimated equals to 0.511 indicates that about 51.1% of the variation in willingness to pay for conservation and improvement and conservation is explained by the variation in the five explanatory variables [sample size, environmental resource valued, year of publication, continent where the study done, model used for data].

Table 4. *Analysis of variance for dependent and explanatory variables.*

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	95027.450	5	19005.490	7.795	.000b
Residual	268212.585	110	2438.296		
Total	363240.034	115			

a. Dependent Variable: Willingness to pay average

b. Predictors: [Constant], sample size, environmental resource valued, year of publication, continent where the study done, model used for data

The F value equals to 7.795 in the table above used to test the hypothesis that all the slope coefficients in the mean willingness to pay regression are simultaneously equal to zero. This null hypothesis is rejected since the p value of the estimated value is very low. In the regression result the p value is practically zero, suggesting that we can strongly reject the hypothesis that collectively all the explanatory variables have no impact on the dependent variable, mean willingness to pay for natural and environmental resource conservation and improvement. It also pointed out that at least one independent

variable has significant impact on the dependent variable.

Table 5. *Estimates for Coefficients of explanatory variables in the model.*

Coefficients[a] for explanatory Variables	Unstandardized Coefficients		Std. Coef.	T	Odds ratio	Sig.
	B	Std. Error	Beta			
[Constant]	-59.61	1891.24		-.032	1.29E-26	.975
valued environmental resource	-31.33***	10.81	-.266	-2.898	2.47E-14	.005
year of publication	.049	.937	.005	.052	1.05	.959
The survey region	-43.50***	10.21	-.386	-4.26	1.28E-19	.000
model used for data	35.64***	10.55	.317	3.38	3.008E+15	.001
sample size	.045*	.027	.165	1.67	1.05	.098

a. Dependent Variable: Willingness to pay average

The significant level defined 1%, 5% and 10% accordingly for ***, ** and **.

The linear regression result in the table above indicated that the extent of value of the estimate for willingness to pay for different Natural and environmental resource defined as function of sample size of respondents interviewed, model type used, study continents. As the result justified that the estimate value of willingness to pay for the resources related directly with sample size and model type used other than Probit, but indirectly with continents the study done, environmental resource valued.

Environmental resource type valued: The estimated parameter estimate resource type valued indicated that one step movement away from valuing ecosystem service to other environmental resources [water, forest, land and biodiversity] impose the decreases in the willingness to pay value. The result supported by [10] that stated Willingness to pay closely related to their individual environmental awareness. The study also supported by [54] that indicated the WTP is greater for products with higher benefits socially for benefits humans compared to those that benefit the environment. The results show similarity with [39] that reported willingness to pay is significant for recreation and Carbon sequestration but not for biodiversity conservation, landscape and other ecosystem services.

Study areas: The area defined as 1 for East Africa and 0 other wise its calculated parameter estimate (-43.5) indicated that moving one step away from East Africa impose reduction in the value of willingness to pay, holding other variables constant. The implied that due to different socioeconomic, institutional settings, technical and related difference in environmental resource valued, the mean of willingness to pay varies across the study regions. The study also supported by [44] that summarized the existence of standard spatial heterogeneity within valuation and benefit transfer across districts and respondents. The finding is also supported by [41] that inferred geographical differences are important drivers of the valuation results.

Sampled size of the respondents: The regressed result specified that the value of the explanatory variable sample size was.045 and that indicated one unit increase in sample size adds the value of willingness to pay for environmental and natural resource by unit of 0.045, holding other variables constant. This showed that larger sample size owned the capacity of increasing the parameter estimate, holding other variables constants. The analysis result pointed out that high large sample size and associated high estimate of the dependent variable could not be the ultimate indicator of reality of the estimate. The finding is also in line with [19] that reported changes in WTP for threatened and endangered species were defined and explained as function of sample size, payment frequency and payment vehicle.

Model type used: The calculated value from the regression for model type (35.64) indicated that using models other than Probit in the regression owned the significant and increasing impact over the value of dependent variables, holding other variables constant. The result implied that one step movement from Probit model to others [Logit and Tobit] could increase the estimate of willingness to pay for environmental resources by proportion of 64%. The result also supported by [15] that summarized as if we multiply the probit coefficient by about 1.81 we will get approximately comparable coefficients to the Logit coefficient.

5. Conclusions

The empirical analysis study aimed on identifying factors affecting Mean size effect of willingness to pay and mean of willingness to pay for preserving, protecting and improve-

ment ecosystem service, water quality and quantity, forest value, land value and biodiversity. The analysis synthesized data from 57 article on 116 observation that carried out from 2002 up to 2019. The reviewed articles were the one that conducted in Ethiopia, Nigeria, Kenya, Uganda, USA, China, Iraq, Malaysia and India. The Mean size effect data gathered from explanatory variables significantly affected the dependent variable and its standard errors. The multiple liner regressing procedure was used to identify determinants of mean willingness to pay for resources conservation and improvements. The regressions analysis of mean of WTP made on resource valued, publication year, model used and sample size. Meta-analysis result indicates that the estimate of willingness to pay among respondents vary due to difference in demographic, social, economic and institutional reasons. The mean size effect of willingness to pay for environmental goods and services is positively related to income, age, education level, training and knowledge. The community members that own better income, experience in the resource access, education level and knowledge are known to put more value over the goods and services obtained from natural resources. The result shows that the improvement and conservation of natural and environmental resources can be accelerated by capacity buildings, enabling the opportunities to have better income and improving knowledge on economics, social and environmental value of the resources. The mean size effect of willingness to pay for improvement and conservation of natural resource is inversely related to initial bid amount, sex and occupation of the respondents. The result specified that women respondents, lower initial bid value and moving away from major occupation [agriculture] that highly linked with environmental resource own reducing effect on the value of natural resource own lowering effect on mean value of willingness to pay for the resource conservation and improvement.

The regression result indicated that the mean willingness to pay for goods and services from natural resource is defined as positive function of the model used and sample size of respondents. The mean willingness to pay for is also known to be defined as negative function of initial bid value and occupation other than farming used. The result is concluded as large sample size of the respondents and model adopted cannot be the ultimate indicator of the reality of the study results. If the scholar is known to use model categories other than Probit, it estimates known to soar due to its specific characters of the model used than the information gathered. The result also concluded as the article with larger sample sized is known to come up with larger estimate of willingness to pay and model type used determines the estimate of the regressand. The other finding from the result is the respondents put different value for various environmental resources based on category and their experience of access and utilization. The mean willingness to pay value given to ecosystem service is lower than that of water, forest, land and biodiversity.

The result in general concluded as it is indispensable to give attention in correctly specify model, not doing measurement errors and clearly defined the resource valued for stakeholders participated in the study. The mean size effect of income, knowledge about the resource, age in relation to experience to valued resource and education level promotes the individuals to state higher willingness to pay for resource valuation. The mean size effect analysis also summarized as asking lower initial bid value, male households and occupation other than agriculture known to impose the respondents to state lower willingness to pay. Hence, the empirical review result pointed out that the existence of possibility of promoting environmental and natural resource, conservation, protection and improvement though capacity building, appropriate model selection and improving income access from the resources.

Abbreviations

CVM	Contingent Valuation Method
SE	Standard Error
WTA	Willingness to Accept
WTC	Willingness to Compensate
WTP	Willingness to Pay

Acknowledgments

I have great and fresh thanks for my Lord Jesus for his eternal mercy, living love and perfect grace. I would like to thanks professor Mengistu Ketema and professor AVS Arora for initiating and capacitating to work on Meta-analysis. I have thanks for my working organization the South Ethiopia Agricultural Research Institute and the Haramaya University where I am studying and for giving me the opportunity and cooperating. I am in great pleasure to thank my father Bassa Faku, my love Meseret wolde, kids Tinbte Zekarias, Addiskidan Zekarias, Zetseat Zekarias, Sofonias Zekarias, Elyroe Zekarias and my special sister Martha sister for their sustained love and taking cares.

Author Contributions

Zekarias Bassa is the sole author. The author read and approved the final manuscript.

Conflicts of Interest

The author declares no conflict of interest.

References

[1] Abebe S. T., Dagnew A,. B., Zeleke, V. G., Eshetu, G. Z., and Cirella, G. T,. 2019. Willingness to Pay for Watershed Management. MDPI *Resources article, 8, 77; 1-18.* https://doi.org/*10.3390/resources8020077*

[2] Adepoju Adebusola Adenike and Omonona Bolarin Titus. 2012. Determinants of Willingness to Pay for Improved Water Supply in Osogbo Metropolis; Osun State, Nigeria. *Research Journal of Social Sciences, 4: 1-6.*

[3] Ahmed M. Hussen. 2004. Principles of Environmental Economics. *Second edition published in the Taylor & Francis e-Library, 29 West 35th Street, New York, NY 10001*. Kalamazoo College, Michigan, USA.

[4] Alem Mezgebo. 2012. Households' willingness to pay for restoring environmental resource: a case study of forest resource from dire dawa area, eastern, Ethiopia. *Ethiopian Journal of Economics, Vol XXI No 2: 32-62.*

[5] Andreas KontoleonandTimothySwanson. 2003. The Willingness to Pay for Property Rights for the Giant Panda: Cana Charismatic Species Bean Instrument for Nature Conservation? *Land Economics, 79(4): 483–499.*

[6] Belay Kasaye. 2015. Farmers" Willingness to Pay for improved Soil Conservation Practices on communal lands in Ethiopia: case study in kuyu woreda. A thesis submitted to the school of graduate studies of Addis Ababa University, Addis Ababa University, Faculty of Business and Economics, Department of Economics, Addis Ababa, Ethiopia.

[7] Bengt Kristr öm. 1990. Valuing Environmental Benefits Using the Contingent Valuation Method - An Econometric Analysis. Ume åEconomic Studies No. 219, 168 pages.

[8] Berhan Asmamaw, Birhanu Beyene, Misikire Tessema, Afework Kara, Biniam Goshu, Abraham Assefa. 2016. Estimating Willingness to Pay for Labeobarbus Fish Species Conservation in Lake Tana, Ethiopia: A Contingent Valuation Study. International *Journal of Natural Resource Ecology and Management. Vol. 1, No. 4, pp. 155-161*.

[9] Berta Martin Lopez, Carlos Montes, and Javier Benayas. 2008. Economic Valuation of Biodiversity Conservation: the Meaning of Numbers. *Conservation Biology, Volume 22, No. 3, 624–635.*

[10] Bing Yu, Yuying Cai, Laiqun Jin and Bisheng Du. 2018. Effects on Willingness to Pay for Marine Conservation: Evidence from Zhejiang Province, China. *Sustainability, 10, 2298;* https://doi.org/*10.3390/su10072298*

[11] Birara Endalew and Beneberu Assefa. 2019. Determinants of households' willingness to pay for the conservation of church forests in northwestern Ethiopia: A contingent valuation study. *Cogent environmental science, 5: 1570659; 1-14.*

[12] Bishop, J. T. 1999. Valuing Forests: A Review of Methods and Applications in Developing Countries. International Institute for Environment and Development: London.

[13] Brian Witt. 2018. Contingent valuation and rural potable water systems: A critical look at the past and future. *WIREs Water. 2019; 6: e1333. https://doi.org/10.1002/wat2.1333*

[14] Chambers, C. N., and Whitehead, J. C. 2003. A Contingent Valuation Estimate of the Benefits of Wolves in Minnesota, *Springer Environmental and Resource Economics, 26(2): 249-267.*

[15] Damodar Gujarat. 2013. Econometrics by Example. *Palgrave Macmillan, First Edition, New York, USA.*

[16] Dare, A. M., Ayinde, I. A., Shittu, A. M. Akerele, D and 2Sam-Wobo, S. O. 2018. Determinants of the factors affecting willingness to pay for improved sanitation among rural households in oyo state, Nigeria. *Nigerian Journal of Agricultural Economics [NJAE]. Volume 8(1): pp. 72-80.*

[17] Diane Hite, Darren Hudson, and Walaiporn Intarapapong. 2002. Willingness to Pay for Water Quality Improvements: The Case of Precision Application Technology. *Western agricultural Economics Association Journal of Agricultural and Resource Economics 27(2): 433-449. pp 436-449.*

[18] Ekka A. and Arun Pandit. 2012. Willingness to Pay for Restoration of Natural Ecosystem: A Study of Sundarban Mangroves by Contingent Valuation Approach. *Indian JournaL of Agricultural Economics. Vol. 67, No. 3. pp. 324-333.*

[19] Evan E. Hjerpe and Anwar Hussain. 2016. Willingness to pay for ecosystem conservation in Alaska's Tongass National Forest: a choice modelling study. Conservation Economics Institute, Forest Policy Center, Auburn University. *Ecology and Society 21(2): 8; 1-14.*

[20] Felix Schl äpfer. 2004. Survey protocol and income effects in the contingent valuation of public goods: a meta-analysis. Institute of Environmental Sciences, University of Zurich, Winterthurerstrasse 190, 8057 Z ürich, Switzerland.

[21] George E. Halkos and Georgia K. Galani. 2012. A review the use of contingent valuation in assessing marine and coastal ecosystems' water quality. University of Thessaly, Department of Economics, MPRA Paper No. 42183. Laboratory of Operations Research, Department of Economics, University of Thessaly, Korai 43, 38333, Volos, Greece.

[22] Georgiou, S. f. Langford, I H, Bateman I J and R K. 1996. Turner Determinants of individuals' willingness to pay for perceived reductions in environmental health risks: a case study of bathing water quality. CSERGE, University of East Anglia, Norwich, UK, and University College London, London. *Environment and Planning A 1998, volume 30, pages 577–594.*

[23] Gidey Kindu Mazgebo and Zeleke Ewnetu. 2014. Household Willingness to pay for improved water services in urban area: A case study from Nebelet town, Ethiopia. Department of Natural resource economics and management, Mekele University, Mekele, Ethiopia. *Full length research paper, Journal of development and agricultrl economics, Vol. 7(1), pp. 12-19. ISSN: 2006-9774.*

[24] IAN J. BATEMAN ANDREW A. LOVETT JULII S. BRAINARD. 2003. APPLIED ENVIRONMENTAL ECONOMICS A GIS Approach to Cost-Benefit Analysis. *The Edinburgh Building, Cambridge CB2 2RU United Kingdom*.

[25] International Institute for Environment and Development [IIED]. 2003. Valuing forests a review of methods and applications in developing countries. Environmental Economics Programme. *Earthprint Limited, Orders Department, Stevenage, Hertfordshire SG1 4TP 3 En*. dsleigh Street London WC1H 0DD UK.

[26] James A. Brox, Ramesh C. Kumar & Kenneth R. Stollery. 1996. WILLINGNESS TO PAY FOR WATER QUALITY AND SUPPLY ENHANCEMENTS IN THE GRAND RIVER WATERSHED, Canadian Water Resources Journal, 21: 3, 275-288.

[27] Javad Javan-Noughabi, Zahra Kavosi, Ahmad Faramarzi and Mohammad Khammarnia. 2017. Identification determinant factors on willingness to pay for health services in Iran. *Health economic reviwu Open Access Spriner Journal*. https://doi.org/*10.1186/s13561-017-0179-x*

[28] Lalisa A. Duguma, Joanes Atela, Peter A. Minang, Alemayehu N. Ayana, Belachew Gizachew, Judith M. Nzyoka and Florence Bernard. 2019. Deforestation and Forest Degradation as an Environmental Behavior: Unpacking Realities Shaping Community Actions. *Land article 8, 26; 1-17.*

[29] Loomis, John B.; Gonz ález-Cab án, Armando; Gregory, Robin. 1996. A contingent valuation study of the value of reducing fire hazards to old-growth forests in the Pacific Northwest. Res. Paper PSW-RP-229-Web. Albany, CA: Pacific Southwest Research Station, Forest Service, U.S. Department of Agriculture; 24 p.

[30] Margaret M. Calderson, Leni D, Camacho, Myrna G, Carandan, Joesfina T. Diazon, Lucrecio L. Rebugio and Noel L. Tolentiono. 2005. Willingness to pay for improved watershed management: Evidance from Metro Manila, Ohillipiness. *Fores science and Technology Vol. 2, No. 1 pp. 42-50.*

[31] Mart ínez-Paz, J. M. and Perni, A. 2011. Environmental Cost of Groundwater: A contingent Valuation Approach. Department of Applied Economics, University of Murcia, Spain Water and Environment Institute, University of Murcia, Spain. Int. J. Environ. Res., 5(3): 603-612.

[32] Mattias Boman, Anni Huhtala, Charlotte Nilsson, Sofia Ahlroth, G öran Bostedt, Leif Mattsson and Peichen Gong. 2012. Applying the Contingent Valuation Method in Resource Accounting. *Working Paper No. 85, Published by The National Institute of Economic Research Stockholm, Sweden.*

[33] Mesfin Tilahun, Erik Mathijs, Bart Muys, Liesbet Vranken, Jozef Deckers Kidanemariam gebregziabher, Kindeya Gebrehiwot, Hans Bauer. 2011. Division of Agricultural and Food Economics, Department of Earth and Environmental Sciences, K. U. Leuven, Celestijnenlaan Leuven, Belgium. Department of Economics, Mekelle University, Mekelle, Ethiopia. Paper prepared for presentation at the EAAE 2011 Congress Change and Uncertainty Challenges for Agriculture, Food and Natural Resources, Zurich, Zurich, Switzerland.

[34] Michael Ansong and Eivin R øskaft. 2014. Local communities' willingness to pay for sustainable forest management in Ghana *JENRM, Vol. I, No. 2, 80-87.*

[35] Nelson H. W. Wawire and Aggrey. D. M Thuo. 2016. Economic Environmental Valuation, Book chapter, Kenyatta University, Department of Economics; Kenyatta university, Environmental Planning and Management Programme, Environment and Sustainable Development, Volume 2 chapter 5, Kenya.

[36] Nnaemeka a. Chukwuone and chukwuemeka e. Okorji. 2008. Willingness to pay for systematic management of community forests for conservation of non-timber forest products in nigeria's rainforest region, Implications for poverty alleviation, Centre for Entrepreneurship and Development Research and Department of Agricultural Economics, University of Nigeria Nsukka, Department of Agricultural Economics, University of Nigeria Nsukka. *Rob B. Dellink and Arjan Ruijs [eds.], Economics of Poverty, Environment and Natural Resource Use, 117-137. Springler.*

[37] Noughabi Zahra Kavosi, Ahmad Faramarzi and Mohammad Khammarnia. 2017. Identification determinant factors on willingness to pay for health services in Iran. *Health Economics Review.*

[38] Nyongesa J. M., H. K. Bett, J. K. Lagat and O. I. Ayuya. 2016 Estimating farmers' stated willingness to accept pay for ecosystem services: case of Lake Naivasha watershed Payment for Ecosystem Services scheme-Kenya. *Ecoloical Process crossmax Springler open access Journal, 1-15.* https://doi.org/*10.1186/s13717-016-0059*

[39] Paola Gatto, Enrico Vidale, laura Secco, Davide Pettenella. 2014. Exploring the willingness to pay for forest ecosystem services by residents of the Veneto Region. *Bio-based and Applied Economics 3(1): 21-43.*

[40] Randall A. Kramer, Thomas P. Holmes, and Michelle Haefele. 2003. Contingent Valuation of Forest Ecosystem Protection. Duke University, USDA Forest Service, and Colorado State University. USA.

[41] Raymond J. G. M. Florax, Chiara M. Travisi and Peter Nijkamp. 2005. A meta-analysis of the willingness to pay for reductions in pesticide risk exposure. Department of Agricultural Economics, Purdue University, 403 W. State Street, West Lafayette, IN 47907-2056, USA. *Selected Paper prepared for presentation at the American Agricultural Economics Association Annual Meeting, Providence, Rhode Island, July 24-27.*

[42] Richard T. Carson. 2000. Contingent Valuation: A User's Guide, Department of Economics, University of California, San Diego, La Jolla, California 92093. Environ. Sci. Technol. 2000, 34, 1413-1418.

[43] Richard T. Carson. 2012. Contingent Valuation: A Practical Alternative when Prices Aren't Available. University of California, San Diego, University of California, San Diego, USA. *Journal of Economic Perspectives—Volume 26, Number 4—Fall 2012—Pages 27–42.*

[44] Robert J. Johnston, Mahesh Ramachandran, Eric T. Schultz, Kathleen Segerson, Elena Y. Besedin. 2011. willingness to pay hot spots and the distribution of ecosystem service values: implications for benefit transfer association of Environmental and Resource Economists Annual Meeting, Pittsburgh, Seattle. George Perkins Marsh Institute Clark University. *Annual meeting selected paper.*

[45] Roger Perman, Yue Ma, James McGilvray and Michael Common. 2003. Natural Resource and Environmental Economics. *Third Edition. Pearson Education Limited Edinburgh Gate Harlow Essex CM20 2JE.*

[46] Rohana, A. R. Mohd Parid, M. Azharizan, M. N. 2011. Conservation of Forest reserve in Urban area: how much residents' willingness to pay. Forest Research Institute Malaysia [FRIM], Kepong, Selangor, Malaysia. *International Journal of Advanced Research in Management and Social Sciences, Vol. 2 | No. 10, ISSN: 2278-6236.*

[47] Shemelis Kebede, Hundie Lamessa and Tariku Abdisa. 2016. Households' Willingness to Pay for Improved Water Supply: Application of the Contingent Valuation Method; Evidence from Jigjiga Town, Ethiopia. Department of Economics, Jigjiga University, Ethiopia. *The Romanian Economic Journal, Year XIX no. 62, pp 191-214.*

[48] Steven C. Hackett. 2006. Environmental and Natural Resources Economics. Theory, Policy, and the Sustainable Society, 3rd edition. M. E. Sharpe Armonk, New York London, England.

[49] Surendran A. and Sekar C. 2010. An economic analysis of willingness to pay [WTP] for conserving the biodiversity. *International Journal of Social Economics, Vol. 37 Issue: 8, pp. 637-648*.

[50] Tadesse Getachew. 2018. Estimating Willingness to Pay for Forest Ecosystem Conservation The Case of Wof-Washa Forest, North Shewa Zone, Amhara National Regional State, Ethiopia Debre Berhan University College of Agriculture and Natural Resource Sciences *Department of Natural Resource Management. ISSN 2422-8397 An International Peer-reviewed Journal Vol. 46.*

[51] Thalany Kamri. 2013. Willingness to Pay for Conservation of Natural Resources in the Gunung Gading National Park, Sarawak. Universiti Putra Malaysia, Selangor 43400, Malaysia Universiti Teknologi MARA, Sarawak, 94300, Malaysia. *Procedia - Social and Behavioral Sciences, 506–515.*

[52] Tom Tietenberg and Lynne Lewis. 2012. Environmental & Natural Resource Economics Emeritus, Colby College and Bates *College. 9th Edition, Pearson Education, Inc., publishing as Addison-Wesley. All rights reserved, United States of America.*

[53] Tony Parto. 1998. Natural Resource and Environmetal Economics. Iowa State Unversity *Press/Amen. Iowa 50014, USA.*

[54] Tully, Stephanie and Winer, Russell S. 2014. The Role of the Beneficiary in Willingness to Pay for Socially Responsible Products: A Meta-Analysis. Available at SSRN: http://dx.doi.org/10.2139/ssrn.2420537

[55] Xiu-hua Song, Tae-Dong Cho1, Xiao-xia Lang, Yong-Ji Piao. 2013. Influencing the Willingness to Pay for Urban Park Service Functions. *China Journal of Environmental Science International ORIGINAL ARTICLE 22(10); 1279-1285.*

[56] Zander KK, Ainsworth GB, Meyerhoff J, Garnett ST. 2014. Threatened Bird Valuation in Australia. *PLoS ONE 9(6): e100411.* http://dx.doi.org/*10.1371/journal.pone.0100411*

[57] Zelalem Lema and Fekadu Beyene. 2012. Willingness to Pay for Improved Rural Water Supply in Goro-Gutu District of Eastern Ethiopia: An Application of Contingent Valuation. International Livestock Research Institute, Addis Ababa, Ethiopia and College of Agriculture and Environmental Sciences, Haramaya University, Ethiopia. Journal of Economics and Sustainable Development, Vol. 3, No. 14. pp, 145-159.