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DETERMINIG FACTORS OF LOCAL COMMUNITIES WILLINGNESS TO DONATE FOR IMPROVED CONSERVATION OF YANKARI GAME RESERVE, NIGERIA.

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Abstract

This study examine the factors that will determine the local communities willingness to donate (WTD) for improve conservation of Yankari Game Reseve. However, Funding is one of the major challenged facing the management of game reserves and protected areas in Nigeria. Sufficient financial funding is an important step towards improve conservation for sustainable use and benefit for the future. A design dichotomous choice-contingent valuation method DC-CVM on 422 locals of adjoining communities of YGR, and the logit model was employed to estimate their willingness to donate for the improve conservation of the reserve. The result indicates that 314(74.4%) of the local respondents are willing to donate. From the result, Age, Years of education, income, membership of association and Awareness are the positively significant determinants of the local's willingness to donate. The result of this study will guide policy makers and conservation managers to incorporate local communities adjoining the reserve into the management and decision making and also their donation will serve as additional fund to compliment the funding gap from government for improve and sustainable management.

Keywords: Conservation, Local Communities, Willingness to Donate, Dichotomous Choice-Contingent Valuation Method, Management, Policy Makers.

1. Introduction

Conservation is an interdisciplinary theme in natural science, social sciences and the exercise of natural resource management. It is term as the studying of the nature of Earth's biodiversity with the aim of protecting the ecosystem and their habitats from extinction and destructions (Sahney and Benton, 2008; Van Dyke, 2008; Soule *et* *al.*, 1986; Wilcox, *et al.*, 1980). Biodiversity Conservation functions as ecosystem maintenance system such as the recreational, sequestential of carbon, educational services, erosion and flooding mitigation (Jia, Fu, Feng, Hou, Liu and Wang, 2014). Such areas are to serve as poverty reduction, job creation, sustainable community and conservation development (Rogerson, 2012). Therefore, conservation of natural

environment resources is a wealth of life which is found on earth plants, animals, microorganisms and the system that they exist in (Olaleru and Egonmwan, 2014).

Conserved areas in Africa have historically barred local people assuming that these areas are surrounded by hostile communities and enjoy little, if any, support from the people (Ariya and Momanyi, 2015; Neumann 1998; Lusigi 1981). Attitudinal studies in some Africa countries (South Africa, Rwanda, Tanzania, and Nigeria) shows that this assumption is overly simplistic (Oman, Thoresen and McMahon 1999; Infield 1988). In these studies, local people shows support to protected areas because they are important for hydrological functions, watersheds, revenue generation and maintenance of nature. Likewise, local people support for wildlife primarily is because wildlife is viewed as a source of food. Whereas, those with negative or neutral attitudes toward the management of protected areas did so because they felt that were only provided with few services or benefits to their communities (Otto, Robinson, Donovan, Lavelle, Villarreal and Pearl, 2013).

Major threats to biodiversity and ecosystem survival include climate change, deforestation, pollution, mass agriculture, overgrazing, pesticide use, poaching, slash-and-burn agriculture, urbanization, and wildlife trade (Ezebilo et al., 2010; Longcore and Rich, 2004; Thomas *et al.*,2004; and Landres *et al.*, 1988). Habitat fragmentation poses one of the most challenges, because global protected areas net covers 30 million km^2 of the Earth's surface (Deguignet, Juffe-Bignoli, Harrison, MacSharry, Burgess and Kingston, 2014).

The consequence of the said threats leads many protected areas into great loss of ecosystem and causes a great exodus migration of many animals' species globally ((Ezebilo et al., 2010).

In addition, deforestation, pollution, mass agriculture, overgrazing, pesticide use, poaching, slash-and-burn agriculture, urbanization and wildlife trade are the major conservation treats that take place and depletes conservation due to lack poor funding on employment of rangers and application of modern tracking equipment's, lack of awareness or sarcasm of their non-market environmental values in our day-to-day activities. Therefore, determining and estimating their associated benefits of conservation of natural resources can be expedient increase in level of knowledge in relation to importance and associated values of ecosystem and the need for improve conservation management of the associated resources for future generation and sustainability (Kaffashi, 2010; Yacob *et al*., 2008, and Barbier *et al*., 1997). The services rendered by conserve resources are one of the major important components for sustainable growth and development of surrounding communities coupled with the increase in leisure and recreation demand at various rich and endowed ecosystem resources environment in countries like Tanzania, Kenya and Nigeria (Kelley, Rensburg and Jeserich, 2016; Ezebilo, and Mattsson, 2010).

However, many conserve environment around the world are financially underfunded, and due to it, quit a number of such programs are either not able to achieve their conservation aims and developmental objectives (Whytock, Buij, Virani and Morgan, 2016). In Africa for example, many

endowed conserve environment find it difficult to manage and conserve this resources due the continuous human pressure and inadequate funds for management (Adamu, Yacob, Radam and Hashim, 2015). There is the prediction that funding of conserve environment by most federation government of African countries may reduce or is reduced because currently most of these resources management are faced with limited funding from government to maintain the conserve natural environment (Cheung, Fok, and Fang 2014). This problem of under or poor funding will lead to the failure of many government, policy makers, environmental managers, visitors and peoples of adjoining communities to recognise the market and non-market values of conservation area. These include the generated revenue from visitors and the non-monetary services that can contribute to the improvement of life quality (Yacob, Radam and Shuib 2009; Anderson and Huggins 2008). This

unfortunate happening leads to lack of financial independence of such rich conserve area in their sustainable survival (Waldron, Mooers, Miller, Nibbelink, Redding, Kuhn and Gittleman 2013), and virtually most of the conserve biodiversity will only survive or exist only if people choose and are willing to protect and allocate fund for their sustainable conservation (Klein, Hendrix, Lohr, Kaytes, Sayler, Swanson, and Reganold, 2015).

A lot of studies have been conducted in determining and estimating acceptable entrance fees to various protected areas and natural resources reserves. Therefore, this study interest is centered towards determining and estimating the willingness to donate by the local people of adjoining communities for improve conservation of YGR, and the potential effect of such donation.

2. Literature review

The establishments of conserve reserves and resources parks are aim at ensuring that varieties of plants species are conserved and protected (Jia, Fu, Feng, Hou, Liu and Wang, 2014: An, Li, Guan, Zhou, Wang, Deng and Jiang, 2007). The main aim of ecosystem conservation is to maintain and protect ecological process which is proved to have continuously contributed significantly in the productive capacity of the protected ecosystem resources, biodiversity genetical materials, protection of culture and rural area development as a whole. (Newing, 2010). Due to the rapidly growing demand for ecological resources of the present day society which lead to habitat

destruction and fragmentation, extinction of species and the general decline or loss of biodiversity in our environment and conserved areas (Frikvist and Erika, 2015; Larby and Patricia, 2009). Globally, the rate at which varieties of species of plants and animals were lost supersedes its natural lost (Chanie and Tesfaye, 2015: Meduna, Ogunjinmu and Onadeko, 2009). The daily increase of human activities is destructing natural resources which necessitate the establishment of conserve and protected environmental resources globally (Grigoroudis, Petridis and Arabatzis, 2014) Conservation is defined as the activity of guarding plant and animal species and their

habitats. Among the goals of wildlife conservation are to ensure that nature is protected for future generations to enjoy and to recognize the importance of wildlife and wilderness lands to humans (Sahney and Benton 2008). Biodiversity conservation can be seen as avoiding and disregarding any steps that can disturb Yankari Game Reserve ecosystem. Conservation would also be addressed as sacrifice (not hostile to conservation objectives) in some ways by the park authority to the community to achieve mutual cooperation. In wider view, management system for conserving biodiversity comprises a general use. The primary objectives must be to enable local communities to manage the diversity of their local system, to ensure productivity (Abimbola O. A. et al., 2011; McNeely, 1997**).**

Researchers within the conservation discipline have focused on the way that the financial independence of conserve area could be enhanced or achieved, Emerton, Bishop and Thomas (2006), defined the financially independence of conservation program as the ability to secure a long-term

stable and sufficient financial resources, timely and appropriate allocation of funds to cover all cost of the management of the program to ensure its effectively and efficiency in line with conservation management. Therefore, getting enough funding for protecting and enhancement of conserve environment is always a topic of concern for sustainable management of natural resources based conservation (Steckenreuter and Wolf, 2013). Funding is aim towards biodiversity conservation is the major point of conservation to environmentalist and conservationist.

Participation in improve conservation refer to a process whereby community members through can be part of the management and developmental activities within the conserve region (Abdulai, 2008). This because in the perspective of rural development project activities implies involve local people in government policies that affects them. And this implies the same with the participation of the surrounding communities of Yankari game reserve.

3. Methodology
3.1 Study area
According to Ayeni (1988), Yankari Game Reserve occupies an area of about 2244 km^2 and lies between Latitude 9°34' and 10°00' N and Longitudes 10°17' and 10°47'E in the south central part of Bauchi state, north-eastern Nigeria. It covers parts of Duguri, Pali and Gwana with a population of 328,284 at the (Nigerian Bereau of Statistics (NBS), 2012). The inhabitants of the adjoining communities are mostly jarawa, bolawa, hausa and Fulani`s and predominantly Muslims and Christians of Alkaleri Local Government.

The predominant activity in rural Bauchi state is small scale Farming, Animal rearing and food processing, with informal trading and micro entrepreneurship activities taking place for livelihood (Haruna et al., 2012). 70% of surrounding communities population are living below $1.00 per day and the rural areas suffer more serious incident of poverty with about 90% of them under the poverty line (Punch, 2013; Daily trust, 2012; Business Day, 2012; and NBS, 2012).

The Reserve is located in the southern portion of Sudan savannah vegetation and it

contributes significantly to the national carbon sequestration system. Is also an important component of river Benue watershed protection system because some rivers from the reserve (e.g. river Gaji, Yashi and Yuli) eventually feed the Benue traverse or border the reserve. There are over 532 vascular plants so far identified in YGR; of which 351 species are dicotyledonous belonging to 81 families, and 181 are monocotyledonous belonging to 23 families (Abalaka and Manu, 2007). There are 52 mammalian species belonging to 29 families in YGR and there are five large mammals of global conservation significance including two that are globally threatened. These are African elephants *Loxodonta Africana* (EN). Lion *oanthera leo (*VU), Afrrican Buffalo *Syncerus caffer* (LR), Roan antelopes *Hippotragus equinus* (LR), *and* wesern Harbeest *Alcelaphus buselaphus major* (LR). The red fronted Gazelle *Gazella rufufrons,* Korrigum Damaliscus *buselaphus korrigum,* western kob kobus *kob kob,* reedbuck *redunca redunca* and giraffe *giraafa camelopardalis* are considered locally extirpated from YGR (Ngoka and Lameed, 2014). There are also over 350 species of bird identified so far in the reserve. Out of which, 130 are resident and may breed in the reserve, 87 are nationally reared, 39 are occasional visitors and 92 migrants of uncertain status (Odunlami, S. S. 2003; Ubaru, J.I., 2000; Olokesusi, F., 1990).

Yankari game reserve also has a large and diverse freshwater ecosystem around its freshwater springs and the Gaji River. Due to underground geothermal activity, Yankari has five water springs – Wikki, Dimil, Gwana, Tunga Maliki and Mawulgo – with constant temperature of 30 to 32 degrees all year round. Wikki is the largest spring and is about 13.0 metres wide and 1.9 metres deep and is the most utilised of the five. Tunga Maliki is the coldest. The fifth spring, Tungan Naliki, is the only cool spring in the park (Obande, Lawal and Ahmed, 2014; Nihotours, 2000).
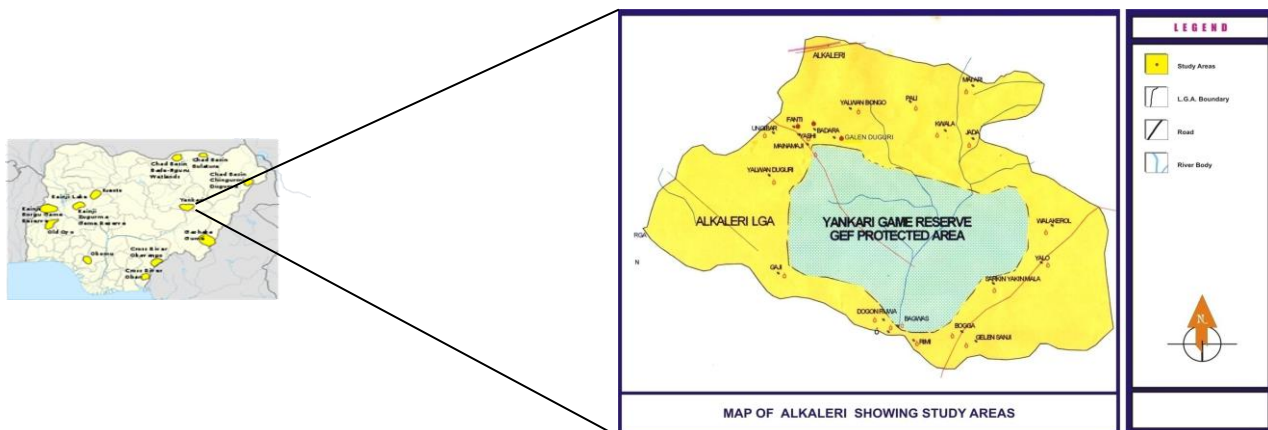

Figure1: Study area (showing Yankari game reserve)
Source: Department of Geography, Abubakar Tatri Ali Polytechnic Bauchi, GIS Unit (2020)

3.2 Population, Sampling methods and collection of study data

3.2.1 Study Population
According to NBS (2012), Alkaleri local government at which Yankari game reserve is located and chosen for this study has a population of 328,284 and 54,714 households. The targeted study populations are all members of the adjoining communities who are above eighteen (18) years of age.

3.2.2 *Sample size*
As recommended by National Oceanic and Atmospheric Administration panel, face-to-face interview mode is expensive when compared to other survey interview modes. This implies that lower samples are to be collected by using face-to-face method in comparison to other mode with a relatively fixed budget to be employed. For this study, face-to-face mode of survey elicitation with 440 samples was employed to avoid higher sampling error.

3.2.3 *Sampling technique*
The surrounding communities were stratified into four (4) based on their direction from the reserve boundry and also re stratified based on distance proximity to the reserve. However, this study utilized the mapping produce by Local Empowerment and Environmental Management Project (LEEMP) and Global Environmental Facility (GEF) (2008), out of which ten (10) communities were strategically selected using Ms excel random number generator and the respondents were randomly selected from the selected communities.

The Yamane (1976) formulae of determining sample size was applied as below;

$$n = N/1+N\,(e)^2$$

n- Sample size =?

N- Total number of population of the study =328,284

e- Level of precision =0.05

1 – Constant

Therefore; n = 328,284/ 1+328,284(0.05)^2

$$=328,284/1+821.71$$

$$=399.51 =400$$

However, 40(10%) additional questionnaires were added to the 400 sample drawn to curtail any problem regarding questionnaire rejection or poor return rate making the total number of the questionnaires to be 440 so as to compensate non-return questionnaires (Ismail, 1992).

3.2.4 *Data Collection*
The study data was elicited using the face-to-face questionnaire interview. The study respondents were both male and female, and due to the cultural and religious constraint of the locality, the enumerators were male and female as well. The female enumerators administer questionnaires to female respondents at their respective houses or working places, while the male enumerators attend to male respondents.
A total of 440 respondents were interviewed and 422 valid responses obtained after treatment of outliers, missing cases of vital information on vital questions.

3.2.5 *Instrument Design*

The structured Questionnaire survey method of data elicitation has been declared to be the foremost tool used in quantitative studies (Jagsi et al., 2015; Ware et al., 2000). It is a well-structured set of questions that elicit responds from respondents either by writing their views or by selecting from a given alternatives (Coombe and Davidson, 2015; Kerr and Churchill, 2001). Therefore, the instrument applied in the collection of data in this study is the direct face-to-face questionnaire interview method of both the dichotomous choice.

3.2.6 *Contingent valuation method*

Contingent valuation method (CVM) is used in estimating economic values for all kinds of environmental goods and services and it is the most widely used in estimating non-use values. CVM is a direct valuation technique in which respondents are asked questions about their willingness to donate (WTP) or willingness to accept (WTA) (Carson, 2005; Emerton and Bos, 2004; Turpie, 2003; Vankatachalam, 2004)

Applying CVM technique of data collection and having standard empirical models of estimating the economic values of natural environmental goods and services. WTP value of a hypothetical change of the environment resources can best be obtained through the questionnaire survey. Responses of WTP questionnaire survey can be used to estimate the net benefit of natural resources to the society using economic analysis technique (Cooper, 1993).

The structured questionnaire survey present a hypothetical scenario on the importance of Yankari game reserve and the need for its conservation, and the DC-CVM format of "take it or leave it (TIOLI)" bid offer consist of only Yes or No option to the respondents and it is adjudge to be the most easy to answer (Yacob et al., 2009) was presented to elicit the respondents willingness to donate towards the reserve improve conservation. CVM was applied to ascertain what the respondents would be willing to donate under the hypothetical market scenario (Adamu, et al., 2015 and Kim et al., 2012).

The process of eliciting respondents information of WTP questions is through a survey (face-to-face, mail, telephone), by asking the on whether they agree to donate some amount money to a hypothetical scenario of changes in a particular or sustainable environmental natural goods and services. Then the "Yes or No" responses that backed the offered bidding price. Through this, one could reveal each respondent maximum WTP if is found to be higher or lower than the offered bid.

In obtaining an accurate result, the overall population sample is divided into sub sets samples in which the bidding price will be offered randomly. When DC-CVM technique is compared to other techniques such as bidding game, which requires contemplative analysis based on precise assessment of respondent behaviour in a long adjustment process, it's found to be clear and easier to understand.

3.2.7 Model specification

In DC-CVM respondents are presented with a hypothetical scenario describing the the environment resource followed by a question on whether they are willing to donate. Their elicited "Yes or No" responses entail their Willingness to donate values and through it, their mean WTP could be estimated (Bishop and Heberlein, 1979; and Cameron and Hanemann 1988 and 1984).

In this study whereby the dependent variable take two values, 'Yes' answers to the bid amounts or "No" as otherwise. As such, the WTP may be a dummy variable where the 'Yes' and 'No' responses are to be coded ad 1 and 0. The logit model predict the probabilities of Yes responses as a function of bid amounts B, and other variables such as age, income, educational level, awareness are used in estimating the mean WTP of the respondents using Cameron model.

$$P = 1/(1 + e^{-z})$$

Where $Y = 1$ for a Yes response and 0 for otherwise, z is the bids amount and the mean WTP is to be estimated under the probability function. The "Yes" proportion of the respondents that are willing to donate base on the bids amount and the utility function factor is estimated as;

Mean WTP $= [\beta_0 + \sum \beta_2 X_2 \ldots \beta_k X_k] / (\beta_1)$

B_0 = the estimated constant, B_k as the coefficient estimated parameters, X_k as the explanatory variable mean value, and B_1 as the estimated bid coefficient.

4. Result and discussion

4.1 *Socio-demographic profile of the Respondents*

The socio demographic characteristics of the respondents is presented in table 1 shows that Male respondents constitutes 76.1% while that of women is 23.9%. The respondents age ranging from 18-25 years constitute 25.4%, 28.3% respondents fall within the range of 26-35 years, 24.4% respondents fall within the range of 36-45 years, while 12.6% and 9.5% fall within the range of 46-55 years and 56 and above years respectively. The marital status of the respondents indicates that 66.1% of the respondents were married while the remaining 33.9% are non-married. The respondent level of education indicates that 24.9% attended a non-formal education, 19.7% attended primary qualification, 44.3% respondents have secondary school qualification and those that attended tertiary education constitutes 11.1% of the respondents. The occupational status of the respondents shows that 22.5% are employed by government, 30.3% are self-employed, 31.5% are farmers while unemployed and retirees constitute 12.1 and 3.6% respondents respectively. Membership to association of respondents shows that 53.6% belong to a particular association that relates to conservation were as those that did not belong to any association constitute 46.4%. The gross monthly income indicates that 39.6% respondents earn between N10,000-N20,000 ($58.8- $113.6) monthly, 30.6% earn between N21,000-N30,000 ($119.3-$170.5), 23.0% earn between N31,000-N40,000 ($176.1- $227.3) while 5.5% earn between N41,000-N50,000 ($232.9- $284.1) and only 1.4% of the respondents earn N51,000 above ($289.8 above) in the year 2016-2017

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Table 1: Socio-demographic profile of the Respondents

Element Percentage	Mean (n=422)	Freq. (%)
Gender		
Male	321	76.1
Female	101	23.9
Age		
18-25	107	25.4
26-35	119	28.3
36-45	103	24.4
46-55	53	12.6
56 and above	40	9.5
Marital status		
Non married	143	33.9
Married	279	66.1
Educational level		
Non formal	105	24.9
Primary	83	19.7
Secondary	187	44.3
Tertiary	47	11.1
Occupation		
Government employed	92	22.5
Self-employed	128	30.3
Farmers	133	31.5
Unemployed	51	12.1
Retiree	13	3.6
Membership of Association		
Yes	226	53.6
No	196	46.4
Level of Income		
₦ 10,000-₦ 20,000 ($58.8- $113.6)	167	39.6
₦ 21,000-₦ 30,000 ($119.3- $170.5)	129	30.6
₦ 31,000-₦ 40,000 ($176.1- $227.3)	97	23.0
₦ 41,000-₦ 50,000 ($232.9- $284.1)	23	5.5
₦ 51,000 and above ($289.8 above)	6	1.6

Source: Field survey, 2020

Logit Regression Model
Table 2 Result of Logit Regression Model

Variable	Coefficient	Standard Error	Marginal effect	P-Value
CONSTANT	-4.29789160	.80355890	-5.415	.0000
AGE	.07937426	.01494674	4.140	.0000
BIDS	-.00120365	.00022487	-5.834	.0000
ASSO	1.23605962	.30444865	2.756	.0000
EDU_YRS	.10712621	.02763805	2.253	.0001
INC	.860987D-04	.162605D-04	7.353	.0000
AWR	.03943391	.01319898	2.442	.0028
Number of observations		422		
Log likelihood function		-152.615		
Mcfadden Pseudo R-squared		.35837		
Percentage correct prediction		85.071		

Source: Field work, 2020

Based on the model result has been present in table 2. Six (6) variables were both found to be significant and having positive coefficient at varying weights.

Age

Age was found to be having a positive coefficient with weight of .07937426 and found to be significant at 1% confidence level. The study finding indicates that as the age of respondents increase, their WTP also increase. Therefore respondents with higher age have higher WTP than those with younger once. Scholarly, this finding is in line with studies of Bhandari and Heshmati, (2010); Barel et al., (2008), and Le and Mjelde, (2007) were positive and significant relationship between age and WTP exist. And contradicts that of Martín-López, Montes and Benayas, (2008) and Reynisdottir et al., (2008).

Education

Years educational of the respondents, which is coded in dummy (0= non formal education, 1= primary education, 2= secondary education and 3= tertiary (colleges, polytechnic and university) have a positive coefficient value weighting .10712621 and is statistically significant at 1% confidence level. This signifies that respondents with higher years of education are more willing to donate than those with low or lower years of education. The result output is signifying that educated people are believed to have more information and awareness on resource conservation than those with lower years of education. Therefore, influence of education on WTP is been reported by researchers such as Wang and Jia (2012) and Barel et al., (2008).

Income

Another important variable in the WTP model is income of the respondents and it also has a positive coefficient of 860987D-04 and significant at 1% confidence level.

The model shows that as the income of the respondent's increase, their willingness to donate also increases. This implies that, respondents with higher income have higher possibility of WTP than those with low or lower income. This is in compliance with many finding and literatures of determining WTP (Wang and Jia, 2012), Bhandiri and Heshmati, 2010; Reyinisdottir et al., 2008; Kim, Wong and Cho, 2007).

Membership Association
Membership of associations that relates to environmental conservation is another important variable with positive coefficient and it is also coded as dummy variable (1= Yes and 2= No. its coefficient weight is 1.23605962 and it is significant at 1% confidence level. This reveals that those respondents that belong to any association that relates to environmental conservation have more willingness to donate than those that are not members to any. These result finding is in line with the findings of Baral et al., (2008) and Messick and Brewer (1983) where members of NGOs are having high WTP.

Awareness
In the study, respondents' awareness is found to be significantly positive with coefficient weight of .03943391 and significant at 5% confidence level. This show a high elasticity of awareness for willingness to donate, indicating that those respondents with positive or high level of awareness are more willing to donate for improve conservation of Yankari game reserve. The said result may be associated to factors such as low level of education and income of women. This outcome coincides with Findings of many studies with positive relativity positive awareness and willingness to donate (Brécard et al., 2009; Clark et al., 2003; Messick and Brewer, 1983).

Bids Amount
However, Bid amount caries a negative sign on its co efficient weight at -.00120365 as expected and significance at 1% confidence level. The negative sign is an indication of inverse relationship between the variable and WTP. This implies that as the bid amount increases, the WTP is decreasing. Therefore, the more the bid amount sis increase the lower the possibility of the respondents willingness to donate (Baral et al., 2008; Loomis, et al., 2000).

5. Conclusion

These study findings revealed that elderly respondents that attained tertiary level of education with a higher income level and higher awareness level constitutes the target market that would contribute to revenue generation for biodiversity conservation in Yankari game reserve.

It also provides a useful policy guide by revealing the importance of economic valuation within the context of resources conservation management for the development of a sound environmental policies and strategies that would help to identify the important of local communities in contributing socially, economically as

well as ecologically for the sustainability of the conserve resources.

In general, this finding will contribute to the growing and existing literature of CVM for conservation of natural resources, especially in developing countries like Nigeria. The amount contributed through the locals will serve in closing the poor funding gap created by the government in management of YGR.

Again, this study justifies the adjoining communities support from tourists for sustainable management and development of ecotourism resources and related nature conservation projects.

The follow up responses of the respondents give an insight about the respondent willingness and non-willingness to donate on natural resources conservation, and it also provide useful guides for policy makers for the development of sound environmental policies and management strategies.

6. Recommendation

Base on the results obtained, the following recommendations were made:

i. It was suggested that to reduce the spate of these illegal activities such as deforestation, pollution, overgrazing, pesticide use, poaching, slash-and-burn agriculture, urbanization, and wildlife trade, there is need for high level of educational and awareness campaign on ecosystem conservation which will be centered towards changing

The economic value result of Yankari game reserve provides a clear picture to the management of the reserve and the ministry of tourism of Bauchi state on other alternative conservation source of fund based on the local peoples commitment and willingness to donate for the improve conservation of the reserve. Therefore, it's now very important for the ministry, managements of the reserve and all other relevant authorities to involve the peoples of surrounding communities as stakeholders for a better and improve management of YGR.

Also, the result of the finding will provide a new means and device to the ministry in charge, management of the reserve and all other stakeholders on the potentials of the donation for the improve conservation of Yankari game reserve by peoples of the surrounding communities. And it will also serve as a major alternative source of fund to the government and the reserve management to supplement the loss of revenue and resources due to illegal activities in and around the reserve.

local people's perception and attitude, and also government and reserve management should provide some essential infrastructural facilities that will improve the living standard and wellbeing of the locals.

ii. It is also recommended that the management of the game reserve can consider reviewing the existing management strategy so as to incorporate the locals because they shows high degree of willingness to donate for the sustainable management of Yankari game reserve.

References

Abalaka, J. I., and Manu, S. (2007). Factors affecting forest bird diversity and recent avifaunal changes in the degrading Kagoro-Nindam forest reserves, Kaduna, Nigeria. *Ostrich-Journal of African Ornithology, 78*(2), 233-238.

Abdulai, A., and Quantson, R. (2008). *The changing role of CSOs in public policy making in Ghana* Institute for Democratic Governance.

Abimbola, O., Lawal, M., and Adetola, J. (2011). Biodiversity conservation and community participation in Kainji lake national park. *Advances in Applied Science Research, 2*(2), 218-226.

Adamu, A., Yacob, M. R., Radam, A., and Hashim, R. (2015). Factors determining visitors' willingness to donate for conservation in Yankari game reserve, Bauchi, Nigeria. *International Journal of Economics and Management, 9*(spec. Dec.), 95-114.

An, S., Li, H., Guan, B., Zhou, C., Wang, Z., Deng, Z., et al. (2007). China's natural wetlands: Past problems, current status, and future challenges. *AMBIO: A Journal of the Human Environment, 36*(4), 335-342.

Anderson, T. L., and Huggins, L. E. (2008). *Greener than thou: Are you really an environmentalist?* Hoover Press.

Ariya, G., and Momanyi, S. (2015). Assessing Wildlife Consumption Awareness and the Attitudes of the Local Lambwe Valley Community towards Ruma National Park, Kenya. *Journal of Tourism and Hospitality*, *2015*

Arnberger, A., and Schoissengeier, R. (2012). The other side of the border: Austrian local residents' attitudes towards the neighbouring Czech Šumava national park. *Journal for Nature Conservation, 20*(3), 135-143.

Ayorinde, K., Oluyemi, J., and Ayeni, J. (1988). Growth performance of four indigenous helmeted Guinea fowl varieties (numida meleagris galeata pallas) in Nigeria. *Bulletin of Animal Health and Production in Africa= Bulletin De La Sante Et De La Production Animales En Afrique,*

Baral, N., Stern, M. J., and Bhattarai, R. (2008). Contingent valuation of ecotourism in Annapurna conservation area, Nepal: Implications for sustainable park finance and local development. *Ecological Economics, 66*(2), 218-227.

Barbier, E. B., Acreman, M., and Knowler, D. (1997). Economic valuation of wetlands: A guide for policy makers and planners.

Bhandari, A. K., and Heshmati, A. (2010). Willingness to donate for biodiversity

conservation. *Journal of Travel and Tourism Marketing*, *27*(6), 612-623.

Bishop, R. C., and Heberlein, T. A. (1979). Measuring values of extra market goods: Are indirect measures biased? *American Journal of Agricultural Economics, 61*(5), 926-930.

Black, C., and Gilmore, G. (1957). The law of admiralty.

Brécard, D., Hlaimi, B., Lucas, S., Perraudeau, Y., and Salladarré, F. (2009). Determinants of demand for green products: An application to eco-label demand for fish in Europe. *Ecological Economics, 69*(1), 115-125.

Business Day news paper, 2012

Cameron, T. A. (1988). A new paradigm for valuing non-market goods using referendum data: Maximum likelihood estimation by censored logistic regression. *Journal of Environmental Economics and Management, 15*(3), 355-379.

Carson, R. T., and Hanemann, W. M. (2005). Contingent valuation. *Handbook of Environmental Economics, 2*, 821-936.

Chanie, S., and Tesfaye, D. (2015). Threats of biodiversity conservation and ecotourism activities in Nechsar national park, Ethiopia. *International Journal of Biodiversity and Conservation, 7*(3), 130-139.

Cheung, L. T., Fok, L., and Fang, W. (2014). Understanding Geopark visitors' preferences and willingness to donate for global Geopark management and conservation. *Journal of Ecotourism, 13*(1), 35-51.

Clark, C. F., Kotchen, M. J., and Moore, M. R. (2003). Internal and external influences on pro-environmental behavior: Participation in a green electricity program. *Journal of Environmental Psychology, 23*(3), 237-246.

Coombe, C., and Davidson, P. (2015). Constructing questionnaires. *The Cambridge Guide to Research in Language Teaching and Learning,* , 217.

Cooper, J. C. (1993). Optimal bid selection for dichotomous choice contingent valuation surveys. *Journal of Environmental Economics and Management, 24*(1), 25-40.

Daily trust news paper, 2012

Deguignet, M., Juffe-Bignoli, D., Harrison, J., MacSharry, B., Burgess, N., and Kingston, N. (2014). United Nations list of protected areas. *UNEP-WCMC: Cambridge, UK, 44*.

Emerton, L., Bishop, J., and Thomas, L. (2006). *Sustainable financing of protected areas: A global review of challenges and options* IUCN.

Emerton, L., and Bos, E. (2004). *Value: Counting ecosystems as water infrastructure* IUCN.

Ezebilo, E. E., and Mattsson, L. (2010). Socio-economic benefits of protected areas as perceived by local people around Cross River national park, Nigeria. *Forest Policy and Economics, 12*(3), 189-193.

Frikvist, E. (2015). "A right to roam": Perceptions of recreational access to the countryside around Manchester, England.

Grigoroudis, E., Petridis, K., and Arabatzis, G. (2014). RDEA: A recursive DEA based algorithm for the optimal design of biomass supply chain networks. *Renewable Energy, 71*, 113-122.

Haruna, U., Sani, M., Danwanka, H., and Adejo, E. (2012). Economic analysis of fresh tomato marketers in Bauchi metropolis of Bauchi state, Nigeria. *Nigerian Journal of Agriculture, Food and Environment, 8*(3), 1-8.

Israel, G. D. (1992). *Determining sample size* University of Florida Cooperative Extension Service, Institute of Food and Agriculture Sciences, EDIS.

Jagsi, R., Griffith, K. A., Kurian, A. W., Morrow, M., Hamilton, A. S., Graff, J. J., et al. (2015). Concerns about cancer risk and experiences with genetic testing in a diverse population of patients with breast cancer. *Journal of Clinical Oncology : Official Journal of the American Society of Clinical Oncology, 33*(14), 1584-1591.

Jia, X., Fu, B., Feng, X., Hou, G., Liu, Y., and Wang, X. (2014). The tradeoff and synergy between ecosystem services in the grain-for-green areas in Northern Shaanxi, China. *Ecological Indicators, 43*, 103-113.

Kaffashi, S., Shamsudin, M. N., Radam, A., Rahim, K. A., and Yacob, M. R. (2013). We are willing to donate to support wetland conservation: Local users' perspective. *International Journal of Sustainable Development and World Ecology, 20*(4), 325-335.

Kelley, H., van Rensburg, T. M., and Jeserich, N. (2016). Determinants of demand for recreational walking trails in Ireland. *Tourism Management, 52*, 173-186.

Kerr, M. K., and Churchill, G. A. (2001). Bootstrapping cluster analysis: Assessing the reliability of conclusions from microarray experiments. *Proceedings of the National Academy of Sciences of the United States of America, 98*(16), 8961-8965.

Kim, J., Mjelde, J. W., Kim, T., Lee, C., and Ahn, K. (2012). Comparing willingness-to-donate between residents and non-residents when correcting hypothetical bias: Case of endangered spotted seal in South Korea. *Ecological Economics, 78*, 123-131.

Kim, S. S., Wong, K. K., and Cho, M. (2007). Assessing the economic value of a world heritage site and willingness-to-donate determinants: A case of Changdeok palace. *Tourism Management, 28*(1), 317-322.

Klein, L. R., Hendrix, W. G., Lohr, V. I., Kaytes, J. B., Sayler, R. D., Swanson,

M. E., et al. (2015). Linking ecology and aesthetics in sustainable Agricultural landscapes: Lessons from the Palouse region of Washington, USA. *Landscape and Urban Planning, 134*, 195-209.

Landres, P. B., Verner, J., and Thomas, J. W. (1988). Ecological uses of vertebrate indicator species: A critique. *Conservation Biology, 2*(4), 316-328.

Larby, P. (2009). Theses in progress in Commonwealth studies 2005-9.

Longcore, T., and Rich, C. (2004). Ecological light pollution. *Frontiers in Ecology and the Environment, 2*(4), 191-198.

Loomis, J., Kent, P., Strange, L., Fausch, K., and Covich, A. (2000). Measuring the total economic value of restoring ecosystem services in an impaired river basin: Results from a contingent valuation survey. *Ecological Economics, 33*(1), 103-117.

Martín-López, B. E. R. T. A., Montes, C., and Benayas, J. (2008). Economic valuation of biodiversity conservation: the meaning of numbers. *Conservation Biology*, *22*(3), 624-635.

McNeely, J. A. (1997). *Conservation and the future: Trends and options toward the year 2025* IUCN.

Meduna, A., Ogunjinmi, A., and Onadeko, S. (2009). Biodiversity conservation problems and their implications on ecotourism in Kainji lake national park,

Nigeria. *Journal of Sustainable Development in Africa, 10*(4), 59-73.

Newing, H. (2010). Bridging the gap: Interdisciplinarity, biocultural diversity and conservation. *Nature and Culture: Rebuilding Lost Connections.Earthscan, London, UK,* , 23-40.

Ngoka, P. C., and Lameed, G. A. (2014). Trends in tourism utilization of Yankari and Cross River National Parks. *Anatolia*, *25*(2), 195-210.

Nigerian Bereau of Statistics (2012)

Obande, G. E., Lawal, K. M., and Ahmed, L. A. (2014). Spectral analysis of aeromagnetic data for geothermal investigation of Wikki Warm Spring, North-East Nigeria. *Geothermics*, *50*, 85-90.

Odunlami, S. S., and Lake, B. (2003). An assessment of the ecotourism potential of Yankari national park, Nigeria. *Eco Club.Com E Paper Series NR, 7*

Olaleru, F., and Egonmwan, R. (2014). Wildlife conservation challenges in Okomu national park, Nigeria. *Ethiopian Journal of Environmental Studies and Management, 7*(6), 670-676.

Oman, D., Thoresen, C. E., and McMahon, K. (1999). Volunteerism and mortality among the community-dwelling elderly. *Journal of Health Psychology*, *4*(3), 301-316

Otto, J., Zerner, C., Robinson, J., Donovan, R., Lavelle, M., Villarreal, R., ... and Pearl, M. (2013). *Natural connections: perspectives in community-based conservation*. Island Press.

Punch News paper, 2013

Reynisdottir, M., Song, H., and Agrusa, J. (2008). Willingness to donate entrance fees to natural attractions: An Icelandic case study. *Tourism Management*, *29*(6), 1076-1083

Rogerson, C. M. (2012). Urban tourism, economic regeneration and inclusion: Evidence from South Africa. *Local Economy,* , 0269094212463789.

Sahney, S., and Benton, M. J. (2008). Recovery from the most profound mass extinction of all time. *Proceedings.Biological Sciences, 275*(1636), 759-765.

Samdin, Z. (2008). Willingness to donate in Taman Negara: A contingent valuation method. *International Journal of Economics and Management, 2*(1), 81-94.

Samdin, Z., Aziz, Y. A., Radam, A., and Yacob, M. R. (2010). Factors influencing the willingness to donate for entrance permit: The evidence from Taman Negara national park. *Journal of Sustainable Development, 3*(3), 212.

Soule, M. E., and Simberloff, D. (1986). What do genetics and ecology tell us about the design of nature reserves? *Biological Conservation, 35*(1), 19-40.

Steckenreuter, A., and Wolf, I. (2013). How to use persuasive communication to encourage visitors to donate park user fees. *Tourism Management, 37*, 58-70.

Van Dyke, F. (2008). *Conservation biology: Foundations, concepts, applications* Springer Science and Business Media.

Venkatachalam, L. (2004). The contingent valuation method: A review. *Environmental Impact Assessment Review, 24*(1), 89-124.

Waldron, A., Mooers, A. O., Miller, D. C., Nibbelink, N., Redding, D., Kuhn, T. S., et al. (2013). Targeting global conservation funding to limit immediate biodiversity declines. *Proceedings of the National Academy of Sciences of the United States of America, 110*(29), 12144-12148.

Wang, P. W., and Jia, J. B. (2012). Tourists' willingness to donate for biodiversity conservation and environment protection, Dalai Lake protected area: Implications for entrance fee and sustainable management. *Ocean and Coastal Management*, *62*, 24-33.

Whytock, R. C., Buij, R., Virani, M. Z., and Morgan, B. J. (2016). Do large birds experience previously undetected levels of hunting pressure in the forests of central and West Africa? *Oryx, 50*(01), 76-83.

Wilcox, R. R. (1998). How many discoveries have been lost by ignoring modern statistical methods? *American Psychologist, 53*(3), 300.

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

Yacob, M. R., Shuib, A., and Radam, A. (2008). How much does ecotourism development contribute to local communities? An empirical study in a small island. *ICFAI Journal of Environmental Economics, 6*(2)