International Journal of Agriculture and Food Science

Effect of biodiversity conservation on livelihood of rural dwellers in Ona Ara Local Government Area of Oyo state

Oyewole OO[1], Olayemi OO[2], Ogunwale OG[3], Olatunji BT[4]
Department of Agricultural Extension and Management, Federal College of Forestry, Ibadan, Nigeria

Abstract
Biodiversity has proven to be an important source of traditional medicines for people in developing countries, particularly those in remote and normally more poverty-stricken areas of the developing world where access to formal health care is limited. Therefore, Effect of biodiversity conservation on livelihood of rural dwellers in Ona Ara Local Government Area of Oyo state was investigated. A multi-stage sampling procedure was used through well structure questionnaire and interviews to gather collect information from 150 rural dweller. Data were analyzed using frequency counts, percentage and means and Chi-square at 0.05% level of significance. The result of analysis revealed that most (54.1%) of the respondents are males and they are in their active age, married with majority (51.4%) had secondary education, with about 1-10years of experience of biodiversity conservation was recorded as the highest percentage. Furthermore, the result revealed on the statement of livelihoods that 56.8%of physical assets is the income generated from the use of hire labor on the farm, 86.5% natural assets on biodiversity conservation and also in human assets, mostly 75.7% of biodiversity conservation assist the dwellers to take care of their families. Chi-square analysis revealed that, among socio-economic characteristics of the respondents, Conclusively, the result reveals that respondents had high benefits from biodiversity conservation with increase income of 62.2%, and 60% of the respondents have moderate benefits that are derive from biodiversity conservation which has led to employment opportunities for most people. It is therefore recommended that Government should put in place policies and laws that will govern farmers, residents that will promote preservation of biodiversity, also Government should construct good roads that will enhance recreational benefit rendered by conservation this will lead to employment opportunities and other benefit.

Keywords: Biodiversity conservation, Livelihood, rural dwellers

Introduction

Biodiversity is the diversity number and variety of plant and animal life within a region of biodiversity is the biological diversity agriculture includes the variety of the whole species present on earth. Biodiversity conservation can be a valuable option for poor people not only in terms of income opportunities, but also for diet diversification, community involvement and health by (Meinzen-Dick *et al,* 2009; Smale *et al* 2008; Sthapit *et al* 2009) [12, 15, 16] and for the sustainable management of agricultural systems (Frison *et al* 2011; Mijatovic *et al* 2012) [7]. Biodiversity conservation has come to be seen as a variant of sustainable community development particularly in the rural area of developing countries (Buta et. al, 2014; Gurmey *et al*, 2014; Meiby *et al*, 2014) [2]. Thus, biodiversity conservation can be a variable alternative to rural developing countries with the coming; the new government adopted various strategies aimed towards developing in rural area. Livelihood is a set of activities involving, securing fodder, medicine and the capacity to acquire above necessities working either individually by using endowments of the self, household on a sustainable basis with dignity (Bain *et al.,* 2014) [1].
Farmers around the worlds are facing competing pressure to grow more food while preserving the world's biodiversity to succeed, agricultural and biodiversity efforts must walk hand to hand and sharing knowledge of agricultural role in preserving biodiversity stewardship programmed for farmers and government mechanisms for incentives biodiversity by Ray Jordan, self-help Africa (Wilshusen *et al.,* 2002).

The challenges of conserving ecosystem while ensuring future food security means that the roles of farmers is more crucial than ever like biodiversity, agricultural benefit from fertile soil, fresh water and natural predator. The important of biodiversity conservation is that it provides economic benefit to people which in water quality soil, protection, equalization of climatic environmental, monitoring, scientific research. It is against this backdrop that this research investigated the extent of effect of biodiversity conservation on livelihood of rural dwellers in OnaAra Local Government Area of Oyo state

Specific objectives
The specific objectives of this study include to:
- identify socio-economic characteristics of respondents in the study area.
- access the benefit derived from biodiversity conservation.
- identify the biodiversity conservation on their livelihood in the study area.

Hypothesis of the study
The hypothesis stated in the null form is tested:

Ho$_1$ – There is no significant relationship between selected socio-economic characteristics of the respondents and their level of livelihood in the study area.

Ho$_2$ – There is no significant relationship between benefits derived and their level of livelihood in the study area.

Materials and Methods

The study was carried out in Ona-Ara local government of Oyo state. Ona –ara local government with headquarters at Akanran. According to2006 population census, ona-ara local government has a total population of 265,059 made up of both male and female, with the land mass of about 3570km. ona-ara local government is bounded in the northern partly by egbeda local government, in southern part by oluyole local government, in the eastern part by ogun/osun state and in the western part by Lagos/Ibadan express way with Ibadan south east local government area on the other side of the express way. Ona-ara local government comprises of eleven wards. The people of ona-ara local government are predominantly farmers with fertile land for each crop like cocoa, kola, cahews and citrus like orange, mango etc. the farming population scattered all over the various communities in the local government which include foworogun, idi-ogun, elese-erin, olosunde,ojebode, akanran and gbada-efon to mention just a few.

Sampling Procedure and Sample size

A Multi-stage sampling procedure was used to select respondents for the study. Ona-ara local government area was purposively selected for this study due to the abundant farming activities in the Area. From the 11 wards, 25% were randomly selected, from which each cell/communities (Ilaji-,Olubode, Amodu- Apapa, Olode- Buremo.) 50% of the respondents were purposively selected due to the population of both livestock and crop farmers which give a total of one hundred and forty-eight (148) respondents used as sample size for the study.

Analysis of data

Information extracted from well structured questionnaires was analyzed with both descriptive analysis and inferential statistical tools using, frequency distribution, percentage (%), mean, and hypothesis were analyzed using chi- square, Pearson Product Moment Correlation (PPMC).

Results and Discussion

Table 1: The social economic characteristic of the respondents

Variables	Frequency	Percentaae (%)
Sex		
Male	80	54.1
Female	68	45.9
Age		
18-25	56	37.8
26-35	35	23.6
36-45	50	33.8
46-55	2	1.4
56 above	5	3.4
Education		
Non-formal	12	8.1
Primary	27	18.2
Secondary	76	51.4
Tertiary	33	22.3
Marital status		
Single	65	43.9
Married	74	50.0
Divorced	3	2.0
Widow	6	4.1
Household		
1-4	75	50.7
5-8	58	39.2
9-12	3	2.0
Above 12	12	8.1
Occupation Farmer	82	50.7
Unskilled	18	55.4
Formal employed	35	12.2
Personal business	13	23.6
Experience		
1-10	76	51.4
10-20	47	31.8
Above 20	25	16.9
Monthly income		
50,000-100,000	73	49.3
100,000-150,000	40	27.0
150.000-200,000	8	5.4

The result of analysis in table 1 showed the socio-economic characteristic of the respondents that males has a higher percentage of 54.1%, while the females were 45.9%. This is in line with Feresu, 2010 [6] and Makindi, 2010 [10] Who reported that gender issue are important in biodiversity conservation and environmental management. The result also revealed that age range of 18-25 records the highest percentage of 37.8%, followed by 36-45 with 33.8%, 26-34 with 23.6% respectively, while 46-55 age range has the lowest percentage of 1.4%, and 3.45 of 56 and above respectively. The result also revealed that larger part of the respondents had their educational background with secondary education of 51.4%, tertiary education 22.3%, primary education 18.2% while respondents that have no formal education were 8.1%, this indicate that most of the respondents had secondary education, this result corresponds with those found by (Uaiene *et al*., 2009), which stated that completion of at least lower primary school implied a much higher propensity of biodiversity conservation, new technology than zero level of education. The result shows that most of the respondents have a household number 1-4, therefore occupying the average percentage of 50.7% followed by 5-8 with 39.0%, the least is 2.0% of 9-12 household and finally 8.1% above 12 household. The result further, revealed the years of experience of respondents in biodiversity conservation, 51.4% of the respondents fall between 1-10 years of experience, with 31.8% of 10-20 years, 16.9% of 20 years and above years of experience this reveals that the highest percentage of respondents fall within the first ten years and it indicates that the knowledge of biodiversity conservation increase as the awareness increases over the years. This was confirmed by (Susan 2012,) that experience should change people in ways that can ultimately be integrated into individual identity.

Table 2a: Level of benefit derived by biodiversity conservation

Benefits	Low	High	Moderate
Employment	25(16.9)	33(22.3)	90(60.8)
Variation of product species	31(20.9)	61(41.2)	56(37.8)
Increase income	13(8.8)	92(62.2)	43(29.1)
Recreation	66(44.6)	28(18.9)	54(36.5)
Community development project	29(19.6)	43(29.1)	76(51.4)
Contribution to climate stability	31(20.9)	38(25.7)	79(53.4)
Protection of water resources	16(10.8)	66(44.6)	66(44.6)
Maintenance of ecosystem	37(25.0)	43(29.1)	68(45.9)
Future resources	9(6.1)	79(53.4)	60(40.5)
Medicinal resources	29(19.6)	21(14.2)	98(66.2)
Food product	2(1.4)	89(60.1)	57(38.5)

*Percentage in parenthesis

From the table 2a, result of analysis revealed the benefits derived by biodiversity conservation, it was observed that increase in income was rated 62.2% as one of a high benefit for biodiversity conservation. This agrees with (Mellor 2002) that biodiversity conservation tends to improve the quality of life of many of the world's poor. 60.8% of the respondents' derived moderate from biodiversity conservation; employment opportunities. This confirmed by (Elizabeth, 2003) that employment engagement in conservation activities offers many opportunities to building, such as organizational skills, learning to cope with new situations and to contribute to important conservation. 44.6% of the respondents indicate that benefit derived from recreation is low, this agrees with (Lan, 2006) that this represent an estimate of the benefit people enjoy from visiting this sites, predominately for recreation value of biodiversity conservation.
Furthermore the medicinal resources was also rated 66.2% as one of the moderate benefits from biodiversity conservation. This also confirm by (EPA, 2013) that biodiversity has greatly contributed to modern medicine and advancement in human health research and treatment. Also 60.1% of the respondents' benefits from food production from biodiversity conservation, this agrees with (Groom, 2006) that biodiversity supports food security and sustained livelihoods through over all genetic diversity.

Table 2b: Categorization of respondents based on their levels of benefit.

Variable	Frequency	Percentage (%)
High	95	64.2
Low	53	35.8
Total	148	100.0

Above mean value = High, below mean value= low (mean=25.1) From the categorization table 2b, the levels of benefit derived from biodiversity conservation of plants and animal is low at 35.8% and high at 64.2%. This implies that the benefit derived from biodiversity conservation by the respondent in the study area is high. This agree (Dublin, 2008) said that categorization of benefit rank in a high-level biodiversity also ensure that we are supply with a very important contribution that which made by biodiversity to human welfare.

Table 3a: Statement on livelihood

Physsical Assets	Mostly	Rarely	Not at All
Income generate from biodiversity	52 (35.1)	61 (41.2)	35(23.6)
Conservation is used for farm tools.			
Income generated is used for building structure on the farm.	30 (20.3)	57 (38.5)	61(41.2)
Income generated used to hire labour on the farm	84 (56.8)	24 (16.2)	40(27.0)

Income generated is used to pay for house rent on the farm.	48 (32.4)	34 (23.0)	66(44.6)
Income generated is used for electric at home	49 (33.1)	41 (27.7)	58(39.2)
Natural Assets			
Dwellers spend less resources on food	92 (62.2)	42 (28.4)	14 (9.5)
items as a result of biodiversity conservation			
if relieved the dwellers dependent on the process food.	58 (39.2)	67 (45.3)	23 (15.5)
Biodiversity conservation makes the enviro-nment looks natural.	128 (86.5)	19 (12.8)	1 (7)
Dwellers interact with nature as a result	100 (67.6)	25 (16.9)	23 (15.5)
of biodiversity conservation.			
Biodiversity conservation prevent	60 (40.5)	38 (25.7)	50 (33.8)
extension of both plant and animals species.			
Biodiversity conservation beautify dwellers farms and homes.	119 (80.4)	28 (18.9)	1 (7)
Human Assets			
Biodiversity conservation assist the dwellers	112 (75.7)	12 (8.1)	4 (16.2)
to take care of their family.			
Income generated is used as education for their children.	105 (70.9)	14 (9.5)	29 (19.6)

Source: Field survey, 2018. Physical assets

The result in table 3a shows that 56.8% of the physical assets; income generated is used to hire labour on the farm, 38.5% rarely used for building structure and 44.6% of the physical assets are not used house rent or rent on the farm. This was in agreement with Weber, (2003) that it is possible to express many physical assets as quantities; there is no established unit for measure the condition quality of biodiversity and ecosystems.

Natural assets
The result in table 3a also shows that 86.5% agree biodiversity conservation make the environment look natural, 45.35%, rarely depends on processed food, while 33.8% disagree with biodiversity conservation to prevent extension of both plant and animal species. This is in line with Teeb (2011) [18] that in essence biodiversity is a measure of the health of nature assets.

Human assets
The result furthers indicated that 75.7% of biodiversity conservation assist the dweller to take care of the family i.e. it is not time consuming and more income generate, while 9.5% is lowest of income generated. This is in tandem with Gretchen (2018) that consideration assumed that biodiversity supplies society with a stream of vital benefits or services without which human life would cease to exist

Table 3b: categorize of response based on statement levels of livelihood

Variables	Frequency	Percentage%
High	62	41.9
Low	86	58.1
Total	148	100.0

Above mean value= high, below mean value= low (mean=21.9) From the categorization table above, it shows that the response based on statement levels of livelihood is low at 41.9%. This implies there is a positive implication of biodiversity conservation on levels of livelihood.

Table 4: chi-square analysis on socio-economic characteristics of the respondents

Variables	X^2 Value	P Value	Decision
Sex	19.73	0.000	S
Age	71.110	0.000	S
Education	67.755	0.000	S
Marital status	40.1941	0.000	S
Household	27.343	0.001	S
Occupation	55.668	0.000	S
Experience	16.434	0.012	S
Income	71.080	0.000	S

The hypothesis was tested with the aid of chi-square X^2

The result in table 4 revealed that there is significant relationship between sex (X^2= 19.73, P=0.000), age (X^2=71.110, P=0.000), education (X^2=67.755,P=0.000), marital status(X^2=40.194, P=0.000), household size (X^2=27.343, P=0.001), occupation (X^2=55.668, P=0.000), years of experience (X^2=16.434, P=0.012), income (X^2=71.080, P=0.000) and level of livelihood. This implies that the benefits of biodiversity conservation on the livelihood of rural dwellers in Ona-ara area is high which so that sex, age, education, marital status, household size, occupation, experience, income of these selected socio-economic are determinant of livelihood.

Table 5: PPMC analysis of benefit and livelihood on biodiversity conservation

Variables	R-Value	P-Value	Decision
Benefit	-0.160	0.052	NS

NS= Not significant at 0.05

The result in table 5 shows that there is no significant relationship between benefit (r = -0.16%, p > 0.052) and livelihood from the respondents, this implies that benefit derive from biodiversity conservation correspond to the livelihood of rural dwellers, which shows that as biodiversity conservation does not correlate with the benefits on livelihood of the respondents. This agrees by (Chigonda, 2014) that other conservation approaches such as private protected area can achieve similar if not better and livelihood impacts on surrounding communities.

Conclusion and Recommendations
The study revealed that most of the respondents are males and they are in their active age, married with majority secondary education, had about 1-10 years of experience of biodiversity conservation was recorded as the highest percentage of years by the respondents. Furthermore, the result revealed on the statement of livelihoods that 56.8% of physical assets is the income generated from the use of hire labor on the farm, 86.5% natural assets on biodiversity conservation and also in human assets, mostly 75.7% of biodiversity conservation assist the dwellers to take care of their families. Conclusively, the result reveals that respondents had high benefits from biodiversity conservation with increase income of 62.2%, and 60% of the respondents have moderate benefits that are derive from biodiversity conservation which has led to employment opportunities for most people. It is therefore recommended that Government should put in place policies and laws that will govern farmers, residents that will promote preservation of biodiversity, also Government should construct good roads that will enhance recreational benefit rendered by conservation this will lead to employment opportunities and other benefit.

References
1. Bain RES, Wright, JA, Christenson E, Bartram JK. Rural urban inequalities in post targets and indicators for drinking-water. Science of the Total Environment. 2015; 490:509-513.
2. Buta N, Holland SM, Kaplanidou K. Local communities and protected areas: the mediating role of place attachment for pro-environmental civic engagement. Journal of Outdoor Recreation and Tourism. 2014; 5(6):1-10.
3. Dublin Ireland. Government publication poster trade section, unit 20 lekki side retail park, Claremorris, co. mayo (tel.. 0.1-6476834/37 or 1090.213432), 2008.
4. Elizabeth B. employee involvement in conservation, link the employee volunteering time bank worldwide, 2003. registered charity No: 1073831, wwwexperiencecorps. co.uk/xq/asp/qx/volunteer.
5. EPA. Cooperation on health and biodiversity 2010. Biodiversity and human health policy brief assets, 2013.
6. Feresu S. Zimbabwe economics and the causes of the crisis, 2010. Http//opendocs.ids.ac.uk-handle.
7. Frison E, Cherfas J, Hodgkin T. 'Agricultural Biodiversity Is Essential for a Sustainable Improvement in Food and Nutrition Security', Sustainability. 2011; 3(1):238-253.
8. Gurney GG, Cinner J, Ban NC, Pressey RL, Pollnac R, Campbell SJ. et al. Poverty and protected areas: an evaluation of a marine integrated conservation and development project in Indonesia. Global Environmental Change. 2014; 26:98-107.
9. Lan RSPI. IEEP values of biodiversity, 2006. http/www.IEEP.org.uk/publication/pdfs/2006/ value of biodiversity June 06 pdf.
10. Makindi SM. biodiversity conservation case study of Kimana Kenya. Africa journal tourism and lecture, 2010; (3):24.
11. Meilby H, Smith-Hall C, Byg A, Larsen HO, Nielsen ØJ, Puri L. et al. are forest incomes sustainable? Firewood and timber extraction and productivity in community managed forests in Nepal. World Development, 2014. http://dx.doi.org/10.1016/j.worlddev.2014.03.011 (accessed on 08 November 2014).
12. Meinzen-Dick RS, Devaux A, Antezana I. 'Underground assets: potato biodiversity to improve the livelihoods of the poor', International Journal of Agricultural Sustainability. 2009; 7:235-248.
13. Mellor JW. poverty reduction and biodiversity conservation, the complex role for intensifying agriculture. Wwf macroeconomics program-p5, 2002, pp.35.httpwww.panda.org/mpd..
14. Mijatović D, Van Oudenhoven F, Eyzaguirre P, Hodgkin T. 'the role of agricultural biodiversity in strengthening resilience to climate change: towards an analytical framework', International Journal of Agricultural Sustainability, 2012, 1-13. DOI: 10.1080/147359 03.2012. 691221.
15. Smale M, Katungi E, Edmeades S. 'Gender, social capital and information exchange in rural Uganda', Journal of International Development. 2008; 20:35-52.
16. Sthapit B, Rana R, Zaguirre EY, Jarvis PD. The value of plant genetics diversity to resources of farmers in Nepal and Vietnam, International journal of agricultural sustainability. 2009; 6:148-166.
17. Susan C. Social issues and personal life considering the environment Journal of social issue. 2012; 73(3):607-681.
18. Teeb. The economies of ecosystems and biodiversity in business enterprise, edited by Joshua bishop, Routledge, Abingdon, 2011.http//www.mfe.govt.nz/publication/water/ waltaki-option existence/value/ianos-/option/existence/ value/Janos pdf.
19. Weber JL. Implementation of land and ecosystem account at the European environmental and economic accounting, handbook of National accounting, 2003, pp. 258.