Local People's Perception of Forest Resources Conservation in Ekiti State, Nigeria

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Abstract: This study examines local people's perception of forest resources (FR) conservation around two plantation forest reserves (PFR) and two natural forest reserves (NFR) in Ekiti State in order to determine the factors that can contribute to sustainable FR conservation. Questionnaire and interview were used to collect data from 240 respondents. Data were analyzed using descriptive and inferential statistics. 75.0% and 86.1% of respondents around PFR recognized the importance of conserving the FR for economic benefits and biodiversity respectively, while 66.7% would not want the FR conserved for cultural values. 82.9% of respondents around NFR would want the FR conserved for economic benefits, while 74.3% and 66.7% would not want the forest conserved for cultural values and biodiversity respectively. For efficient conservation, participation in forest management and involvement in decision making with means of 3.45 and 3.52 ranked highest in PFR and NFR respectively. Probit regression analysis showed that in PFR and NFR, age, education and income were positively significant to FR conservation ($p < 0.05$). Creating an enabling environment that will make local people appreciate historical cultural values of the forest for tourism is essential for efficient FR conservation in the study area.

Key words: Forest resources conservation, local people, perception.

1. Introduction

Forest resources conservation involves the management of resources that are found in the forest in such a way that they yield the highest sustainable benefit for the present human generation while still maintaining their potentials to meet the need of future generations [1]. Through proper conservation activities, forest resources that are viable and self perpetuating could be harvested regularly on a sustainable yield basis. The essence of conservation is thus to balance the rates of use of these resources against the rates of their formation in order to maintain stability and ensure sustained benefits.

Forest resources that are managed are the tangible and the intangible resources while the tangible ones are the timber and non-timber physical components of the forest, the intangible are the maintenance of the ecosystem productivity and benefits emanating from

services relating to amelioration and beautification of the environment. Conservation is thus emphasized for the protection of the ecosystem with judicious utilization of the resources.

In any nation, the uses of forest resources are enormous as seen in industrial development, energy supply, provision of food, provision of infrastructural facilities, healthcare delivery, educational development, environmental protection and in contributing to employment creation. About 1.65 million households in Nigeria derived their livelihood from forest related activities while about 86% of rural households depend on the forest for biomass as source of energy [2, 3].

The conservation of these forest resources has only been feasible in forest reserves in Nigeria and as far back as the colonial era, forest policy had the conservation of land and resources as major objectives. Between 1920 and 1930, 10.04% of the country total land area was gazetted into forest reserves. This made the forest reserves of Nigeria to cover a total land area

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of 96,518 km² which represents 27% of the total forest area (natural and plantation forests). It is within these forest reserves that management efforts are concentrated and conservation laws were strictly enforced [4].

However, the prevailing status of Nigeria's forest reserves demands serious consideration. This is because the forest reserves are under the siege of deforestation by the activities of both the government and people who have depended on the forest for revenue generation. These activities which include mainly timber exploitation are carried out without reference to the wishes of the generality of the local people for whom, the reserves were supposed to be held in trust. Thus, Government action and that of the illegal local exploiters in breaching the integrity of the local people has led to the encroachment by the people living around the reserves. This is more so, when adequate consideration has not been given to the needs of the local people as stakeholders when formulating forest conservation policies and actions [5]. With the encroachment in forest reserves, illegal forest operation has been at alarming rate and this has led to deforestation. Thus, the total area of reserved forest by 1999 has reduced to 46,542.14 km² which is 5.04% of the total land area while the total forest area was put at 14.8% [6]. These estimates for forest reserve fall far short of the International standard which is 25% of any country's land mass [7]. This scenario shows a major failure in coordinating and sustainably managing Nigeria forest resources.

For forest resources to be managed sustainably, forest resources management must be based on strategy that takes account of all human activities that affect the forest. There is a need to gather information on all those who have a stake in the forest. These include government, dealers in forest products, notably timber and local communities that rely on resources of the forest for their livelihood. The information should include the reason why they feel the forest should be conserved and how it should be done.

Therefore, this study's aim is developing a perspective on the links between forest management and the socio-economic characteristics that determine people's opinion and their decisions on forest resources conservation in Ekiti State. The study targeted the local communities living around the forest reserves as stakeholders. This is because the neglect of local communities in the past has been one of the main causes of rapid decline in forest resources despite all efforts at their management [5].

2. Methodology

2.1 Study Area

The study was carried out in Ekiti State, Nigeria. Ekiti State is situated in the South Western part of the country and is lying between longitudes 4°5' and 5°45' East of the Greenwich Meridian and latitudes 7°15' and 8°5' North of the Equator. The mean annual rainfall ranges between 1,500 mm and 2,000 mm while the mean annual temperature ranges from minimum of 23.2 °C to maximum of 30.5 °C. The State is mono-ethnic community with a population of 2,340,000 [8]. It covers a land mass area of approximately 5,887.89 km² with vegetation that consists of tropical forest in the south, while guinea savannah predominates the northern peripheries. There are ten forest reserves, covering 297.20 km² of land in the state, representing 5.05% of the total land area. Though the land sizes of the forest reserves remain the same, however about 45% of the reserves are already degraded due to excessive exploitation of resources while others are under serious threat. Four of the forest reserves are no longer natural and the forest land is now covered with *Tectona grandis* and *Gmelina arborea* plantation.

2.2 Sampling Technique

Two plantation forest reserves namely Aramoko and Ikere and two natural forest reserves namely Eda I and Ise were purposively selected (Fig. 1). This was to compare people's perception of forest resources in the

two types of forest reserves. The four forest reserves represent 40% of the total number of the forest reserves and cover a land mass area of 99.68 km². Three communities surrounding each forest reserve at a radius of about 5 km were randomly selected and 20 questionnaires were administered randomly to household's heads in each community. This made a total of 60 questionnaires in a forest reserve. Thus, for the four forest reserves, a total of 240 questionnaires were administered but due to incomplete information to some vital questions, the study made use of data from 213 (108 from PFR and 105 from NFR) respondents.

Data were collected through the use of semi-structured questionnaire and personal interview.

Data were generated on the socio-economic characteristics of the respondents, respondents' perception on the need for forest conservation and respondents' opinion for efficient forest conservation management.

2.3 Statistical Analysis

Data were analyzed using descriptive and inferential statistics. Likert scale of 1 to 5 points with a mean score of 3 was used to measure respondents' perceptions for efficient forest management regimes. Strongly disagreed was awarded 1 point, disagreed 2 points, undecided 3 points, agreed 4 points and strongly agreed 5 points. For ease of analysis and interpretation, respondents' perception statement were

Fig. 1 Map of Ekiti State showing the study area.

Source: forestry department, Ekiti State and adapted from Ekiti State, Nigeria: maps and local information [9].

categorized into two aspects (agreed and disagreed), while undecided responses were merged with disagreed response. A mean score of 3 and above was used to denote agree while a mean score below 3 was used to denote disagree. Probit regression analysis was used to ascertain the probability relationship between respondents' socio-economic characteristics and forest resources conservation. The Probit regression model is as specified below in Eq. (1):

$$\text{Pr}(Y_i = 1) = f(\Delta_i X_i) + e_i \quad (1)$$

Where:

Y is a dichotomous dependent variable which can assume the value of 0 or 1. It measured local people's conservation of forest resources, Yes = 1; No = 0;

$X_i = n \times K$ matrix of explanatory/independent variables;

$\Delta_i = K \times 1$ vector of parameters/coefficients to be estimated;

e_i = error term.

The explanatory variables used for the study include: age, gender, marital status, schooling years, occupation, income and religion. The choice of these explanatory variables was based on comprehensive review of related literatures.

3. Results and Discussion

3.1 Local People's Opinion on the Conservation of Forest Resources for Biodiversity

The results of the study in Table 1 revealed that respondents in PFR and NFR differed in their opinion on the conservation of forest resources for biodiversity. Table 1 expresses that 75% of the respondents in PFR want the forest resources conserved for biodiversity while only 33.3% of the respondents in NFR want the forest resources conserved for biodiversity. The implication of this finding is that the rationale for plantation forest reserve is for biodiversity conservation. This also supports the policy of government sensitization and intervention in the tree planting campaign.

Furthermore, it was discovered during the course of this study that people around the PFR now prefer the forest for biodiversity after realising that they had lost the benefits of the natural forest. The PFR studied was originally a natural forest and it constituted 11.4% of the total forest reserves. The history of the PFR is pathetic in that the forest area was gazetted into forest reserve in 1942 but in early 1970, the forest reserve was cleared off and planted with *Gmelina arborea* (Gmelina) in anticipation of the raw material for pulp and paper industries which never came into reality. *Tectona grandis* (Teak) was latter introduced in early 1990 to make the forest reserve a plantation of Gmelina and Teak.

The replacement of this natural forest with plantation forest of monoculture exotic wood species led to loss of genetic resources of many biological species which the people living around the forest now want. Moreover, the fast grown woods are different from the indigenous tropical timbers in terms of species, log size, mechanical properties and decorative values [10]. Thus, they are not perfect substitutes for the indigenous species such as *Milicea excelsa*, *Mansonia altissima* and *Khaya ivorensis*.

On the other hand, respondents living around the NFR would not want it conserved by the Government because they were aggrieved at the non-sustainable exploitation of the forest by Government. While the communities living around the forest were restricted from the forest, Government was exploiting without regard to sustained yield principle and without due consideration to the communities which originally owned the forest reserve.

3.2 Local People's Opinion on the Conservation of Forest Resources for Cultural Heritage

With respect to cultural heritage, respondents around the PFR and NFR share the same opinion on the conservation of forest resources for cultural heritage. Respondents' opinion on the need to conserve forest resources for cultural heritage was

Table 1 Local people's opinion on the conservation of forest resources for biodiversity.

Conservation practice	Plantation forest reserves		Natural forest reserve	
	Frequency	%	Frequency	%
Conservation of forest for biodiversity				
Yes	81	75.0	35	33.3
No	27	25.0	70	66.7
Total	108	100	105	100

Table 2 Local people's opinion on the conservation of forest reserves for cultural values.

Conservation practice	Plantation forest reserve		Natural forest reserve	
	Frequency	%	Frequency	%
Conservation of forest for cultural value				
Yes	36	33.3	27	25.7
No	72	66.7	78	74.3
Total	108	100	105	100

negative. As most respondents 66.7% for PFR and 74.3% for NFR (Table 2) felt that developing and promoting the cultural values of the forest could lead to worshipping of idols which is contrary to their christian faith. This belief may however not be true because many countries of the world project their culture for tourism in order to sustain their economy. Studies have shown that promoting the cultural aspects of forest, especially those which have to do with historical local culture and practices that contribute to forest conservation could lead to tourism which could boost the local economy [11, 12].

Tourism would generate economic returns and also give opportunity to connect with people from other cultures. The returns from forest tourism could also be distributed to landowners and authorities of the communities. The entire communities could similarly have their revenue increased from the sales of their goods and services to tourists visiting the reserves. Economic returns from tourism have been opined to be practically important in the relationships between the social goal of poverty reduction and biodiversity conservation [13]. From the 2009 annual report of Afadjato—Community Forest Conservation Project carried out in Accra, Ghana, a sum of \$2,700 was generated from 786 visitors on tourism of the Afadjato Conservation area in 1999. With proper development

and promotion, the number of people who visited the project area in 2009 had increased to 4,867 with generated revenue of \$50,148.

3.3 Local People's Opinion on the Conservation of Forest Resources for Economic Returns

Table 3 revealed that respondents' opinion on the need to conserve the forest for economic returns received positive responses. In PFR, 86.1% of the respondents agreed that the forest should be managed for economic returns, while in NFR, 82.9% of the respondents share the same opinion that the forest resources should be managed for economic returns. The implication of this finding is that forest resources conservation could lead to income earning for local people around PFR and NFR.

The opinion of respondents on economic returns from forest conservation is expected because, from time immemorial, rural people have been depending on the forest for their wellbeing while the contributions of forests and forest products to poverty reduction among rural people had been asserted [7, 14]. The resources mainly gathered from the forest for livelihood are Fuelwood and Non-Wood Forest Products (NWFPs). Fuelwood has the greatest use for domestic cooking and heating. Reports show that in Nigeria about 86% of rural household depend on the forest for fuelwood as source of energy [15, 16].

Table 3 Local people's opinion on the conservation of forest reserves for economic returns.

Variables	Plantation forest reserve		Natural forest reserve	
	Frequency	%	Frequency	%
Conservation of forest for economic returns				
Yes	93	86.1	87	82.9
No	15	13.9	18	17.1
Total	108	100	105	100

Table 4 Measurement and description of the independent/explanatory variables for plantation natural forest reserves.

Explanatory variable	Plantation forest reserve		Natural forest reserve		Description
	Mean	Std. Dev.	Mean	Std. Dev.	
Age	49.11	3.31	57.21	2.14	Continuous (years)
Gender	0.68	0.06	0.60	0.07	Dichotomous, Male 1; Female 0
Marital status	0.75	0.02	0.80	0.49	Dichotomous, Married 1; Others, 0
Schooling years	13.07	0.51	11.64	0.39	Continuous (years)
Occupation	0.43	0.25	0.52	0.09	Dichotomous, Civil servants 1; Others, 0
Total income	31,405.21	1807.42	25,650.11	1720.02	Continuous (N/month)
Religion	0.86	0.13	0.89	0.03	Dichotomous, Christianity 1; Others, 0

Non-wood Forest Products as means of livelihood include nuts, fruits, bushmeats, raisins, dyes and plants. They serve as source of food, meat, spices and medicine to the rural people. Income is also generated from the sales of various products obtained from the NWFPs. The implication of the aforementioned is that forests serve as livelihood insurance to the rural people. Consequently, failure to recognize the economic benefits the communities can gain from conservation could lead to resistance to forest conservation policies. Hence to ensure sustainable forest development there must be a balance between socio-economic activities of the poor rural communities and forest resources conservation

3.4 Socio-economic Characteristics Influencing the Conservation of Forest Resources for Biodiversity, Cultural Value and Economic Returns

All socio- economic characteristics considered in influencing respondents' opinions on conservation are summarized in Table 4. As shown in Table 4, there are differences in some of the factors across the two types of forest reserves. Some of the differences are noticeable in respondents around the NFR who are

older in age with lower income and average years of formal education. These differences did not influence respondents' view on conservation.

Result of Probit regression analysis is as presented in Table 5. This result shows that respondents' age, schooling years, income and religion were all significant variables in forest resources conservation in PFR and NFR. In addition to these 3 significant variables, occupation was a significant variable in forest resources conservation in NFR but not in PFR. While respondents' age, schooling years and income were positively related to forest resources conservation religion was negatively related to forest resources conservation in the two types of forest reserves. This implies that respondents' age, schooling years and income had a strong influence on how far local people would appreciate the need to conserve the forest resources in both PFR and NFR. Also while the coefficients of schooling years were significant at one percent, those of age, religion and income were significant at 5 percent. The level of significant indirectly explains how important the variables were in influencing forest resources conservation among the respondents in the two types of forest reserves.

Table 5 Estimate of probit regression analysis showing the relationship between respondents' socioeconomic characteristics and forest resources conservation, where ** = significant at 1%, * = significant at 5%.

Variables	Plantation forest reserve			Natural forest reserve		
	Coefficient	Std error	t value	Coefficient	Std error	t value
Age	0.0974*	0.0403	2.4169	0.0704*	0.0297	2.3704
Gender	0.0321	0.1541	0.2083	-0.0405	0.1011	0.4006
Schooling year	0.1506**	0.0481	3.1310	0.0985**	0.0302	3.2616
Marital status	0.0714	0.1005	0.7104	0.0397	0.0911	0.4358
Occupation	0.0887	0.0716	1.2388	0.0806*	0.0401	2.0100
Total income	0.0752*	0.0316	2.3797	0.0792*	0.0392	2.0204
Religion	-0.0618*	0.0311	1.9871	-0.0591*	0.0295	-2.0034
Constant	1.8150	1.3612	1.4107	1.6213	1.2041	1.3741

Table 6 Local people's perception of forest management regimes in plantation and Natural forest reserves. Decision is disagree with perception index mean less than mean score of 3, decision is agree with perception index mean greater than mean score of 3.

Statements	Plantation forest reserves				Natural forest reserves			
	Index mean	Std. dev.	Rank	Decision	Index mean	Std. dev.	Rank	Decision
(1) Participation in decision making and extraction will ensure commitment to conservation.	3.45	1.18	1	Agreed	3.52	1.19	1	Agreed
(2) Provision of incentives will promote conservation.	3.39	1.17	2	Agreed	3.41	1.37	2	Agreed
(3) Education through extension officers will enhance effective forest management.	2.72	1.09	5	Disagreed	2.61	1.11	4	Disagreed
(4) Promotion of alternative energy sources will prevent deforestation.	3.09	1.13	4	Agreed	2.54	1.25	5	Disagreed
(5) Provision of employment will generate income and reduce impact on forest resources for livelihood.	3.12	1.41	3	Agreed	3.09	1.13	3	Agreed

3.5 Respondents' Perception of Management Regimes for Efficient Conservation of Forest Resources in Plantation and Natural Forest Reserves

Table 6 presents respondents' perception rating of management regimes towards efficient conservation of forest resources in the two types of forest reserves studied. The result shows that the perception index mean values for (i) Participation in decision making and extraction, (ii) Conservation incentive and (iii) Provision of employment to local people were greater than the mean score of 3.0 in both PFR and NFR with participation in decision making and extraction ranking 1st in the two types of forest. The implication of this finding is that respondents agreed to the above statements meaning that forest resources would be better conserved, if local people sources of income are

improved and they are allowed to participate in the management and decision making of forest resources. Promotion of alternative energy sources with perception index mean of 3.09 was only greater than the mean score of 3.0 in PFR and not in NFR. The perception index means of 2.72 and 2.61 obtained on education through extension officers for PFR and NFR were less than the mean score of 3.0. This implied that respondents disagreed that education through extension officers would not enhance efficient forest resources conservation in the two types of forest reserves. This finding is contrary to the result obtained through probit regression analysis on education where respondents' level of formal education had a positive and significant relationship with conservation in the two types of forest considered.

Respondents' disagreement on education through extension officer could be deduced from the fact that local people believe so much in their indigenous knowledge in conserving the forest and would prefer to stick to it rather than receiving training from the extension officers of the State Department of Forestry. This is evident in their enactment of traditional laws which were used in conjunction with taboos and folklore to protect the forests and place sanctions on disturbed land [17].

4. Conclusion

This study has revealed that the local people around natural and plantation forest reserves recognized the importance of conserving forest resources for economic benefits but would not want the forest conserved for cultural purposes. Only the respondents in PFR and not NFR would want the forest conserved for biodiversity. An assessment of the socio-economic factors influencing forest resources conservation showed that age, education and income had a strong influence on how respondents could appreciate forest resources conservation. Likert scale used to measure respondents' perception of forest management regimes for forest resources conservation indicated participation in decision making and extraction as most important management regimes statement in the two types of forest reserves.

In view of the above, it is necessary to create enabling environment that will make local people embrace formal education and also give them access to generate income. There is also the need to decentralize the management of the forest to allow local people participate in both the management and the decision making of forest resources for efficient conservation. Furthermore, the local people in the study area should be properly oriented on the importance of conserving the forest resources for cultural values. Moreso that Ekiti State Government is focusing on tourism as one of its priority point agenda. Extension workers and the Non- Governmental

Organization (NGO) should be engaged in creating awareness on the benefits that could accrue from promoting the historical cultural values of the forest for tourism.

References

- [1] Sayer, J. 2001. "Conservation and Protection of Tropical Rainforests: the Perspectives of the World Conservation Union." *Unasylva* 52 (3): 40-5.
- [2] Ajakaye, D. O. 2001. "Socio-economic Issues in National Development: Forestry Perspectives." Forestry and National Development. In *Proceedings of the 27th Annual Conference of Forestry Association of Nigeria*, edited by Popoola L., Abu, J. E. and Oni P. I. Abuja, Nigeria: 45-51.
- [3] Akinbami, J. F. K. 1997. "Comparative Environmental Effects and Cost Analysis between Conventional and Non-conventional Energy Source: A Case for Objective Analysis and Decision Making in Nigeria's Energy Policy." *Nigerian Journal of Renewable Energy* 5 (1 and 2): 131-139.
- [4] Abu, J. E. 1993. "Forest Policy and Politics: Implication for Social Forestry Programmes in Southern Nigeria." In *Proceedings of the 23rd Annual Conference of Forestry Association of Nigeria*, 71-80.
- [5] Okali, D. UU. 1997. "Keynote Address: Environment and Resources Development: Towards Sustainable Forestry Development in Nigeria." In *Proceedings of the 25th Annual Conference of Forestry Association of Nigeria*, 1-11.
- [6] Adinna, E. N., and Attah, V. I. 2000. "Forest Reserve Practices and Problems in Nigeria." *The Nigeria Journal of Forestry* 30 (2): 53-61.
- [7] FAO. 2000. *The Role of Wood Energy in Africa*. FAO Rome: FAO Forestry paper.
- [8] NPC (National Population Commission). 2006. "Nigeria's Census Summary, 2006." From the Office of the National Population Commission, Abuja, Nigeria. Accessed January 11, 2012. <http://www.nigeriamasterweb.com/Nigeria06CensusFig.html>.
- [9] Forestry Department, Ekiti State. 2012 "Adapted from Ekiti State, Nigeria: Maps and Local Information." UniQue Solutions Int'l Ltd, Nigeria. Accessed Febuary 14, 2012. <http://www.ekiti.com/AboutEkiti/maps.html>.
- [10] Oyagade, A. O. 1997. "Nigerian Rain Forest Conservation: the Challenge to the Wood-based Sector." In *Proceedings of the 25th Annual Conference of Forestry Association of Nigeria*, 299-304.
- [11] Guthiga, P. M. 2008. "Understanding Local Communities' Perceptions of Existing Forest Management Regimes of a Kenyan Rainforest." *International Journal of Social Forestry* 1 (2): 145-166.

- [12] Owusu, E. H., and Ekpe, E .K. 2011. "An Evaluation of Forest Conservation Perceptions after A Decade of Community Conservation in Afadjato-Agumatsa." *International Journal of Environmental Sciences* 2 (2): 429-439.
- [13] Sanderson, S. E., and Redford K. H. 2003. "Contested Relationships between Biodiversity, Conservation and Poverty Alleviation." *Oryx* 37: 389-390.
- [14] FAO. 1994. *Forest Products Outlook*. Rome: FAO Monthly Bulletin.
- [15] Kayode, J., and Kadeba, O. 2001. "Indigenous Fuelwood Tree Species in Rural Areas of Ekiti State, Nigeria." *African Scientist* 2 (4): 15-19.
- [16] Fuwape, J. A. 2007. "Bio-energy: Conversion and utilization of Wood as Bio-fuel in Nigeria." In *Proceedings of IUFRO all division 5 Conference*, Taipei, Taiwan, 96-99.
- [17] Ojating, I. 1997. "Folklore and Conservation in Nigeria: Using PRA to Learn from the Elders." *Journal PLA Notes* 28:22-24.