

Assessment of Conservation Measures of Selected Tree Crops Going into Extinction Adopted by Rural Farmers in Ohafia L.G.A Of Abia State, Nigeria

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Abstract

The study assessed the conservation measures of selected tree crops going into extinction adopted by rural farmers Ohafia Local Government Area of Abia State, Nigeria. The study described the socioeconomic characteristics of the respondents, identified the tree crops going into extinction, ascertained the conservation measures adopted, determined factors influencing the use of conservation measures on tree crops going into extinction and identified the constraints faced by farmers in conserving tree crops going into extinction in the study area. Multi-stage random sampling technique was adopted in selecting 120 respondents. Primary data were collected for the study with the use of structured questionnaire. Data collected were analyzed using both descriptive and inferential statistics. The major result showed that the endangered tree plant species were Gmelina (94.2%), Neem Plant (84.2%), African breadfruit Ukwa (77.5%), Oha tree (69.2%) and *Irvingia gabonensis* (65.0%). The result also showed that conservation measures by the farmers were, permanent cover under plantation ($\bar{x} = 3.3$), use of mucuna and herbicides ($\bar{x} = 3.2$), intercropping ($\bar{x} = 3.0$), alley cropping ($\bar{x} = 2.9$), cover cropping ($\bar{x} = 2.8$), no bush burning, slashing and mulching ($\bar{x} = 2.8$), crop rotation ($\bar{x} = 2.8$), minimum tillage ($\bar{x} = 2.7$), and improved short term season fallow with improved leguminous. Tobit regression analysis revealed that the coefficients of education at 10%, income at 1% and farming experience at 5% positively influenced the use of conservation measures on tree plants going into extinction. The result further showed that among the constraints of the farmers in conserving these endangered tree plants were wanton deforestation ($\bar{x} = 3.70$), lack of information ($\bar{x} = 3.38$), ageing and dying farming population ($\bar{x} = 3.32$), poor extension services ($\bar{x} = 3.25$), neglect of farming by youths ($\bar{x} = 3.32$), inadequate records ($\bar{x} = 3.15$) and inadequate storage of seeds ($\bar{x} = 3.67$). The study recommended that adequate documentation and publicity of the endangered species should be carried out so that the general public can also help in their protection and conservation.

Key Words: Tree plants, conservation measures, extinction.

1.0 INTRODUCTION

The environment according to Agbogidi and Ofuoku (2007) is the closest neighbour of man. Man depends directly and indirectly on the environment for almost everything relating to growth and survival on planet earth. Given the dynamic nature of the global ecosystem, environment changes, driven by man-made natural cause is inevitable. Economic activities and the rate of

population growth have increased to a point where the effect of humanity on the environment can no longer be ignored (Aimufia, 2002).

According to the International Union for the Conservation of Nature (IUCN), an endangered species is an organism or a population of organism that faces a high risk of becoming extinct due to loss of its habitat, high death rate or changes in environmental and prey-predator parameters. The death rate of such organism far outweighs its birth rate over a period of time resulting to a decline in its population. Some common examples of endangered animal species include African Elephant, Tiger, Lion and Cheetah. In Nigeria, of the 4,600 plant species, 707 are said to be endangered, while some hundreds of both plants and animal species have since gone into extinction due to loss of habitat occasioned by environmental degradation and climate change (ANFP, 2006). Aliyu (2006) stated that reasonable species of medicinal species are threatened with habitat loss following heightened deforestation (Agbogidi, 2002; Agbogidi and Ofuoku, 2006). Although there is great incompatibility in urbanization/industrialization and agriculture, developmental activities should be environmentally friendly to allow for sustained yield (Agbogidi and Okonta, 2009).

A good number of tropical forest trees species have immense socio-economic, nutritional and cultural importance, especially to rural dwellers that depend on them (Nwoboshi, 2000). These species could serve as alternative sources of food, especially during the “hungry season” (November to April, when farm crops are planted) and thus contribute to food security. These trees provide a vast array of Non-Timber Forest Products (NTFPs), which provide important and diverse products and services such as food production, health care delivery, economic empowerment, shelter, clothing, cultural and spiritual satisfaction, etc. It has been predicted that the importance of these tree species will increase in coming decades especially for sustainable development of rural livelihoods that depend on them, which can be attributed to the increasing demand and the emerging domestic and international markets for their products (Onumadu *et al.*; 2000).

Anthropogenic activities including farming, hunting, tree felling, bush burning, mining operation, petroleum exploitation, civil engineering construction and water exploration have been shown to impact on the edible fruit trees negatively (Adeyemi and Jegede, 2002). Adelus *et al.*, (2002) noted that urban forest reserves and enclaves have suffered more undue depletion and degradation with loss of biodiversity and renewable resources as a result of urbanization and encroachment on areas originally perceived as forest reserves and estate. In the same vein, Okonkwo *et al.*, (2002) reported that serious anthropogenic activities of man constitute great environmental hazards. Impact of certain projects on the vegetation of ecosystems in the tropics including Nigeria is widespread. For example, establishment of modern markets, television stations, amusement parks, housing estates, company sites and stadia in Nigeria and other parts of the tropics, have led to the removal and destruction of various economic vegetation, with the use of some of these projects.

Despite their importance, a lot of tropical forest tree plant species, have been greatly neglected, particularly with respect to their regeneration. The yield of the current crop of trees is decreasing due to their old age and the fact that they have been harvested for decades (ITTO, 2005). Due to

lack of care and old age, a lot of the trees species have died or are in the process of doing so. In Nigeria, many forest fruit tree species are endangered with the possibility of going into extinction in the near future except something is done to conserve them or increase their population (FORMECU, 2005). Allowing the species to go into extinction will endanger the livelihood of millions of rural dwellers and reduce the rich biological diversity of the ecosystem. The study therefore assessed the conservation measures of selected tree crops going into extinction in Ohafia L.G.A of Abia State

Specific Objectives

The specific objectives of this study are to;

1. describe the socioeconomic characteristics of the respondents in the study area
2. identify the tree crops going into extinction in the study area
3. ascertain the conservation measures adopted in the study area
4. determine factors influencing the use of conservation measures on tree crops going into extinction
5. identify the constrains faced by farmers in conserving tree crops going into extinction

2.0 METHODOLOGY

Ohafia is a clan as well as a local government area in Abia State, Nigeria. It is an Igbo speaking region. The ancestral capital of Ohafia clan is the centrally located village of Elu. Ohafia Local Government Area, is an administrative jurisdiction assigned by the Nigeria Government, which covers the entire Ohafia villages and other clans such as Abiriba and Nkporo, with its Administrative Headquarters at Ebem Ohafia. The ancestors of the Ohafia people were renowned as mighty warriors. This aspect of the Ohafia peoples history remains fundamental to the Ohafia people's sense of identity. The warrior's cap or "leopard cap" (Igbo: *Okpu agu*)¹ is well known and is an associated product of Ohafia. The Ohafia warrior tradition is embodied in the performance of *iri agha*.

Multi-stage random sampling technique was adopted in selecting the respondents. In the first stage, six autonomous communities were selected in Ohafia LGA by simple random sampling. In the second stage, two villages were selected from each of the six autonomous communities selected, making a total of twelve villages. In the third stage, ten farmers were selected from each of the twelve villages selected making a total 120 (one hundred and twenty farmers). Primary data were collected for the study with the use of structured questionnaire. Data collected were analyzed using both descriptive and inferential statistic.

Model Specification

Probit model used in the study is specified explicitly as;

$$Y_i^* = B^1 x_i + E$$

$$Y_i = 0 \text{ if } Y_i^* = 0$$

$$Y_i = 1 \text{ if } Y_i^* > 0$$

Where:

- Y_i^* = an underlying latent variable that indexes the use of conservation measures
- Y_i = dummy variable indexing farmers' decision to use conservation measures (use =1, otherwise =0)
- B^1 = a vector of estimated parameter

E = the error term

The value of log likelihood function is given as, empirical model are presented below;

$$Y = f(X_1, X_2, X_3, X_4, X_5, X_6, X_{13} + e_i)$$

Y = Access to ICTs (access = 1, otherwise = 0)

X₁ = Gender (male = 1, otherwise = 0)

X₂ = Age (years)

X₃ = Education (years of schooling)

X₄ = Marital Status (married = 1, otherwise = 0)

X₅ = Household Size (numbers)

X₆ = Farm Size (hectares)

X₇ = Distance (Km)

X₈ = Occupation (farming = 1, otherwise = 0)

X₉ = Farm-income (Naira)

X₁₀ = Non-farm income (Naira)

X₁₁ = Farming Experience (Naira)

X₁₂ = Access to Credit (access = 1, otherwise = 0)

X₁₃ = Cooperative Membership (member = 1, otherwise = 0)

e_i = Error term

3.0 RESULTS AND DISCUSSION SOCIOECONOMIC CHARACTERISTICS

Table 1: Distribution of respondents according to their socioeconomic characteristics

Socioeconomic characteristics	Frequency	Percentage
Gender		
Male	74	61.7
Female	46	38.3
Age		
20 – 30	58	48.33
31 – 40	33	27.50
41 – 50	26	21.67
51 – 60	3	2.50
Mean	42.6	
Marital status		
Single	46	38.3
Married	71	59.2
Separated	1	0.8
Widowed	2	1.7
Household size		
1-4	80	66.67
5-8	40	33.33
Mean	4.8	
Level of education		
Primary education	3	2.5

Secondary education	14	11.7
Tertiary	103	85.8
Farming experience		
1 – 10	59	49.17
11 – 20	26	21.67
21 – 30	14	11.67
31 – 40	13	10.83
21 – 25	12	10.00
26 – 30	-	-
31 – 36	3	2.50
Mean	15.5	
Income		
50,000 – 100,000	42	35.00
101,000 – 150,000	20	16.67
151,000 – 200,000	29	24.17
201,000 – 250,000	18	15.00
251,000 – 300,000	11	9.17
Mean	151,875	
Total	120	100.0

Field survey, 2016

The distribution of respondents according socioeconomic characteristics was presented in Table 1. The table showed that large proportion (61.7%) was male while 38.3% were female. The result revealed that 48.33% of the respondents were within the age ranges of 20 – 30 years, 27.50% were within the age ranges of 31 and 40 years of age, 21.67% were within the age ranges of 41 – 50 years while 2.50% of the respondents were within the age ranges of 51 – 60 years. The result generally indicated that majority of the respondents were young, active and are still in their productive ages. The results on marital status showed that majority (59.2%) of the respondents were married. The distribution of respondents according to their household size was showed 66.67% of the respondents had 1 – 4 persons in their house hold while 33.33% had 5 – 8 persons in their household. The household member might be source of labour for farm work (Chinaka, 2004) This may be the simple reason that larger household sizes have more readily available labour for agriculture than smaller household. All the respondents had one form of formal education or the other as shown in Table 1 and large proportion (85.8%) of the respondents had tertiary education. According to the result, large proportion of the respondents had working experience of 1 – 5 years. Farmers who have stayed long in the system are better equipped than beginners. (Anijah-obi, 2001) confirmed this, in her assertion that longer years of farming experience help the farmers to make rational decision. The inexperienced farmers may not fully be active in conserving trees plants. Table 1 revealed that 35.0% of the respondents were within monthly income ranges of #50,000 – 100,000, 16.67% were within monthly income ranges of #101,000 – 150,000, 24.17% of the respondents were within monthly income ranges of # 151,000 – 200,000, 15.00% were within income ranges of #201,000 – 250,000 and 9.17% earned between #251,000 – 300,000 monthly. The mean income of #161,875 indicated relatively high incomes among the respondents.

ENDANGERED TREE PLANTS**Table 2: Distribution of respondents according to endangered tree plants in the study area**

Endangered tree plants	Frequency	Percentage
Gmelina	113	94.17
African Breadfruit (<i>Ukwa</i>)	93	77.5
<i>Irvingia gabonensis</i> (<i>Ugiri</i>)	78	65.0
Neon Plant (Dogonyara)	101	84.17
Oha tree	83	69.17
Kola nut	49	40.8
<i>Achi</i>	59	49.17

Source: *Field Survey, 2016*

The distribution of respondents according to the endangered tree plant was shown in Table 2. The Table revealed that the major endangered tree plant species were Gmelina (94.2%), Neem Plant (84.2%), African breadfruit *Ukwa* (77.5%), Oha tree (69.2%) and *Irvingia gabonensis* (65.0%). The result implied that these plants are in danger of extinction in the study area

CONSERVATION MEASURES**Table 3: Distribution of respondents according to their perceived conservation measure**

Conservation measures	$\sum x$	\bar{x}
No burning, slashing and mulching	343	2.80
Minimum tillage	335	2.71
Direct planting	325	2.71
Alley cropping	348	2.90
Cover cropping	340	2.83
Crop rotation	317	2.64
Intercropping	356	2.97
Improved short term season fallow with improved leguminous	329	2.74
Permanent cover under plantation	397	3.30
Mucuna and herbicide	381	3.18
Grand mean		2.85
Sample size (n)		120

*Decision: $\bar{x} \geq 2.5$ indicates constraint, $\bar{x} \leq 2.49$ indicates no constraint

Table 3 showed the distribution of respondents according to their perceived conservation measure. The result revealed that some of the conservation measures by the farmers were, permanent cover under plantation ($\bar{x} = 3.3$), use of mucuna and herbicides ($\bar{x} = 3.2$), intercropping ($\bar{x} = 3.0$), alley cropping ($\bar{x} = 2.9$), cover cropping ($\bar{x} = 2.8$), no burning, slashing and mulching ($\bar{x} = 2.8$), crop rotation ($\bar{x} = 2.8$), minimum tillage ($\bar{x} = 2.7$), and improved short term season fallow with improved leguminous. The grand mean of 2.9 implied that the respondents perceived that these conservation measures will go along way in conserving endangered tree plant species.

FACTORS INFLUENCING THE USE OF CONSERVATION MEASURES

Table 4: Tobit regression estimates of the determinants of use of conservation measure on endangered tree plant

Variables	Coefficient	Standard error	t- value
Constant	0.012	0.120	0.08
Gender (X ₁)	0.010	0.025	0.41
Age (X ₂)	-0.002	0.001	1.06
Marital status (X ₃)	0.006	0.022	-0.26
Education (X ₄)	0.025	0.014	1.74*
Household size (X ₅)	0.006	0.005	1.11
Farm size (X ₆)	-0.009	0.022	-0.44
Distance (X ₇)	-0.00009	0.00017	-0.54
Occupation (X ₈)	-0.007	0.014	-0.52
Farm income (X ₉)	2.05×10 ⁻⁸	0.48×10 ⁻⁸	4.27***
Non-farm income (X ₁₀)	1.48×10 ⁻⁸	1.96×10 ⁻⁸	-0.75
Farming experience (X ₁₁)	0.002	0.001	2.10*
Credit access (X ₁₂)	0.050	0.027	1.11
Cooperative membership (X ₁₃)	0.048	0.027	1.07
Chi ² (X ²)	20.40***		
Pseudo R ²	0.7255		
Log Likelihood	22.073		

Source: *Field Survey, 2016*

*, **and *** is significant at 10% and 1% levels of probability.

Table 4 showed Tobit regression result of the factors influencing the use of conservation measures in the study area. The result showed the Pseudo R² value of 0.7255 indicating that 72.55% of the variations of in the dependent variables were accounted for while about 27.5% were due to error. The Chi-square value was statistically significant at 1% level of probabilities which indicates the Tobit regression line of best fit.

The coefficient of education was statistically significant at 10% level of probability and positively related. The result implied an increase in the level of education of the respondents will lead to a corresponding increase in the use of conservation measures in the study area.

The coefficient of farm income was statistically significant at 1% level of probability and positively related. The result implied an increase in the farm income of the respondents will lead to a corresponding increase in the use of conservation measures in the study area.

The coefficient of farming experience was statistically significant at 5% level of probability and positively related. The result implied an increase in the farming experience of the respondents will lead to a corresponding increase in the use of conservation measures in the study area.

CONSTRAINTS IN CONSERVATION OF TREE PLANTS**Table 5: constraints in preservation of tree plants**

Constrains	Sum	Mean
Wanton deforestation	444	3.70
Ageing and dying farming population	398	3.32
Neglect of farming by youths	360	3.00
Inadequate records	378	3.15
Inadequate storage of seeds	320	2.67
Poor extension services	390	3.25
Lack of information	406	3.38
Grand mean		3.21
Sample size (n)		120

Field survey, 2015

The result in table 5 showed that among the constraints of the farmers in conserving these endangered tree plants were Wanton deforestation ($\bar{x} = 3.70$), Lack of information ($\bar{x} = 3.38$), ageing and dying farming population ($\bar{x} = 3.32$), Poor extension services ($\bar{x} = 3.25$), Neglect of farming by youths ($\bar{x} = 3.32$), Inadequate records ($\bar{x} = 3.15$) and Inadequate storage of seeds ($\bar{x} = 3.67$). The result implied that many factors were responsible for endangering these plant species in the study area.

CONCLUSION AND RECOMMENDATIONS

As several plants and animals species continued to go extinct due to loss of habitat, occasioned by environmental degradation and climate change, there is every need for adequate protection and conservation of both the endangered species in their natural habitat to be encouraged. In-situ conservation which involves the protection of species in their natural habitat should be encouraged. In-situ conservation in most cases is carried out by removing the endangered species in question and placing it under human controlled environment which in most cases is more costly, and the species faces the challenges of survival after reintroduction in the wild

Based on the findings of the study, the following recommendations were made;

1. Some cultural practices which favour conservation of natural resources should be encouraged.
2. Government should develop and encourage the use of alternative resources of energy to discourage most Nigerians from using fuel wood as a source of energy which has caused the depletion of forest resources over the years.
3. Adequate protection of the existing forest reserves and national parks should be carried out to check activities of illegal timber dealers and poachers.
4. Adequate documentation and publicity of the endangered species should be carried out so that the general public can also help in their protection and conservation.
5. Massive afforestation program by both government and private individuals to check the effect of climate change and environmental degradation which is responsible for loss of biodiversity should be encouraged.
6. Artificial regeneration and subsequent improvement of the species (domestication) appears to be a very viable option of saving them from extinction and ensuring that their products are supplied on a sustained basis.

REFERENCES

- Agbogidi .O.M (2002). Deforestation and the Nigerians rural environment. *In: Ibitoye OA (ed.). Rural environment and sustainable development*,Petoa Educational Publishers, Ado-Ekiti, pp.230-234.
- Agbogidi .O.M. and Ofuoku AU (2007). Promoting environmental protection in Nigeria through environmental education: the role of woman. *J. Environ. Ext.*, 6: 28-33.
- Agbogidi OM. and Eshegbeyi O F (2008). Forestry development for a safe environment. *In: Onykwelu JC, Adekunle VAJ, Oke DO (eds.).Proceedings of the 1st National Conference of the Forests and Forest Products Society of Nigeria (FFPN) held at the Federal University of Technology, Akure, Ondo State between 16th - 18th April, 2008*, pp.95-98.
- Agbogidi, O.M. and Ofuoku AU (2006). Biodiversity conservation and poverty alleviation in the Niger Delta area of Nigeria. *Agriculturea Conspectus Scientifiucs*,Vol.71(3): 103-110.
- Agbogidi,O.M. and Okonta BC (2009). Conservation of biodiversity: the goal of sustainable development. *Afr.J. Agric. Res. Dev.*, (In press).
- Aimufia,D.I. (2002). Forests, people and the environment: a keynote address. *In: Popoola, (ed.).Proceedings of a National Workshop organized by FANCONSULT and Edo State Chapter of FAN held in Benin-city, Edo State between 5th and 6th of September, 2002*, pp.5-14.
- Aliyu,B.S. (2006). Some ethno-medicinal plants of the savannah region of West Africa: description and photochemical. Triumph Publishing Company Ltd, Kano.
- Chinaka,E.C.(2004).An Appraisal of the participation of women in Root and Tuber Crop Production in Imo State of Nigeria. M.Sc. Thesis submitted to the Department of Agricultural economics and Extension, Faculty of Agriculture, Abia State University, Uturu
- FORMECU 2005 Federal Republic of Nigeria, Integrating Agriculture with forestry Development Project in Ogun and Ondo State
- ITTO, (2005). Status of Tropical Forest management 2005, Summary report of International Tropical Timber Organisation, yokahama, Japan. (pp. 35)
- Nwoboshi LC (2000). The nutrient factor in sustainable forestry. University Press, Ibadan.
- Onumadu. F.N, Popoola, L .and Adekunle O. A.(2000).Journal of environment Extension , Agroforestry Farming system: Environmental and Socio-Economic Benefits Vol.1(1):36