

LEVEL OF UTILIZATION OF AGROFORESTRY PRACTICES IN AKWA IBOM STATE, NIGERIA

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ABSTRACT

Akpabio, I. A., Umoh, E. E., Udousung, I. J., and Okon, D. 2007. Level of utilization of agroforestry practices in Akwa Ibom State, Nigeria. Nigeria. Nigerian Journal of Agriculture Food and Environment. 4:(1-4):1 – 7.

The study identified the level of utilization of agroforestry practices (AFPs) by male and female farmers, in the farming system of Akwa Ibom State of Nigeria. Responses derived from 125 randomly selected respondents showed that farmers were favourably disposed to the utilization of only five of the sixteen identified AFPs in the study area, including: "leaving of isolated woody trees on farmlands and at boundaries of farm plots". Male and female responses were generally similar although a major difference was observed with regard to "planting of trees for fuelwood". Composite Index however, revealed a general low level of utilization of AFPs, although female farmers were relatively more disposed to the utilization of AFPs. Recommendations have been proffered to improve on the utilization level of AFPs in the study area.

Keywords: Agroforestry, Akwa Ibom State, Gender, Nigeria, Utilization

INTRODUCTION

The International Centre for Research in Agroforestry (ICRAF, 2000) reported that about 1.2 billion people—about 20% of the world's population—depend to a large extent on forestry produce and services for their survival. Ironically though, large scale deforestation has remained the most pervasive of all developmental concerns facing developing nations in the humid tropics and it has remained at the front burner of the world's attention. This is more so in Nigeria where forest destruction is put at an average of 400,000 hectares per year (ha/yr) while reforestation has been occurring at a rate of only 32,000 ha/year (cf. Adedire, 2004). Umeh (1985) observed that Nigeria's natural forest resources are fast diminishing and that many species in flora and fauna are threatened with extinction.

Deforestation has resulted in soil degradation and global warming, which have grave implications for human socio-economic activities. Soil degradation may lead to losses of lives and property, while global warming directly affects crop yield (Swaminathan, 1987; Adedire, 2004). This situation is quite critical in Akwa Ibom State of Nigeria, where more than 80% of the population depends on forestry products for survival. Regardless of this fact however, the Nigeria Conservation Foundation (2000) reported an imbalance between the demand and supply of forest products. The Forestry Monitoring Evaluation and Coordinating Unit (FORMECU, 1999) also projected a deficit of fuelwood, poles and saw-wood, over a 10 – year period of up to 2010. The situation is further exacerbated by the seeming non-challance of the state Forestry Directorate to issues of afforestation. Udo and King (2001) quoted relevant reports of the State Directorate of forestry, to the effect that during the period from 1997 – 2000, only 50 ha. of forestry plantation were developed in the state. The present situation may be worse if cognizance is taken of Ekpo's (2004) lamentation of the poor and dwindling funding status of the directorate. It has also been reported that only 4.14% of the total land area of Akwa Ibom State is under forest cover, a proportion that is grossly short of the 10% recommended by FORMECU (1999) and the 25% originally proposed for the country (Ekpo, 2001).

Taking cognizance of the potentials of agroforestry to redress problems of environmental deterioration and rural development (Etukudo, 2000, Foley and Barnard, 1984, Mayers, 2007) vis-à-vis the present situation of the state, Udo and King (1997) advocated the production of food trees and introduction of agroforestry in order to ameliorate the present situation. The Akwa Ibom State Forestry Directorate had since embarked on agroforestry and taungya programmes in selected areas of the state. The state government has also embraced yearly National Tree Planting Campaign activities. Against this background and taking cognizance of the necessity to ensure that the momentum of operations is sustained, this study was conducted, to ascertain the level of utilization of the various agroforestry practices disseminated to small scale farmers in Akwa Ibom State of Nigeria. It is however, important to recognize the integral relationship of gender with livelihood, especially with respect to agricultural activities in Nigeria (Directorate for

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International Development, 2004; Akpabio, 2005) and the necessity to ensure that the research takes into account different gender perspectives. Against this background, this study disaggregated the responses of male and female respondents' with respect to their various levels of utilization of the various agroforestry practices disseminated to them. In essence, this study was conducted, to determine the level of utilization of agroforestry practices by male and female agroforestry practitioners' in Akwa Ibom State of Nigeria. The specific objectives of the study included: (i) Identification of the socio-economic characteristics of agroforestry practitioners in the study area; (ii) Determination of the level of utilization of various agroforestry practices by agroforestry practitioners in the study area and (iii) Determination of the general status of respondents' level of utilization of agroforestry practices in the study area.

MATERIALS AND METHODS

Interviews and a set of pre-tested structured questionnaires were used to collect information from respondents. Collated data were analysed with the aid of descriptive and inferential statistical tools.

The sample frame for the study comprised all the small scale farmers involved in the agroforestry project of the Forestry Department of the Akwa Ibom State Ministry of Environment. All the five Local Government Areas (LGAs) specifically targeted for the Agroforestry project (Oruk-Anam, Urue-offong Oruko, Itu, Ikot Abasi and Esit Eket) were purposefully selected for the study. A simple random sampling procedure was also utilized to select 25 farmers from each of the LGAs under consideration. This gave a total number of 125 respondents that were sampled for the study.

In order to evaluate respondents' level of utilization of agroforestry practices (AFPs) 16 practices were identified through focus group discussions and a literature research. Respondents were thereafter requested to indicate their level of preference for the utilization of each identified AFP. This was done with the aid of a 3-point Likert continuum of: Not preferred, little preferred and well preferred. These were assigned respective scores of "1", "2" and "3" for each AFP, after which a mean cut-off score of 2.0 (1 + 2 + 3/3) was utilized to demarcate between a preferentially utilized AFP (PU = $x \geq 2.0$) and Not Preferentially Utilized AFP (NUP = $x < 2.0$).

The general status of respondents' level of utilization of agroforestry practices introduced in the area of study was determined with the aid of a Composite Index Technique, which had three ranges of (1) low (0.00 – 0.33); (2) average (0.34 – 0.66) and (3) high (0.67 – 1.00).

RESULTS AND DISCUSSION

Socio-economic Characteristics of Agroforestry Practitioners

Table 1 reveals that 60% respondents were female while 40% were male. Majority (89.6%) respondents were married, while 64% were more than 40 years of age. With regard to educational status, 25.6% respondents were not formally educated while 44.8% had acquired a primary level of education. In essence, about 70.4% respondents had little or no formal education. Sixty-four percent respondents were revealed to be full-time farmers, while others combined farming with other farms of economic pursuits. Table 1 also shows that 57.6% respondents had acquired more than 10 years of farming experience. It was also revealed that farming activities took place mainly on multiple, rented land holdings scattered all over the study area, with individual farm sizes ranging between 0.5 – 2ha for 75% respondents. Farm income was revealed to be less than or equal to ₦20,000 for about 65.6% respondents while Forestry Field Officers were the major source of information on agroforestry practices in the study area.

On a disaggregated basis, while there were more female (than male), participants in the agroforestry programme in the study area, male participants were relatively older and more educated. The male also operated more from personal holdings, with a focus on cash crops (oil palm etc) and hence earned relatively higher income than female respondents. On the other hand, female respondents were revealed to be relatively more dependent (than the male) on farming as an economic activity. They were also more experienced in farming activities, although their farming activities took place more on rented land portions.

Preferentially Utilized Agroforestry Practices

Table 2 shows information to the effect that farmers are favourably disposed to the utilization of only five of the sixteen (16) identified AFPs in their farming systems. These AFPs include: woody trees planted and left to grow ($x = 2.44$; rank = 1); planting of woody trees at boundaries of individual farm plots ($x = 2.2.6$; rank = 2); planting of woody trees in combination with fruit trees ($x = 2.19$; rank = 3); planting of vegetable crops in combination with woody trees at early stage of growth of woody trees ($x = 2.09$; rank = 4) and planting of woody trees to act as windbreaks/shade trees for building ($x = 2.03$; rank = 5).

On a disaggregated basis, male and female respondents were generally similar. A major difference was however observed in respect of responses to item 7 (planting trees for fuelwood). Female respondents' regarded this item as a preferentially utilized AFP, while the male did not see it as such. In essence, female respondents utilized 6 (of the 16) AFPs in their farming systems, while the male utilized only 5 AFPs. Table 2 also shows that female respondents generally allocated high affirmative responses to the 5 generally utilized AFPs. This may be attributed to their higher level of involvement in farming practice in the study area (Akpabio, 2000; Akpabio and Ekpe, 2003). Women have also been depicted to be more actively engaged in experimenting with new ideas and practices on available farmland spaces

(Offiong and Okon, 2001; Akpabio, 2005). It is important to note that full time male farmers in the study area focus on the cultivation and tendering of economic trees like oil palm (*Elaeis guineensis*), rubber (*Hevea brasiliensis*) and coconut (*Cocos nucifera* etc).

Table 1: Socio-economic characteristics of agroforestry practitioners in Akwa Ibom State, Nigeria (n = 125)

S/N	Variables	Male	Female	Total
1.	Sex	50 (40.0)	75 (60.0)	125 (100)
2.	Status			
	Single	7 (14.0)	6 (8.0)	13 (10.4)
	Married	43 (86.0)	69 (92.0)	112 (89.6)
3.	Age Distribution (years)			
	40 or below	22 (44.0)	23 (30.7)	45 (36.0)
	More than 40	28 (52.6)	52 (69.3)	80 (64.0)
4.	Educational Status			
	None	2 (4.0)	30 (40.0)	32 (25.6)
	Primary/Vocational	24 (48.0)	32 (42.7)	56 (44.8)
	Secondary	16 (32.0)	11 (14.7)	27 (21.6)
	Tertiary	8 (16.0)	2 (2.6)	10 (8.0)
5.	Primary Occupation			
	Farming	30 (60.0)	50 (66.7)	80 (64.0)
	Farming/Trading etc	8 (16.0)	10 (13.3)	18 (14.4)
	Farming /Civil Service	12 (24.0)	15 (20.0)	27 (21.6)
6.	Land Use Status			
	Ownership	10 (20.0)	5 (6.7)	15 (12.0)
	Tenancy	40 (80.0)	70 (93.3)	110 (88.0)
7.	Farming Experience			
	Less than 10 years	31 (62.0)	22 (29.33)	53 (42.4)
	More than 10 years	19 (38.0)	53 (70.7)	72 (57.6)
8.	Spatial Farm Distribution			
	Only 1	5 (10.0)	6 (8.0)	11 (8.8)
	1 – 3	23 (46.0)	31(41.3)	54 (43.2)
	More than 3	22 (44.0)	38 (50.7)	60 (48.0)
9.	Farm Income/Season (₦)			
	Less than 10,000	13 (26.0)	19 (25.31)	32 (25.6)
	10 – 20,000	17 (34.0)	33 (44.0)	50 (40.0)
	More than 20,000	20 (40.0)	23 (30.7)	43 (34.4)
10.	Source of Awareness			
	Radio	4 (8.0)	4 (5.3)	8 (6.4)
	Forestry Officer	42 (84.0)	66 (88.0)	108 (86.4)
	Neighbour	4 (8.0)	5 (6.7)	9 (7.2)

Source: Field survey, 2007

The act of “planting woody trees” as implied by respondents, with reference to item 1, may not be a true reflection of activities in the general study area. Farmers may not actually plant woody trees on volition. However, they do plant fruit trees and generally would not cut down mature naturally growing woody trees found on their farm plots, in the course of land preparation for crop cultivation. Such woody trees may include *Elaeis guineensis*, (oil palm), *Dacryodes edulis*, (black pear), *Acioa barteri*, (ukana), *Adansonia digitata*, (baobab), *Parkia biglobosa* (African locust beans), and *Khaya senegalensis* (dry zone mahogany) etc. It is however necessary to state that participants in the agroforestry programme of the State Directorate of Forestry, who were actually sampled for the study, do plant woody trees, but not for their direct utilization. The activity of planting woody trees is the first major AFP that is introduced to agroforestry clientele. The land utilized for this activity is mainly government (forestry directorate) owned, and which is allotted in plots, to interested farmers. Plots allocation is predicated on the understanding that participants plant seedlings

of woody trees (which are given out free to farmers) under the supervision of Forestry Officers. The farmers' thereafter have unfettered access to the allocated portions of farmland, on which they can now cultivate mainly arable crops, approved by the Forestry Directorate. Preferred crops may include *Solanum melongena* (egg plant) and vegetable crops (item 2; rank = 4) like *Telfairia occidentalis*, (fluted pumpkin), *Cucumis melo* (melon) and *Talinum triangulare* (water leaf) etc. This farming system is of benefit to both the farmers (mainly females and the landless) who have free access to partially developed plots of land for their farming operations; and to the Forestry Directorate, which is assisted to expand the area of forestry under its jurisdiction. This is at a little or no cost, in comparison to the hire of extra hands as labour or recruitment of new staff. The farmer is also expected to secure the newly established woody trees from vandals.

The act of planting trees (either scattered or patterned) at farm/compound boundaries (item 4; rank = 2) is an age-long AFP, which is mainly utilized on family owned/communal land holdings, to demarcate such plots from landholdings of other families/communities. It is mainly done to secure such holdings from encroachment, thereby preventing endless litigations that may arise from attempts to repossess such holdings. Trees planted at boundaries of homesteads/compounds serve additional purposes other than security of holdings. They may aid to restrict homestead livestock (especially poultry, goat and sheep) from loitering/straying into/from adjacent properties and also protect them from harm and/or prevent them from engaging in destructive activities in nearby compounds.

Trees may also help to ensure privacy by screening/shielding compounds from prying eyes. Prevalent trees/shrubs at boundaries of land holdings and compounds include: Atama (*Heinsia crinata*), editan (*Lasienthera Africana*), ata (*Xylopia aethiopica*), nya (*Anthonata macrophylla*) and itumo (*Newbouldia laevis*). Others include: ekpakpan (*Barteria nigritiana*) which is very useful for the construction of the major stakes/beams in the walls of local mud/thatched houses); odudu (*Lonchocarpus griffoneanus*), Nkarika/Pepper fruit (*Denettia tripetata*) bitter leaf (*Vernonia amygdaline*) and Ndiya (*Cola pachycarpa*). Prominent exotic trees which may be found mainly in peri-urban and urban areas include: whistling pine (*Casuarina eguiseifolia*), Sand box tree (*Itura crepitans*) and Caribbean pine (*Pinus caribaea*).

The act of planting woody trees, in combination with fruit trees (item 6; rank = 3) is normally utilized at boundaries of individual landholdings, to act as live fences, as wind breaks/shades trees and to provide access to fruits. Fruit trees also make up the highest proportion of forest trees in homestead gardens. Common examples in the locality include: Udara (Ibibio) - African star apple (*Chrysophyllum albidum*); black pear-eben- (Ibibio) (*Dacryodes edulis*); mango (*Mangifera indica*), *Terminalia catapa*, (Indian almond), guava (*Psidium guayava*) avocado pear (*Persa americana*) and oranges (*Citrus spp*). Maturing woody trees are generally left undisturbed on landholdings which are cleared in preparation for cultivation of crops. However, the women who are mainly responsible for household sustenance, in terms of food provision, may also tend growing woody trees, in future anticipation of such being utilized for fuel wood.

Status of level of utilization of agroforestry practices

A composite index level of utilization of agroforestry practices in the study area was calculated, and it was revealed that a very high proportion of respondents' (67.2%) recorded low levels of utilization of AFPs introduced in the study area. On a disaggregated basis, it was revealed that a relatively higher proportion (70%) of male respondents recorded low levels of utilization of AFPs than female respondents (65.3%). On the contrary, a relatively higher proportion of female respondents (18.7%) recorded higher levels of utilization of AFPs than the male (10.0%). In essence, it may be inferred that there is a low level of utilization of agroforestry practices in the study area, although female farmers were revealed to be more involved in the utilization of agroforestry practices in their farming systems than male farmers.

Table 2: Preferentially utilized agroforestry practice in Akwa Ibom State,

Nigeria

S/N	Agroforestry Practices	Male Gender (n = 50)		Female Gender (n = 75)		Total (General) (n = 125)		Remarks	
		Mean	Rank	Mean	Rank	Mean	Rank		
1.	Woody trees planted and left to grow	2.36	1	2.52	1	2.44	1	PU	
2.	Combination of woody trees/vegetables at early planting phase	2.08	4	2.10	4	2.09	4	PU	
3.	Trees at hedges/crops in between	1.52	8	1.53	11	1.52	8		NPU
4.	Planting trees at farm/compound boundary	2.10	2	2.42	2	2.26	2	PU	
5.	Trees/food crops/livestock raising combination	1.66	6	1.57	8	1.62	6		NPU
6.	Planting woody trees for windbreak	2.02	5	2.03	6	2.04	5	PU	
7.	Planting trees for fuel wood	0.94	15	2.07	5*	1.51	9		NPU
8.	Trees/fodder on range land	1.20	14	1.47	12	1.34	14		NPU
9.	Planting protein rich trees for fodder	1.14	16	1.29	16	1.21	16		NPU
10.	Planting fodder on range land	1.30	12	1.55	9	1.43	11		NPU
11.	Crops/trees/pasture/animals	1.28	13	1.40	15	1.34	14		NPU
12.	Woody trees at hedges for browse/mulch/green manure/soil conservation	1.32	10	1.44	13	1.43	11		NPU
13.	Trees/beekeeping	1.42	9	1.44	13	1.43	11		NPU
14.	Trees lining fish ponds	1.56	7	1.54	10	1.55	7		NPU
15.	Trees planted for fodder, soil protection and reclamation	1.32	10	1.61	7	1.47	10		NPU
16.	Planting woody trees with fruit trees	2.10	2	2.27	3	2.19	3	PU	

- Major gender perceptual difference
- PU- Preferentially utilised AFP NPU- Non-Preferentially utilised

Table 3: Index of level of utilization of agroforestry practices by farmers in Akwa Ibom State, Nigeria

Index Range	Level of Interpretation	Male (n = 50)		Female (n = 75)		Total (n = 125)	
		F	P	F	P	F	P
0.00 – 0.33	Low	35	70.0	49	65.3	84	67.2
0.34 – 0.66	Average	10	20.0	12	16.0	22	17.6
0.67 – 1.00	High	5	10.0	14	18.7	19	15.2
Total		50	100.0	75	100.0	125	100.0

CONCLUSION AND RECOMMENDATIONS

Farmers in the study area prefer to utilize five agroforestry practices (AFPs) in their farming system. The three major AFPs were: “woody trees, planted and left to grow”, “planting of woody trees at boundaries of farm plots” and

“planting of woody trees in combination with fruit trees”. Male and female responses were generally similar, except that female respondents also preferred to “plant woody trees to be utilized as fuelwood” on their farm plots. In essence, female respondents utilized six AFPs on their farm plots unlike male farmers who utilized only five AFPs. Composite index however revealed generally low level of utilization of AFPs in the study area, although female respondents recorded relatively higher levels of utilization of AFPs than male respondents. A focus on the socio-economic characteristics of agroforestry practitioners in the study area revealed that female farmers were more experienced and more involved in AFPs than male farmers, although male farmers were older in age, had better access to private landholdings, and earned more income from farming activities than female farmers.

A lot still has to be done in order to popularize agroforestry practices so as to enhance its acceptability and ultimate entrenchment in the farming system of the study area. Against this background, the following recommendations may be derived from this study.

1. Sustained education and environmental awareness campaign activities are required to sensitize the general public on the consequences of deforestation and the role of agroforestry in environmental sustainability. 2). The agroforestry programme of the study area, as presently conceived and implemented, is perceived by the people as a government activity targeted at increasing the stock of woody trees in the ecosystem. Sustained efforts should be focused on presenting agroforestry as a livelihood sustaining and risk-mitigation activity. In those wise improved varieties of indigenous tree crops and popular exotic fruit trees/cash crops should be introduced as components of the agroforestry programme in the study area. An implementation of the above recommendation would result in forestry lands being viewed as economic entities where matured fruits from economic trees, could be sold and income derived thereof. This will hasten the acceptability and entrenchment of agroforestry into the farming system in the study area. 3). Attention should be focused on encouraging landless women farmers to participate in the agroforestry programme. This is because they are enthusiastic about the prospect of having a pseudo-title to land, albeit for a limited period of time. The response of women to the practice of agroforestry would be more pronounced if they have a clear title to land. In this wise, the large expanses of fallow forest lands scattered all over the state, could be allotted to interested women farmers from adjoining communities and they should be encouraged, with credit facilities, improved inputs and extension advice to plant multi-purpose trees, in combination with arable crops. Sustainability of this proposed venture would be ensured if experienced forestry officers are posted to supervise operations at these sites.

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