



FARMERS' PERCEPTION ON THE USE OF ON-FARM TREES IN OYO STATE, NIGERIA

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ABSTRACT

Information obtained from the assessment of on-farm trees is very important for biodiversity conservation, food security interventions and rural livelihoods development. The study assessed the perception of farmers on the usefulness of on-farm trees in Oyo state based on the four Oyo State Agricultural Development Programme (OYSADEP) zoning. On-farm trees are tree species located outside the gazetted forest reserves or found on farmlands. A total of one hundred and sixty (160) farmers were selected from each of the OYSADEP zones through a multi-stage sampling design. Information collected includes level of awareness of forest tree species on farmlands, retention of tree species and average income obtainable. Data were subjected to descriptive and inferential statistics analysis. The result showed that the perception of farmers on the usefulness of forest trees species on farmlands in the study zones varied. About 29.3% of the farmers indicated that they retained tree species on their farmlands during land clearing while 70.7% of the farmers revealed that they carried out total tree felling. Also, result indicated that majority of the farmers across the four zones inherited their farmlands (71.3%) and were also prepared to pass the same farmlands to their children. The removal of forest tree species on farmlands is a major attribute of the farmers of these zones, thus perception of farmers on the usefulness of trees on farmlands is very low. There is a significant relationship between the selected socioeconomic characteristics of the farmers and their perception on te usefulness of trees on their farmland at 5% probability level. The desire by the farmers to selectively retain trees on farmlands should be promoted as alternative in managing forest resources because the farmers generated an average monthly income of about ₦34,000; ₦33,500; ₦26,000 and ₦22,666 from Oyo, Saki, Ogbomoso and Ibadan zones respectively. The act of retaining forest trees on farmlands has the capacity to reduce the pressure which human population is mounting on the primary forest especially in the remaining natural forest ecosystem of Nigeria.

Keywords: Perception, forest trees, farmers, farmlands



INTRODUCTION

The 1970's environmental degradation provoked a rush of aid to countries hit by drought and desertification. Following this in the 1980's was a plethora of agroforestry research that recognized the major role of trees in rural development and soil fertility (Aju, 2012). Within the same period, rainforests threatened through logging and agricultural expansion received unprecedented consideration and tree planting was encouraged (Aju, 2012). In the 1980's, interest also mounted in Non-Timber Forest Products (NTFPs) which were previously relegated to the status of minor products. It was at this time that trees especially 'trees outside the forest'(T.O.F), a phrase coined in 1995 (FAO, 2001), began to be considered in terms of their contribution to the well-being of people and their environment.

Trees are not just confined to forests but exist outside the forests also. Trees outside forests (TOF) are of significant importance and perform a number of ecological, economic and socio-cultural functions. Trees are one of the most important components of the biosphere, which directly influences the global atmosphere cycles and human wellbeing. Detecting forest conditions as well as monitoring the changes of various forest structural, biophysical or biochemical variables can enable accurate understanding of forest ecosystem services.

Over the years, farmers have tried to retain, protect, plant and manage trees on their farmlands. The role of these trees in providing a number of locally important goods and services such as cheap food supplements, poles, timber, fuel wood, fibers, herbal medicines, and fodder and erosion control is well recognized and documented (Okafor, 1980; Arnold, 1990; Aju, 2012). But these trees and their important functions have been overlooked and ignored. Instead, more attention has always been focused on trees in the forests (gazetted forest areas) which are viewed as resources and as a store of biological diversity (FAO, 2001) which are geometrically and rapidly decreasing. Figure 1 shows an example of tree species growing on Maize farmland in Ido, Oyo State.



Fig.1: Forest trees growing on farmland.

Trees outside forests (TOF) refer to trees located on lands other than forest lands, such as farmlands, human settlements and bare lands (FAO, 2001). The many uses and services of trees outside forests are obvious but available data on these important resources are not available in the study location. Also, in spite of the fact that over the years, farmers have utilized the benefits of non-timber forests product found on their arable lands, an account has not been made of the increase or decrease productivity, biodiversity, ecological importance and the biometric features of the trees on farmlands (Wesley, 1990).

The main objective of this study is to examine and assess the trees on farmlands with the view to determining the perception of farmers towards the usefulness of these tree species and also bring out relevant and adequate information for policy development and for managerial purposes in Oyo State. Emphasis is basically on indices such as respondents' socio-characteristics, size of farm holdings, financial and non-financial benefits obtainable from the forest trees, land acquisition, tree inception and retention etc.

Oyo State Agricultural Development Programme (OYSADEP) Zoning was adopted for the study because it is an agricultural programme that deals with farmers in the state. Also, there is an increasing population pressure that has led to virtual disappearance of most forests in the gazetted zones (Forest reserves); hence people are increasingly relying on TOF, mainly in form



of agroforestry, fallow and on-farm trees, for the continued provision of forest goods and services. The study is part of a response to the concern over lack of data on TOF expressed by experts at a consultation on this issue held in Kotka, Finland in 1996 (Aju, 2012).

MATERIALS AND METHODS

Study areas

The study area is Oyo state (Fig 2). It lies in the south west geographical zone of Nigeria. The state is bounded by Benin Republic in the West, in the North and East by Kwara and Osun states respectively and Ogun state in the South (Adeola *et al*, 2012). Oyo state covers a land area of 27, 140,000sq.km. The state lies between latitude 7°N and 9°N of the equator and between longitude 2.5°E and 5°E of the prime meridian (Meludu and Ajayi, 2005).

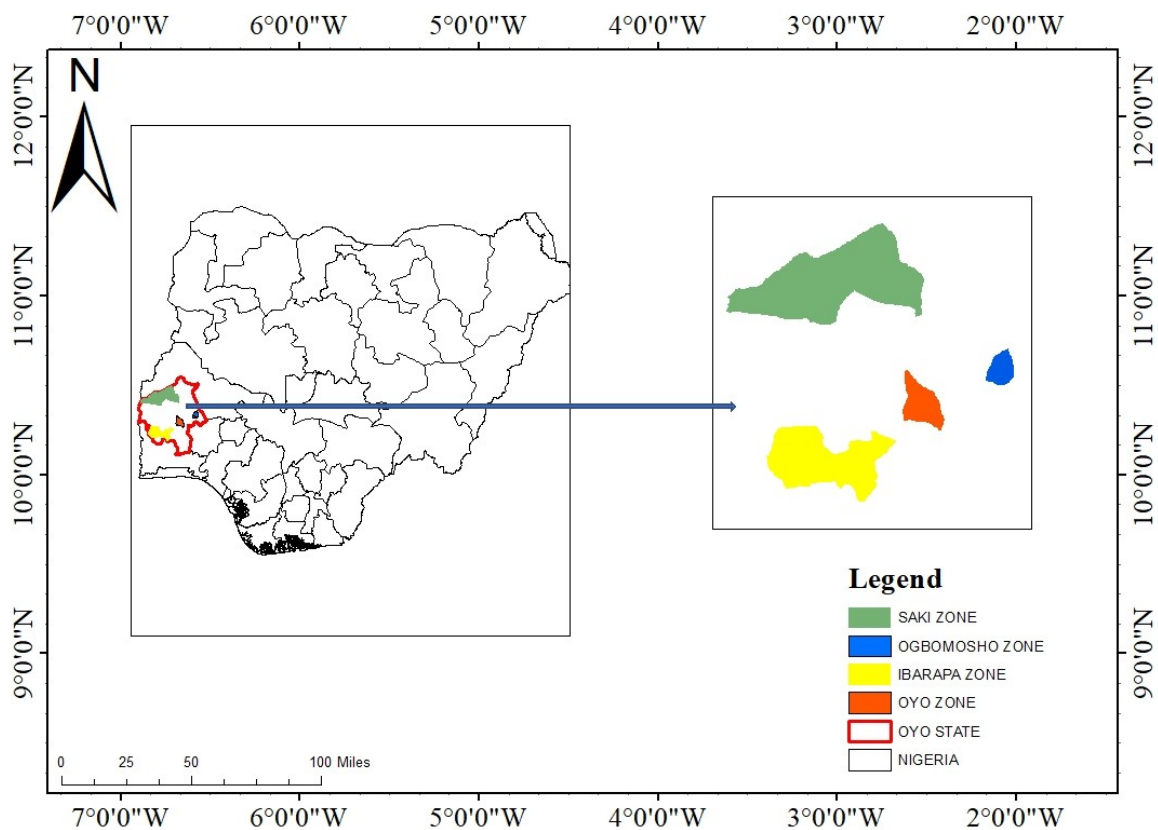


Figure 2: Map of Oyo State showing the various OYSADEP zones



The Oyo state Agricultural Development Programme (OYSADEP) zoning falls into four (4) major areas in the state namely: Ibadan zone, Saki zone, Oyo zone and Ogbomosho zone as shown in Figure 2. The climate is tropical seasonally characterized by two peaks wet season in the south and one peak wet season in the north. Oyo State has a population size of 3,489,000. Average daily temperature ranges between 25°C and 35°C almost throughout the year (Adeola *et al*, 2012).

Data collection

Formal survey of farmers using a set of open-ended questionnaires was used to generate data on the open grown trees. The open-ended questionnaire allowed the farmers to express themselves and indicate their feelings and perception about the effects of forest trees retention and planting on their farmlands.

To ensure a more representative sampling, a three stage sampling technique was adopted based on the Oyo State Agricultural Development Programme (OYSADEP) administrative zoning arrangement. Under this administrative framework, each zone was divided into blocks and each of the blocks further divided into smaller units called cells. Oyo State Agricultural Development Project has divided the state into four agricultural zones and twenty eight (28) blocks for administrative convenience.

For this study, Multi-stage random sampling technique was employed to select the farmers. The first stage involved the selection of all OYSADEP zones within the state. The second stage involved random selection of two local government areas from each of the OYSADEP zones, since local government areas represent an agricultural extension block of the OYSADEP, making a total of eight (8) blocks (Atiba, Oyo-East, Ibarapa-East, Iddo, Ogbomosho-South, Ogo-oluwa, Atisbo and Saki-East blocks) while sampling procedure for the third stage involved purposive selection of two cells from each of the block making a total of 16 cells for the study. It is from these cells one hundred and sixty farmers (160) were systematically selected for the assessment of the questionnaire as regards the trees growing on their farmlands. A total of 160 questionnaires was design for this study representing forty (40) questionnaires to each OYSADEP zone as shown in table 1.



Data analysis

The data obtained from the questionnaire administration were analyzed using appropriate quantitative and qualitative statistics such as tables, charts, parentages and Chi-square test.

RESULTS AND DISCUSSIONS

Table 1: Distribution of questionnaire in the studied zones

OYSADEP Zones	No of Questionnaire Distributed	No of Questionnaire returned	Percentage retrieval (%)
Ibadan	40	40	100
Oyo	40	40	100
Ogbomoso	40	37	92.5
Saki	40	40	100

Source: Field survey, 2017

Table 2: Demographic Characteristics of the respondents

VARIABLES	OYSADEP ZONES				
	IBADAN	OYO	OGBOMOSHO	SAKI	TOTAL
GENDER					
Male	29(72.5%)	32(80%)	28(75.7%)	33(82.5%)	122(77.7%)
Female	11(27.5%)	8(20%)	9(22.5%)	7(17.5%)	35(22.3%)
MARITAL STATUS					
Single	0	0	0	0	0
Married	30(75%)	23(57.5%)	33(89.2%)	25(62.5%)	116(73.9%)
Divorced	2(5%)	3(7.5%)	2(5.4%)	2(5%)	9(5.7%)
Widowed	6(15%)	8(20%)	1(2.7%)	9(22.5%)	21(13.4%)
Separated	2(5%)	6(15%)	1(2.7%)	4(10%)	11(7.0%)
HOUSEHOLD SIZE					
0 – 4	9(22.5%)	7(17.5%)	10(27.0%)	12(30%)	38(24.2%)
5 – 9	24(60%)	29(72.5%)	21(56.8%)	23(57.5%)	97(61.8%)



10 – 15	7(17.5%)	4(10%)	6(16.2%)	5(12.5%)	22(14.0%)
Above 15	0	0	0	0	0
EDUCATIONAL STATUS					
No formal education	11(27.5%)	15(37.5%)	10(27.0%)	16(40%)	52(33.1%)
Primary education	15(37.5%)	13(32.5%)	11(29.7%)	13(32.5%)	52(33.1%)
Secondary education	8(20%)	6(15%)	10(27.0%)	5(12.5%)	29(18.5%)
Tertiary education	5(12.5%)	2(5%)	1(2.7%)	6(15%)	14(8.9%)
Others	1(2.5%)	4(10%)	5(13.5%)	0(0%)	10(6.4%)
AGE (YEARS)					
21-30	0(0%)	0(0%)	2(5.4%)	2(5%)	4(2.5%)
31-40	2(5%)	2(5%)	3(8.1%)	3(7.5%)	10(6.4%)
41-50	10(25%)	9(22.5%)	12(32.4%)	6(15%)	37(23.6%)
51-60	17(42.5%)	16(40%)	19(51.4%)	14(35%)	66(42.0%)
61 – 70	11(27.5%)	13(32.5%)	1(2.7%)	15(37.5%)	40(25.5%)
PRY. OCCUPATION					
Ret. C/servant	3(7.5%)	2(5%)	0(0%)	0(0%)	5(3.2%)
Farming	27(67.5%)	31(77.5%)	26(70.0%)	21(52.5%)	105(66.9%)
Teaching	5(12.5%)	0(0%)	3(8.1%)	6(15%)	14(8.9%)
Trading	4(10%)	5(12.5%)	6(16.2%)	2(5%)	17(10.8%)
Welding	0(0%)	2(5%)	0(0%)	4(10%)	6(3.8%)
Hunting	1(2.5%)	0(0%)	2(5.4%)	7(17.5%)	10(6.4%)
SEC. OCCUPATION					
Farming	13	9	11	19	52 (45.6%)
Trading	10	9	9	14	42 (36.8%)
Driving	2	6	0	2	10 (8.8%)
Contractor	8	0	2	0	10 (8.8%)

Source: Field survey, 2017



Table 3: Response to land acquisition, tree inception and tree retention on farmlands

VARIABLES	OYSADEP ZONES				
	IBADAN	OYO	OGBOMOSHO	SAKI	TOTAL
LAND ACQUISITION					
Purchase	3 (7.5%)	1 (2.5%)	1 (2.5%)	4 (10%)	9 (5.7%)
Inherited	29 (72.5%)	30 (75%)	28 (75.5%)	25 (62.5%)	112 (71.3%)
Rent/leased	8 (20%)	9 (22.5%)	8 (21.6%)	11 (27.5%)	36 (22.9%)
TOTAL	40	40	37	40	100.0
TREE INCEPTION					
Yes	28 (70%)	30 (75%)	23 (62.2%)	23 (57.5%)	104 (66.2%)
No	12 (30%)	10 (25%)	14 (37.8%)	17 (42.5%)	53 (33.8%)
TOTAL	40	40	37	40	100.0
TREES RETENTION					
Yes	14 (35%)	10 (25%)	13 (35.1%)	9 (22.5%)	46 (29.3%)
No	26 (65%)	30 (75%)	24 (64.9%)	31 (71.5%)	111 (70.7%)
TOTAL	40	40	37	40	100.0

Source: Field survey, 2017

The response of the farmers on mode of land acquisition showed that the majority of the farmers inherited the farmland on which they carry out their farming activities with 71.3% of the total respondents. However, in each of the zone, the majority of the farmers inherited their farmlands [Ibadan/Ibarapa (72.5%), Ogbomoso (75.5%), Oyo (75%) and Saki (62.5%)], with 5.7% of the total respondents purchased their farmlands while 22.9% rented the land on which they farm table 3. The response of farmers to tree inception on their farmlands revealed that Oyo zone of OYSADEP had the highest percentage of those that met trees on their farmland with 75% of the



total respondents, while respectively Ibadan/Ibarapa, Ogbomoso and Saki zones had 70%, 23% and 23%. Whereas, in Ibadan/Ibarapa zone 30% indicated they didn't meet trees on their farmlands. In other zones, Oyo (25%), Ogbomoso (37.8%) and Saki (42.5%) indicated no trees were met on their farmlands. This result showed that trees initially occupied land until farmers cleared or cut the trees on the farm to make use of the land. The result of the study showed that the practice of tree cutting or removal during land clearing for farming is a major attribute of the farmers of the studied zones. Many people do not retain tree species on farmlands during clearing of forest ecosystems for farming. The result shows that only 29.3% of the total respondents do retain trees on farmlands during clearing of forest for farmland, while 70.7% are involved in tree felling due to their cropping pattern. Although, variations exist across the sampled zones in the responses to tree retention during land preparation for farming as shown in the table 3 above.

The question relating to farm sizes revealed that majority of the farmers in Ibadan zone have farm sizes less than 2acres (50.0%) with mean of 3.63 and standard deviation of 6.29. in Oyo zone, 37.5% of the farmer had farmland less than 2acres while 35% had between 2 to 5acres (table 5). In Ogbomoso however, 59.6% of the farmers had farmland less than 2acres while 32.4% had between 2 to 5 acres. Also, in Saki zone of the state, less than 2acres of land had 12 farmers (30%) of the total respondents in the zone, while the highest percentage of farmland size was noticed for the range between 2 to 5acres (table 4). In general, the least farmland sizes across the different zones were revealed for the land sizes greater than 5acres. This is an indication that the majority of the farmers sampled across OYSADEP zones were smallholders. Although discussions with the farmers revealed that the majority of them have not been able to make use of their total land area. That is, in some cases portion of their lands are being put in to farming while the remaining parts remain bushy. Also discussions with the farmers revealed that land fragmentation has make their farmlands becoming smaller as farmlands are being inherited by children.



Table 4: Average number of farmlands (with percentages) of OYSADEP zones

Land (acres)	Ibadan	Oyo	Ogbomoso	Saki	Total
Less than 2acres	20 (50%)	15 (37.5%)	22 (59.6%)	12 (30.0%)	44.0%
2 – 5acres	14 (35%)	14 (35%)	12 (32.4%)	18 (45%)	36.9%
Greater than 5acres	6 (15%)	11(27.5%)	3 (8.1%)	10 (25%)	19.1%
Total	40	40	37	40	100
Minimum	1.00	1.50	1.00	1.00	
Maximum	40.00	48.00	15.00	25.00	
Mean	3.63	9.325	2.905	5.89	
Std. Dev.	6.29	0.12	3.02	6.14	

Source: Field survey, 2017

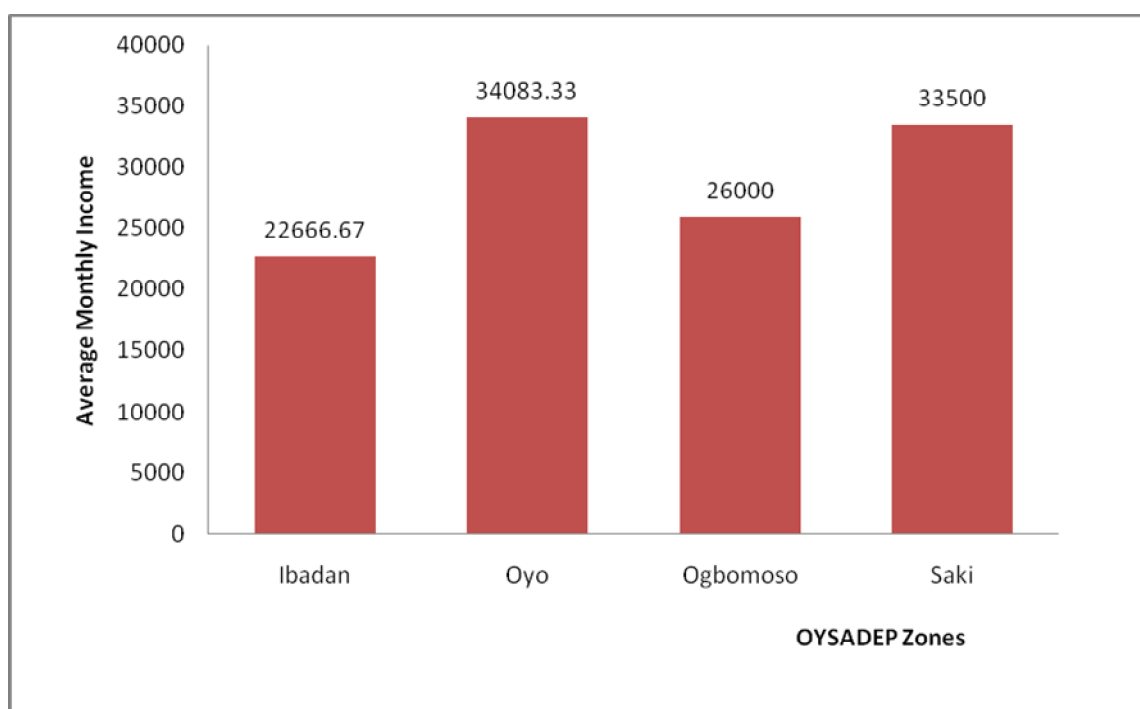


Fig 3: Chart showing average monthly income from forest trees across OYSADEP zones



Farm Sizes and Income from Tree Resources

The result of this study revealed that across the OYSADEP zones, about 19.1% of the farmers had farmlands greater than 5 acres with Oyo and Saki zones accounting for the highest values of 27.5% and 25% respectively (table 4). According to Arnold (1990), trees outside forests and its products have market value and may indeed be essential for resource poor peasants. However, in income generated from tree resources on farmlands, farmers from Saki zone indicated averagely about ₦34,083.33, Ibadan zone ₦22,666.67 while Saki and Ogbomoso zones get ₦33,500 and ₦26,000 respectively as indicated by those that had forest trees on their farm (Fig. 3). A related study carried out in rural Madhya Pradesh, India showed that Non-timber forest products provided 40 - 63% of total annual income (Tewari and Campbell 1996), while in Zimbabwe, their subsistence (non-market) values contributed 35.0% of total household income (Cavendish 1997). The result from the study revealed that the more the size of farmland the more the revenue obtained from the farmland. According to Ajake, (2012) the study concluded that as farm size increases there is a corresponding increase of forest tree species integrated into farmlands and invariably, the more forest resources obtainable.

Table 5: Test of Statistics (Chi-Square)

Variables	Chi-square Value	Degree of freedom	Asymptotic Sig
Gender	48.210	1	0.000*
Age	106.100	4	0.000*
Marital Status	178.000	3	0.002*
Level of Education	51.439	4	0.000*
Household size	50.510	2	0.001*
Income	44.621	4	0.000*

*= significant at 0.05 level of probability



Test of hypothesis

The chi-square analysis (Table 5) conducted on gender, age, marital status, level of education and household size showed a statistically significant relationship between the selected socio-economic variables of the respondents and their perception about the usefulness of trees on their farmlands in the study area. Therefore, there is significant relationship within the variables. This result indicate that age, gender, marital status, level of education and household size have impacts on the views of the farmers in relation to the trees growing on their farmlands.

Responses of farmers to Non-timber Products and non-financial benefits of OGTs on their farmlands

According to Bergeret and Ribot (1990), trees outside forest area are major important source of food and many valuables to the rural populace; hence they are referred to as "nurse trees". This study however confirmed this as many of the trees on farmland are useful to the farmers. This is in agreement with the findings of FAO (1990), that trees left on fallow and farm lands in the West African Humid Forest Zone are those valued for their food. To get this variable, respondents were provided with a section to list or provide possible non – financial benefits and non-timber products they obtained from these trees species on their farmland. The lists of NTFPs and Non-financial benefits identified by the farmers are provided in table 6 and 7 respectively.

Table 6: List of NTFPs benefits of OGTs on Farmlands

Non-Timber Forest Products	Frequency	Percentage (%)
Fuel wood	35	18.3
Sponges	24	12.6
Leaves	21	11.0
Fruits	35	18.3
Chewing sticks	18	9.4
Vegetables	19	10.0
wildlife	22	11.5
Bitter kola	17	8.9
Total	191	100.0

Source: Field survey 2017



Table 7: Non-financial benefits of OGTs on Farmlands

Non-financial benefits	Frequency	Percentage (%)
Shade	39	15.5
Windbreaks	18	7.2
Fencing	23	9.2
Animal feed	27	10.8
Soil improvement	38	15.1
Fuel wood	37	14.7
Construction materials	33	13.2
Stalk	36	14.3
Total	251	100.0

Source: Field survey 2017

Farm sizes and Tree Management

The sizes of farm holding determine the extent to which the land is utilized and to which trees are interspersed with farm crops. The farm sizes of the studied farmers were categorized into three groups. The findings as shown in Table 4 revealed that the farm sizes of most farmers were less than two acres (53.5%), while those between 2 and 5 acres had 38.2% of the total respondents. A few people have farm sizes greater than five acres (8.3%). This is an indication that the farmers of these zones are smallholders. It is known that the more forest trees are on farmlands, the higher the quantity of forest resources harvested, and the increase in income generation and food supply. This will reduce the frequency of the people visit to the gazetted forest for harvesting of forest products. In addition to the ecological functions of these forest trees species on farms, the study discovered that most of these species were of high economic, medicinal, and social value to the people as those that retained the tree species make valuable use of them. Furthermore, discussions with the farmers revealed that most of them have farmlands scatteredly located in their community. That is, a farmer can have different farms for cassava, yam, cocoa, plantain etc.

The result shows that the practice of tree felling during farm clearing is a major attribute of most of the farmers. Although, variations exist in the responses to tree retention on farmlands across the sampled villages (table 3). The result shows that 29.3% retain trees on farmlands while



70.7% are involved in tree felling. For those farmers who claimed to retain trees do it to get products like leaves, livestock feeds, fruits etc. while those that clear all trees, the overwhelming reasons given was that there is danger of shading their crops.

CONCLUSION AND RECOMMENDATION

Trees left on farmlands are consciously managed by farmers to form an integral part of the farming systems and have great impacts on forest management. Results from the study areas showed that removal of forest tree species on farmlands is a majority attribute of the farmers of these zones as many of them engaged in cutting down of these tree species during farm preparation for their farming activities. From the result it can be concluded that the farmers are smallholders having or managing small area of land for their farming. The role of farmland trees in people's livelihood was also found to be of great extent as many of the farmers make valuable use of the tree resources on their farmland by getting both non-financial benefits as well as major NTFPs from the farmlands. Meanwhile, the act of retaining forest trees on farmlands has the capacity to reduce the pressure which human population is mounting on the primary forest especially in the remaining natural forest ecosystem of Nigeria.

The act by farmers to selectively keep trees of significance alive and integrate them into farming systems should be promoted as part of the alternative in managing forest resources. This is indicated as results revealed that average monthly income of about ₦34,000; ₦33,500; ₦26,000 and ₦22,666 were generated from Oyo, Saki, Ogbomoso and Ibadan OYSADEP zones respectively. These practices tend to increase output of farmers through the sale of forest resources on farmlands and the bigger the farmlands, the more income that will be generated. Although, some of the farmers are knowledgeable about tree crop interaction with forest tree species, but it is necessary that adequate forestry and agricultural education through extension services be encouraged and intensified in order to sustain the consciousness of managing the remaining forest trees species on farmlands for ecological, research, educational and other benefits to rural people and the state at large.

This study has shown that the perception of farmers on the usefulness of trees on their farmlands is very low. There is no doubt that with continued growth in populations, coupled with shrinking



forests, and degraded ecosystems, trees on farmlands are bound to play a much greater local and global role in meeting the challenges of resource sustainability, climate change amelioration, poverty reduction and in contributing to food security.

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