

Farmers' Perception and Adoption of Agroforestry Practices in Osun State, Nigeria

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Abstract

The study assessed Farmers' perception and adoption of agroforestry practices in Osun state, Nigeria. Multistage sampling technique was used for the study. Three local governments were randomly selected from each of the three senatorial districts in the state. Three farming communities were then randomly selected in each LGA and 10 respondents were purposively selected in each sampled community. Primary data were collected through semi-structured questionnaire to 270 respondents. In addition information was obtained from a key informant in each sampled community with the use of interview schedule. The results of the study showed that there were divergent perceptions about agroforestry practice in the study area. 10% of the respondents in Osun west senatorial district were of the opinion that agroforestry practice is a scientific process that is difficult to practice, 62% perceived that it can improve farm productivity while 12% opined that the practice is not properly understood. Chi-square test ($p < 0.05$) shows that there is significant association between respondents educational qualification and the adoption of agroforestry practices in all the senatorial districts of Osun state. Chi-square test ($p < 0.05$) also shows that there is a significant association between respondents; land ownership and the adoption of Agroforestry practices in all the senatorial districts of the study area. The adopted agro-forestry practices in the study area include retention of trees on farmland, planting of trees on boundaries, shifting cultivation and home gardening. Challenges faced by farmers in the practice of agroforestry practice among others are; lack of technical knowhow, small land holdings, fire outbreak and poor extension service. More farmers can be encouraged to practice agroforestry through improved agroforestry extension service to the farmers, encouraging farmers to form cooperative groups, organizing training programmes for farmers in agroforestry and free distribution of tree seedlings to farmers.

Keywords: Farmers' perception; Adoption; Agroforestry practices; Home gardening; Nigeria

Introduction

A wealth of literature confirms that agroforestry practices may contribute to the welfare and livelihoods of farmers. Through the integration of trees on farm and in the landscape, agroforestry (AF), defined as a dynamic, ecologically based natural resource management system, diversifies and sustains production for increased social, economic and environmental benefits [1]. AF has thus been recognized as one of the strategies to introduce indigenous and exotic trees into cropping systems and impact on livelihoods of small-holder farmers in Sub-Saharan Africa [2].

Several studies have perceived AF practices in different ways; Lundgren and Raintree [3] viewed it as the set of land-use practices which involves the combination of trees, agricultural crops and/or animals on the same land management unit. Although cultivating trees in combination with crops and livestock is considered an ancient practice, factors such as the deteriorating economic situation in many parts of the developing world; increased tropical deforestation; degradation and scarcity of land because of population pressures; and growing interest in farming systems, intercropping and the environment [4] have contributed to a rising interest in agroforestry since the 1970s. Most research on agroforestry has been conducted from the biophysical perspective, but socio-economic aspects in relation to perception of farmers are gaining attention [5].

In relation to the perceived benefit of agroforestry practices, its potential to uplift the socioeconomic conditions of the farmers has been identified. According to Maren and Carolyn [6], agroforestry enhanced the socioeconomic livelihood of rural farmers by enhancing income earning potentials and overall food and nutritional security as well as provision of fuel wood, fodder for animal consumption and

employment. Earlier, Kandji et al. [7] pointed out that agroforestry systems improves the microclimate which in turn improves the adaptive capacity of land owners to climate change. Thus, Kandji et al. [7] suggested that the presence of trees in agricultural croplands can provide agricultural producers with an additional source of income that helps to strengthen their socioeconomic resilience. Integrating trees into systems where they can be planted close to each other and pruned or browsed intensively can help increase economic benefits. The farm-grown fodder increases milk production and can substitute for relatively expensive purchased dairy meal, thus increasing farmers' income [8].

Main agroforestry practices include improved fallows, taungya farming, home gardens, alley cropping, growing multipurpose trees and shrubs on farmland as well as boundary planting, [4,9]. Studies in several parts of Africa, including Nigeria have demonstrated the economic and agronomic returns of these practices [8]. Structures to retard the process of deforestation and environmental degradation have been adopted reluctantly and, even when adopted, the management and maintenance have been less than desirable. Thus, despite the

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considerable progress in agroforestry research and dissemination, awareness and attitude of land users practicing AF systems is of utmost value before any recommendations should be made [1]. Faced with this situation, many researchers have called for the assessment of agroforestry systems (e.g. Franzel et al. [8]) from the perception of the farmers.

Given the potential of AF practices to improve agricultural land use systems and provide lasting benefits and alleviating adverse environmental effects at local and global levels, this study seeks to assess how farmers perceive Agroforestry practices in Osun state; ascertain the level of adoption of agroforestry practices by farmers in the study area; identify the various Agroforestry practices adopted by farmer in the study area identify Agroforestry tree species commonly planted by farmers in the study area; identify problems faced by local farmers, that influence the adoption of Agroforestry practices in the study area

Methodology

The study area

The study area is Osun state, Nigeria. The state was carved out of the old Oyo state on the 27th August 1991. It is located between longitudes 040301 E and 4051 E and latitude 70301 N and 70501 N, South-western Nigeria. It covers an area of approximately 14,875 square kilometers. The area is mainly agrarian, and it is also divided into three federal senatorial districts, each of which is composed of two administrative zones. The 1991 census puts the population of the state at 2.2million [10]. The State is made up of 30 local government areas with over 200 towns, villages and other settlements. The state has a considerable number of highly urbanized settlements some of which are Osogbo, Ile-Ife, Ipetumodu, Ilesa, Ikirun, Iwo, Ede, Ila-Orangun and Ikire. Others include, Ejigbo, Ilobu, Gbongan, Okuku, Inisa, Ijebu-Ijesa, Ipetu-Ijesha etc. The people of the state are mainly traders, artisans and farmers. Their other occupations include hand-woven textiles, tie and dye, leather work, calabash carving and mat-weaving. Osun State is bounded in the West by Oyo State, Ondo and Ekiti States in the East, Kwara State in the North and Ogun in the South. The State runs an agrarian economy with a vast majority of the populace taking to farming [10].

Method of data collection

Three local government areas were randomly selected from each of the 3 senatorial districts in the study area (Figure 1). Three farming communities were then selected in each LGA using random sampling technique to make a total of 27. In each of the twenty seven sampled farming communities, 10 respondents were purposively selected and semi-structured questionnaire was administered on them. A total number of 270 farmers were sampled to make up the total respondents of the study. The selected local government areas and the sampled communities are presented in Table 1.

Method of data analysis

The data collected was analyzed using descriptive statistics that include the use of frequency distribution and percentages Tables and bar charts. Chi- square test was used to test for the nature of association between respondent's age, family size, farm size, land ownership, farming experience, level of education and adoption of agroforestry practices in the study area.

Hypotheses tested

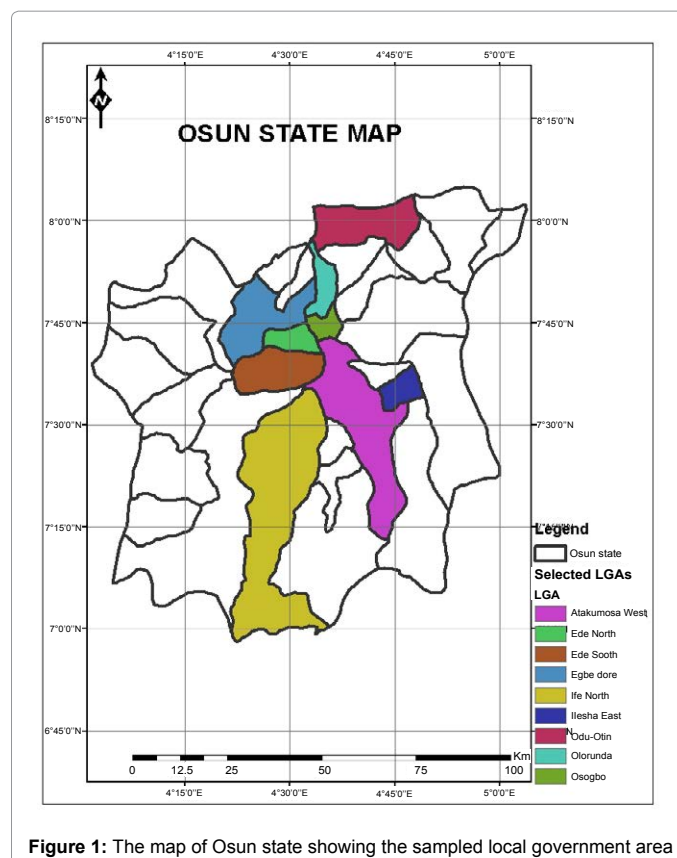
The following hypotheses were tested in the study.

- Ho: Age of farmers has no significant association with the adoption of Agroforestry practices in the study area
- Ho: Adoption of agroforestry practices is independent of the farm size of farmers in the study area
- Ho: Educational qualification of farmers has no significant association with the Perception/adoption of agroforestry practices in the study area
- Ho: Farmers land ownership status has no significant association with the adoption of agroforestry practices in the study area.
- Ho: Farmers farming experience has no significant impact on the adoption of agroforestry practices in the study area

Results and Discussion

Farmers perception of agroforestry practices in the study area

Table 2 shows that in Osun west senatorial district, 10% of the respondents were of the opinion that agroforestry practice is a scientific practice that is difficult to practice, 62% perceived that it can improve farm productivity, 12% opined that the practice is not properly understood while 16% were of the perception that agroforestry practice is a common practice among the local farmers. In Osun central senatorial district the highest percentage, 56% of respondents viewed agroforestry as a practice that can improve productivity, 19% opined that it is a common practice among local farmers, 13% were of the opinion that agroforestry is a scientific practice that is difficult to practice, while 11% perceived agroforestry practice as a practice that is not properly understood.



Senetorial District	Local Government	Communities
Osun East	Ife North	Ipoye
		Olobo
		Oyere-aborishade
	Atakumosa West	Iloba
		Ila-Ijesa
		Itangunmodi
	Ilesha East	Ijayiregbe
		Isotun
		Ibala
OsunWest	Egbedore	Iragberi
		Iwoye
		Elemela
	Ede North	Elemo
		Eleeduogangan
		Abeere
	Ede South	Olodan
		Araromi
		Elewure
OsunCentral	Olorunda	Dagbolu
		Alabameta
		Oba-ile
	Odootin	Oyan
		Ekusa
		Ataka
	Oshogbo	Boredun
		Onigboyi
		Owode

Source: Field Survey, 2013

Table 1: The name of the communities selected in each of the senatorial district

From the foregoing, it therefore follows that there is a high degree of variation on the perception of the relevance of agroforestry technology to local farming situation in the study area. This agrees with Oladele and Fawole [11] who noted that farmers' perception of new technologies varies greatly in South-western Nigeria. Majority of the respondents in the study area are aware of the positive impact of agroforestry practices. The respondents were aware of the economic and environmental benefits of agroforestry practices and had favourable attitude towards those practices. It may be due to the fact that a significant proportion of the respondents were literate in the study area. Most of the respondents know that agro-forestry practices increases productivity although difficult to practice.

During focus group discussion agroforestry was viewed by the respondents to have a potential of solving their fuel wood need problems, improve the soil fertility and provide favorable climate for crops. Farmers had indigenous knowledge on the usage of trees in farming systems as well as some environmental uses, such as soil erosion control, provision of shade as well as climate moderation.

The responses are indication that planting of trees on their farmland will increase the overall output of the farmland. This benefit is expected to increase the overall household gains. Regmi [12] asserted that maintenance of mixed trees on the farmland made households resilient to cope with uncertainty and risks. At the time of insect or disease outbreak on one species they can meet their need from other species. Thus this practice has reduced the chances of complete crop failure. Similarly, Nepaune et al. [13] noted that agroforestry practices have the potential to maintain/improve surrounding condition of the forest and save time on collecting fodder and firewood from the

forest. The saved time opened up avenues for other farming activities. A considerable number of the respondents pointed out that it is a common practice among local farmers as the practice of retaining trees on farm land has been a usual practice from time immemorial. It is noteworthy that these respondents have experienced improved productivity and saw increased role of farm trees to meet their need of livelihood. However they noted that it is quite difficult to practice, while some of the respondents also noted that the practice of agroforestry is not properly understood, this is an indication of lack of knowledge, which may be due to the problem of no access to agroforestry extension workers which has limited their information about agroforestry practices and as such limited their knowledge and perception about agroforestry innovations. This is in line with the work of Keilet al. [14] who considered information and knowledge about a given technology, as key to adoption of such technology.

Farmers' adoption of agroforestry practice in the study area

Table 3 shows farmers adoption of agroforestry practice in the study area. In Osun west senatorial district, 76% of respondents were involved in Agroforestry practice, while 24% affirm that they have never practice agroforestry. In Osun east, 80% of the respondents are involved in agroforestry practice while 20% have not adopted the practice. In Osun central, 72% of the respondents were involved compare to 28% which indicated that they had never practice agroforestry at any period of their farming experience. This means a higher percentage of farmers are involved in the practice of agroforestry in the study area. This implies that there is probably more awareness about the potentials of agroforestry practices in increasing productivity per unit area among the farmers in the study area. Akinbile et al. [15] noted that agroforestry has a way of instituting sustainable agricultural development in Nigeria. This is because agroforestry has the ability to combat the various environmental problems with the purpose of assisting farmers to maintain the fertility of their soils, ensure diversification of crop, wood and timber species per unit area and to stabilize, improve and conserve farmers' environment. The level of adoption of agroforestry by the framers therefore becomes very important since it determines the success of agroforestry practices. On the average an appreciable number of farmers (76%) indicated their adoption of Agroforestry while 24% indicated they did not adopt the practice. The main reason for the high level of adoption was because of multiple benefits the farmers gain from the crop-tree combination and also because agroforestry has been an age-long practice among the local farmers not only in the study area but all over the country.

Chi-square test ($p > 0.05$) shows there is no significant association between respondents' age and the adoption of agroforestry practices in Osun West senatorial district while in Osun Central and Osun east senatorial districts ($p < 0.05$) there is a significant association between respondents age and the adoption of agroforestry practices (Chi-square test of hypothesis 1). The reason for this might not be unconnected with the fact that there is no clear cut distinction in the ages of those that are involved in agroforestry practice in Osun West senatorial district. The different categories of ages of respondents are involved in agroforestry practice. However in Osun Central and Osun East senatorial districts more of the farmers that are involved in agroforestry practices are above 40 years of age.

Chi-square test ($p > 0.05$) also shows that there is no significant association between respondents farm size and the adoption of agroforestry practices in the 3 senatorial districts of the study area (Chi-square test of hypothesis 2). This means farm size is not an important determinant in the adoption of agroforestry practices

Farmers perception	Osun West		Osun central		Osun East		Total	
	Freq	%	Freq	%	Freq	%	Freq	%
As a scientific practice that is difficult to practice	9	10	12	13	7	7	28	10
As a practice that can improve farm productivity	56	62	50	56	56	62	162	60
As a practice not properly understood	11	12	11	12	7	8	29	11
As a common practice among local farmers	14	16	17	19	20	22	51	19
Total	90	100	90	100	90	100	90	100

Source: Field Survey, 2013

Table 2: Farmers perception of agroforestry practice in osun state

Adoption	Yes	%	No	%	Total
Osun west	68	76	22	24	90
Osun east	72	80	18	20	90
Osun central	65	72	25	28	90

Source: Field Survey, 2013

Table 3: Farmers adoption of agroforestry practice

among local famers in the study area. Other factors like education and land ownership play more important role in determining the adoption of agroforestry practices among the farmers in the study area.

As such chi-square test ($p < 0.05$) shows that there is significant association between respondents educational qualification and the adoption of agroforestry practices in all the senatorial districts of Osun state (Chi-square test of hypothesis 3). This shows that education is a determining factor in the adoption of agroforestry practice. When farmers are educated they have better access to information and innovations which help farmers to quickly adopt new technology.

In the same vein, chi-square test ($p < 0.05$) shows that there is a significant association between respondents; land ownership and the adoption of Agroforestry practices in all the senatorial districts of the study area (chi-square test of hypothesis 4). This also shows that land ownership plays important role in adopting agroforestry since it involves trees planting. Adedayo (2004) showed that land ownership plays a significant role in the adoption of alley cropping among local farmers in Akure Local Government area of Ondo State, Nigeria. He noted further that tenant farmers are not usually allowed to plant trees as such they cannot adopt agroforestry practice because it involves tree planting.

Types of agroforestry practices adopted by farmers in the study area

The adopted agro-forestry practices in the study area include retention of trees on farmland, planting of trees on boundaries, scattered trees on farmland, shifting cultivation, taungya farming and home gardening. However, the level of adoption of each of the stated practices differs across the senatorial districts in the study area (Table 4). The results of the study revealed that, in Osun west senatorial district, planting of trees on boundary was the most adopted agro forestry practices (23%). 16% of the respondents in the same senatorial district adopted improved fallow, scattered trees on farm land and home garden.

In Osun central senatorial district, improved fallow, tree planting on boundary and home garden, carries the highest percentage. Basically 22% of the respondents were involved in improved fallow. This practice is followed by adoption of tree planting on boundary (20%) and home

garden (18%). 13% of the respondents adopted the practice of scattered trees on farmland while 11% adopted tree retention practice. In Osun east senatorial district of the study area, the most adopted agro forestry practices were planting trees on farm boundaries (23%), home gardening (21%) and improve fallow (13%).

Agroforestry tree species commonly planted or retained by farmers in Study area

The result of the study shows that various agroforestry tree species are planted by farmers in the study area (Table 5). In Osun west senatorial district, 14% retained *Millicia excelsa* and *Antiaris africana* respectively. 13% of the respondents commonly plant *Gliricidia sepium* while 12% retain *Khaya ivorensis* during land preparation. 10% of the respondents retain trees such as *Azadiracta indica*, *Treculia africana*, *Moringa oliefera* and *Antiaris africana* on their farm lands.

Further, results revealed that commonly planted or retained agroforestry trees in Osun central senatorial district slightly differs from that of Osun west. *Albizia zygia* is the most common with 24% of the respondents retaining the tree on their farm land. *Azadiracta indica* and *Gmelina arborea* follows in a proportion of 19% and 12% respectively followed by *Millicia excelsa* (10%). Other agro forestry trees in Osun central include *Khaya ivorensis* and, *Gliricidia sepium* both of which are retained by 8% of the respondents.

Common agroforestry trees in Osun east are *Moringa oliefera* which is planted by 21% of the respondents. Others in the senatorial district are *Gliricidia sepium* (16%) and *Albizia zygia* (14%). Further, *Cola spp*, *Citrus sinensis* and *Theobroma Cacao* are also commonly planted tree crops in the study area. Specifically, in Osun east senatorial district of the study area 44% of the respondents plant *Cola nitida*, *Citrus sinensis* is planted by 51% of the respondents in Osun central while 11% and 12% plant the crop in Osun west and east senatorial district respectively.

Problems faced by local famers, which influence the adoption of agroforestry practices in the study area

Table 6 shows that the problems faced by local farmers which influence the adoption of agro forestry practices in the study area include land tenure problems, small land holdings, fire outbreak, lack of technical knowhow, non-availability of tree seedlings and trees casting shadow on crops among others. Among all these problems, lack of technical knowhow ranked highest. 19%, 24% and 14% of the respondents in Osun west, Osun central and Osun east senatorial districts of the study area respectively were of the view that lack of technical knowhow is the most difficult problem influencing the adoption of agroforestry practices.

This shows that poor technical knowhow is a strong barrier to

Practices	Osun West		Osun central		Osun East		Total	
	Freq	%	Freq	%	Freq	%	Freq	%
Retaining trees on farmland	11	12	10	11	9	10	30	11
Shifting cultivation	6	7	3	3	3	3	18	4
Improved fallow	14	16	20	22	12	13	46	17
Scattered trees on farmland	14	16	12	13	11	12	37	14
Planting trees on boundary	21	23	18	20	21	23	60	22
Taungya farming	10	11	11	12	9	10	30	11
Home gardening	14	16	16	18	19	21	49	19

Source: Field survey, 2013

Table 4: Types of agro-forestry practices adopted by farmers in the study area

Tree species	Osun West		Osun central		Osun East		Total	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Tectona grandis	9	10	1	1	4	2	14	4
Gmelina arborea	0	0	11	12	3	1	14	4
Gliricidia sepium	12	13	7	7	14	16	33	12
Millicia excelsa	13	14	9	10	13	14	35	13
Azadiractha indica	9	10	17	19	8	4	34	11
Albizia zygia	5	6	20	24	13	14	38	15
Antiaris Africana	13	14	7	8	0	0	20	7
Khaya ivorensis	11	12	7	8	13	14	31	10
Treculia africana	9	10	6	2	3	3	18	5
Moringa oleifera	9	10	5	6	19	12	33	12
Cola nitida	9	10	1	1	40	44	50	19
Theobroma cacao	16	18	6	7	12	13	34	13
Elaeis guineensis	2	2	13	14	5	6	20	7
Mangifera indica	19	21	8	9	3	3	30	11
Chrysophyllum albidum	11	12	1	1	5	6	17	6
Azelaia africana	10	11	7	8	9	10	26	10
Parkia biglobosa	9	10	3	3	1	1	13	5
Citrus sinensis	10	11	46	51	11	12	67	25
Psidium guajava	4	4	5	6	4	4	13	5

Source: Field survey, 2013

Table 5: Types of agroforestry tree species commonly planted or retained by farmers in the study area

Problems faced by farmers	Osun West		Osun central		Osun East		Total	
	Freq	%	Freq	%	Freq	%	Freq	%
Fire outbreak	4	4	9	10	7	8	20	7
Poor extension service	22	24	19	21	1	1	42	15
Land tenure system	6	7	9	10	20	22	35	13
Small land holdings	5	6	5	6	9	10	19	7
Non availability of seed/seedlings	7	8	5	6	6	7	18	7
Lack of technical know-how	17	19	22	24	13	14	52	19
Long gestation period	4	4	6	7	15	17	25	9
Lack of incentives	12	13	7	8	16	18	35	13
trees casting shadow on crops	13	14	8	9	3	3	24	9

Source: Field survey, 2013

Table 6: Problems faced by farmers that influence the adoption of agroforestry practices

the adoption of agroforestry practices in the study area especially by the young farmers, who had little farming experience. Keil et al. [14] considered information and knowledge about a given technology as key to the adoption of new agricultural practices, especially when experiments about new technologies and innovations are carried out in the presence of farmers. Keil et al. [14] stated that farmers that are involved in on-farm experimentation of agroforestry technologies with the researchers are more likely to adopt the practice than those who are not

Poor extension service is another problem hindering adoption of agro forestry practices in the study area. 24% of respondents in Osun west, 21% in Osun central and 1% in Osun east respectively stated that they do not have access to extension services. Land tenure system and lack of incentives were also viewed to be part of the problems influencing adoption of agroforestry practices across the senatorial districts in the study area. 22% and 10% of the respondents in Osun East and Osun Central respectively stated that land tenure is a constraint to the adoption of agroforestry practices.

Land tenure is another major constraint to the adoption of Agroforestry practices in the study area because high proportion of respondents (46%) acquired their land through lease while 40% is through inheritance. Land under lease can only be used to grow agricultural crops such as cassava, maize, yam, cocoyam, okra, potatoes e.tc. They are not allowed to plant trees that will grow over a long period of time. Adedayo [15,16] noted that tenant farmers and squatters find it difficult to plant trees on their farm land due to tenurial restrictions. Land owners always view tree planting by tenants as a way of claiming land ownership from them. As such they don't allow them to plant trees.

Other problems include long gestation period of trees, casting of shadow by trees and fire outbreak. In Osun west, 4%, 13% and 4% respectively stated that the above mentioned problems discouraged the adoption of agro forestry practices. In Osun east, 17% and 18% viewed long gestation period of trees and lack of incentives as problems affecting adoption of agro forestry practices.

Recommended solutions to the problems faced by farmers in the adoption of agroforestry practice in the study area

In view of the identified problems facing the adoption of agroforestry practices among farmers in the study area, the following recommendations can help to solve the problem to a great extent.

- Improved agroforestry extension services: The state forestry Department should ensure that improved agroforestry extension services are provided to the farmers in the study area. This will help to solve the problems of non-awareness and lack of knowledge about agroforestry practices.
- Training programme: The State Forestry Department should organize training programmes for farmers in the study area with practical demonstration of some agroforestry practices like pruning and mulching. This will help to expose them to some practical aspect of agroforestry. Such as, tree crop interactions, nursery establishment, seed pre-treatment and tree pruning activities,
- Distribution of tree seedlings to farmers: The state Forestry Department should endeavor to distribute tree seedlings to farmers freely. Where ever possible, short rotation tree seedlings should be given to farmers so as to encourage them to plant trees on their farm land.
- Farmers' cooperative groups should be encouraged: Farmers should be encouraged to form formal cooperative groups in the study area. This is to enable them benefit from the economies of large scale production and help them have access to research extension, credit facilities and eventually to draw down government/NGO interference, to better their lot.

The state government should help to establish adult literacy centres in the study area. These centres will generally help to educate illiterate farmers. Education will help to reduce ignorance among many of the farmers because many of them will be exposed to information and innovations that will help them to adopt agroforestry practices.

Conclusions

This study has shown that agroforestry practice is a common practice among farmers in the study area. Many of them (60% on the average) perceive agroforestry as a practice that can improve farm productivity. In spite of this, some of them (10%) perceived it as a scientific method that is difficult to practice, while 11% perceived it as a method not properly understood. As such not all the farmers in the study area have adopted agroforestry practice despite the fact that it is an age

long practice. The study showed that there is a significant association between the age and educational qualification of respondents as well as respondents land ownership and the adoption of agroforestry practices in the study area. There is however no significant association between respondents' farm size and the adoption of agroforestry practices in the study area. The adopted agro-forestry practices in the study area include retention of trees on farmland, planting of trees on farm boundaries, scattered trees on farmland, shifting cultivation, taungya farming and home gardening. Many of the farmers are however faced with some problems which influence their adoption of agroforestry practices. These problems include; land tenure problems, small land holdings, fire outbreak, lack of technical knowhow, non-availability of tree seedlings and trees casting shadow on crops among others. Lack of technical knowhow ranked highest among all these problems followed by poor extension service and lack of incentives.

References

1. Mukadasi B, Nabalegwa W (2008) Extension for Agroforestry Technology Adoption: Mixed Intercropping of *Crotalaria* (*crotalania*grahamjana) and maize (*zea mays* L.) in Kabale District Uganda. *Environmental Research Journal* 2: 131-137
2. Kwesiga F, Akinnifesi FK, Mafongoya PL, McDermott MH, Agumya A (2003) Agroforestry research and development in southern Africa during the 1990s: Review and challenges ahead. *Agroforestry Systems* 59: 173-186
3. Lundgren BO, Raintree JB (1982) Sustained Agroforestry. In Nestel B (ed.) *Agricultural Research for Development: Potential and Challenges in Asia*. ISNAR, The Hague, Netherlands
4. Nair PKR (1993) *An introduction to Agroforestry*. Kluwer Academic publishers, Netherlands.
5. Mercer DE, Miller RP (1998) Socioeconomic research in agroforestry: progress, prospects, priorities. *Agroforestry Systems* 38: 177-193
6. Maren Oelbermann and Carolyn E. Smith (2011). *Climate Change Adaptation using Agroforestry Practices: A Case Study from Costa Rica*. Stefano Casalegno (Ed.) *Global Warming Impacts - Case Studies on the Economy, Human Health, and on Urban and Natural Environments*, ISBN: 978-953-307-785-7, InTech, DOI: 10.5772/24172
7. Kandji ST, Verchot LV, Mackensen J, Boye A, Van Noordwijk M et al. (2006) Opportunities for linking climate change adaptation and mitigation through agroforestry systems. In: Garrity DP, Okono A, Grayson M, Parrott S (Eds) *World Agroforestry into the Future* (Edn) World Agroforestry Centre (ICRAF), ISBN 9290591846, Nairobi, Kenya.
8. Franzel S, Phiri D, Kwesiga F (2001) Assessing the adoption potential of improved fallows in eastern Zambia. In S Franzel, Scherr SJ (Eds.), *Trees on the Farm: Assessing the adoption potential of Agroforestry Practices in Africa* 37-64. Wallingford, UK: CAB International.
9. Sinclair FL (1999) A general classification of agroforestry practice. *Agroforestry Systems* 46: 161-180.
10. SEEDS (2007) *State Economic Empowerment and Development Strategy* (SEEDS). Osun State government.
11. Oladele OI, Fawole P (2007) Farmers perception of the Relevance of Agricultural technologies in South-Western Nigeria In : *Journal of Human resources and Ecology* 21: 191-194
12. Regmi BN (2003) Contribution of agroforestry for rural livelihoods: A case of Dhading District, Nepal. Paper presented at the International Conference on Rural Livelihoods, Forests and Biodiversity, Bonn, Germany 19-23.
13. Neupane RP, Sharma KR, Thapa GB (2001) Adoption of agroforestry in the hills of Nepal: A logistic regression analysis. *Agricultural systems*. Elsevier science limited 72: 177-196
14. Keil A, Zeller M, Franzel S (2005) Improved fallows in smallholder maize production in Zambia: do initial testers adopt the technology. *Agroforestry Systems* 64: 225-236
15. Akinbile LA, Salimonu KK, Yekinni OT (2007) Farmers Participation in Agroforestry Practices in Ondo State, Nigeria. *Research Journal of Applied Sciences* 2: 229-232
16. Adedayo AG (2004) Assessment of awareness and acceptability of Alley cropping among rural farmers in Akure South LGA, Ondo State, Nigeria. *Journal of Tropical Forest Resources*, 2: 99-108.