Global Scientific JOURNALS

CONSTRAINTS TO AGROFORESTRY PRACTICES AND LIVELIHOOD OUTCOME OF FARMERS IN ADJOINING COMMUNITIES OF ONIGAMBARI FOREST RESERVE, OYO-STATE, NIGERIA.

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Abstract:

Agroforestry integrates trees with crops and /or animals with the main objectives of reducing risk and increasing total productivity. This study reveals the constraints to agroforestry practices and livelihood outcome of farmers in adjoining communities of Onigambari forest reserve of Oyo-state, Nigeria. Multi-stage sampling technique was used, five adjoining communities were randomly selected for the study and systematic random sampling was used to select farming households from each of the communities. Fifty percent (50%) of farming households were randomly selected across the communities giving a sample size of 139 respondents. Primary data was obtained using a well-structured questionnaire complemented with interview schedule to elicit more information from the farmers. Data were analyzed using descriptive and inferential statistical tools. Results show that male farmers were greater in number than female farmers. Most of the respondents were medium scale farmers who source for credit from self, friends and family. Farmers were cultivating between four to six acres of land for their farming activities with more than one farm land under their control. Farmers were into all forms of agroforestry practices. The prevalent agroforestry practices among the respondents in the study area was home-stead gardens, tree planting/ animal rearing, community woodlots, apiculture and tree planting on boundaries. The main constraints encountered by the agroforestry farmers in the study area was lack of access to credit followed closely by climate change and long gestation periods of trees. Pearson Product Moment Correlation analysis shows no significant relationship between constraint faced by farmers and their livelihood outcome. Farmers should establish cooperative societies through farmers' associations to access soft loans in order to address the constraint of lack of access to credit. Farmers should also be enlightened more on measures to mitigate and adapt with climate change issues. Research institutes should disseminate more information to farmers about trees whose gestation period has been reduced so that farmers can plant such trees with crops on their farmlands.

Introduction

Agroforestry is a sustainable land management system which constitutes the overall yield of land and combines the production of crops (including tree crops), forest plants and/or animals simultaneously or sequentially, on the same unit of land and applies management practices that are compatible with the cultural practices of the local population (King 2007). Agroforestry is a dynamic, ecologically based natural resource management system that, through the integration of trees in farm land and range land, diversifies and sustains production for increased social, economic and environmental benefits for land users at all levels (Leakey 1996). The three main components of Agroforestry-animals, crops and trees can be combined in numerous spatial and temporal arrangements and for different functions, creating thus many different kinds of systems. The Agroforestry systems include Agrisilvicultural system, Silvopastoral system and Agrosilvopastoral system. Agrisilvicultural system comprises of home gardens, alley cropping, taungya, improved fallows and so on. Silvopastoral system comprises of trees on rangeland, protein banks and plantation crops with pastures and animal. Agrosilvopastoral system comprises of home gardening involving animals, multi-purpose woody hedgerows, Apiculture and so on. Taungya Farming is a system that has been used as a method of establishing forestry plantation which consists of growing annual agricultural crops along with the forestry species during the early years of establishment of the forestry plantation. Otegbeye and Famuyide (2005) also indicated that, taungya farming was widely adopted in the arid and semi-arid land of Nigeria, as a method of reforestation. Improved fallow is a rotational system that uses preferred tree species as the fallow species in rotation with cultivated crops as in traditional shifting cultivation. In addition, a significant improvement in soil moisture content has been observed in improved fallow system (Jacob et al; 2013). Home Garden represent land use systems involving deliberate management of multipurpose trees and shrubs in intimate association with annual and perennial agricultural crops and livestock within the compounds of individual houses.

Nigerians have always depended on the forest for their survival, economic development, as well as environmental amelioration. Climate change is projected to affect agricultural and natural ecosystems around the world, and there is no reason to expect that agroforestry systems will be spared. Like all other plants and animals, those existing within agroforestry systems will be exposed to temperatures that are higher than those of the past, to higher carbon dioxide concentrations, and they may also experience changes in precipitation. (Burke, Lobell and

Guarino, 2009). According to Krantz (2001), a livelihood comprises of the capabilities, assets (stores, resources, claims and access) and activities required for a means of living. A livelihood constitutes of adequate stocks and flows of food and cash to meet basic needs of life and it comprises people, their capabilities and means of living including income and assets. Also, a livelihood is environmentally sustainable when it contributes to the stability of environmental assets and has a sustainable positive net benefit effects on other livelihoods sources (Stephen, Nora and Moses 2009)**.** Livelihood outcome are the possible results of a sustainable approach to development. This study has tried to investigate the possible constraints to agroforestry practices and livelihood outcomes of farmers in adjoining communities of Onigambari forest reserve of Oyo-state, Nigeria.

Research Methodology

Multi-stage sampling technique was used in selecting the respondents for the study. In the first stage, five adjoining communities around Gambari Forest Reserve of Oyo state (Onigambari, Busogboro, Onipe, Sheriki, Oja badan) were randomly selected in the study area. In the second stage, systematic random sampling was used to select farming households from each of the communities. Third stage involved random selection of fifty percent of farming households across the communities to give a sample size of 139 respondents.

Table 1: Diagrammatic representation of the sampling procedure and sample size

Communities	Farming households	50% of farming households
Onigambari	67	34
Busogboro	53	27
Onipe	47	24
Sheriki	49	25
Oja badan	57	29
Total		139 respondents

Source: Field survey, 2018

Data for this study was collected using a well –structured questionnaire. Field survey was used to gather primary data for this study.   A well-structured interview schedule was used to obtain information from sampled rural farmers involved in Agroforestry in the study area. The questions were drawn in English and translated to Yoruba during administration.

Data Analysis

Data was analyzed using descriptive (such as mean, frequency, percentage table etc.) and inferential statistics using the Statistical Package for Social Science (SPSS).

Results and Discussion

Results obtained from the study revealed that male farmers (71.2%) were greater in number than female farmers (22.8%) in the study area, then most (86.3%) of the farmers were married. The average household size was five members whereas most (69.8%) of the respondents had between four to six household members as shown in table 2. Also, most (48.2%) of the farmers fell within

41-50 years of age with mean age of 49 years which implies that the Agroforestry farmers are young, agile and still in the active productive age category. Most (43.2%) of the farmers have a primary education while 36.0% of the farmers had no formal education, thereby indicating that Agroforestry is relatively easy and does not require much literacy.

Table 2: Distribution of respondents by personal characteristics (n=139)

Variable	Frequency	Percentage	Mean	Std. deviation
Age (years)				
<40	19	13.9		
41-50	67	48.2	49.3	9.02
51-60	32	23.0		
61-70	21	15.1		
Sex				
Male	99	71.2		
Female	40	22.8		
Level of education				
No formal education	50	36.0		
Primary education	60	43.2		
Secondary education	29	20.9		
Marital status				
Single	9	6.5		
Married	120	86.3		
Divorced	1	0.7		
Widowed	9	6.5		
Household size				
1-3	25	18.0		
4-6	97	69.8	4.81	
>6	17	12.2		

Source: Field survey, 2018

Majority (69.8%) of the farmers were using four to six acres of land for their farming activities and they had more than one farmlands under their control. More than half (64.0%) of the respondents was realizing an annual income between #500,000- #799,999 but the average annual income accrued to an agroforestry farmer in the study area was about #578,345. The study indicated that more than half of the respondents are relatively new to agroforestry practices having years of experience of less than twenty years. Most (55.4%) of the respondents are medium scale farmers who source for credit from self, friends and family as shown in table 3. The result also shows that 96.4% and 95.0% of the respondents were into cultivation of cassava and maize respectively while 94.2%

cultivated vegetables (Okro, Tomatoes, Pepper, green leafy vegetables, cochorus (ewedu) in the study area

Table 3: Distribution of respondents by their enterprise characteristics (n=139)

Variable	Frequency	Percentage	Mean	Std. deviation
Farm size (Acres)				
1-3	25	18.0		
4-6	97	69.8	4.88	1.44
>6	17	12.2		
Number of farm owned				
1-2	45	32.4		
3-4	59	42.4		
5 and above	35	25.2		
Yearly income(Naira)				
200,000-499,999	39	28.1		
500,000-799,999	89	64.0	578,345.3	
800,000 and above	11	7.9		
Scale of production				
small	32	23.0		
medium	77	55.4		
large	30	21.6		
Years of experience				
< 10years	6	4.3		
10-15 years	84	60.4	14.35	3.39
16-25 years	42	30.2		
Above 25 years	7	5.0		
Sources of labour				
self	21	15.1		
family	21	15.1		
Hired labour	32	23.0		
Self, family and hired labour	65	46.8		
Sources of credit				
self	28	20.1		

family	32	23.0		
friends	14	10.1		
bank	11	7.9		
Self and friends	49	35.3		
Self and family	5	3.6		
Sources of land acquisition				
purchased	27	19.4		
rented	31	22.3		
leased	35	25.2		
inherited	46	33.1		

Crops planted				
maize	132	95.0		
cassava	134	96.4		
vegetable	131	94.2		
yam	130	93.5		
cocoyam	50	36.0		

Source: Field survey, (2018)

The prevalent agroforestry practices among the respondents as shown in table 4 reveals that, 84.9% of the farmers practiced home stead garden thereby making this practice the most common in the study area. Tree planting/ Animal rearing, community woodlots and apiculture were commonly practiced in the study area. However, practices like tree planting on boundaries was not commonly practiced among the agroforestry farmers as shown below.

Table 4: Respondents level of involvement in Agroforestry practices

Agroforestry practices	Always	Occasionally	Rarely	Mean	Rank
Homestead garden	118 (84.9)		3 (2.2)	2.76	1st
Community woodlots	31 (22.3)	12(8.6)	108(77.7)	0.67	3rd
Apiculture	28 (20.1)		11(79.9)	0.60	4th
Tree planting/ Animal rearing	101(72.7)	19(13.7)	9(6.5)	2.53	2nd
Tree planting on boundaries	20(14.4)		119(85.6)	0.43	5th

- Multiple Response

Source: Field survey, 2018

The study reveals that among those agroforestry practices that were always utilized, homestead garden, tree planting/ animal rearing were the most frequent with 84.9% and 72.7% respectively. Among those agroforestry practices that were occasionally utilized, the study reveals that community woodlots and tree planting/ animal rearing were the most frequent.

Livelihood outcome was measured using the following indicators (i) food security of agroforestry farmers (ii)perceived health status of agroforestry farmers (iii) agroforestry farmers' vulnerability to poverty.

Constraints to agroforestry practices

Table 5 shows that 86.3% of the respondents were severely constrained by lack of access to credit in their involvement in agroforestry practices, 9.4% were severely constrained and lack of access to credit was not a constraint to 7.9% of the respondents. This implies that majority of the respondents were constrained by lack of access to credit. The main constraint encountered by the agroforestry farmers in the study area is lack of access to credit with a mean scores of 2.05 and followed closely by climate change and long gestation period of trees with mean score of 1.98 and 1.89 respectively. Climate change was a severe constraint to about 85.6% of the respondents while 6.5% of the respondents considered it as a very severe constraint, 7.9% claimed that it is not a constraint. This implies that majority of the farmers have a challenge with climate change in their agroforestry practices. However, a larger portion (85.6%) of the respondents claimed that "No market for forest products" was not a constraint to their involvement in agroforestry practices, only 14.4% of them identified it as a serious constraint. This implies that most of the farmers have a ready-made market for their products which was also encouraging. Rottening of forest products and inadequate knowledge about agroforestry practices were also indicated as not a constraint in their involvement in agroforestry practices by 85.6% and 54.7% respectively.

Table 5: Constraints to Agroforestry practices

S/n	Item	Not a constraint	Not severe	Severe	Very severe	Mean	Rank
1	Inadequate knowledge about forestry	54.7	----------	45.3	------------	0.90	5th
2	No market for forest product	85.6	------------	14.4	------------	0.28	8th
3	Government policies	82.7	------------	17.3	-------------	0.35	7th
4	Rottening of forest product	85.6	----------	14.4	------------	0.28	9th
5	Climate change	------------	7.9	85.6	6.5	1.98	2nd
6	Lack of technical know-how	69.1	------------	3.9	-----------	0.62	6th
7	Lack of access to credit	-----------	4.3	86.3	9.4	2.05	1st
8	Lack of access to land	54.7	2.9	38.8	3.6	0.91	4th
9	Long gestation period	13.7	2.9	63.3	20.1	1.89	3rd

Source: Field survey, 2018

Relationship between constraints to agroforestry practices and the livelihood outcome of farmers

H_01: There is no significant relationship between constraints to agroforestry practices and respondents' livelihood outcome

Table 6 shows that there is no significant relationship between constraints faced by farmers and their livelihood outcome. This implies that constraints encountered in agroforestry practices do not necessarily affect the livelihood outcome of farmers.

Table 6: Pearson Product Moment Correlation Analysis of the relationship between constraint to agroforestry practices and the livelihood outcome of farmers

Variable	r	p	
Constraints to agroforestry practices and livelihood outcome	-0.108	0.207	Not significant

Source: Field survey, 2018

Conclusion and Recommendations

Based on the findings of the study, the main constraints encountered by the agroforestry farmers in the study area was lack of access to credit followed closely by climate change and long gestation periods of trees. The following are recommendations based on the research findings: Farmers should establish cooperative societies through farmers' associations to access soft loans in order to address the constraint of lack of access to credit. Farmers should also be enlightened more on measures to mitigate and adapt with climate change issues. Research institutes should disseminate more information to farmers about trees whose gestation period has been reduced so that farmers can plant such trees with crops on their farmlands.

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