

Constraints and Attitudes to Agroforestry Practices among Farmers in Ekiti State, Nigeria

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Abstract

This study examined the constraints and attitude of farmers towards agroforestry practices in Ekiti State, Nigeria. Multi-stage sampling technique was used to select 180 farmers. The mean scores and standard deviations of farmers' attitude towards agroforestry practices showed that the farmers expressed positive attitude towards 15 statements out of the 16 statements bordering on agroforestry practices. Specific issue which elicited most favourable positive attitude from the farmers is "engaging in agroforestry practice is necessary to achieve increased agricultural productivity". However, the negative statement that farmers disagree with most on their attitude towards engaging in agroforestry practices is "most farmers are not willing to engage in agroforestry practices due to lack of fund". The factor analysis revealed that the constraints faced by farmers in engaging in agroforestry practices are techno-information, cost and public policies constraint, technical/institutional support constraint, land, belief and risk taking constraint and agricultural extension/planting materials constraint. As verified through this study, farmers must be properly given needed attention through extension activities on agroforestry practices that can encourage them to plant agroforestry trees. Promulgations on land use should be farmers' friendly enough in order to encourage them to engage in agroforestry practices and make them to have the confidence to reap the benefits of planting trees that may still come to them several years later. Other technical support such as credit must be given by government agencies and non-governmental organizations (NGOs) in order to encourage farmers to engage in agroforestry practices because of the benefits (both socio-economic and environmental) that can be derived by the farmers and the society at large.

Key words: Agroforestry practices, constraints, attitudes, factor analysis.

Introduction

Agriculture has recently been facing serious environmental challenges among which are land depletion and degradation, deforestation, climate change, etc. Agroforestry was conceived as a potential strategy to meet the needs of local people and help mitigate these challenges. It addresses in general, issues of tree planting, which can combat land depletion because of its potential for soil conservation and as a result contribute to the alleviation of rural poverty (Alao & Shuaibu, 2011, Cooper, Leakey, Rao & Reynolds, 1996, International Centre for Research in Agroforestry [ICRAF], 1993).

Agroforestry practices can be described in two broad categories (Ekiti State inclusive): farm - based and forest-based. The farm-based practices deal with tree planting on and around agricultural fields, tree wood lots and commercial crop under shade trees or agriculture crops inter-cropped with commercial trees. The

forest-based practices involve specific agricultural practices associated with forests where farmers collect food, fruits and gums (Tejani & Lai, 1992). In this study, agroforestry is referred to as farm-based practices. Agroforestry trees therefore involve those trees planted in and within home gardens, agricultural fields and commercial trees interplanted with agricultural crops. This does not exclude 'fruit trees' which are limited to those that provide fruit for human food such as mangoes, citrus, as well as some nut-bearing trees, such as walnuts. Agroforestry trees do not only yield useful products but also play vital role as more permanent elements in the landscape, sustaining the capacity of the land to feed people. Examples of these agroforestry trees are Mango (*Mangifera indica*), Cashew (*Anacardium occidentale*), Orange (*Citrus specie*), Guava (*Psidium guajava*), Tamarindus indica, and some indigenous species such as Locust bean

(*Parkia biglobosa*), *Vitellaria paradoxa*, *Adansonia digitata*, Oil palm (*Elaise guineensis*), *Azadirachta indica* and *Irvinga gabonensis* etc.

With various tree planting campaign programmes by successive governments (both federal and state) and the ancillary benefits derivable from agroforestry trees, it is expected that farmers should not have much problem in planting agroforestry trees. Again with the desertification that is moving southward from the Northern part of Nigeria and Ekiti State being the entrance to the South-western Nigeria, there is need to plant more trees and engage in agroforestry practices in order to forestall the devastating effects of desert encroachment, therefore there is need to examine the attitude and constraints to this practice in the state.

Several studies have investigated issues of tenure in agroforestry, for example those by German (2009) and Kohlin (2001), their studies focused on conservation and management of community wood lots. Mango and Hebink (2016) examined agroforestry as a second soil fertility management paradigm in Western Kenya. Meijer, Catacutan, Ajayi, Sileshi and Nieuwenhuis (2014) only reviewed on the role of knowledge, attitudes and perceptions in the uptake of agricultural and agroforestry innovations among smallholder farmers in sub-Saharan Africa. It is imperative to state that none of these studies attempted to ascertain the constraints and attitude of farmers to agroforestry practices in Ekiti State, Nigeria. Therefore, it is of a particular interest to understand the constraints and attitude of farmers to agroforestry practices in Ekiti State, Nigeria. Therefore, this study proposes to provide answers to the following questions: firstly, what are the attitude of farmers toward agroforestry tree planting and engagement in

$$Y_1 = a_{11}X_1 + a_{12}X_2 + \dots + a_{1n}X_n$$

$$Y_2 = a_{21}X_1 + a_{22}X_2 + \dots + a_{2n}X_n$$

$$\vdots = \vdots$$

$$\vdots = \vdots$$

$$Y_n = a_{n1}X_1 + a_{n2}X_2 + \dots + a_{nn}X_n$$

Where:

$Y_1, Y_2 \dots Y_n$ = observed variables/constraints facing farmers in engaging agroforestry practices in the study area.

other agroforestry practices in Ekiti State? Secondly, what are farmers' constraints to agroforestry practices in the study area? By providing answers to these questions, this study is expected to make significant contributions to our understanding of the constraints and attitude of farmers to agroforestry practices especially tree planting and thus some important empirical justification for policies aimed at increasing tree planting through enhanced investment in agroforestry programmes.

Methodology

The study was conducted in Ekiti State, Nigeria. Survey design through the use of multistage and random sampling techniques was adopted to sample the respondents. Ekiti state is made up of two agricultural zones with the zonal headquarters in Ikere-Ekiti and Aramoko-Ekiti. The state headquarters of Ekiti State Agricultural Development Programme is in Ikole-Ekiti. The two agricultural zones in the state were selected. Each zone was made up of 8 Local Government Areas (LGAs). Three (3) local government areas were randomly selected from each agricultural zone making 6 LGAs and from the selected LGAs; three communities were randomly selected from each LGA making 18 communities for the study. Random sampling procedure was also used to select ten (10) farmers from each sampled farming community to give a total of 180 respondents. Data generated were analyzed with descriptive statistics and factor analysis. Questionnaire and/or interview schedule was used to collect data from the respondents.

Principal Component Analysis (PCA) as the extraction method of the Factor Analysis (FA) model, used to aggregate the constraint indicators conditional on the 4-scale likert rating technique, is specified as shown below:

$a_1 - a_n$ = factor loadings or correlation coefficients.

$X_1, X_2, \dots X_n$ = unobserved underlying factors constraining farmers in engaging agroforestry practices in the study area. Only variables with factor loadings of /0.40/ and above at 10% overlapping variance were used in naming the factors.

A 4-point likert rating scale was used to describe farmers' attitudes towards engaging in

agroforestry practices in the study area. The scaling was graded as follows; Strongly Agree (SA) awarded 4 points, Agree (A) awarded 3 points, Disagree (D) awarded 2 points and Strongly Disagree (SD) awarded 1 point to determine each respondent's level of agreement or disagreement with the generated perception statements. Rating scales with a pool of positive and negative statements were framed through review of literature on agroforestry practices.

The mean score of respondents based on the 4-point rating scale was computed as;

$$\frac{4 + 3 + 2 + 1}{4} = 2.50$$

A cut-off mark of 2.5 was used to select statements which were perceived favourably by the respondents. For all the positive statements a mean score (MS) of ≥ 2.5 depicts a favourable statement with regard to attitude of farmers towards agroforestry tree planting and engagement in other agroforestry practices. Also for all negative statements (scoring of all negative statements used to ascertain the attitude of farmers towards agroforestry tree planting and engagement in other agroforestry practices were reversed) a mean score of ≥ 2.5 shows a favourable statement with regard to the attitude of farmers towards agroforestry tree planting and engagement in other agroforestry practices.

Results and Discussion

Farmers' attitude towards agroforestry practices in Ekiti State, Nigeria

Table 1 shows the distribution of the mean scores and standard deviations of farmers' attitude towards agroforestry practices in Ekiti State. The result shows that the farmers expressed positive attitude towards 15 statements out of the 16 statements bordering on agroforestry practices. However, only one statement "farmers do not lose their benefits of participating in other agricultural programmes if engaging in agroforestry practice (MS = 2.43)" was perceived by the farmers negatively. Specifically, the following positive statements elicited favourable attitude from the farmers: engaging in agroforestry practice is necessary to achieve increased agricultural productivity (MS = 3.56); engaging in agroforestry practice is necessary to enhance farmers income generation (MS = 3.36); planting and retention of agroforestry trees makes extension workers to

provide better services to farmers (MS = 2.57); engaging in agroforestry practice makes farmers to benefit more from donor assisted agroforestry programmes (MS = 3.02); engaging in agroforestry practice enhance the farmers' access to agroforestry tree products (AFTPs) (MS = 3.18); engaging in agroforestry practice enhance the nutritional status of the farmers households (MS = 2.99); farmers engage in agroforestry practices because it helps farmers to benefit from other donor assisted agricultural and rural development programme in the state (MS = 3.29); engaging in agroforestry practice reduces land degradation due to deforestation (MS = 3.20); engaging in agroforestry practice helps in the improvement of soil fertility (MS = 3.48); planting and retention of agroforestry trees to improve environmental sustainability (MS = 3.41) and engaging in agroforestry tree planting has increased the farmers' use of tree products for local medicinal purposes (MS = 3.43). However, the farmers disagree with the following negative statements on their attitude towards engaging in agroforestry practices in the study area; most farmers are not willing to plant agroforestry trees due to lack of fund (MS = 3.38); planting and nurturing of agroforestry trees is not encouraging because it affects other farm activities negatively (e.g paying little attention to the other farm activities) (MS = 2.57) and planting and nurturing of agroforestry trees don't allow expansion of food crop farm areas (MS = 2.52).

These findings show that the majority of the farmers have strong positive attitude towards agroforestry tree planting and engaging in other agroforestry practices in Ekiti State. More so, the low standard deviations from the mean for the responses, is an indication that the farmers' individual scores as regards their attitude towards the planting of agroforestry trees and engaging in other agroforestry practices did not differ from their mean score. This finding agrees with Ozor, Agwu, Chuckwuone, Madukwe and Gartorth (2007) who noted in their study that farmers shown positive attitude in favour agricultural technology in Nigeria. And also, this finding also confirms the work of Agwu and Abah (2009) who also noted that farmers showed positive attitude towards National Fadama Development Project (NFDPII) in Kogi

State. From the foregoing, it is clearly revealed that farmers always show positive attitude towards programmes, projects, agricultural practices that hold great benefits for them. The positive attitude of the farmers towards engaging in agroforestry practices may be alluded to the level of awareness of the positive benefits associated with agroforestry tree planting e.g. reduced deforestation and land degradation; soil protection, nutrient recycling; weed suppression and provision of staking materials and fuel wood; reducing soil erosion, improving soil organic matter and nutrient status, and sustaining

crop yield under continuous cropping. In this study, specific issues which elicited most favourable attitude from the farmers include engaging in agroforestry practice is necessary to achieve increased agricultural productivity and engaging in agroforestry practice helps in the improvement of soil fertility. This implies that the farmers are aware that agroforestry tree planting and engagement in other agroforestry practices can improve their socio-economic status and sustain their soil for improved agricultural productivity.

Table 1: Farmers' attitude towards engagement in agroforestry practices in Ekiti State

S/No.	Items	Mean Score	Standard Deviation	Remarks
1.	Engaging in agroforestry practice is necessary to achieve increased agricultural productivity	3.56	0.609	Agree
2.	Engaging in agroforestry practice is necessary to enhance farmers income generation	3.36	0.715	Agree
3.	Most farmers are not willing to plant agroforestry trees due to lack of fund	3.38	0.734	Disagree
4.	Planting and nurturing of agroforestry trees is not encouraging because it affects other farm activities negatively (e.g paying little attention to the other farm activities)	2.57	1.009	Disagree
5.	Planting and retention of agroforestry trees makes extension workers to provide better services to farmers	2.57	1.009	Agree
6.	Engaging in agroforestry practice has made governments to be more responsive to farmers' needs	2.67	0.818	Agree
7.	Farmers do not loose their benefits of participating in other agricultural programmes if engaging in agroforestry practice	2.43	0.963	Agree
8.	Engaging in agroforestry practice makes farmers to benefits more from donor assisted agroforestry programmes	3.02	0.776	Agree
9.	Engaging in agroforestry practice enhance the farmers' access to agroforestry tree products (AFTPs)	3.18	0.627	Agree
10.	Engaging in agroforestry practice enhance the nutritional status of the farmers households	2.99	0.832	Agree
11.	Farmers engage in agroforestry practices because it helps farmers to benefit from other donor assisted agricultural and rural development programme in the state	3.29	0.674	Agree
12.*	Planting and nurturing of agroforestry trees don't allow expansion of food crop farm areas	2.52	1.091	Disagree
13.	Engaging in agroforestry practice reduces land degradation due to deforestation	3.20	0.822	Agree
14.	Engaging in agroforestry practice helps in the improvement of soil fertility	3.48	0.705	Agree
15.	Planting and retention of agroforestry trees to improve environmental sustainability	3.41	0.632	Agree
16.	Engaging in agroforestry tree planting has increased the farmers' use of tree products for local medicinal purposes	3.43	0.608	Agree

* Negative statements

Constraints to agroforestry practices by farmers in Ekiti State, Nigeria

Table 2 shows the varimax-rotated principal component factor analysis of major factors constraining farmers in planting agroforestry trees and engaging in other agroforestry practices in the study area. From result in the table, four (4) factors were extracted based on the responses of the respondents (farmers). The Kaiser criterion (1960) was used for selecting the number of underlying factors or principal components explaining the data. In this study, the number was decided by leaving out components with corresponding Eigen values (a measure of explained variance) of less than one. Only variables with factor loadings of /0.40/ and above at 10% overlapping variance were used in naming the factors. Variables that have factor loading of less than /0.40/ were not used while variables that loaded in more than one constraints were also discarded (Madukwe, 2004). The communalities represent the relation between the variable and all other variables (i.e., the squared multiple correlation between the item and all other items).

These factors are; factor 1(Techno-information and public policies factor), factor 2 (Technical/Institutional support factor), factor 3 (Land, belief and risk taking factor) and factor 4 (Agricultural extension/planting materials factor).

Under factor 1 (Techno-information and public policies factor), the specific constraining variable against agroforestry tree planting and engagement in other agroforestry practices include: high cost of fertilizers and other inputs (0.764); poor access to agroforestry tree planting information by the farmers (0.691); lack of adequate access to agroforestry practices/ technologies (0.680); lack of adequate extension programmes directed towards agroforestry practice (0.589); inadequate government policies to encourage farmers in agroforestry practices (0.540) and high cost of farmland (0.427).

Variables that loaded under factor 2 (Technical/Institutional support factor) include: Insufficient knowledge of credit source to support farm work (0.790); Lack of adequate access to supporting institutional facilities e.g, cooperative, tree planting education programme (0.678); Limited Government responsiveness to agroforestry tree management and programme (0.637); Lack of access to and awareness about NGOs programme for agroforestry tree planting (0.614); Illiteracy of the farmers (0.560); Poor technical know-how of the farmers in relation to agroforestry tree planting technology (0.439).

The constraints as perceived by the respondents (farmers) constraining farmers' willingness to plant agroforestry trees and engage in other agroforestry practices under factor 3 (Land, belief and risk taking factor) include: involvement of the farmers in some off farm jobs, e.g. trading, artisans, teaching, etc. (0.749); inherited system of land ownership (0.685); religious belief of the farmers about tree planting (0.643) and unwillingness of the farmers to take risks involved in planting/retaining and nurturing agroforestry trees (0.522).

Under factor 4 (Agricultural extension/planting materials factor) the specific constraining variable against agroforestry tree planting and engagement in other agroforestry practices include: high cost of improved agroforestry tree planting materials (-0.747) and poor agricultural extension service delivery (0.439).

Adekunle (2009) reported that on some of the reasons why some respondents are not willing to plant trees to include non-availability of land as the majority has a small landholding, problems with land tenure, long gestation period of trees, lack of planting materials (seeds and seedlings), lack of technical expertise, lack of incentive and poor government policies. Rural communities condemn the act of tree planting (i.e. rural belief system). Trees, according to them, are a free gift of nature that cannot be exhausted.

Table 2: Farmers' Constraints to Agroforestry practices in Ekiti State

Constraints	Factor 1	Factor 2	Factor 3	Factor 4	Commonality
High cost of fertilizers and other inputs	0.764				0.615
Poor access to agroforestry tree planting information by the farmers	0.691				0.584
Lack of adequate access to agroforestry practices/ technologies	0.680				0.519
Lack of adequate extension programmes directed towards agroforestry practice	0.589				0.462
Inadequate government policies to encourage farmers in agroforestry practices	0.540				0.557
High cost of farmland	0.427				0.360
Insufficient knowledge of credit source to support farm work.		0.790			0.650
Lack of adequate access to supporting institutional facilities e.g. cooperative, tree planting education programme.		0.678			0.524
Limited Government responsiveness to agroforestry tree management and programme		0.637			0.534
Lack of access to and awareness about NGOs programme for agroforestry tree planting		0.614			0.424
Illiteracy of the farmers		0.560			0.442
Poor technical know-how of the farmers in relation to agroforestry tree planting technology		0.439			0.401
Involvement of the farmers in some off farm jobs, e.g. trading, artisans, teaching, etc.			0.749		0.568
Inherited system of land ownership			0.685		0.476
Religious belief of the farmers about tree planting			0.643		0.512
Unwillingness of the farmers to take risks involved in planting, retaining and nurturing agroforestry trees			0.522		0.450
*High cost of improved agroforestry tree planting materials				-0.747	0.602
Poor agricultural extension service delivery				0.439	0.407
Percentage (%) of variance	15.397	14.836	11.049	8.136	49.418

Factor 1(Techno-information, cost and public policies factor), factor 2 (Technical/institutional support factor), factor 3 (Land, belief and risk taking factor) and factor 4 (Agricultural extension/planting materials factor).

Conclusions and Recommendations

The study investigated the constraints and attitude of farmers to agroforestry practices. Our findings show that specific issue which elicited most favourable positive attitude from the farmers is “engaging in agroforestry practice is necessary to achieve increased agricultural productivity” while the negative statement that farmers disagree with most on their attitude towards agroforestry practices is “most farmers are not willing to plant agroforestry trees due to lack of fund”. The study also revealed that the constraints faced by farmers in engaging agroforestry practices are techno-information, cost and public policies constraint, technical/institutional support constraint, land, belief and risk taking constraint and agricultural

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- extension/planting materials constraint. As verified through this study, farmers must be properly given needed attention through extension activities on agroforestry practices that can encourage them to plant agroforestry trees.
- Promulgations on land use should be farmers’ friendly in order to encourage them to practice agroforestry and make them to have the confidence to reap the benefits that may still come to them several years later. Other technical support such as credit must be given by government agencies especially in market failure scenario and non-governmental organizations (NGOs) should help so that farmers could be encouraged to engage in agroforestry practices because of the benefits that can be derived from it both by the farmers and the society at large.
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