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Determinants of Farmer's Attitude to Plant Agro-forestry Trees in Kaduna State, Nigeria

O. E. Olagunju[1*], O. C. Ariyo[1], U. U. Emeghara[2], O. S. Olagunju[3] and S. O. Olafemi[3]

[1]Department of Entrepreneurship and Innovative Agriculture, Federal College of Forestry Mechanization, P.M.B. 2273, Afaka, Kaduna, Kaduna State, Nigeria.
[2]Department of Crop Production Technology, Federal College of Forestry Mechanization, P.M.B.2273, Afaka, Kaduna, Kaduna State, Nigeria.
[3]Department of Agricultural Technology, Federal College of Forestry Mechanization, P.M.B.2273, Afaka, Kaduna, Kaduna State, Nigeria.

Authors' contributions

This work was carried out in collaboration among all authors. Authors OEO and OCA designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors UUE and OSO managed the analyses of the study. Author SOO managed the literature searches. All authors read and approved the final manuscript.

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ABSTRACT

Agro-forestry trees enhance food and nutrition security, increase income and help solve land management problems. This study assessed the determinants of farmer's attitude to plant agro-forestry trees in Giwa Local Government Area (LGA) of Kaduna State. Six (6) districts were purposively selected from the eight (8) districts in Giwa LGA. Two villages were randomly selected from each district to give a total of twelve (12) villages. Ten agroforestry farmers were selected from each village to make a total of 120 respondents. Data were collected using structured questionnaires. The data were analysed using descriptive statistics, inferential statistics - Chi-square and Pearson Product Moment Correlation (PPMC) and regression analysis. The results revealed that the mean age was 40.12 years. Chi-square analysis showed that age (χ^2=18.487,

**Corresponding author: E-mail: olubuck@yahoo.com;*

P=0.001), educational level (χ^2=9.656, P=0.04) were significant to farmers' attitude. PPMC showed that income (r=0.181, p=0.049), membership in organization (r=0.214, P=0.02) were significant to farmers' attitude. Regression analysis showed that years of experience (β=0.330, P=0.001) and constraints (β=0.246, P=0.11) were the determinants of farmers attitude. Farmers (59%) have unfavourable attitude towards tree planting. It was concluded that age group, educational level, income and membership in organization are very important and paramount in enhancing planting of agroforestry trees while years of experience and constraints faced by farmers were major determinants of famer's attitude to planting agro-forestry trees.

Keywords: Attitude; agro-forestry; trees; farmers; planting; Kaduna State.

1. INTRODUCTION

In recent times, it has become obvious that to achieve much success on sustainable land management and farming system, research and extension services have to be intensified. This involves improving and modifying where necessary the farmers' method of land management and soil improvement practices. Growing population pressure and incessant droughts in recent years together with excessive deforestation, overgrazing and yearly bush burning have all combined to bring about rapid rate of desertification [1]. A collection of agroforestry systems which have the potential to providing food, fodder, fuel, wood, crop and livestock products is essential for the overall well-being of the rural and urban populace, hence, agroforestry begins with placing the right plant, in the right place and for the right purpose [2].

Agroforestry can be defined as an approach to land use based on the deliberate integration of trees and shrubs in crop and livestock production system, it referred to a management system that integrates trees in the agricultural and non-agricultural landscapes and a deliberate mixture of trees with crops and animals which gives increased production and ecological stability [3,4]. Agro-forestry is a collective name for all land use systems and practices where woody perennial plants are deliberately grown on the same land management units as agricultural crops and/or animals, either in spatial mixture or in temporal sequence [5]. It can be described as a dynamic ecologically based natural resource management system, that through integration of trees on farms and the agricultural landscape, diversification and sustained production is increased for social, economic and environmental benefits for land users at all levels [6]. According to [7], agro-forestry can be viewed as a societal response primarily born out of the need to fulfil the immediate basic needs for food, fuel, fodder, shelter and protection. The practice can help to ensure sustained productivity of crops and animal by protecting and enhancing the nature base and also be the foundation of putting trees to work in conservation and production system for farms, forests, ranches, and communities [8].

Agro-forestry can also be described as a concept that harmonizes agriculture with forestry and pastoralism. It is a very promising way to link food production with improved forestry activities [9]. According to [10], agro-forestry is another word for age-old land use system where forestry, agriculture and pastoralism are practiced in combination. It is the system of land use involving planting of trees or deliberate retention of trees by farmers within the farm or homestead for a variety of purposes which includes wood, fodder, fruits, medicine, shade, soil improvement and water conservation [11].

Agro-forestry is more than intercropping trees with food crops, it combines crop and livestock production with forestry activities to improve or prevent further degradation of ecosystem. Agro-forestry systems normally involve two or more species of plants (or plants and animals), at least one of which is a woody perennial and hence, two or more outputs. Agroforestry is a sustainable management system for land that increases overall production, combines agricultural crops, tree crops and forest plants and/or animals sequentially and applies management practices that are compatible with cultural patterns of local population (International Commission Research for Agroforestry [12].

Agro-forestry trees do not only yield useful products but also play vital roles as it involves planting trees within home gardens, agricultural fields and commercial trees interplant with food crops. This does not exclude fruit trees which are limited to those that provide fruit for human food such as mango, citrus, as well as some nut-

bearing trees, such as walnut [12]. Growing trees along with crops and livestock enhances crop yield, conserves soil and nutrient recycling while producing fuel wood, fruits and timber [13]. According to [14] agro-forestry has been shown to provide a number of benefits to farmers such as; enhancement of soil fertility in many situations and improvement farm household resilience through provision of additional produce such as firewood products for sale or home consumption as fuel. Although, the insight that trees on farms provide livelihood benefits is not new and diversity based approaches to agricultural adaptation to climate variability have been adopted by many farmers [15]. Trees play a crucial role in almost all terrestrial ecosystems; they provide a wide range of products and services to rural and urban people. As natural vegetation is cleared for agriculture, trees are integrated into productive landscapes the practice known as agroforestry [2]. Agroforestry practices, when appropriately targeted to biophysical and socio-economic conditions have the potential to address some of the problems of poverty, food insecurity and environmental degradation [16].

FAO [17] estimated that global food prices has risen by over 80 percent in 3 years and had added at least 75 million people to the 850 million already suffering from hunger and poverty. Many parts of Africa have continued to experience declines in per capital farm income, land and soil degradation, aggravated by biodiversity, where climate is highly variable especially in the arid parts of Africa. Many observations have begun attributing recent land degradation to climate change [18,19]. Experience suggests that agroforestry science and its application in development by small holders throughout the tropics must play important role in achieving greater food security [20].

In Nigeria, insufficient food and fibre are major challenges to meeting the demand of ever increasing population [21]. With rapid population growth and land use pressure, natural fallows and shifting cultivation have been reduced to below the minimum threshold required for the system to sustain itself and these have led to land shortage and decrease in soil fertility; also, attempt to resuscitate land and promote yield with the use of chemical fertilizer have also resulted in soil toxicity and environmental pollution [22,23,24], Nigeria forest is a meagre 17,800 hectares, the population is growing at the 2.9% annually and 2.8% of these forests are disappearing yearly.

Agroforestry is practiced by millions of farmers, and has been a feature of agriculture for millennia, an estimated 1.2 billion rural people practice agroforestry on their farms and in their communities; they depend upon its products for their well-being and survival, it encompasses a wide range of planting trees that are grown on farms and it also includes the generation of soil health, food security, fruit trees for nutrition and income, fodder trees that improves small scale livestock production [25,4]. Agro-forestry practices represent such land use practices as it offers a solution to the problem posed by the high demand on land and stands as a means of halting the vicious circle of deforestation, soil erosion and degradation. It is one of the sustainable agricultural practices in soil fertility practices that use natural resource management principles to replenish soil fertility [26]. The litter fall is the major pathway for the return of nitrogen, phosphorous, calcium and magnesium to the soil, which implies that cultivation of perennial shrubs and trees would allow leaf fall into the soil with subsequently decomposition that would enrich the soil [27].

According to Jose [3] emphasized that, trees have multiple uses, each providing a range of benefits such asgums, resin or latex product; however, this cannot meet the demand of the population that is growing at a fast rate. Trees-based enterprises help to ensure food and nutritional security, increase the income and assets, and help solve their land management problems. Agricultural soils in the tropics, as also in the northern guinea savannah zone, maintained their fertility due to tight cycling of nutrients between, vegetation and soil, if this cycle is broken through forest destruction and rapid loss of nutrients are likely to take place which result in an impoverished soil [13]. Hence selected and managed trees can increase soil fertility and control erosion in appropriate agricultural and forestry production system with population growth (animal and human) outstripping production lead to degradation.

Limited knowledge of agroforestry practices however, remains a barrier to the widespread of agroforestry practices, even to farmers who are aware of agroforestry, their understanding is still limited when compared to the scientific concept of agroforestry which means its benefits may not be maximized. For example, there is widespread

misconception among farmers that agroforestry can only be applied in upland areas [8]. The attitude of farmers towards agroforestry adoption plays a key role, but this has been less studied [16]. Strengthening agroforestry practices using appropriate trees and shrubs would encourage rural dwellers in tackling environmental problem. According to [28] the principal beneficiaries of agroforestry practices are subsistence farmers, hence, the key factor in promoting the agroforestry is the farmer. Some efforts have been made to assess the farmer's participation in agro-forestry but no form and moral effort was made in the past to find out the reasons for non-adoption of agro-forestry in the area. Adoption of agro-forestry practices by farmers might have been a response, as a means to ensure alternative sources of sustaining their families. The adoption of agro-forestry might have been an attempt by the farmers to ensure security against crop losses and wastage, as the agro-forestry product will provide alternatives to food income and other uses. Also, when the environmental costs of flooding and erosion are taken into consideration, the economic merits of agroforestry become more real.

Agro-forestry serves an important tool that can bridge up the gap between demand and supply of wood and non-wood forest products [29]. Although, a lot of factors could be responsible for this, access to land for permanent cropping is extremely limited due to land tenure structure and current population growth rate. Also, the degrees of uncertainty over land tenure security prevailed more and this reduce incentive of farmers to involve in tree conservation and management practices [30,31]. Also, as a result of increasing demand for land, there has been deforestation of economic trees, leaving the land to erosion, fuel wood scarcity and loss of vegetation with its consequent depletion of soil fertility thereby hindering the preservation of existing forest reserves [32]. It therefore becomes a necessity to understand the level of rural farmers' attitude toward agro-forestry practices. The fact that tenure security and other socio economic attributes of small holders can influence their attitudes to involve in soil conservation practice such as agro-forestry farming is often neglected [33]. According to [34] the present level of knowledge of the rural women on agroforestry is low because most farmers lack the educational training. The unfavourable attitude is also attributable to ignorance on the part of the farmers, as majority of them are not aware of the beneficial /damaging effect of certain practices. With the favourable attitude towards agroforestry, farmers can carryout silvicultural operation on trees around their homesteads thereby contributing to sustainable forest management, environmental protection and biodiversity conservation. It is against this backdrop, the study was undertaken with the following objectives:

(i) To describe the socio-economic characteristics of farmers in Giwa Local Government Area;
(ii) To determine farmers attitude to planting agroforestry trees in Giwa Local Government Area;
(iii) To ascertain the factors influencing tree planting in Giwa Local Government Area and
(iv) To examine the constraints to planting of agroforestry trees in Giwa Local Government Area.

1.1 Hypothesis

The hypothesis of the study was stated in null form

H_0: There is no significant relationship between the selected socio-economic characteristics and farmers' attitude to plant agroforestry trees.

2. METHODOLOGY

The study was carried out in Giwa Local Government Area (LGA) of Kaduna state. The area is characterized by alternating dry and wet season with a mean annual rainfall of 1100 mm. The area experiences the on-set of the raining season in May and ends in October. The mean daily minimum and maximum temperature are 19°c and 35°c respectively [35,36]. These conditions suit the crops grown in the area, which include sorghum, cowpea, maize, soybean, millet, groundnut and vegetables; usually a combination of crops and livestock production is a common practice.

2.1 Sampling Procedure and Sample Size

Multistage sampling procedure was used for the study. Out of eight (8) districts in Giwa LGA, six (6) districts were purposively selected because of the high concentration of agroforestry farmers. The districts are Kaya, Galadimawa, Fatika, Yakawada, Salanke and Karaukarau. Within

each district, two (2) villages were randomly selected thus making twelve villages. Ten (10) agroforestry famers were selected from each village to make a total of 120 respondents as sample size. Structured questionnaire was administered to each respondent in line with the objectives of the study. Only 118 questionnaires were used for the analysis.

2.2 Data Analysis

The data collected were analysed using descriptive statistics, inferential statistics (Chi-square, Pearson Product Moment Correlation (PPMC) were used to test the hypothesis. Regression analysis was used to isolate the determinants of farmer's attitude towards agroforestry practices.

3. RESULTS AND DISCUSSION

3.1 Socio-economic Characteristics of Respondents

The socio-economic characteristics of the respondents presented on Table 1 showed that the mean age was 40.12 years, an indication that the respondents were in their active age and strong to carry out the required agroforestry work on the farm. Majority (92.4%) of the respondents were male while females were quite few (7.6%). This could be as a result of religious and cultural beliefs that restrict women from participating in some activities *(Purdah)*. Table 1 further showed that few (15.3%) of the respondents had Quranic education, while 20.3% and 31.4%had secondary education and tertiary education respectively. Education is an essential factor for effecting desirable changes in attitude, skills and knowledge of individuals [37]. The monthly income of the respondents showed that 28.80% had monthly income between ₦11, 000 to ₦ 20,000. 21.20% has ≤₦ 10,000, and between ₦ 21,000 to ₦ 30,000 monthly income. The percentage of respondents that had between ₦ 41,000 to ₦ 50,000 and ₦ 31,000 to ₦ 40,000 monthly income are 11.00% and 9.30% respectively while only 8.50% of the respondents had above ₦ 50, 000 as monthly income. In terms of other income generating activities, most (50%) of the respondents were involved in trading to augment for the family income especially during the off-season. Others were involved in Tailoring (21.20%), Weaving and Carpentry had equal percentage of 11.90. The proportion of the respondent engaged in fishing as other income generating activity was 3.40%. Membership of organization as presented on Table 1 showed that majority (35.60%) of the respondents belonged to Religious group, 29.70% were members of Cooperative society while 21.20% are members of Famer's club. 0.08% of the respondents are not members of any organization. Been a member of organization gives the famer's access to information on agroforestry practices.

3.2 Chi-square Analysis between Some Selected Socio-economic Characteristics and Farmer's Attitude to Agroforestry Trees Planting

The Chi-square Analysis between the selected socio-economic characteristics of the respondents and their attitude to agroforestry trees planting on Table 2 showed that only age group (χ^2=18.487, p=0.001), and educational level (χ^2=9.656, p=0.047) were significant to the attitude of the farmers in planting agro-forestry trees. Thus the null (Ho) hypothesis which says there is no significant relationship between selected socio-economic characteristics and farmer's attitude to plant agroforestry trees is thereby rejected. This implied that age plays a significant role in their participation in agroforestry practices. It also showed that most farmers are literate in terms of education; this gives access to information and knowledge which in turn enhances favourable attitude of planting agroforestry trees.

3.3 Correlations between Selected Socio-economic Characteristics and Farmers Attitude to Agroforestry Trees Planting

Correlation result on Table 3 showed that there is a significant relationship between income (r=0.181, p=0.049), membership in organization (r=0.214, p=0.020) and farmers attitude to planting agroforestry trees. These implied that income will always be a motivating factor in agroforestry trees planting while membership in organization gives access to information and technical-know-how to agroforestry practices. Agroforestry is found to be the most desirable strategy for maintaining social, economic and ecological sustainability [38].

Table 1. Distribution of respondents based on their socio-economic characteristics

Variable	Frequency (n=118)	Percentage (%)
Age (Years)		
Below 20	12	10.20
21-30	23	19.50
31-40	26	22.00
41-50	32	27.10
51 and above	25	21.00
Sex		
Male	109	92.40
Female	9	7.60
Educational status		
Non formal education	29	24.60
Arabic education	18	15.30
Primary education	10	8.50
Secondary education	24	20.30
Tertiary education	37	31.40
Other income generating activities		
Trading	60	50.00
Weaving	14	11.90
Tailoring	25	21.20
Carpentry	14	11.90
Fishing	4	3.40
Monthly income		
≤ 10, 000	25	21.20
11, 000 – 20,000	34	28.80
21,000 – 30,000	25	21.20
31,000 – 40,000	11	9.30
41,000 – 50,000	13	11.00
50,000 – and above	10	8.50
Membership in organization		
None	1	0.80
Religious group	42	35.60
Work group	15	12.70
Cooperative society	35	29.70
Farmer's club	25	21.20

Source: Field survey, 2019

Table 2. Chi- square analysis between some selected socio-economic characteristics and farmer's attitude to agroforestry trees planting

Variable	χ^2	df	P	Remark
Age group	18.487	4	0.001	S
Gender	0.455	1	0.378	NS
Marital status	6.915	3	0.075	NS
Educational level	9.656	4	0.047	S
Household size	0.750	3	0.861	NS
Other income	6.856	5	0.232	NS

Source: Field survey, 2019

Table 3. Correlations between socio-economic characteristics and farmers attitude to agroforestry trees planting

Variable	r- value	P-value	Remark
Income	0.181	0.049	S
Membershipin organization	0.214	0.020	S
Source of labour	0.052	0.574	NS

Source: Field survey, 2019

Table 4. Distribution of respondents based on their attitude to planting of agroforestry trees (Categorization of scores)

Attitudinal statement	SA	A	U	D	SD	Total	Mean
Agroforestry is a difficult task	150	312	0	24	0	486	4.12
Agroforestry takes a lot of land	90	168	36	102	9	405	3.43
Agroforestry lead to fragmentation	75	120	18	90	18	321	2.72
Agroforestry enhances population and spread of agricultural pest and diseases	75	168	9	72	21	345	2.92
Agroforestry brings about cost minimization due to the use of organic and manure from plants and animals	150	288	0	24	3	465	3.94
Agroforestry enhances soil fertility	240	228	35	30	0	534	4.53
Agroforestry practices improves the environmental condition	120	72	0	84	24	300	2.54
Agroforestry practices brings about multiple income to the farmer	165	264	0	24	9	462	3.92
Agroforestry practices brings about land reclamation	75	84	0	108	24	291	2.47

Source: Field survey, 2019

Mean score = 3.34; Favourable= above the mean score; Unfavourable=below the mean score

3.4 Distribution of Respondents Based on Their Attitude to Planting of Agroforestry Trees

Agroforestry offers a sustainable balanced productivity between wood and food and also an increase in total productivity per unit area of land. However, with low level of knowledge of importance of agroforestry practices, there will be unfavourable attitude to planting trees. For example, when the environmental costs of flooding and erosion, are taken into consideration, the economic merits of agroforestry become more real. Table 4 showed a 5 point Likert scale-type with 9 attitudinal statements developed to determine farmer's attitude to planting agroforestry trees. The respondents were asked to respond to these attitudinal variables. The score for each respondent was calculated and compared with the mean score of 3.34. Table 5 revealed that the most (59%) of the respondents had unfavourable attitude towards planting of agroforestry trees while 41% had favourable attitude towards planting of agroforestry trees. Hence with increased level of knowledge on the benefits of agro-forestry practices focusing on resistance, positive attitude towards tree planting can be enhanced. Trees stand for improved *r*esistance of farms to unpredictable weather extremes, resistance of farmers to harvest fluctuations and resistance to current and future environmental challenges [39].

Table 5. Attitude to planting agroforestry trees

Variable	Frequency	Percentage
Unfavourable	66	59.00
Favourable	52	41.00
Total	118	100

Source: Field survey, 2019

3.5 Regression Analysis of Determinants of Farmers Attitude to Plant Agroforestry Trees

Regression analysis of determinants of farmer's attitude to plant agroforestry trees on Table 6 showed that years of experience (β= 0.003, p= 0.001) and the constraints (β=0.246, P=0.001) were determinants of farmers attitude to planting agroforestry trees. This implied that the more the number of years in agroforestry practices, the favourable the farmers attitude to planting the trees, this could be as a result of the benefits the farmers have enjoyed over the years, such as soil conservation and soil improvement for an improved yield. On the other hand the constraint also determines the farmers' attitude to planting trees, this implied that if the farmers are able to overcome these constraints, (lack of technical know-how, lack of capital and issues with cattle herdsmen), the farmers will have more favourable attitude towards planting agroforestry trees which in turn will improve the agroforestry practices. Agroforestry not only increases

agricultural productivity but also extends resource supplies for peoples' basic needs and promotes the development of animal husbandry, forestry and economic [40].

3.6 Types of Tree Species Common Planted by Respondents for Agroforestry Purposes

The types of tree species commonly planted by the respondents are presented on Table 7. Twelve species of trees were commonly planted as agroforestry trees, these includes *Parkia biglobosa*, *Psidium guajava*, *Tamarindus indica*, *Moringa oleifera*, *Vitellaria paradoxa*, *Vitex doniana*, *Prosopis africana*, *Gliricidia sepium*, *Leucaena leucocephala*, *Acacia auriculiformis*, *Jacarada mimosifolia* and *Acacia nilotica*. Fabaceae family had the highest number of species (7) while other families such as Myrtaceae, Moringaceae, Sapotaceae, Lamiaceae and Bignoniaceae were represented with a single species. Most of the tree species used as agroforestry in the study area has economic values and medicinal properties as stated by the respondents. The maximum of eleven (11) ranks were obtained for all the tree species. *Moringa oleifera* and *Vitellaria paradoxa* were ranked first. This was followed by *Psidium guajava*, *Parkia biglobosa*, *Vitex doniana* and *Tamarindus indica* which were ranked second, third, fourth and fifth respectively. *Jacaranda mimosifolia*, *Gliricidia sepium* and *Acacia nilotica* were assigned rank eight, nine and tenth while *Leucaena leucocephala* was ranked last (eleventh). However, respondents stated that the main purpose of planting agroforestry trees was to improve soil fertility, protect crops and livestock from winds, restore degraded lands and other benefits such as fruits, firewood and medicinal plants which the trees provides.

3.7 Constraints to Planting Agroforestry Trees

The constraints faced by farmers to planting of agroforestry trees on Table 8 showed that issues with herdsmen ranked the highest as majority (78%) of the respondents had it as a major concern especially during the planting season. The respondents emphasized during the interview that the herdsmen push in their animals into the farms and also unleash terror on their victims. Hence most of the farmers live in absolute fear. This was corroborated by [41] that the combination of a growing cattle population, the effects of climate change on the availability of water and forage crops, as well as the lack of access to North Eastern foraging grounds due to the Boko Haram crisis are the proximate causes of the increasing tensions between farming communities and Fulani herdsmen. Lack of credit facility, pest and diseases and lack of information formed 55.90%, 54.20% and 51.70% of the famer's constraints respectively. Inadequate access to land (50.80%) for agroforestry practices is another constraint, most of the rural farmers are poor and may not be able to afford going to virgin lands for cultivation due to the cost of transportation, the farmers therefore are forced to stay on the land that is being used over times and also subjected to fragmentation. This was supported by [42] that land fragmentation is caused by land distribution, redistribution and inheritance rule which is often considered as the source of inefficiencies in agroforestry. Other constraints such as poor sources of information, inadequate finance, lack of technical know-how, watering problem and complexity in management had 49.20%, 46.60%, 43.20%, 37.30% and 34.70% respectively. However, 65.30%, 62.70% and 56.80% of the respondents do not have problem of complexity in management, watering problem and lack of technical know-how.

Table 6. Regression analysis of determinants of respondents' attitude towards planting agroforestry trees

Variables	Std error	Coefficient	T.	P-value	Remark
Actual age	0.011	0.46	0.884	0.884	NS
Age group	0.123	0.123	0.393	0.695	NS
Gender	0.173	0.035	0.378	0.707	NS
Membership in Organization	0.037	0.125	1.407	0.163	NS
Years of experience	0.050	0.330	-3.508	0.001	S
Source of capital	0.030	0.085	0.905	0.368	NS
Source of labour	0.056	0.046	0.508	0.612	NS
Constraints	0.094	0.246	2.606	0.011	S
Enhancement	0.101	0.036	0.355	0.723	Ns

$R=0.531 R^2=0.282$, Adjusted $R^2=0.184$, $F=2.889$

Table 7. Types of tree species commonly planted by the famers

S/n	Tree species	Family	Form	Common name	*Frequency	Percentage	Rank
1	*Parkia biglobosa*(Jacq.) G.Don	Fabaceae	Tree	African locus bean	109	92.40	3
2	*Psidium guajava* L.	Myrtaceae	Shrub	Guava	114	96.60	2
3	*Tamarindus indica* L.	Fabaceae	Tree	Tamarindus	106	89.20	5
4	*Moringa oleifera* Lam.	Moringaceae	Tree	Moringa	115	97.50	1
5	*Vitellaria paradoxa* C.F.Gaertn	Sapotaceae	Tree	Shear butter	115	97.50	1
6	*Vitex doniana* Sweet	Lamiaceae	Tree	Black plum	107	90.70	4
7	*Prosopis africana*(Guill. & Perr.) Taub.	Fabaceae	Tree	African mesquite	100	84.70	6
8	*Gliricidia sepium*(Jacq.) Walp.	Fabaceae	Tree	Gliricidia	93	78.80	9
9	*Leucaena leucocephala*(Lam.) de Wit	Fabaceae	Tree	Leucaena	91	77.10	11
10	*Acacia auriculiformis* Benth.	Fabaceae	Tree	Earleaf acacia	95	80.50	7
11	*Jacaranda mimosifolia* D.Don	Bignoniaceae	Shrub	Jacaranda	94	79.70	8
12	*Acacia nilotica* (Linn.) Wild ex. Del.	Fabaceae	Tree	Gum arabic tree	92	78.00	10

Source: Field Survey, 2019

**Multiple responses*

Table 8. Constraints to planting of agroforestry trees

Statement	Yes	No
Herdsmen issue	92 (78.00)	26 (22)
Lack of technical know-how	51 (43.20)	67 (56.60)
Inadequate finance	55 (46.60)	63 (54)
Watering problem	44 (37.30)	77 (65.70)
Complexity in management	41 (34.70)	77 (65.30)
Pest and disease infestation	64 (54.20)	54 (45.80)
Inadequate land	60 (50.80)	58 (49.20)
Lack of credit facility	66 (55.90)	52 (44.10)
Lack of information	61 (51.70)	57 (48.30)
Poor source of information	58 (49.20)	60 (50.80)

Source: Field Survey, 2019
Values in parenthesis are percentages

4. CONCLUSION

Growing population pressure and droughts in recent years together with excessive deforestation, overgrazing and yearly bush burning have all combined to bring about rapid rate of desertification. Agro forestry offers a sustainable balance of productivity between both wood and food and also an increase in total productivity per unit area of land. Agroforestry enhance sustained productivity of crops and animals by protecting and enhancing the nature base through deliberate integration of trees and shrubs in crop and livestock production. It can be concluded from the results of the study that majority of the agroforestry famers are male with the mean age of 40.12 years and are educated. Less than halve of the famers had favourable attitude to agroforestry trees planting. Age group, educational level, income and membership in organization are very important and paramount while years of experience and constraints faced by farmers were major determinants of famer's attitude to planting agro-forestry trees. It can also be concluded that herdsmen issue, lack of credit facility, pest and diseases, lack of information and inadequate access to land formed the major constraints faced by farmers in planting of agroforestry trees. Other constraints include poor sources of information, inadequate finance, lack of technical know-how, watering problem and complexity in management.

5. RECOMMENDATIONS

Based on the findings of this study the following recommendations were made.

i. The farmers need education and training in agroforestry to improve their level of knowledge for favourable attitude and practices.
ii. The famers should be encouraged to be member of an organization, this will give them more information and knowledge about the benefits of agroforestry trees planting and boost their attitude towards agroforestry practices.
iii. Government should mediate into the problems of famers and herdsmen through dialogue and provide ranching/paddock for the herdsmen. This will reduce incessant classes between the famers and herdsmen thereby alleviating fears on the part of the famers and encourage agroforestry trees planting.
iv. Prompt and timely information as well as agroforestry farm inputs should be made available to the famers. The farm inputs should be at subsidized rate for easy access and affordability by famers.
v. In other to encourage tree planting, government should supply tree seedlings to the farmers for improved agroforestry practices.

CONSENT

As per international standard or university standard, respondents' written consent has been collected and preserved by the authors.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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