Analysis On Agroforestry Practice in Mamudo Village of Potiskum Local Government Area Yobe State, Nigeria

* **Safiyanu I.[1], Umar A. I.[1], Makinta A.[1], Ya'u M. A.[1], Amshi M. A.[1], Babagana A.[1], Shu'aibu A. D.[2]**

[1]Department of Forestry and Environmental Technology Yobe State College of Agriculture Science and Technology, Gujba PMB 1104 Damaturu
[2]Depaertment of Agricultural Technology Yobe State College of Agriculture Science and Technology, Gujba PMB 1104 Damaturu

Corresponding author: Email:aliyuumaridriss@gmail.com : 08067568130

ABSTRACT

The focouse of this research is to examine agroforestry practice in Mamudo village of Potiskum local government area Yobe state Nigeria. The study achieved the objective which include Assess perceived the benefit of agroforestry practices by farmers in the study area, identify the possible measures to improve the agroforestry practices in the study area, determine the factors limiting the agroforestry practice in the study area. The sample size of 100 respondents was drawn for the study. Questionnaires was used for data collection. Simple random sampling techniques was adopted in selecting the respondents. The researcher used descriptive statistics in presenting the data. The results of the study revealed that 90(93%) of the respondents were male while 7(7%) of the respondents were female. The study revealed Agroforestry practice conserving soil by providing moisture to soil for plant growth, Agroforestry practice providing income to rural farmers, Agroforestry practice has not Reducing deforestation and pressure on woodlands by providing farm-grown fuel wood, Agroforestry practice controlling soil erosion in the farmland, agroforestry has increasing extension services to farmers. The research also revealed that his revealed that majority of the respondents have secondary education. his revealed that majority of the respondents have secondary education, the findings also revealed that hat 12(12%) of the respondents have 1 – 6 years' experience in farming, 13(13%) of the respondents have 7 -10 year experience in farming, 29(30%) of the respondents have 11 – 15 years of experience in farming while 43(45%) of the respondents have 16 years and above experience in farming. There is need to collaborate with policy makers for the development of agroforestry practice, loans should be giving to the farmers by government and Non-governmental organization.

Keywords: Agroforestry, Farmers, Practices, Extension, Livelihoods

INTRODUCTION

1.1 Background of the study

One of the challenges facing Nigeria is the production of sufficient food and fiber to meet the need of the country of ever-increasing population (Alao, and Shuaibu, 2016). With rapid population increase and land use pressure, natural fallows and shifting cultivation have been reduced to below the minimum threshold required for the system to sustain itself (Opio, 2018). These have led to land shortages and continuous arable cultivation without fallowing (Thangata, *et al.,* 2018). Agroforestry practice represent such land use practices as it offer a solution to the problem posted by the high demand on land, and stands as a means of halting the vicious circle of Deforestation, soil Erosion and other environmental problems facing Nigeria. It is one of the sustainable Agricultural practices in soil fertility practice that uses natural resource management principles to replenish soil fertility (Ajayi, *et al.*,2018); Markus, (2016). Agroforestry is an ancient practice in sub-Saharan Africa where farmer deliberately integrate and retain trees in their farmland. According to International Center for Research in Agroforestry (ICRAF) (2019)

Agroforestry practices have the potential of improving Agricultural land use systems, providing lasting benefits and alleviating adverse environmental effects at local and global levels. This techniques as practiced in Nigeria has the potential to address slash and burn Agriculture and anthropocentric forces that are responsible for degradation. It provides a tool for accelerated economic improvement in Rural livelihood in a country where over half of the population reside in the Rural area (Merem, 2015). It can help to ensure sustained productivity of the natural resource base by enhancing soil fertility, controlling Erosion and improving the micro-climate of crop land, nutrient cycling, carbon sequestration, Bio drainage, Bio energy and Bio fuel and providing grazing land (Umeh, 2018). Agroforestry can significantly reduce the demand on forest and natural woodland. It could therefore supplement forest restoration strategies (Michael, *et al.,* 2017).

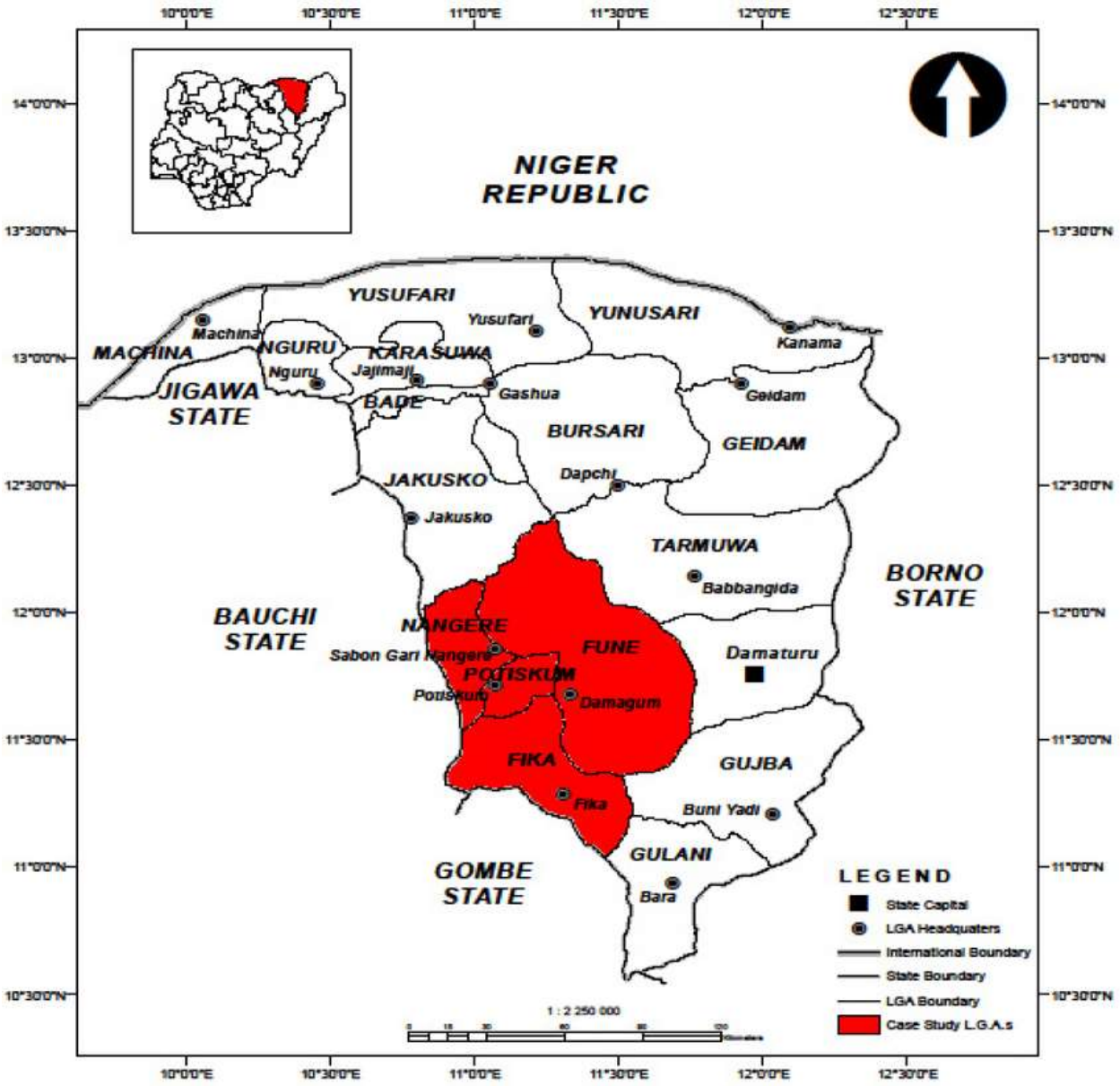
2. MATERIAL AND METHOD

2.1 The Study area

Potiskum Local Government Area is located in Yobe State, Nigeria, on the A3 highway at $11^0$04'E coordinate: $11^0$43'N, $11^0$04'E. It has an area of 559 Square kilometers (21659 mi) and a population of 205,876 at the 2006 census. The postal code of the area is 631. (Suleiman, *et al.,* 2018). While Mamudo is a ward in Potiskum local government area of Yobe State Nigeria, the latitude: $11^0$41' North. Longitude: $11^0$11'3 East. Mamudo is a village in Potiskum local government and has an elevation of 434 meters. Mamudo is situated southwest of Garin Maje.

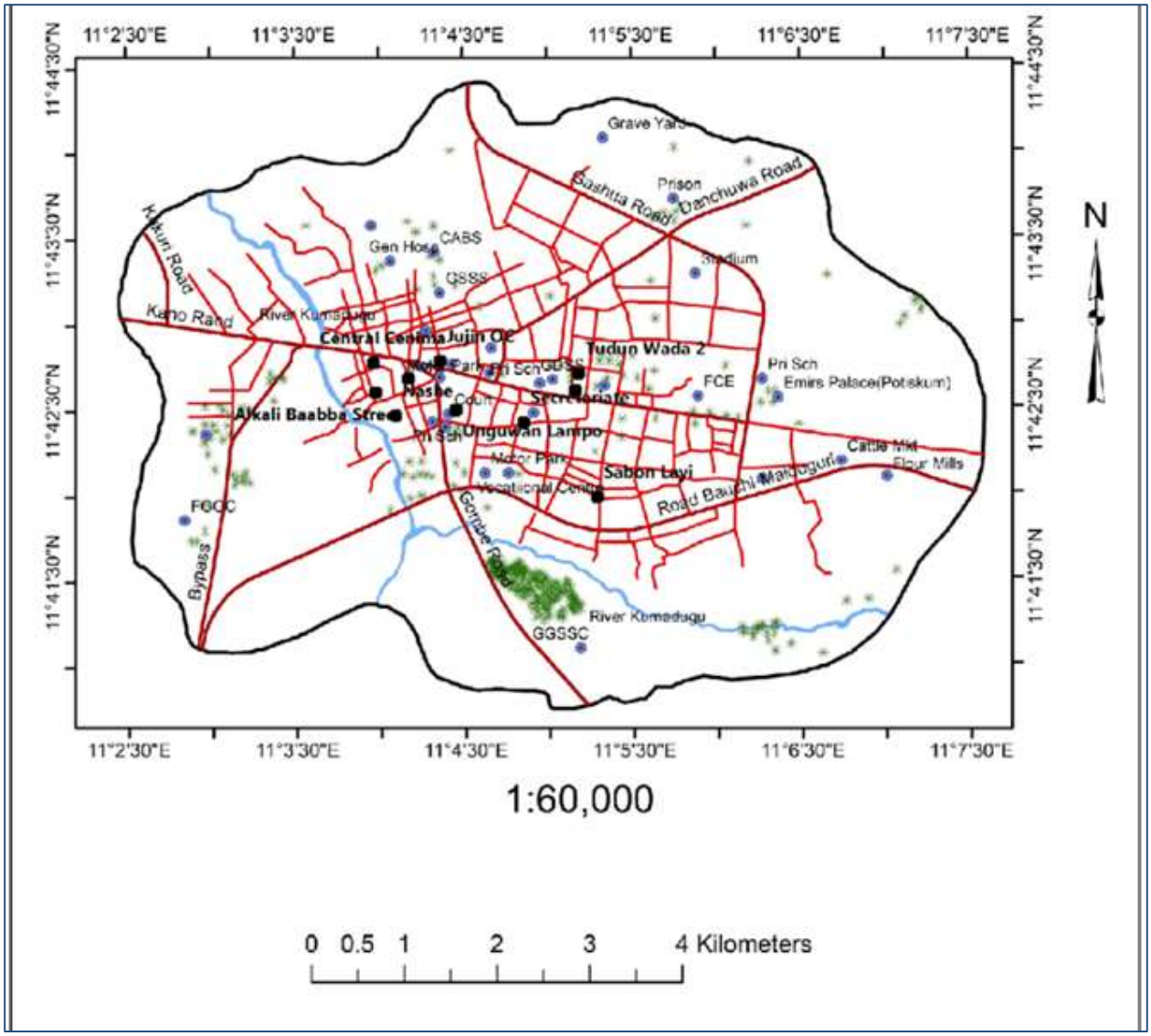
The study area fall the climate smart Agriculture (C S A) concept reflects an ambition to improve the integration of Agriculture development and climate responsiveness. The Tropical Savanna climate with district dry wet season. Dry season last for about six month (November to April), while the rain season spans from (May to October). There is a distinct drop in temperature at the Onset of rain season. A slight increase after the cessation of rain is common before the Onset of Harmattans in December and January when the temperature drops further to 25^0C and increase from March to May for about 45^0C (Naca.gov.ng com, 2018). The soil of the study area is made of mixture of different colored which are sandy, loamy and clay. The soil is the most important properties affecting crop production because it determines depth the roots can penetrate, the amount of water that can be stored in the soil

and the movement of air, water and soil fauna and overall soil fertility (Hernan and Auwalu, 2018). The vegetation of the study are is predominately of the Sudan Savanna Type which scattered Acacia trees. There is also an area of Sahel Savannah, consisting of sand soil and thurn scrubs which is located in the far north. The species of the tree found area; *Tamarandus Indica*, *Acasia Seneglasis*, *Balanite Egyptic*, *Mangiferial Indica*, *Psidium Guajaba*, *Adamsonia Digitata*, e.t.c. the common species of the grasses include; *Tephrosialinearis*, *breadleaf*, *Mitracarpus Scarber*.



Source; GIS Office Ministry of Land and Survey, Damaturu, 2025.

Figure 1: Map of Yobe State Showing Potiskum Local Government area



Source; GIS Office Ministry of Land and Survey, Damaturu, 2025.

Figure 2: Map of Potiskum Local Government Areas.

2.2 Study Design and Data Collection

The data was collected through structural interview schedule with content relevant questionnaire on of the objectives of the study. The instrument validate by two professional in the field of Agroforestry practice from the Department of Forestry in the Yobe State Ministry of Environment, and verbal interview with some of the rural farmers, agroforestry practice and other lecturers from the Department of Forestry and Environmental Technology in Yobe State College of Agriculture, Science and Technology Gujba.

2.3 Data Collection Techniques

The secondary sources of data consist of Textbooks, Journals, magazine, document information from the State ministry of Agriculture and Environment, published and unpublished material and relevance project, while the primary sources of data was

administered of the questionnaire to the respondent by hand in their respective areas. The questionnaire were retrieved immediately in completion, clarification on question item. Purposely sampling techniques was adopted in selecting respondent which comprised of (4) communities in Mamudo village of Potiskum Local Government Area of Yobe State. A total of 100 respondents were selected from four (4) communities and a structural questionnaire were distributed to agroforestry practice which involve the improvement of planting the *mangiferial indica*, (Mango), *psidium guajava* (guava), *moringa oleifera* (moringa), *Azadirachta indica*, *Arachis hypogea* (groundnut), *vigna subterranea*, (Bambara Nut), *zea mays* (Maize) *abelmoschus esculentus* such as Goat, Sheep, fish, Cattles, and Rabbit. During the interview specific question is being asked and the information which obtain from the respondents were recorded.

2.4 Data Analysis

The data was analyze using SPSS (Statistical Package for social Sciences) and present it in Descriptive statistic like frequency, simple Percentage, as well as pie, respectively were employed in representing the data in visual form

3. RESULTS AND DISCUSSION

3.1 Socioeconomic characteristics of the respondents

This chapter presents the analysis of data and its interpretation. The techniques used were the frequency distribution tables and percentages, in this study, a total of one hundred (100) questionnaires were distributed, and ninety seven (97) were duly complete and retrieved and making a response rate of 100%

Table 1: Socio-economic characteristics of the respondents

Sex		
Sex	**Frequency**	**Percentage**
Male	90	90
Female	7	7
Total	97	100
Age		
Age	**Frequency**	**Percentage**
18-25	23	23
26-29	12	12
30-39	15	15
40-49	32	32
50yrs and above	15	15
Total	97	100
Marital Status		
Marital Status	**Frequency**	**Percentage**
Single	39	39
Married	52	52
Widow	2	2
Separate	5	5
Total	97	100
Educational Level		
Educational Level	**Frequency**	**Percentage**
No formal education	14	14
Primary	27	27
Secondary	32	32
Tertiary	24	24
Total	97	100
Experiences in Farming		
Experiences in Farming	**Frequency**	**Percentage**
Strong agreed	35	35
Agreed	12	12
Disagreed	29	29
Strong disagreed	19	19
Undecided	2	2
Total	97	100

Source: Field Survey, 2025

The table above shows that 90(93%) of the respondents were male while 7(7%) of the

respondents were female. This revealed that majority of the respondents were male This research line up with the finding of Gambo et al., (2019) who revealed that majority (99%) of the farmers were males while females were only 1%. This may be attributed to the nature of the area where religion, culture, norms and values that restrict women from outdoor activities.The table above shows that 23(24%) of the respondents are in age of 18 – 25 years, 12(12%) of the respondents were in age of 26 – 29%, 15(16%) of the respondents were in age of 30 – 39 years, 32(33%) of the respondents were in age of 40 – 49 years while 15(15%) of the respondents were in age of 50 years and above. This revealed that majority of the respondents are in age of 40 – 49 years old. The table above shows that 38(39%) of the respondents were single, 52(54%) of the respondents were married, this research supported the work of Umar (2012) who reported that `different ethno-religious groups continue to attach prestige to marriage as an indicator of social responsibility, 2(2%) of the respondents were widow the results is also in agreement with Gambo et al., (2019) who revealed that 91% of the respondents were married while, 8.1% and 1.1% were single, and widow respectively. while 5(5%) of the respondents were separated. This revealed that most of the respondents were married. The table above shows that 14(14%) of the respondents they have no formal education, 27(28%) of the respondents have primary education, 32(33%) of the respondents have secondary education this is in partial agreement with Gambo et al., (2019) who revealed that majority (93%) of the farmers were literate. While 24(25%) of the respondents have tertiary education. This revealed that majority of the respondents have secondary education. The table above shows that 12(12%) of the respondents have 1 – 6 years' experience in farming, 13(13%) of the respondents have 7 -10 year experience in farming, 29(30%) of the respondents have 11 – 15 years of experience in farming while 43(45%) of the respondents have 16 years and above experience in farming. This revealed that majority of the have 16 years and above experience in farming.

Table 2: Agroforestry Practices Conserving Soil by Providing Moisture to Soil for Plant Growth and Income to Rural Farmers

Agroforestry Practices Conserving Soil by Providing Moisture To Soil For Plant Growth		
Response	**Frequency**	**Percentage**
Strong Agreed	35	35
Agreed	12	12
Disagreed	29	29
Strong Disagreed	19	19
Undecided	2	2
Total	97	100
Agroforestry Practices Providing Income To Rural Farmers		
Response	Frequency	Percentage
Strong Agreed	35	35
Agreed	12	12
Disagreed	29	29
Strong Disagreed	19	19
Undecided	2	2
Total	97	100

Source: Field Survey, 2025

The table above shows 35(36%) of the respondent strongly agreed that Agroforestry practice conserving soil by providing moisture to soil for plant growth, 12(12%) of the respondents agreed that Agroforestry practice conserving soil by providing moisture to soil for plant growth, 29(30%) of the respondents disagreed that Agroforestry practice, 19(20%) of the respondents strongly disagreed that

Agroforestry practice while 2(2%) of the respondents undecided that Agroforestry practice conserving soil by providing moisture to soil for plant growth. This revealed that majority of the respondents strongly agreed. The table above shows that 35(36%) of the respondents strongly agreed that Agroforestry practice providing income to rural farmers, 12(12%) of the respondents agreed that Agroforestry practice providing income to rural farmers, 29(30%) of the respondents disagreed that Agroforestry practice providing income to rural farmers. This is in- line with Adekunle (2009) report that farmers with farm land located in different places have the opportunity to combine several agroforestry systems. 19(20%) of the respondents strongly disagreed that Agroforestry practice providing income to rural farmers while 2(2%) of the respondents undecided that Agroforestry practice providing income to rural farmers. This revealed that majority of the strongly agreed that Agroforestry practice providing income to rural farmers.

Table 3: Agroforestry practices and Improving access to planting materials by expanding increasing extension services to farmers is measures to improve the seed supply is measures to improve the agroforestry practices

Increasing extension services to farmers is measures to improve the agroforestry practices		
Responses	**Frequency**	**Percentage**
Strong Agreed	4	4
Agreed	4	4
Disagreed	54	56
Strongly Disagreed	34	35
Undecided	1	1
Total	**97**	**100**
Measures to improve seed supply in agroforestry practices		
Responses	**Frequency**	**Percentage**
Strong Agreed	61	63
Agreed	32	33
Disagreed	1	1
Strongly Disagreed	3	3
Undecided	-	-
Total	**97**	**100**

Source: Field survey, 2025

The table above shows that 4(4%) of the respondents strongly agreed that Agroforestry practice has Reducing deforestation and pressure on woodlands by providing farm-grown fuel wood, 4(4%) of the respondents agreed that Agroforestry practice has Reducing deforestation. 54(56%) of the respondents disagreed that Agroforestry practice has Reducing deforestation. This shows that majority of the respondents disagreed that Agroforestry practice has Reducing deforestation and pressure on woodlands by providing farm-grown fuel wood. The table above shows that 61(63%) of the respondents strongly agreed that Agroforestry practice controlling soil erosion in the farmland, 32(33%) agreed that Agroforestry practice controlling soil erosion in the farmland, 1(1%) of the respondents disagreed that Agroforestry practice controlling soil erosion in the farmland, while 3(3%) of the respondents strongly disagreed that Agroforestry practice controlling soil erosion in the farmland. This revealed that majority of the respondents strongly agreed that Agroforestry practice controlling soil erosion in the farmland.

Table 4: Increasing extension services to farmers is measures to improve the agroforestry practices and measures to improve the agroforestry practices

Measures to improve planting materials in

agroforestry practices

Responses	Frequency	Percentage
Strong Agreed	26	27
Agreed	42	43
Disagreed	23	24
Strongly Disagreed	3	3
Undecided	3	3
Total	**97**	**100**

Measures to improve the agroforestry practices

Responses	Frequency	Percentage
Strong Agreed	71	73
Agreed	21	22
Disagreed	1	1
Strongly Disagreed	2	2
Undecided	2	2
Total	**97**	**100**

Source: Field survey, 2025

The table above shows that 26(27%) of the respondents strongly agreed that increasing extension services to farmers is measures to improve the agroforestry practices, 42(43%) of the respondents agreed that increasing extension services to farmers is measures to improve the agroforestry practices, 23(24%) of the respondents disagreed that increasing extension services to farmers is measures to improve the agroforestry practices, 3(3%) of the respondents strongly disagreed that increasing extension services to farmers is measures to improve the agroforestry practices while 3(3%) of the respondents undecided that increasing extension services to farmers is measures to improve the agroforestry practices. This revealed that majority of the respondents agreed that increasing extension services to farmers is measures to improve the agroforestry practices. While 2(2%) of the respondents undecided that Improving access to planting materials by expanding seed supply is measures to improve the agroforestry practices . this shows that majority of the respondents strongly agreed that Improving access to planting materials by expanding seed supply is measures to improve the agroforestry practices .

Table 5: Measures to improve Training of Agricultural Extension Agent in Agroforestry Practices

Training agricultural extension agent and posted to various area where agroforestry practice is applicable is measures to improve the agroforestry practices

Responses	Frequency	Percentage
Strong Agreed	55	57
Agreed	23	24
Disagreed	12	12
Strongly Disagreed	7	7
Undecided	-	-
Total	**97**	**100**

Making policies to enhance agroforestry is measures to improve the agroforestry practices

Responses	Frequency	Percentage
Strong Agreed	65	67
Agreed	21	22
Disagreed	10	10
Strongly Disagreed	-	-
Undecided	1	1
Total	**97**	**100**

Source; Field survey, 2025

The table above shows that 55(57%) of the respondents strongly agreed that Training agricultural extension agent and posted to various area where agroforestry practice is applicable is measures to improve the agroforestry practices, 23(24%) of the respondents agreed that Training agricultural extension agent and posted to various area where agroforestry practice is applicable is measures to improve the agroforestry practices, 12(12%) of the respondents disagreed that Training agricultural extension agent and posted to various area where agroforestry practice is applicable is measures to improve the agroforestry practices. While 7(7%) of the respondents strongly disagreed that Training agricultural extension agent and posted to various area where agroforestry practice is applicable is measures to improve the agroforestry practices. The table above shows that 65(67%) of the respondents strongly agreed that Making policies to enhance agroforestry is measures to improve the agroforestry practices, 21(22%) of the respondents agreed that Making policies to enhance agroforestry is measures to improve the agroforestry practices, 10(10%) of the respondents disagreed that Making policies to enhance agroforestry is measures to improve the agroforestry practices, while 1(1%) of the respondents undecided that Making policies to enhance agroforestry is measures to improve the agroforestry practices. This revealed that majority of the respondents strongly agreed that Making policies to enhance agroforestry is measures to improve the agroforestry practices.

Table 6: Limited local market for marketing of agroforestry products is the factors limiting agroforestry practice and Long gestation period to reap the benefits of agroforestry is the factors limiting agroforestry practice

Limited local market for marketing of agroforestry products is the factors limiting agroforestry practice		
Responses	**Frequency**	**Percentage**
Strong Agreed	12	12
Agreed	45	46
Disagreed	35	36
Strongly	3	3
Disagreed	2	2
Undecided		
Total	**97**	**100**

Long gestation period to reap the benefits of agroforestry is the factors limiting agroforestry practice		
Responses	**Frequency**	**Percentage**
Strong Agreed	30	31
Agreed	33	34
Disagreed	21	22
Strongly	10	10
Disagreed	3	3
Undecided		
Total	**97**	**100**

Source; Field survey, 2025

The table above shows that 12(12%) of the respondents strongly agreed that Limited local market for marketing of agroforestry products is the factors limiting agroforestry practice, 45(46%) of the respondents agreed that Limited local market for marketing of agroforestry products is the factors limiting agroforestry practice, 35(36%) of the respondents disagreed that Limited local market for marketing of agroforestry products is the factors limiting agroforestry practice, 3(3%) of the respondents strongly disagreed that Limited local market for marketing of agroforestry products is the factors limiting agroforestry practice this research comfort with umeh (2008) who finding highlight the factors that limit the agroforestry practices, while 2(2%) of the respondents undecided that Limited local market

for marketing of agroforestry products is the factors limiting agroforestry practice. This revealed that majority of the respondents agreed that Limited local market for marketing of agroforestry products is the factors limiting agroforestry practice. The table above shows that 30(31%) of the respondents strongly agreed that Long gestation period to reap the benefits of agroforestry is the factors limiting agroforestry practice, 33(34%) of the respondents agreed that Long gestation period to reap the benefits of agroforestry is the factors limiting agroforestry practice, 21(22%)of the respondents disagreed that Long gestation period to reap the benefits of agroforestry is the factors limiting agroforestry practice, 10(10%) of the respondents strongly disagreed that Long gestation period to reap the benefits of agroforestry is the factors limiting agroforestry practice, while 3(3%) of the respondents undecided that Long gestation period to reap the benefits of agroforestry is the factors limiting agroforestry practice. This revealed that majority of the respondents agreed that Long gestation period to reap the benefits of agroforestry is the factors limiting agroforestry practice.

Table 7: Inadequate knowledge by farmers for practices agroforestry is the factors limiting agroforestry practice and High incidence of bush fire is the factors limiting agroforestry practice

Inadequate knowledge by farmers for practices agroforestry is the factors limiting agroforestry practice		
Responses	**Frequency**	**Percentage**
Strong Agreed	52	54
Agreed	25	26
Disagreed	12	12
	6	6
Strongly Disagreed	2	2
Undecided		
Total	**97**	**100**

High incidence of bush fire is the factors limiting agroforestry practice		
Responses	**Frequency**	**Percentage**
Strong Agreed	29	30
Agreed	31	32
Disagreed	32	33
	3	3
Strongly Disagreed	2	2
Undecided		
Total	**97**	**100**

Source; Field survey, 2025

The table above indicated that 52(54%) of the respondents strongly agreed that Inadequate knowledge by farmers for practices agroforestry is the factors limiting agroforestry practice, 25(26%) of the respondents agreed that Inadequate knowledge by farmers for practices agroforestry is the factors limiting agroforestry practice, 12(12%) of the respondents disagreed that Inadequate knowledge by farmers for practices agroforestry is the factors limiting agroforestry practice, 6(6%) of the respondents strongly disagreed that Inadequate knowledge by farmers for practices agroforestry is the factors limiting agroforestry practice while 2(2%) of the respondents undecided that Inadequate knowledge by farmers for practices agroforestry is the factors limiting agroforestry practice. This revealed that majority of the respondents strongly agreed that Inadequate knowledge by farmers for practices agroforestry is the factors limiting agroforestry practice this findings opined with Venkateswarlu, J. (1993). The table above shows that 29(30%) of the respondents strongly agreed that High incidence of bush fire is the factors limiting agroforestry practice, 31(32%) of the respondents agreed that High incidence of bush fire is the factors limiting agroforestry practice, 32(33%) disagreed that High incidence of bush fire is the factors

limiting agroforestry practice, 3(3%)of the respondents strongly disagreed that High incidence of bush fire is the factors limiting agroforestry practice, while 2(2%) of the respondents undecided that High incidence of bush fire is the factors limiting agroforestry practice. This revealed that majority of the respondents disagreed that High incidence of bush fire is the factors limiting agroforestry practice.

4. CONCLUSIONS

This study concluded that there is existence of agroforestry system in the study area which are highly beneficial in the community, the agroforestry activities also increase the sources of household food security and income generation for sustainable livelihood of the farmers. Deforestation and other anthropogenic activities highlighted as the major incidence which serve as a factors restraining agroforestry activities in the community.

5. RECOMMENDATIONS

i. There is need to collaborate with policy makers for the development of agroforestry practice
ii. Loans should be giving to the farmers by government and Non-governmental organization to improve their farming activities.
iii. Stoke holders should create a means of supporting agroforestry famers on how improve their farming activities.

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