

Awareness and Importance of Agroforestry Practice among farmers in Selected Villages of Igabi Local Government Area, Kaduna State, Nigeria

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ABSTRACT:-The study examined the awareness and importance of farmer's participation in agroforestry practices in four selected villages of Igabi local government area, Kaduna State. Multi-stage, purposive and random sampling method were used to select 100 agro-forestry farmers and structured questionnaire administered on them. Descriptive statistics such as percentage and Likert scale were used to analyze the data obtained. The result revealed that male (67.00%) dominated the agroforestry farming enterprise; 97.00% of the respondents are in their working age group of 21-60 years. The greatest percentage (61.00%) was married. 89.00% had education, while 11.00% never attended school. The study revealed that farmers in the study area were aware and practicing different types of agroforestry system such as mulching with forest species (93.00%), retaining of trees on the farm(88.00%), planting of trees along with the retained trees(38.00%), taungya farming system(28.00%), and alley farming(20.00%). The study also revealed the importance of agroforestry practice to the farmers which include; increased in agricultural productivity (mean score of 3.40), improved environmental sustainability (mean score of 3.10), enhancement of nutritional status of the farmers households(mean score of 3.00), use for medicinal purposes (mean score of 2.90), reduction of land degradation due to deforestation (mean score of 2.85), enhancement of farmers income generation (mean score of 2.70), improvement in soil fertility (mean score of 2.60), and access to agroforestry tree products(mean score of 2.55). However the farmers were constrained with factor such as non availability of farm labour(77.00%), high cost of improved agro-forestry tree planting materials(67.00%), lack of

capital (65.00%), lack of credit (62.00%), poor soil fertility(57.00%), inheritance system of land ownership (55.00%), high cost of fertilizers (52.00%), poor extension service delivery (47.00%) and theft of produce(40.00%). The study therefore recommends that awareness of the importance of agroforestry should be made known to farmers through organizing workshops and seminars, radio programmes and community awareness campaign by the extension agents. Land should be made available to farmers by state government who owned all land based on the land act operated in the country and government and other stakeholders in food production sector should rendered assistance in the areas of provision of credit facilities, exotic species, improved seedlings and subsidized agricultural inputs like fertilizer to the farmers.

KEYWORDS: - Attitude, Farmers, Agroforestry Practices, Constraints, Igabi, Kaduna

I. INTRODUCTION

Agroforestry involves the practice in which trees of economic values are incorporated with arable food crops in a farming system. Leakey (2017) gave the current definition of agroforestry by International Centre for Research in Agroforestry (ICRAF) as a "collective term for a land use systems and practices whereby woody perennial are intentionally integrated with crops and/or animals on the same land management unit, either in spatial mixture or in temporal sequence." This definition of agroforestry clearly shows that the practice involves an agricultural system in which arable crops can be cultivated with trees or shrubs of economic value and at the same time animals can be reared on the same land putting land

that cannot be used for agricultural purpose due to its poor fertility to better use. Agroforestry is defined by Akinbile et al. (2007) as an aspect of farm forestry that encourages a deliberate integration of woody perennials with agricultural crops and/or animals on the same land management unit, with the aim of enhancing soil fertility and increasing farmers' income through the use of economic trees.

Agroforestry is a land use system management system in which trees or shrubs are grown around or among crops or pasture lands (ICRAF, 2007). It combines shrubs and trees in agriculture and forestry technologies to create more diverse, productive, profitable, healthy, and ecologically sound and sustainable land use system. There must be both ecological and economic interaction between the woody and non-woody component to qualify as agroforestry. Agroforestry practices can be categorized in two broad main part: farm based and forest based. The farm based practices deals with tree planting on and around agricultural field or planting of commercial crops under shade trees or food crops inter-planted with commercial tree (Oni, 2015). The forest based practices involve agricultural practices associated with forest where farmers collect food, fruit and gum. In this study, agroforestry is referred to as farm based practices.

The practice of agroforestry cannot be overemphasized or underemphasized due to its numerous benefits to the farmers economically and environmentally. The importance of agroforestry practice include the ability to combat environmental degradation such as control of soil erosion, reducing run-off, acting as wind break and reducing the increasing rate of infiltration. Other beneficial effect of agroforestry practice is that it serves as a tool for combating food security among household through provision of food items and medicinal herbs as well as generating income to the farmers. The practice of agroforestry can combat environmental degradation as well as making the rural poor to have sustainable agriculture. ICRAF described the benefits of practicing agroforestry in relation to scarcity of land and stated that where there is soil erosion which may lead to limited land for farming, agroforestry practices bring about long term agricultural sustainability as highlighted by Attia(2017).. Agroforestry practices also serve as a mean to prevent deforestation. Ingwe et.al.(2009) asserts that the promotion of agroforestry practice is helping to restore forest and degraded environment as well as reducing gases emission from green houses.

Against these backdrops, this study is aimed at identify farmers awareness of types of agroforestry practices they can engaged on, assess the importance of agroforestry practices and identify constraints to agroforestry practices in Igabi Local Government Area of Kaduna State, Nigeria.

II. MATERIALS AND METHODS

A. Study Area

The study was conducted in four selected villages in Igabi Local Government Areas of Kaduna state. Igabi is one of the four local government areas which constitute Kaduna metropolitan city, an important commercial and administrative centre in Northern Nigeria and comprises of different sets of people with diversified socio-cultural characteristics. Igabi local government is located in Guinea Savannah of Nigeria on latitude $10^{\circ} 32'$ and $7^{\circ} 17'E$. The headquarter of Igabi Local Government Area is Turunku. The population of Igabi local government area according to 2006 population census was estimated at 570,000 people (NPC, 2006). Annual rainfall is between 250mm-1000mm and usually begins early May and ends in October and the dry season is between October-April. The major crops produced in the area are cowpea, yam, cassava, maize, millet, guinea corn., sugar cane and cocoyam. The social set up of the place attributes to the natural resources found in the area e.g. forest, granite and timber etc. The agroforestry trees that exist in this study area include *Gliricidia sepium*, *Leucaena leucocephala* and other tree species.

B. Sampling Techniques and Frame

Multi stage sampling technique was employed in this study. In the first stage Igabi local government area was purposively selected out of twenty three local government area Kaduna state because of the predominance of agroforestry practices in the area. At the second stage, four(4) villages which include Sabon Afaka, Sabon-Birin, Rigachikun and Turunku were also purposively selected from the local government area due to existence of agroforestry practices in these areas. The final stage was randomly selection of twenty five (25) respondents from each of the selected village. This gave the total number of one hundred respondents

C. Data Collection

Data for this study was obtained from primary source. The primary data was obtained through the use of structured questionnaire to gather information on the socio-economic characteristics of the farmers such as age, sex, level

of education, household size and farming experience. Other information gathered from the respondents include level of farmers awareness of types of agroforestry practices they can engaged on, importance of agroforestry practice and constraints militating against the practice of agroforestry.

D. Method of Data Analysis

Descriptive statistics such as frequency distribution, percentages and mean were used to analyse the socio – economic characteristics of the farmers, level of farmers awareness of types of agroforestry practices they can engaged on, constraints militating against the practice of agroforestry and Likert- scale was adopted to analyse the importance of agroforestry practices.

1). Likert Scale Rating Technique : Likert -scale is a psychometric scale commonly used in questionnaires. When responding to a Likert questionnaire item, respondents specify their level of agreement or disagreement on a symmetric agree-disagree scale for a series of itemized statements. A 4- point rating scale was used in this work to describe the importance of agroforestry practices in the study area. The scaling was graded as; Strongly Agreed (SA), Agreed (A), Disagreed (D) and Strongly Disagreed (SD) with corresponding values of 4, 3, 2 and 1 respectively. The mean score for the scaling was calculated as $4+3+2+1 = 10 / 4 = 2.5$. The decision rule is that a mean score for any statement that is 2.5 and above is termed to be positive responses from the farmers which mean they agreed to such statement while any statement with mean score of less than 2.5 is considered to be a disagreement statement.

III. RESULTS AND DISCUSSION

E. Socio – Economic Characteristics of Respondents

The results of the socio – economic characteristics of the respondents is shown on Table 1. The result shows that male (67.00 %) dominated the practice of agroforestry farming in the study area. The result also revealed that majority (97.00 %) of the respondents is between 21 – 60years old. This shows that majority of the farmer's are in their active working age group which should positively influence the decision of the respondents in practicing agroforestry. Table 1 also showed that 89.00 % of respondents were educated with 42.00% of them having secondary school certificate, followed by 26.00% with primary school certificate, 21.00% had tertiary

education while 11.00% of the farmers had no formal education. This shows that majority of the agro forestry farmers in the study area can read and write. 61.00 % Of the farmers were married while 39.00 % were single. This shows that majority of the farmers are married with about 80 .00 % of them having a family size that is 6 people and above with most of them about 72.00 % having over five years of experience in agroforestry practice. The findings concerning the socio – economic characteristics of farmers obtained in this study consolidated the studies of Ayodele(2019) and Oladele et.al.(2020).The authors reported similar values for age, gender, educational level, household size and farming experience for farmers in Igabi Local Government Area of Kaduna State.

F. Farmers Awareness of Type of Agro forestry Practices they can engaged on.

Table 2 shows the farmers awareness of various types of agroforestry practices they can engaged on in the study area. 93.00 % of the respondents are aware of mulching with agroforestry species, 88.00 % of the farmers are aware of the practice of retaining of trees on farm lands, 38.00 % of the farmers are aware of planting trees along with the arable crops and 28.00 % are aware of the practice of tungya farming systems while only 20.00% of the farmers are aware of the practice of alley farming.. Retaining of trees in the farm is a common practice found across the country. Adekunle (2009), reported that farmers in Ondo State retained different species of trees on their farms for different purposes. .Mustapha and Jimoh (2012) in their study reported that majority of the farmers (63.1%) retained different types of trees on their farm land. Mustapha and Jimoh (2012) also reported that some of the farmers (55%) apart from retaining trees also plant trees along with arable crops on their farms. So the greater awareness for tree retention in this study is not surprising as the greater awareness support the works of both Adekunle (2009) and .Mustapha and Jimoh (2012). The high level of awareness for mulching with agroforest species is also expected since it is a practice that is common among farmers across the country. The low level of awareness for planting of exotic tree species with arable crops, taungya farming system and alley farming system may be associated with the scientific nature for these practices which the local farmers may be lacking. Ibrahim et.al. (2019) reported that 70.8% of the respondents in their study were aware of agroforestry practices in the study area, while 29.2% were not aware.

Table 1: Socio-Economic Characteristics of the Farmers

Socio-Economic Variables	Frequency N = 100	Percentage (%)
Gender		
Male	67	67.00
Female	33	33.00
Age		
21-30 years	28	28.00
31-40 years	30	30.00
41-50 years	21	21.00
51-60 years	18	18.00
Above 60 years	3	03.00
Level of Education		
No Formal Education	11	11.00
Primary	26	26.00
Secondary	42	42.00
Tertiary	21	21.00
Marital Status		
Single	39	39.00
Married	61	61.00
Household size		
1-5	20	20.00
6-10	44	44.00
11-15	24	24.00
Above 15	12	12.00
Years of Experience		
1-5	28	28.00
6-10	46	46.00
> 10	26	26.00

Table 2: Distribution of Respondents Based on Farmers Awareness of Types of Agroforestry Practices

Agroforestry practices (%)	Aware (%)	Not aware (%)
Tungya farming system	28(28.00)	72(72.00)
Retaining trees on farm land	88(88.00)	12.(12.00)
Mulching with agro-forestry species	93(93.00)	07(07.00)
Alley farming	20(20.00)	80(80.00)
Planting of trees with arable crops	38(38.00)	62(62.00)
Mean Value		

G. Importance of Agroforestry Practice in the Study Area.

The importance of agroforestry practice to farmers in the study area is presented Table 3. Eight statements bordering on the importances of agroforestry practices was postulated and were subjected to four points Likert scale. The result revealed that the farmers agreed to all the eight importances of agroforestry practice identified in this study. Farmers agreed that agroforestry practice increases agricultural productivity (mean score = 3.40); improves environmental sustainability (mean score = 3.10); enhances nutritional status of the farmers households (mean

score = 3.00); increases the farmers’ use of tree products for local medicinal purposes (mean score = 2.90); reduces land degradation caused by deforestation (mean score = 2.85), enhances farmers income generation (mean score= 2.70); helps in the improvement of soil fertility (Mean Score = 2.60) and enhances farmers’ access to agroforestry tree products (AFTPs) (mean score = 2.55). These importances of agroforestry practice identified in this study have been documented by many scholars. According to Adegeye et al. (2010), various fruit and nut- producing trees and shrubs make substantial contribution to the dietary needs of large number of people particularly in the rural

areas. Richard et al, (2009), also asserts that environmental stability and other benefits like income generation of agroforestry to the resource poor farmers, makes it more appealing to the farmers. Attia et.al. (2017), identified increase in soil fertility, control of soil erosion, serves as fodder for animals, source of food and medicine, source of fuelwood as the beneficial effects of practicing agroforestry. Similarly in another study Ibrahim et.al. (2019), also identified some beneficial effects of agroforestry practices to include; income generation, provision of food, fodder for animal, source of employment, provision of medicinal herbs, serves as windbreak and way of making better use of land.

H. Constrains to Agroforestry Practice

Table 4 shows the result of constraints to agroforestry practice in the study area. Nine constraints were identified and they were ranked. The ranking showed that scarcity of labour to work on the farm ranked first with 77.00% of the

farmers identifying this as a problem militating against them practicing agroforestry. This was closely followed by 67.00 % of the farmers who claimed that high cost of improved agroforestry tree planting materials was a problem. Other constraints include; lack of capital (65.00 %), lack of credit facility (62.00%), poor soil fertility (57.00 %), inheritance system of land ownership (55.00%), high cost of fertilizer (52.00%), poor agricultural extension service delivery (47.00%) and theft of produce (40.00 %). These constraints identified in this study were similar to those reported by Ibrahim et. al. (2019) in their study. They reported that land tenure system, inadequate capital, unavailability of labour, poor access to extension services, poor yield and theft, poor soil fertility, high incidence of pests and diseases plus poor access to credit were among the constraints identified to be militating against agroforestry practices by farmers in New Bussa, Nigeria.

Table3. Importance of Agroforestry Practice in the Study Area

Importance of Agroforestry Practice	Strongly Agreed (4)	Agreed (3)	Strongly Disagreed (2)	Disagreed (1)	Total Score	Mean Score	Remark
Increases agricultural productivity	50(200)	40(120)	10(20)	0(0)	340	3.40	Agreed
Enhances farmers income generation	30(120)	30(90)	20(40)	20(20)	270	2.70	Agreed
Enhances farmers' access to agroforestry tree products	25(100)	25(75)	30(60)	20(20)	255	2.55	Agreed
Enhances the nutritional status of the farmers households	40(160)	30(90)	20(40)	10(10)	300	3.00	Agreed
Reduces land degradation due to deforestation	35(140)	30(90)	20(40)	15(15)	285	2.85	Agreed
Helps in the improvement of soil fertility	25(100)	30(90)	25(50)	20(20)	260	2.60	Agreed
Improves environmental sustainability	45(180)	30(90)	15(30)	10(10)	310	3.10	Agreed
Tree products use for local medicinal	40(160)	25(75)	20(40)	15(15)	290	2.90	Agreed

purposes							
Mean Total	290(1160)	240(720)	160(320)	110(110)	800(2310)	2.89	Agreed

Table4. Constrains to Agroforestry Practice in the Study Area

Constraint	Frequency	Percentage	Ranking
Poor soil fertility	57	57.00	5 th
Lack of capital	65	65.00	3 rd
Theft of produce	40	40.00	9 th
High cost of improved planting materials	67	67.00	2 nd
Poor extension service delivery	47	47.00	8 th
Inherited system of land ownership	55	55.00	6 th
Scarcity of labour	77	77.00	1 st
High cost of fertilizer	52	52.00	7 th
Lack of credit facility	62	62.00	4 th

IV. CONCLUSION

The study revealed that farmers in the study area are aware and were practicing different types of agroforestry system such as mulching of crops with forest products, retaining of trees on the farm, planting of trees along with arable crops, taungya farming system and alley farming. The study also revealed some importance derived from agroforestry practice by the farmers which include; increased in agricultural productivity, improved environmental sustainability, enhancement of nutritional status of the farmers households, improvement of health delivery through the use of medicinal herbs, reduction of land degradation caused by deforestation, enhancement of farmers income generation, improvement of soil fertility and enhancement of farmers' access to agroforestry tree products (AFTPs) which shows that agroforestry practice can be considered as a mean for attainment of food security in the study area and the country at large. However agroforestry practices is constrained by scarcity of farm labour, high cost of improved agroforestry tree planting materials, lack of capital, lack of credit facility, poor soil fertility. Inheritance system of land ownership, high cost of fertilizers, poor extension service delivery and theft of produce. The study therefore recommends that awareness of the importance of agroforestry practice should be made known to farmers through organizing workshops and seminars, radio programmes and community awareness campaign by the extension agents. Land should be made available to farmers by state government who owned all land based on the land act operated in the country, government and other stakeholders in food production sector should also rendered assistance in the areas of provision of credit facilities, exotic species, improved seedlings and subsidized agricultural inputs like fertilizer to the farmers.

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