



CONSTRAINTS FACING AGROFORESTRY PRACTICES AMONG FARMERS IN NEW BUSSA, NIGERIA

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ABSTRACT

*The study examined agroforestry practices and its constraints among selected farmers in New Bussa, Niger State, Nigeria. Data were collected using a well-structured questionnaire, personal interview and observations from the total of one hundred and twenty respondents. Descriptive statistics were used to analyse the data collected. Findings revealed that farming was male dominated with a mean age and family size of 41 years and 10 persons respectively. More than half (69.2%) of the farmers were literate with mean years of experience in farming being 14 years. The most common trees on the farmlands were *Vitellaria paradoxa*, *Mangifera indica*, *Parkia biglobosa*, *Azadirachta indica*, *Azalia africana*, *Detarium microcarpum* and *Vitex doniana*. Majority of the farmers were aware (70.8%) of agroforestry practices mainly through conservation education (32.5%) and forest guards (20.0%) to conserve economic trees and improve farm produce. Medicinal herbs (98.3%), Source of income (81.7%) and Source of food (80.3%) were the major benefit accrued to farmers from agroforestry in the study area. Constraints to agroforestry practices in the study area included limited use of farm machineries (75%), poor access to credit facilities (70.8%), fast growing nature of trees (68.3%), Land tenure (65.8%), Marketing channel (62.5%) and increase in population (56.7%). The study thus, recommended that extension agents from public and non-governmental organizations should enlighten farmers more on agroforestry through workshops and community awareness campaign and assistance should be given to farmers in form of credit facilities, improved seeds or varieties, and soft loans for enhanced production.*

Keywords: Agroforestry, Awareness, Benefits, Constraints, Conservation, Economic trees,

INTRODUCTION

Traditional agroforestry is variously referred to as indigenous agroforestry or ethno agroforestry. Traditional agroforestry started in prehistoric times when hunters and gatherers deliberately or accidentally dispersed seeds of highly valued fruit trees in the vicinity of their campfires. These seeds later germinated and grew to produce fruits for food and were managed in mixture of naturally grown timber trees and other herbal plants (Udofia, 2010).

Agroforestry is an effort at combining trees and shrubs with crops with emphasis on their mutual benefits to enhance diversity, productivity, profitability and sustainability of the land use system and hence the farmer. Agroforestry as a land

use system has been in practice for very many years and in most continents of the world. In the past century, there had been efforts to develop the concept of Agroforestry as science in order to appropriately quantify improvement in productivity of various crops and the soil as well as the cash flow in terms of profit to the farmer. However, Agroforestry is a land management system combining forest trees and food crops production with or without livestock in such a way that they are technically and financially feasible and will enable the small holder farmer to obtain high income and living standards while ensuring improvement of soil and the environment. Agroforestry is seen as a sustainable land management practice that can help to resuscitate lands and maintain live supporting

practices in the farm lands of the householder farmers in the sub-humid topics. It includes all practices that deliberately combine trees and shrubs with agricultural crops and/or livestock overtime or space. It is an age long technology which several civilizations have used to sustain their food production systems (Adeola, 2015).

Almost half of the world's agricultural lands have at least 10 percent tree cover, suggesting that agroforestry, an integrated system of trees, crops and/or livestock within a managed farm or agricultural landscape, is widespread and critical to the livelihood of millions of people. In fact, agroforestry is significant in the production of both local commodities (such as fuel wood, timber, fruit and fodder) and global ones (such as coconut, coffee, tea, cocoa, rubber and gum). It can also play a strategic role in helping many countries meet key national development objectives, especially those related to poverty eradication, food security and environmental sustainability. In towns and villages, its positive outcomes can be seen in food, fuel wood and watershed management, contributing to a more resilient food system (FAO, 2011).

Agroforestry serves to improve the resilience of farmers and increase their household income through the harvesting of diverse products at different times of the year. It also brings job opportunities from the processing of tree products, expanding the economic benefits to rural communities and National Economies. Agroforestry Systems can be conceived for spaces varying from plots to farms to landscapes. At plot level, farmers may combine nitrogen fixing trees with cereal crops. At farm level, they may plant trees in woodlots or along boundaries and at landscape scale communities may rehabilitate degraded areas through trees and other vegetation. Effective agroforestry systems make the most of positive interactions between their various components, so that the final product is more valuable than in the absence of trees, while the risks of failed harvests and dependence on chemical inputs are reduced. The potential of agroforestry to contribute to sustainable development has been recognized in international policy (FAO, 2011).

The intergovernmental panel on climate change (IPCC) increasingly acknowledges it as a component of climate-smart agriculture. During the 2011 conference of the parties (COP) meetings in Durban, agroforestry was frequently mentioned as having a strong potential for climate change adaptation and mitigation (FAO, 2013). In addition, the United Nations Convention to combat Desertification (UNCCD) acknowledges agroforestry's potential to control desertification and rehabilitation. It is therefore necessary to assess or investigate agroforestry practices and its constraints among farmers in New Bussa, Niger State, Nigeria.

Specifically, the study identified the personal characteristics of respondents, economic trees commonly found/grown on the farm in the study area, determined the awareness of respondents towards agroforestry, described the benefits of agroforestry in the study area and examined the constraints to agroforestry in the study area.

MATERIALS AND METHODS

Study Area

New Bussa is a town in Niger State, Nigeria. It is the new site of Bussa after the Kainji Lake dam set the previous location underwater. As of 2007, New Bussa had an estimated population of 24,449. New Bussa is the headquarters of the Borgu Emirate and the Borgu Local Government Area. New Bussa sits at 9^o53'N, 4^o31'E and the original town of Bussa was located about 40km North of New Bussa at 10^o13'51'N, 4^o28'31"E (altitude 561ft or 170meters) (The World Gazetteer, 2007). Agriculture is the main source of livelihood of the people, particularly indigenes and the town attracts non-indigenes as a result of Federal Government parastatals prevailing in the area.

Sampling technique and sample size

New Bussa was clustered into six areas: Senior camp, Main Bussa, General hospital Road, Ibadan way, Baptist Church side and Dogongeri. Snowball method was adopted to select twenty farmers from each of the clustered area. This gave a sample size of one hundred and twenty farmers (120).

Method of data collection

Primary data were used for the study. A well-structured questionnaire based on the objectives of the study was used to generate data from the respondents. (Head of households) personal interview and observations were also used to gather data from the farmers.

Method of data analysis

Data obtained from the farmers were analysed using descriptive statistics such as frequency, percentages and charts.

RESULTS

Personal characteristics of the respondents

The result entry in Table 1 indicates that the majority of the respondents (65%) were male while the remaining (35%) were female. This means that males dominated farming in the study area; this could be due to energy demand of farming, unemployment level and government campaign on back to land (Agriculture). 30% of the respondents were within the economically active age group of 31-40 years while the mean age of the respondents was 40.9years. This is similar to the mean age (41.62) of farmers recorded by Umunna *et al* (Ummuna *et al.*, 2018) in Igabi Local Government Area of Kaduna State. The greater proportion of the economically active age group could increase food security in the country. This age group according to Asiabaka (2002) is motivational, innovative and adaptive to agricultural innovations.

The majority (66.7%) of the respondents were married. The singles were about 20.8% while 8.3% and 4.2% were divorced and widowed respectively. The farmers could be expected to make rational decision towards agroforestry practices since they might be relying on the farm to provide for their family members. Onwubuya and Ajani (2012) affirmed that married people dominate agricultural production activities in Nigeria.

38.3% of the farmers had 6-10 members in their household while the average household size was 10 persons indicating a medium family size. Nwaru (2004) observed that large household size would help in reducing labour constraint in agricultural production. Most of the respondents (69.2%) were literate; they had secondary and tertiary education. United States Agency for International Development, USAID (2010) reported that the more educated a farmer is the more chances that the farmer would adopt innovations. This would help the farmers in understanding the concept of agroforestry.

4.2% of the farmers had 1-10years experience, 22.5% had 11-20years, and 33.3% had 21-30years of farming experience while the average farming experience was about 14years. This shows that appreciable proportions of the farmers were quite knowledgeable in farming and can easily perceive new improved ideas.

Table 1:- Personal Characteristics of the respondents

| Variables | Frequency (n=120) | Percentage (%) | Mean | Standard Deviation |
|-------------------------------|------------------------------|-----------------------|-------------|-------------------------------|
| Sex | | | | |
| Male | 78 | 65 | | |
| Female | 42 | 35 | | |
| Age | | | | |
| ≤30 | 28 | 23.3 | | |
| 31-40 | 36 | 30.0 | 40.91 | 15.03 |
| 41-50 | 22 | 18.3 | | |
| ≥51 | 34 | 28.3 | | |
| Marital Status | | | | |
| Single | 25 | 20.8 | | |
| Married | 80 | 66.7 | | |
| Divorced | 10 | 8.3 | | |
| Widowed | 5 | 4.2 | | |
| Household Size (Units) | | | | |
| 1-5 | 41 | 34.2 | | |
| 6-10 | 46 | 38.3 | 10.21 | 5.975 |
| 11-15 | 24 | 20.0 | | |
| 16-20 | 9 | 7.5 | | |
| Educational Status | | | | |
| No formal Education | 20 | 16.7 | | |
| Primary Education | 17 | 14.2 | | |
| Secondary Education | 33 | 27.5 | | |
| Tertiary Education | 50 | 41.7 | | |
| Years of experience | | | | |
| 1-10 | 53 | 44.2 | | |
| 11-20 | 27 | 22.5 | 14.4 | |
| 21-30 | 40 | 33.3 | | |

Source; Field Survey, 2018

Economic trees commonly found in the study area.

The results of questionnaire, personal interview and observations on the farms visited during research work revealed the following economic trees in the study area:- *Vitellaria paradoxa*, *Detarium microcarpum*, *Parkia biglobosa*, *Gmelina arborea*, *Tectona grandis*, *Azzeria africana*, *Anacardium occidentale*, *Mangifera indica*, *Lannea acida*, *Anogeissus leiocarpus*, *Azardirachta indica*, *Piliostigma thonningii*, *Nauclea latifolia*, *Grewia mollis*, *Ficus sychomorus*, *Leucaena leucocephala*, *Acacia spp*, *Khaya senegalensis* *Eucalyptus citriodora*, *Sterculia setigera*, *Terminalia mollis*, *Prosopis africana*, *Vitex doniana*.

The dominant trees are *Vitellaria paradoxa*, *Parkia biglobosa*, *Mangifera indica*, *Detarium microcarpum* and *Azzeria Africana*. The above result was similar to those trees identified by Etukudo (2000) in his book of forestry. These trees would serve the purpose of wind break, erosion control, soil stabilization source of food, medicine and income in the study area (Ibrahim *et al.*, 2018).

Respondents Awareness towards Agroforestry

Figure 1 revealed that 70.8% of the respondents were aware of Agroforestry practices in the study area, while 29.2% were not aware. The means of awareness (figure 2) was majorly through conservation education (32%) and forest guards (20%). This could be due to the protected area i.e., Kainji Lake National Park that surrounds the study

area. In this case public enlightenment could be given to the people on the need to conserve economic trees by farmers on their farms through the forest guards and park patrol team. The high awareness level could also be as a result of the educational level of the respondents. This

awareness result corroborates the report of Sulaiman *et al*, (2015) in his study of the awareness and use of information and communication technologies among extension agents in Kaduna State of Nigeria.

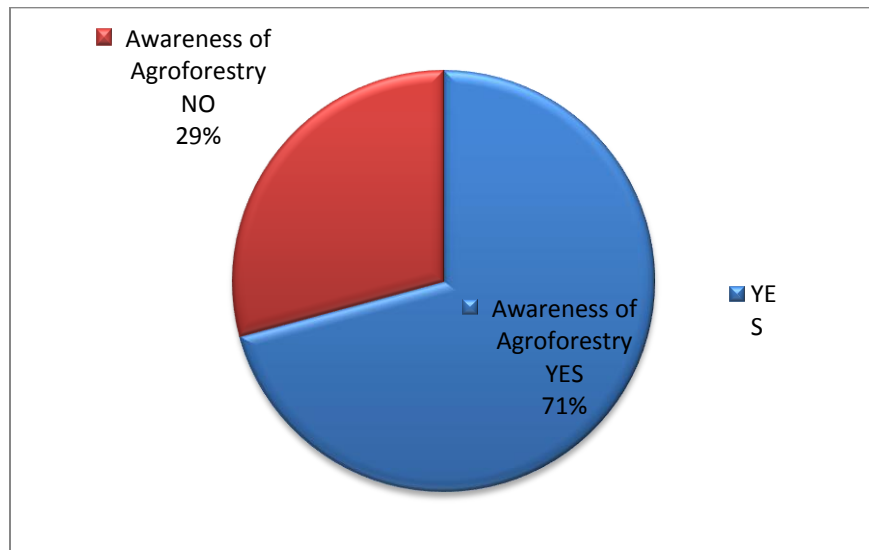


Figure 1: Awareness of Agroforestry in the study area

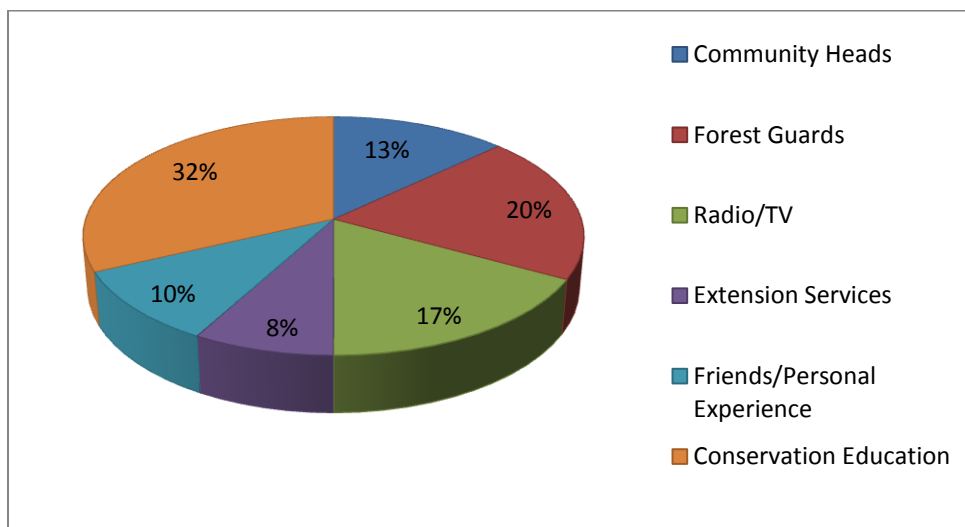


Figure 2: Means of Awareness

Benefits of Agroforestry in the study area

The results of the benefits of Agroforestry in the study area as presented in figure 3 revealed that agroforestry has several benefits to the farmers and their households as it cut across all the variables presented. Medicinal herbs had the highest percentage (98.3%), this is in line with the report of Aju and Uwalaka (2010) that “ever before the

introduction of Western drugs in Nigeria the people depended solely on plants, animals and mineral recipes for their medical care.

Adekunle (2005) also added that ethno medicine has gained much acceptance as the only alternative medicine by the poor due to lack of adequate medical personnel and the unaffordable cost of orthodox medicine in the rural area. However,

farmers who were involved in hunting and gathering of minor forest produce in the nearby forest for their livelihood stopped at the introduction of agroforestry and concentrated only on farming as agroforestry ensured good and cheap fodder for them which in turn increased the number of livestock. Sales from livestock and tree crops

produced on home garden agroforestry system in South Eastern Nigeria accounted for over 60% of family cash income (Robert and Tim, 2004). The percentage for others (4.2%) could be benefit such as shade for the farmers to rest after work or tiredness, shade for livestock, stake for yams or boundaries on the farm.

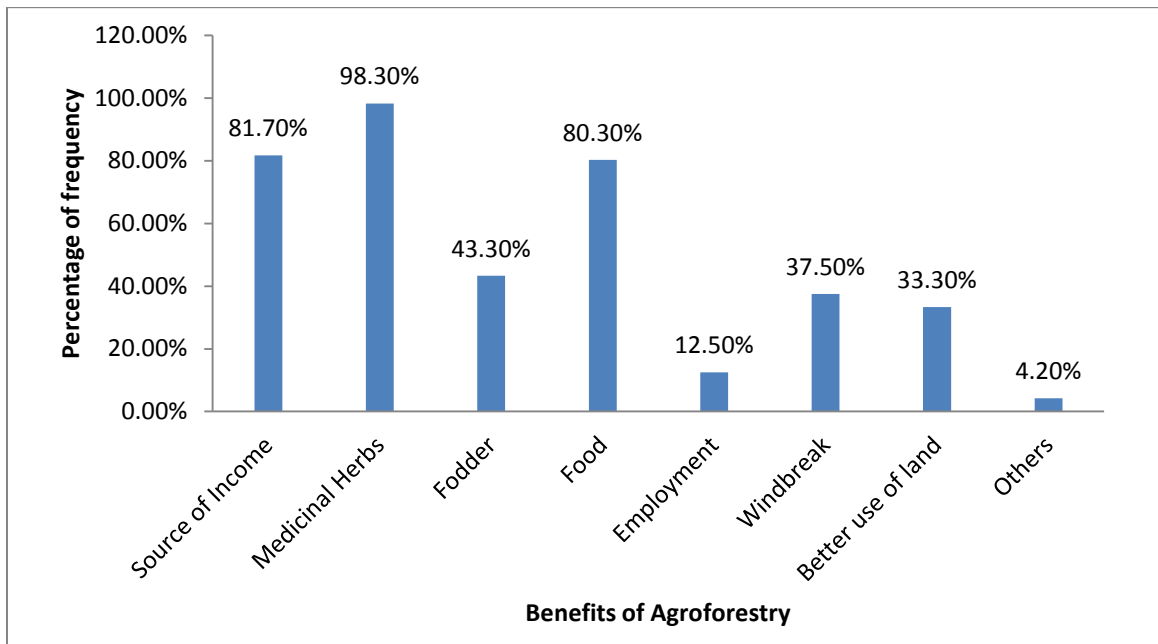


Figure 3: Benefits of Agroforestry in the study area

Constraints to Agroforestry Practices

The major constraints to agroforestry practices were limited use of machineries (75%), poor access to credit (70%), fast growing nature of trees (68.3%) land tenure (65.8%) and marketing channels (62.5%). Limited use of machineries could be due to inability of the farmers to afford the cost of purchase or hiring of machineries, hindrance from the roots of trees on the farm, small size of the farm due to land tenure system and technical know-how. Poor access to credit could be attributed to the fact that most farm households are not members of cooperative/ farm organizations and consequently may not have direct access to credit facilities and good price for products. Fast growing nature of trees form canopy or shades over arable crops planted by farmers which invariably lead to poor growth and yield. Land tenure system in our society is another challenge to farmers. Land owners a times feel reluctant to lease their land totally for farming, when released stiff conditions may be attached making it difficult for farmers to acquire

land. Marketing farm products, both agricultural and forestry produce are sometimes difficult for farmers. Distance from farm to market, transportation problem, bad road network, attitude of buyers trying to cheat the farmers, processing and storage problems are all marketing challenges facing farmers. It sometimes leads to waste of agricultural produce and consequently low income accrued to farmers who has laboured for long. This result is similar to the barriers to agroforestry development identified by FAO (2013).

Other constraints include inadequate capital (58.3%), this could affect the inputs of the farm, results from poor or low yield, inaccessibility to soft loans either from the government or non-governmental bodies and reduced standard of living of the farmers. Increase in population (56.7%) increases demand for available land leading to competition, industrialization and land scarcity for agroforestry. Unavailability of labour (50.8%) is another constraint, whereby educated and well-to-

do individuals who needs hired labour to farm large hectares of land are not able to get. High incidence of pests and diseases (50.8%) could be caused by incidence of climate change and the associated problem of excessive rainfall and drought. This could result to poor yield, low quality / market value and poor return to households (Mabel, 2015). The respondents perceived that the minor constraints to agroforestry were poor yield and theft (46.7%), poor access to extension service (41.7%), poor soil fertility (32.5%) and short growing season.

Poor yield and theft equally constitute constraints especially when the soil is not fertile and the stands located at unsafe places according to Mabel (2015). However, inefficient government extension services contribute to continue low yields of production in Nigeria because farmers are deprived of vital innovations that could improve their output. The above results corroborate the report of Ibrahim *et al* (2018) in assessment of Agroforestry practices in Kaiama Local Government Area of Kwara State.

Table 2:- Constraints to Agroforestry Practices

| Constraints | Frequency | Percentages (%) | Ranking |
|--------------------------------------|-----------|-----------------|------------------|
| Land tenure | 79 | 65.8 | 4 th |
| Inadequate Capital | 70 | 58.3 | 6 th |
| Increase in Population | 68 | 56.7 | 7 th |
| Unavailability of labour | 61 | 50.8 | 8 th |
| Poor access to extension services | 50 | 41.7 | 11 th |
| Marketing Channel | 75 | 62.5 | 5 th |
| Poor yield and theft | 56 | 46.7 | 10 th |
| Fast Growing nature of trees | 82 | 68.3 | 3 rd |
| Short Growing Season | 33 | 27.5 | 13 th |
| Limited use of Machineries | 90 | 75.0 | 1 st |
| Poor Soil fertility | 39 | 32.5 | 12 th |
| High incidence of pests and diseases | 60 | 50.0 | 9 th |
| Poor access to credit | 85 | 70.8 | 2 nd |

CONCLUSION

The study has shown that majority of the farmers were aware of agroforestry in the study area mostly through conservation education.

Agroforestry is an alternative cultivation strategy that has been adopted by some farmers in the study area. Tress and shrub retained on the farm lands in the study area grew as wild plants, although few were consciously cultivated (such as *Gmelina arborea*, *Tectona grandis*, *Mangifera indica*, *Anarcadium occidentale* *Azardirachta indica* and *Khaya senegelensis*) by indigenous farmers as integral part of the rural farming systems in the study area. The practice of agroforestry tends to increase and improve forest resources, farm produce and health delivery through medicinal herbs which constitute the rural economy. Despite the benefits and goodness of agroforestry the farmers were constrained by limited use of machineries, poor access to credit facilities, fast growing nature of trees, land tenure system, Marketing difficulties, inadequate capital, poor access to extension

services, high incidence of pests and diseases. These could be overcome through the following recommendations.

Recommendations

- (1) Extension agents from public and non-governmental organizations should build requisite knowledge and skills of farmers on agroforestry practices. This can be achieved through workshop, radio programmes and community awareness campaign.
- (2) Land tenure system should be removed through land decree policy, enforced by the government and make land available to interested farmers.
- (3) Assistance should be made available by the government and non-governmental agencies to farmers through the provision of credit facilities, exotic species, improved

seeds/varieties, improved marketing channel and rural infrastructural development.

- (4) Soft loans should be put in place for farmers by government and non-governmental organizations to improve their farming and standard of living.

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