ANALYSIS OF AGRO FORESTRY FARMERS (TREE-PLANTING) IN GIWA LOCAL GOVERNMENT AREA, KADUNA STATE, NIGERIA.

BY

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(M.SC/AGRIC/03479/2006-07)

THESIS SUBMITTED TO THE POSTGRADUATE SCHOOL, AHMADU BELLO UNIVERSITY, ZARIA, IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF THE DEGREE OF MASTERS OF SCIENCE IN AGRICULTURAL EXTENSION AND RURAL SOCIOLOGY,

DEPARTMENT OF AGRICULTURAL ECONOMIC AND RURAL SOCIOLOGY.
FACULTY OF AGRICULTURE, AHMADU BELLO UNIVERSITY, ZARIA.

DECEMBER, 2011

DECLARATION

I hereby declare that this thesis entitled: "Analysis of Agro Forestry Farmers (Tree-Planting) in Giwa Local Government area, Kaduna State, Nigeria." was written by me and it is a record of my own research work, except where reference is made to published literature and duly acknowledge. No part of this thesis was previously presented before for another degree or diploma at any University.

_____ _____

Usman Kabir Date

The above declaration is confirmed

CERTIFICATION

This thesis entitled: **"Analysis of Agro Forestry Farmers (Tree-Planting) in Giwa Local Government area, Kaduna State, Nigeria."** by Usman Kabir meets the regulations governing the award of degree of masters of Ahmadu Bello University, Zaria, and is approved for its contribution to scientific knowledge and literary presentation.

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To my beloved mother, Sa'adatu Yusuf, and brother and sisters, Abubakar, Hadiza and Fatima, for their patience, love and support during the study.

ACKNOWLEDGEMENTS

I would like to express my profound gratitude and special appreciation to my supervisors, Dr. M.O. Akinola, and Dr. M.W. Musa for their advice, guidance, patience, constructive criticisms and useful suggestions in the course of the study. The assistance benefited from all the departmental lecturers and non-academic staff is also appreciated.

I sincerely acknowledge my indebtedness to Professor D.F. Omokore, the Head of Department of Agricultural Economic and Rural Sociology for his tireless efforts in seeing my progress during the study period. Similarly, I appreciate the editing work of Professor Shehu Abdulraham at one stage of the research or the other.

Above all, I praise the name of the Almighty Allah for the wonderful opportunity and privilege to complete the study.

ABSTRACT

The purpose of this study was carry out on Analysis of Agro Forestry Farmers (Tree-Planting) in Giwa Local Government area, Kaduna State, Nigeria.. The specific objectives were to describe socio-economic characteristics of agroforestry farmers in the study area, identify the types of trees that are commonly planted by the farmers and for what purpose, describe the socio-economic and ecological benefits derived by the farmers through tree-planting as an agroforestry in the study area. Data collection for the study was through the administration of questionnaires to one hundred and twenty (120) farmers selected which involved eight (8) villages purposively selected out of twenty villages within Giwa Local Government Area (L.G.A.). The information obtained from the respondents include socio-economic data (age, sex, educational status, household size, farming experience, farm size membership of cooperative society and marital status), types of tree that are commonly planted by the farmers and for what purposes, the socio-economic and ecological benefits derived by the farmers using agroforestry practice and the constraints militating against tree-planting as an agroforestry. The age of respondents ranged from below 30 years to 60 years and above with a mean of 40 years, while the average household size consists of 13 people. About 97.5% mostly plant neems, while only 8.3% plant mahogamy. The socio-economic and ecological benefits derived by farmers from the planted trees in order of priority include, firewood, shelter against wind, provision of shades, soil conservation, livestock feed, employment opportunities, erosion control as well as for recreation. The major constraints militating against tree-planting as an agroforestry practice include unavailability of tree seedling (94.40%), watering problem (73.40%), lack of credit facilities (68.20%), insufficient capital (66.50%), poor sources of information (54.50%), high pest and disease infestation (52.30%) and fencing problem (12.50%). In conclusion farmers need education and training in forestry/agroforestry practice. The farmers should be supplied with tree seedling. Tree planting/agroforestry should be introduced at primary, secondary school and at higher institutions of learning, political and religious leaders to initiate community tree planting as an agroforestry projects that could served as demonstration to farmers.

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CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

The increasing population pressure on natural resources due to increased demands for food and wood for different purposes has made it difficult for the life supporting systems such as vegetation to keep pace with these demands substantially the need for fuel wood, which is the only source of energy in the rural areas. Consequently, trees are hewn down for fuel without replacement, thus leading to exposure of land to erosional driving forces of wind and water. (Abalu, 1988).

However, this has lead to the introduction of Agroforestry/forestry component into some states Agricultural Development Projects (ADPs) as early as 1975. Agroforestry is seen as the potential to increase the overall yield from the land through the combination of forest trees with crops or with domestic animals or both, either in time or space, and yet prevent environmental degradation, while providing both food and forest productions and services. Agroforestry is a system of land use where woody perennial (trees or shrubs) are deliberately inter planted with animal crops and at the same time animals are reared on the same piece of land with the aim of obtaining greater outputs. Agroforestry enable the farm to remain productive throughout the entire year, resist plaques and infestations that monoculture cannot and minimize soil erosion (Young, 1998).

Furthermore, in order to further accelerate aforestration or tree-planting particularly in giwa local government area of Kaduna State, this make the international institute for Tropical Agricultural (IITA) in 1995 decided to pilot a tree-planting programme in the area. This was done in an to reduce deforestation which is dangerous to mankind and the environment. Also the

traditional shifting cultivation and bush fallow system, relied on the ability of trees and shrubs to regenerate nutrients to the top soil for animal crop production.

1.2 Statement of Problem

In Nigeria, over 75% of the population resides in the rural areas and more than 70% of rural inhabitants are farmers (Azeez, 2002). According to FAO (1999), Nigeria forest is a meager 17,800 hectares, the population is growing at the 2.9% annually and 2.8% of these forests are disappearing yearly. Only 1.3% of Nigeria's land stand of undisturbed forest land area at 1995 (Akinsanmi, 1999). This cannot meet the demand of a population that is growing appreciably. The need to combat deforestation is therefore imperative.

In Giwa Local Government Area of Kaduna State, the natural vegetation of the area has been adversely affected by the continous indiscriminate felling of trees, past cultivation, fire and grazing. As a result of this, and the recent increase in the rate of fuel-wood extraction due to high costs of alternative sources of domestic energy (kerosene, gas and Electricity). It will be difficult for the area to meet its fuelwood needs in the near future unless appropriate measures are taken.

An efficient way of combating this problem in the area is the practice of agroforestry with respect to tree-planting or afforestation which should be backed up with judicious forest management. It is in view of this that, this research will specifically address the following research questions.

i. What are the socio-economic characteristics of agroforestry farmers in the study area?
ii. What are the types of trees that are commonly planted by farmers and for what purposes in the study area?
iii. What are the socio-economic and ecological benefits derived by farmers through tree-planting in the study area? and

iv. What are the constraints militating against tree-planting in the study area?

1.3 Objective of the Study

The broad objective of the study is to assess tree-planting as an Agroforestry practice in Giwa Local Government Area of Kaduna-State: The specific objective are to:

i. describe the socio-economic characteristic of agroforestry farmers in the study area;

ii. identify and describe the type of trees that are commonly planted by the farmers and for what purposes.

iii. describe the socio-economic and ecological benefits derived by the farmers through tree-planting using agroforestry practice.

iv. identify the constraints militating against tree-planting as an agroforestry planting.

1.4 Justification of the Study

The need to study agroforestry for sustainable agricultural production become imperative. This is because agroforestry frequently offers not only a sustainable balance of productivity between wood and food, but also an increase in total productivity per unit area of land. When the environmental costs of flooding and erosion, for example, are taken into consideration, the economic merits of agroforestry become more apparent.

This study was borne out of the need to know the current state of agroforestry practice in Giwa Local Government Area of Kaduna State, with a view to promoting agroforestry as a viable technology for improved livelihood of rural farmers and to make available, useful reference materials for students, researchers and policy makers on sustainable agricultural production.

CHAPTER TWO

LITERATURE REVIEW

2.1 The Concept of Agroforestry

Agroforestry is a system of land use where woody perennial (trees or shrubs) are deliberately inter planted with annual crops and at the same time animals are reared on the same piece of land with the aim of obtaining greater outputs. Furthermore, agroforestry enable the farm to remain productive throughout the entire year, resist plagues and infestations that monoculture cannot and minimize soil erosion. The microclimate within the farm is modified and minerals are recycled through natural processes that include organic matter from dead leaves branches and manure from livestock. Yields are diverse and include nutritious fruits, forage, fuelwood, construction poles, timber, resins etc. This diversity of products makes the farmers more self sufficient and protect him from the market fluctuations which are disastrous to small farmers producing only one kind of product. (Young, 1998)

According to mendie, (2004), agroforestry is only another word for age-old land use systems where forestry, Agriculture and pastoralism are practiced in combination. Shifting cultivation was successful in the past but due to increase in population, fallow periods have shortened and the soil lose its fertility and is becoming ineffective. Modern agroforestry takes traditional farms of land use into consideration and applies newly acquired knowledge in order to improve land use practices.

Kang (1991) referred to agroforestry as the intercropping of woody species with annual crops. He defined it as a collective name for land use systems in which trees are grown with agricultural crops and/or pasture and livestock; either in a spatial arrangement or a time sequence

and in which there is both economic and ecological interaction between tree and non-tree components of the system.

2.2 Agroforestry Systems and Practices

The words "system" and "practices" are often used synonymously, in agroforestry literature. However, some distinction can be made between them. An agrofoestry system is a specific local example of a practice, characterized by environment plant species and their arrangement, management, and socioeconomic functioning. An agroforestry practice denotes a distinctive arrangement of components in space and time. It should be noted that both the systems and the practices are known by similar names; but the systems are (or ought to be) related to the specific locality or the region where they exist, or other descriptive characteristics that are specific to it. (ICRAF, 1990).

2.3 Classification of Agroforestry

Various classifications of agroforestry have been made by several authors based on the different attributes of MPTS in farming. Mac Dicken and Vergara (1990) classified agroforestry on the basis of use; while Momodu (1997; 1998) classified based on tree type, origin and function. The commonest classification today which is based on the three components of the agroforestry system (trees, arable crops and livestock) as adopted by Kang (1991) and Kang et al (1991) classifies agroforestry system into three broad systems: agrosilvicultural system, silvopastoral system, and agrosilvopastoral system.

2.3.1 Agrosilvicultural System

This is a mixture of annual crops and woody perennials. It involves all combinations of trees and shrubs with arable crops, for food production and

environmental protection. The system has been in practice in the tropics for centuries. (Young, 1989). The system includes

i. Bush Fallow

This is a common traditional cropping practice in Nigeria and most tropics. Land under natural vegetation is cleared, cropped with agricultural crops for a few years and then left untended while the natural vegetation regenerates (Nair, 1993).

During clearing, useful trees and shrubs are left standing and are often lightly pruned and serve as support for climbing species. The cultivation phase is two to three years with a regeneration phase between ten and twenty years. However, this regeneration phase is becoming progressively shorter due to population pressure.

ii. Multi-Storey Cropping

This is the cultivation of several species together it is a cropping system where timber trees and herbaceous plants are combined in a dense, mixed and usually irregular arrangement (Young, 1995). It can be established on steep slopes, hence making productive use of slopping valley-side land.

iii. Shade Trees for Plantation Crops

In this system, trees and shrubs are grown to shade tender crops of high value, which require a cool environment; for instance cocoa and coffee plantations.

iv. Shelterbelts and Windbreaks

Windbreaks are narrow stripes of trees, shrubs and/or grasses, planted to protect fields, homes canal and other valuable areas from the wind and blowing sand (Nair, 1993). Shelterbelts are long, multiple roles of trees and shrubs along seacoasts, or in areas where wind is a major cause of soil erosion and moisture loss to protect the environment.

v. Alley Cropping

This is an agroforestry practice, in which trees and shrubs (preferably fast growing leguminous species) are established in hedgerows (Kang, 1993), Arable crops are then planted in the alleys formed between the hedgerows.

2.3.2. Silvopastoral System

This is a system that combines pasture land, livestock and woody perennials. It is a specialised livestock production system, mostly on a large scale. The system includes the following practices:

i. Fodder Bank

This is a storage facility in which already processed and packaged forages are kept for use during periods of scarcity of natural feeds. The forages are usually dry and in bale forms and are given to animals.

ii. Living Fences and Fodder Hedgerows

Living fences are trees and shrubs planted to restrain the movement of farm animals beyond certain boundaries. They are often made of forage MPTs serving as livestock feed. Fodder hedgerows are planted on the farm as a source of feed for livestock, especially in dearth period.

iii. Trees and Shrubs on Pastures

It is customary to retain indigenous trees on a pasture or plant trees and shrubs to provide shade for the animals while grazing. Such trees and shrubs could also serve as a valuable source of fodder if well selected.

2.3.3 Agrosilvopastoral System

This is a combination of annual crops, pasture, livestock and woody perennials. When the trees are arranged into hedgerows, it is called alley farming.

i. Tree-Livestock-Crop Mixture

In this practice, MPTS and livestock are combined with arable crop production. The crops could be used as livestock feed or used as independent products, while their residue is used as feed. Tree primings also provide useful fodder.

ii. Integrated Production System

This is a specialised livestock production system containing trees, pasture and livestock. The trees are combined with livestock either for direct grazing or hay and silage making.

2.4 Tree Species for Agroforestry Practice

Agroforestry usually refers to multipurpose trees (MPTs) or multipurposetrees and shrubs (MPTS) (Nair, 1993). Important groups include fruit trees, fodder trees and fuel wood species. Though all trees are multipurpose, in the agroforestry context MPTS are those trees, which are deliberately kept and managed for more than one preferred useful product and/or service. The intention or cultivation of these trees is normally economically, though sometimes ecologicallymotivated. MPTS aremanaged for the following major reasons:

i. Fodder Trees

A large number of tropical shrubs are traditionally known for their fodder. Protein is their main nutritive role in animal nutrition. They are of special significance because of their presence during day serious when grasses may be lacking or in states of extremely low nutritive value; pod-producing MPTS may become a very useful source of energy and protein concentrate.

ii. Fuel wood Trees

Though any woody material can be used for fuel wood, the term fuel wood crop refers to plants suitable for deliberate cultivation to provide wood for fuel in cooking, baking and roasting.

iii. Fruit Trees

The indigenous farming systems in Africa often include fruit and non fruit-producing trees. These are common components in home gardens. The fruit trees are usually adapted to local conditions and are important to diet and are a valuable component of the economy.

2.5 The Prospect of Agroforestry Practice

Igboanugo (1995) stated that agroforestry as an important aspect of land resource management provides man with his needs viz: fuelwood, building materials, food from plants, livestock and games, herbal medicines, revenue to meet other needs protects the environments, thereby reducing environmental degradation and is useful in the rehabilitation of degraded sites. If all farmers are motivated to practice agroforestry based on scientific principles, a congenial environment would have been created for achieving continued and sustainable social and economic development that would cut across all spectra of the society.

Agroforestry if accepted, could be a sustainable substitute for shifted cultivation. This is because it ensures continuous production practices over a givenunit area of land as land becomes more unavailable to the farmers. Agroforestry enables the farmer to maximize the use of farm holdings through continuous cropping without following or through organized fallow use without degrading the soil. Land is a major factor of agricultural production. Therefore, protection of soil from deterioration reduces costs of fertilization by chemicals, ensure soil rehabilitation and increases or stabilizes farm yields. (Osemeobo, 1993).

Kerkhof (1990), stated that through agroforestry farmers obtained edible fruits, oils vegetables, fodder, herbal medicines, fuelwood, fiber timber and honey from the agroforestry woody perennial of the system. Other benefits include, protection of agricultural lands from soil erosion, soil fertility enhancement and sustenance through nutrient cycling by the woody perennials, the economic advantages of extra revenue earnings from the tree crop component over farming systems devoid of trees in croplands, trees are either scattered individually or clustered in small groups primarily to provide shade and produce fuelwood. In some areas are so arranged to form windbreak to protect their food crops.

2.6 The benefits of trees

An agroforestry system generally speaking combines at least two of the following components: trees, crops and animal in an optimal fashion. The component influences each other and the wider environment. Trees play both ecological as well as economic roles in a farming system. Trees are the source of wide variety of potential benefit as well as providing edible fruits and pods, animal fodder, building Materials, honey, latex and resin. The trees and their products can also be harmful in certain circurnstances. The benefits include: -

(a) **Soil conservation:** The trees protect the soil against water. The foliage reduces the speed of rain drops and gives more time to the soil to absorb the water. This way the run off and consequently surface water erosion is eliminated and water in the soil is increased.

Trees protect the soil from wind erosion. The foliage reduces the speed of wind in dry season and prevent surface erosion which could remove valuable top soil in form of dust-storm.

(b) **Soil improvement:** Trees sustain nutrient cycling and increase soil fertility through humus production. Trees deep root system take up nutrient from the deeper layers of the soil. A considerable amount is stored in the biomass of trees, which in time will become available lo oilier species. Deep rooted trees can penetrate compact and hard soils layers. This increases the porosity thus improving the water holding and infiltration capacity as well as aeration 6f the soil, some trees have the capacity to make nitrogen available in the soil. This I important nutrient is taken from air and with the help of bacteria and fixed in nodules on the roots of leguminous trees examples, Leucaena, Gliricidia, Erythrina. Prosepis and Alnus.

(c) **Agricultural crop improvement:** When trees and crops arc grown together on the same piece of land there will be interactions between the two components, which may have positive or negative result. Trees incorporated in agroforestry moderate climatic characteristics such as wind speed, temperature, humidity and high intensity. Trees store water in their crowns, which increases the availability of water to plants in the undergrowth. The crops benefit from trees resides deposited on the ground or mixed in the soil. On the other hand, tree crown block out a large part of the sunlight and the shallow roots of trees compete with crops and pastures for water and nutrient. Trees occupy space which could be used for other plants. Some trees produces certain toxic substances ion their roots or foliage that inhibit the growth of herbaceous vegetation etc. Also (he micro climate which trees create is beneficial to the animals that roam beneath the tree crowns. Animal can browse on trees and shrubs to supplement their usual diet.

(c) **Wood and other products:** From the trees the farmer can acquire timber, poles, fuel wood, gum, fodder and fruits that can either be used to satisfy household or alternatively as a cash crop. The great advantage for wood as a cash crop is that the farmer can keep the trees when practice is low until the market condition become favourable.

(e) **Recreation:** The trees create a pleasant environment either for work in the farms or for recreations in village woodlots or alleys or even in the house yards. They can also cover or hide ugly sites such as quarries or rubbish dumps and beautify the scenery.

(f) **Employment opportunities:** Trees cultivation increases the employment opportunities and incomes. Wood products can be put into the market or can be further worked out into tools-handles, wooden boxes, beams, wood caving, charcoal etc by individual or group of farmers.

Agroforestry can be feasible in both a market situation as well as for farmers operating at subsistence farming is being done, introducing agroforestry should not lead to any drop in yields of usual crops. It may be advisable to start with small amount of fast growing multipurpose trees and trees should be planted at the edge of field to prevent competition for sunlight, nutrients and water.

2.7 The Socio-Economic factors that affect the practice of agroforestry

Budowski G. (1993) stated that farmers have multiple criteria for assessing new technogies, including economic profitability, risk, contribution to food security, time taken to see return on investment and labour requirement. Poorer farmers also face serious overall resource problem, which limit their ability to invest even in highly profitable agroforestry systems, particularly given poorly developed credit and land markets. There is often a limited supply of

family labour, land and capital which must be spread over a large number of substance, investment and income earning activities and farmers prefer lower input systems, even if those are not the most profitable.

Lindell (1997) stated that the socio-economic factors include object poverty, population pressure, week institutions, and uncontrolled development for instance Government policy on prices of inputs such as fertilizers, seedlings and food crops were the major factor affecting the practice of Agroforestry other things include the management capability of farmers, labour cost for establishing and maintaining the system as well as the costs of seeds or seedlings.

Wangsadigaga and Ismanto (1991) both sees the socio-economic factors that affect the practice of agroforestry are illegal wood gathering, unrestrained livestock grazing, illegal land occupancy. An increasing commercial orientation within the forest community regarding forest products. The extensive clearing by shifting cultivators, over exploitation by concessionaries, and forest fires. An expanding population has increased demand for forest land and forest products. The level of awareness concerning the need for conservation and protection of the environment are low. Government regulations are difficult to enforce, and commonly conflicts of interests arise between and among local people, the forestry sector, and other development sectors.

Southgate, (1992) stated that in certain parts of Africa land tenure rules specifically forbid the practice of agroforestry, for example, the planting of trees, the incentive for investing in soil fertility improvement for future use of the land is low unless the benefits accrue to the tree planter. At a site in southeast Nigeria, communal control of land rotation, as well as seasonal redistribution of land which is commonly held, were identified as factors that affect the practice of agroforestry.

Jaiyeoba (1996) said lack of fund to provide loans, credit or subsides that could help poor farmers who wish to practice agroforestry hinder the success of in most rural areas. Most of the farmers operate at subsistence level because they lack the capital to cultivate on a large scale and their local authority has done nothing to improve agroforestry, lack of co-ordination between forestry, agriculture and other government department that work with farmers contributed to the factors that affect the practice of agroforestry, for example, local farmers find it difficult to get young tree seedlings. Also, the land use system discourage tree planting majorly on farms own by Absentee landlord and managed by tenants. The landlord forbids the farmers to plant trees on their farm the marketing facilities and pricing policies are inadequate and poor for the forestry products. This has gone a long way to discourage farmers from practicing agroforestry.

Evidence have shown that, nearly all the tropical forests lie within developing counties are characterized by high population growth and low level of income. In these zones, alternative uses to meet the needs of the expanding population are necessary and these alternative uses are heaped on forests because the people are poor. The forests destroyed for food crop cultivation, grazing and bush fire in the face of rapid population growth and ever present poverty without any commensurable replacement for centuries had greatly modified the original vegetation in the arid and semi-arid zones. This slow and steady irreversible destruction of the plants lover leading to the formation of new desert landscapes, and the resultant harsh environment which causes bodily discomfort to both man and livestock, need urgent action to halt it. Indeed, a large number of other socio-economic factors can be identified as extremely important in the social context of agroforestry introduction and development, are local use and knowledge, local organization and participation in tree management, off-farm and on-farm income, food security and human

nutrition, and gender and age of farmers are some such issues that are commonly deemed are critical (Donovan, 1989).

Rose (1986) stated that land tenure systems that do not guarantee continued ownership and control of land are not likely to be conducive to the adopted of longer-term strategies (and relatively short-term practices that include benefits which will only be realized in the long run) such as groforestry. Secure and rights, in particular, have proven pivotal in determining whether to agroforestry or not.

Messer (2003) the social economic factors includes demand for product and services, markets access and information, infrastructure (road, irrigation and so on), access to capital and credit, off-farm alternatives, and tree tenure, restrictions to access (such as in protected areas). Household-to-household variations, including availability of labour and unwillingness to take risks, policies, incentives and restrictions, germplasm access, knowledge, awareness and extension, communication and knowledge management, health issues are very important, including the impact of HIV/AIDs on household and health care expenses. Gender issues, local institutions and social conflicts.

Hoskins and Dixon (1994) both sees the socio economic factors that affect agrofoerestry practices are that even though some farmers are aware of agroforestry technology. There is however a widespread resistance to radical changes in farming techniques, especially where these require a high input of labour for obvious and entirely rational reasons, farmers tend to prefer small, gradual changes in their farming method. And unless they are convinced of new techniques, they are unwilling to take any major risk in trying them out. Agroforestry as a special farming practices demands changes in the labour practices of the farming system into which they introduced. This implies that labour requirements must be scrutinized by farmers before they

decide whether or not to be adopt the practice. Labour strategies to use input of various family members have been developed for use at various times of the year for different tasks. Additional labour for persons already fully occupied at the peak of the seasons already fully occupied at peak of the season is considered more costly than when the additional demands came at the black period. For example, alley farming is labour-intensive with much of the demands occurring in the busiest period of the year. During this period the cost of production will increasing considerably if additional labour must be hired. Additional labour demanded for alley cropping at labour peak periods could increase the cost of production.

Dove (1992) in the developing world, evidence shows that government regulations, preferences, perceptions and preconceptions affect the success of almost any activities involving people. It is often assumed that foresters understand the population they govern, in the rural areas, this assumption is not always true.

2.8 Constraints to Agro-Forestry Practices

Farmers face a number of constraints that hinder them from practicing agroforestry. These include lack of awareness and poor knowledge on improved follow is most critical compared to other problems. This is followed by lack of interest to practice agroforestry, for example, like tree planting, the long time it takes to realize benefits from trees, as farmers have to wait for two years before getting benefits from improved follow and lack of seeds/seedlings. (Ajayi, 2003).

Kwesiga, (2003) Revealed that, there were no effective by laws against livestock grazing and burning. The effectiveness of by laws against browsing varies depending on the type of cultural community involved and the level of agro-pastoral farming. Lack effectiveness of the by laws was due to lack of understanding of the exact provision of the by-laws by various

components of the community. There is also the problem of insecurity of tenure over land influences the practice process of agricultural technologies negatively. Livestock grazing is becoming a serious problem because of the land tenure system in which land is communally owned and free livestock grazing.

Jaiyeola, (1996), stated that, lack of coordination between forestry, agriculture and other Government department that work with farmers contributed to the failure of agroforestry practice. For example, the local farmers find it difficult to get young tree seedlings. Also, the land use system discourage tree planting majorly on farm area owned by absentee landlord and managed by tenants. The landlord forbids the farmer to plant trees on their farm. Moreso, inadequate road network make it difficult for extensionist to reach the farmers needs, that is educate the illiterate farmers and provide farming facilities for them. Agroforestry extension has not been well packaged to the farmers. Theagroforestry systems, which the farmers practice are the ones they inherited from their father. Extension has not introduced any improved system to them.

Agroforestry reduces water erosion to the lower levels through ground-surface litter cover. The litter cover reduces the tearing effect of raindrop impact on the soil and also checks runoff which carries away most of the organic matter on the soil surface. Trees root systems intercept, absorb and recycle nutrients in the soil that would otherwise have been lost through leaching thereby making a more closed nutrient cycle. The basis of this, is that because of their deep roots, trees are able to absorb nutrients from soil depths that shallow roots cannot reach. That is, nutrients in deeper soil horizons, that are unavailable to shallow rooted crops, are taken up by deep-rooted trees and deposited on the soil surface through litter fall. (Chowdry, 1985).

2.9 Theoretical Framework

Theory is a set of abstract and logical composition with attempts to explain relationship between phenomena on untested assumption about realities. Social theories serve general principle put forward to represent faces and events of social realities in the society. The theoretical framework for this study will be social change and modernization theory. This is expected to form the basis for empirical analysis for the proposed study.

2.9.1 Theories of Social Change

Social change can be said to be a state of dynamism that precludes stagnation, which if well managed and directed, always implies progress development, and functioning of a social system. Ekong(2003) further summed up social change as a significant modification in human attitudes and behaviour pattern as a result of education, and alteration in social condition as a result of changes in the policies of a social organization, including consequences and manifestation of such changes.

Strauss (1959), stated that the essence of human life is change in development and growth. However, the process of change involves interaction and so individual must be understood in terms of the group in which they belong or participate. Zaltman et al (1972), describe change in social and economic life style and values of people, technological innovation and social institution. Merton (1968), defined social change as the process through which alteration occurs in the structure and function of a social system. Jibowo (2000), defined social change as any change in ideas, values norms, social roles, habits, obligation of people, or change in life-style, life goals, chances, environment, or in the composition or organization of their society.

Rogers (1995), said social change can be planned or unplanned. Planned change entails the direct human intervention in the shaping and direction of change toward some predefined goals. When a state government introduces free education or agricultural revolution or land reforms, these changes are planned in advance to realize certain known goals. Accidental or unplanned change is that which happens suddenly-usually through the act of nature, thereby affording man no chance to plan before it occurs. Earthquake, flood, locust infestation, lighting blast are all good examples of agents of un-planned change. In planned change, the goals are clearly defined, the means for their achievement are known and appropriately selected and uncertainly is minimized. Unplanned change on the other hands is usually very costly, as it carries with it none of these desirable attributes.

However, this study, was guided by the theory of social change, which assists in analyzing the changes in agriculture with reference to the introduction of agro forestry, which is referred to as land management techniques. Thus implies the combination of forest trees with food crops or domestic animals or both and applies management technique that are compatible with the cultural practices of the local population and sound environmental conditions. The combinations may be either simultaneous or staggered in time or space, the goal being to optimize per unit area production while at the same time respecting the principle of sustained yield. Agro forestry is a planned change because it deliberately seeks to increase the overall yield from the land through the combinations of forest trees with crops or with domestic animals, or both, either in time or space, and yet prevent environmental degradation, while producing both food and forest production and services.

2.9.2 Modernization Theory

Modernization is the process by which individuals change from traditional way of life to a more complex technologically advanced rapidly changing style of life (Rogers, 1983).

Modernization denotes a total transformation of traditional or pre-modern society into types of technologies and associated social organization which characterize the advance economically prosperous and relatively politically stable nation of western world. There are several attempts that have been made to interpret and explain the nature and process of change in the rural sector. (Moore, 1983)

According to Rogers (1971), modernization theory based on social change is a process in which new ideas and alterations occur in the structure and function of social system. The modernization theory is the theoretical assumption underlying the planning and execution of change programmes in most developing countries. This approach focus on the premise that will occur when there are changes in technology, level of capital investment and market demand, the approach further stresses that to achieve the goals of change programmes such as modernizing agriculture, close attention must be paid to the attributes of innovations and socio-economic characteristics of clients (farmers).

In this approach emphasis is on changes that could lead to increased production in agriculture. However, modernization of agriculture could create and unbalanced development and affect the welfare of the people as exemplified by green revolution in Asia, America and some parts of Africa.

In these instances, the practice of agroforestry as a modernization strategy in agricultural production was based on the assumption that the programme was designed to increase agricultural production and to resolve the problem of welfare or social equity and increase

agricultural production. Agroforestry seeks to explain the process by which the innovation has the potential to provide rural households with food, fodder fuel wood and other tree products. At the same time the innovation has help to ensure and sustainable productivity of the natural resource base by enhancing soil fertility, controlling erosion and improving the microclimate of crop-land and grazing land. The innovation (agroforestry) now spreads from its source of invention to its ultimate users.

CHAPTER THREE

METHODOLOGY

3.1 Study Area

The study will be conducted in Giwa local government area of Kaduna state. It lies between latitude 11.20°N to 11.52°N and longitude 7.0°E to 7.5°E. It is bounded to the Northern by Funtua and Malumfashi local government areas of Katsina state. It is situated Northwest of Zaria in the transition zones between Northern Guinea savannah and Sudan savannah. On the Western part it is bounded by Birnin Gwari local government area and on the Southern part by Igabi local government of Kaduna state. There are about 20 villages and 11 wards in Giwa local government area. Some of the major villages are Shika, Giwa, Yakawada and Galadimawa. The area is characterized by alternating dry and wet seasons with a mean annual rainfall of 1100mm (FOS, 1994). The rainfall duration is about 5 months beginning in May and ends in October. The mean daily minimum and maximum temperatures are 19°C and 35°C, respectively. This conditions suit the crops grown in the area, examples of such crops are Sorghum, cowpea, maize, soybean, millet, groundnut, vegetables and yam etc. The local government is blessed with floodplains popularly know as Fadama lands. These floodplains are characterized by availability and accessibility to both open surface and underground water. The major crops grown during the dry season are tomatoes, pepper, onions, wheat, lettuce, carrot, garden egg plant, maize, amaranthus and sugar cane.

People of Giwa Local Government Area are predominantly farmers. Farming is usually a combination of crops and livestock production, with a few full time pastoralists. Other activities involved in by the people in giwa local government area are petty-trading, blacksmithing, civil-service, leather works, mat- making. The women also engage in technical and hand craft,

harvesting, processing and marketing. In addition to their household activities, women also rear small ruminants and chicken around the house.

Giwa local government area has an estimated population of 286,427 (NPC, 2006). The major tribes are Hausa/Fulani. Apart from Hausa/Fulani who are the dominant tribes in the area, there are other tribes who have settled in the area, such as Yoruba, Igbo, and Jaba e.t.c. The people of giwa local government area are predominantly Muslims, with a few who are Christians.

3.2 Sampling Procedure and Sample Size

A reconnaissance survey was conducted. The sampling frame of farmers that practice agroforestry in Giwa Local Government Area was 604. Twenty percent (20%) of farmers that practice agroforestry were purposely selected. In all, a total 120 respondents was used for the study as shown in the table below.

Name of villages	Population of farmers that practice agroforestry	Sample size
Kaya	75	15
Galadimawa	132	26
Fatika	89	18
Yakawada	67	13
Karaukarau	65	13
Salanke	74	15
Gangara	57	11
Gandagau	45	9
Total	604	120

3.3 Method of Data Collection

Primary and secondary data was used for the study. The primary data was collected through structured questionnaire, while the secondary data were obtained from relevant literature such as International Commission Research of Agroforestry (ICRAF), World Bank reports, Food

and Agricultural Organization (FAO.) report and other sources including unpublished research thesis and dissertations, scholarly journals, scientific and technical reports.

3.4 Analytical Technique

The analytical tools used in order to achieve the research objectives for the study was descriptive statistics. Descriptive statistics such as means, percentages, frequency distribution and range was used to achieve objectives of the study.

3.5 Definition and Measurement of Variables

Sex: This refers to the character of being male or female. Some Agricultural activities required a lot of stamina while some don't. the energetic farm activities are often undertaken by males while the females take part in the less strenuous activities e.g. harvesting etc. respondent will indicate whether they are male (1) or female.

Age: In this study age was measured by the total number of years a farmer has attained from birth to the time of data collection.

Education: This will give a good impression of the respondents level of literacy. Education here is referred to the higher education a farmer attained which include, Qur'anic, primary and tertiary Education. This was measured by the level of formal education attained.

Farming Experience: This indicates the number of years spent so far in farming. Based on their exposure to farmers could be adjudge that they posses greater ability to predict possible problems and likely solutions that result in higher output and income. It was measured in years.

Membership of Co-operative:- membership of co-operative empowers people in their business and farming activities thereby improving their economic status. It is expected that members of cooperative will tend to learn and adopt an innovation faster than non-members as a result of ease of information flow and influence from adoptions in the co-operative (Ezeh and Ijioma, 2007). This was measured as the number of years a member has spent in the co-operative.

Marital Status: This refers to the character of being single (1) or married (2)

Tenure system: This is means to acquisition of land for farming activities by farmers. Tenure system was measured base on how they acquired the land, which include inheritance, purchase, borrowed and gift.

Access to extension contact: This refers to whether a farmer had contact with extension agents, or not. It was measured as the number of times a farmer is visited by the extension agent in a month.

Household size: household size refers to the total number of people in a certain house who are under the care of a particular household head. This was measure in number.

Farm size: This is refer to the total hecters of land under cultivation by a particular farmer. This was measured in hectares (ha).

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Socio-economic characteristic of Respondents

This section presents and discusses the result of the socio-economic activities of agroforestry farmers in the study area, as well as othersobjectives that have a bearing on their tree-planting as an agroforestry practice. Some of the important demographic and farm characteristics considered were age, sex, education, mode of acquisition of farm land etc. The types of trees that are commonly planted by the farmers and for what purpose, the socio-economic and ecological benefits derived by the farmers through tree planting and the constraints militating against tree planting.

4.1.1: Age of the Respondents

The result in table 4.1 presents the age of respondents ranged from about 29 years to 60 years and above. With a mean of about 43 years. About 40.00% of the respondent fell within 30-40 years age bracket an indication that more able bodies people are involves in farming as well as tree-planting as an agro forestry, which has a tedious nature, requires that a farmer is young, agile and able bodied so as to be able to withstand the pressure of work. However, only 6.76% of the respondents were 60 years and above. This may be due to the tedious nature of farming which make it impossible for old people to stay away from it.

4.1.2 Sex of Respondents

The result in table 4.1 shows the age of the respondents that 91.67% of the respondents were males while only 8.33% were female. This shows that there is gender imbalance in agricultural practice in the area. This is as a result of religion and cultural beliefs of the inhabitants as well as land little ownership.

4.1.3: Level of Education of Respondents

Education is an essential factor for effecting desirable changes in attitude, skills and knowledge of individuals (Odebode, 1997). The result presents in table 4.1 shows a total of 40.00% of the respondents had quranic education, 32.50% and 16.67% attended, primary and secondary, education respectively. While only 10.83% attended tertiary education. It is clear that the level of quranic, primary and secondary education of the respondents is very high. This means that the farmers can read agroforestry extension guides in form of tracts and bulletins if language is put into consideration.

Table 4.1: Distribution of respondents according their socio-economic characteristics

Variable	Frequency	Percentage %
Age		
Below 30	8	6.76
30-40	48	40.00
41-50	43	35.83
51-60	17	14.16
60 and above	4	3.33
Mean	43yrs	
Sex		
Male	110	91.67
Female	10	8.33
Educational status		
Qur'anic	48	40.00
Primary	39	32.50
Secondary	20	16.67
Tertiary	13	10.83
Household Size		
1-5	4	3.33
6-10	24	20.00
11-15	85	70.83
16 and above	7	5.83
Farming Experience		
1-5 years	3	2.50
6-10 years	25	20.83
11-15 years	69	57.50
16 and above	23	19.16
Farm size		
Below 1 hecter	4	3.33
1-2 hecter	34	28.33
3-4 hecter	70	58.33
4 and above hecter	14	11.67
Belonging to cooperative society		
1-5	6	5.00
6-10	20	16.67
11-15	38	31.16
15 and above	56	46.66
Marital status		
Married	109	90.83
Single	11	9.16
Total	**120**	**100.0**

4.1.4 House Hold Size of the respondents

As shown in table 4.1 the household size of the respondents ranging from 1 to 16 and above. About 70.83% of the respondents had a household size ranging from 16 and above. 20.00% had a family size of 6 to 10. While 5.83% and 3.33% had a household size of 11-15 and 1-5 respectively. It is observed that large household size is very necessary in order to satisfy the labour requirement on the farm. Furthermore, this seemingly large household size is a characteristics future of subsistence agricultural practices by most of less developing country of the world. On the other hand large household size will increase household consumption expenditure which competes with the money the farmer would have used for other production purpose (Ammani, 2008).

4.1.5 Farming Experience of the Respondents

The result presents in table 4.1 shows the respondents years of farming experience ranging from 1-16 years and above. 57.50% of the respondents had farming experience ranging from 11-15 years farming experience. 20.83% of the respondents had farming experience ranging from 6-10 years. While 19.16% had farming experience ranging from 16 years and above. Only 2.50% had farming experience ranging from 1-5 years. It is revealed that though most farmers in the study area practiced either one form of agroforestry or the other, most of them are not educated in the act. Some even practice it by chanced.

4.1.6 Farm size of the Respondents

The results in table 4.1 shows the respondents total farm size ranging from 1 to 4 hecters and above. 58.33% of the respondents had total farm size of 3 to 4 hecters. About 28.33% of the respondents had a total farm size of 4 and above hecters. Only 3.33% had below 1 hecters of farm land. It is revealed that more than 90% of the farmers in the area are subsistence farmer

which is an impediment to agricultural mechanization because it will be difficult to use farm machine on small and fragmented individual farms.

4.1.7 Land Tenure System of the Respondents

The analysis in table 4.1 shows the distribution of respondents base on land acquisition. This is based on inheritance, family, gift, purchased, borrow and tenancy. 44.00% inherited the land they use for cultivation from their ancestors. 38.3% acquired the land from their parents. 7.50% and 5.83% acquired the land by purchase and borrowed respectively. While 2.50% acquired the land by been a tenancy. Only 0.80% acquired the land by gift. It is observed that the fragmentation of farmland is mostly common with inherited farm lands. This result in increase in the unit cost of operating the farms and also limit the farmers' readiness to practice improved agroforestry system. Land acquisition in the study area is through inheritance and purchase. According to Olukosi and Erhabor (1998), pieces of land are acquired in some subsistence farming communities through inheritance and passed from one generation to another while others are either bought or rented.

4.1.8 Membership of cooperative participation of Respondents

The table 4.1 shows the respondents numbers of years they have been in cooperative society. About 46.66% had been in cooperative society ranging from 15 years and above. 31.16% had been in cooperative society ranging from 11-15 years. 16.67% had been in cooperative society ranging from 6-10 years. While only 5.00% had been in cooperative society ranging from 1-5 years. It is observed that membership of association can provide means of interaction with other farmers and this can provide avenue through which innovation diffusion among farmers.

4.1.9 Marital Status of the Respondents

The result in table 4.1 shows the marital status of the respondents in the area. It shows that 91.66% of the respondents are married. While 8.33% are single. This result was in line with the assertion of Perez-morales (1996) who noted that people in rural areas get married earlier than their peers in urban area in order to get labour for farm work.

4.2 Types of Trees that are commonly planted by the farmers and for what purposes in the study area

Table 4.2 indicate the respondents community types of trees planted by the farmers ranging from neem, mango, guava, cashews, citrus, tamarindusindica (tsamiya), acacia Senegal (gum Arabic) etc. About 97.50% of the respondents plant neem; while, 95.83%, 79.17%, 75.00%, 70.83%, 66.67%, 62.50%,55.83% and 54.17% plant citrus, gum Arabic guava, mango, Adansoniadigitata (kuka), cashews, tomarindusindica (tsamiya) and vitellari parades (kandanya) respectively while only 8.33% plant mahogany.

Table 4.2.1: Distribution of respondent according to most commonly trees planted by the farmers.

Commonly trees plants by farmers	Number of respondents	Percentage (%)
Neem	117	97.50
Citrus	115	95.83
Acacia Senegal (gum Arabic	95	79.17
Guava	90	75.00
Mango	85	70.83
Adansoniadigitata (kuka)	80	66.67
Cashews	75	62.50
Tamarindusindica (tsamiya)	67	55.83
Vitellariparados (kandanya)	65	54.17
Mahogamy	10	8.33

4.2.2 Purpose of Tree Planting

This shows the respondents purpose of tree-planting, the result shows that 91.67% plant trees for the purpose of fire wood, 79.17%, 68.33%, 63.33% and 54.17% plant trees for the

purpose of food, shelter, livestock and nutrient regeneration. While only 21.67% plant trees for the purpose of windbreak. It is observed that tree planting as an agroforestry practice appears to be largely restricted to residential areas. Very little attention was paid to tree planting as a means to control desert encroachment on farm land and erosion.

Table 4.2.2 Distribution of Respondent According To Purpose of Tree Planting

Purpose of tree planting	Number of respondents	% percentage
Fire wood	110	91.67
Food	95	79.17
Shelter	82	68.33
Livestock	78	63.33
Nutrient regeneration	65	54.17
Wind break	26	21.67

4.3 The socio-economic and ecological benefits derives by the farmers through tree planting

The farmers derived various socio-economic and ecological benefits from trees planted. All the farmers sampled responded that the benefit derived from the planted trees include provision of shade, fruit/vegetables, provision of fire wood as well as for enhancement of erosion control. 97.50% of respondents that tree planting provide them with wood and other products. 81.67%, 79.17%, 68.33%, 44.17%, 20.83% and 15.83% that tree planting provided shelter against wind, provision of shades, soil conservation, livestock feed, employment opportunities and erosion control respectively. Only 6.67% of the respondents that planted trees, in addition provided for recreation.

Table 4.3: Distribution of respondents according to benefits derived from tree planting

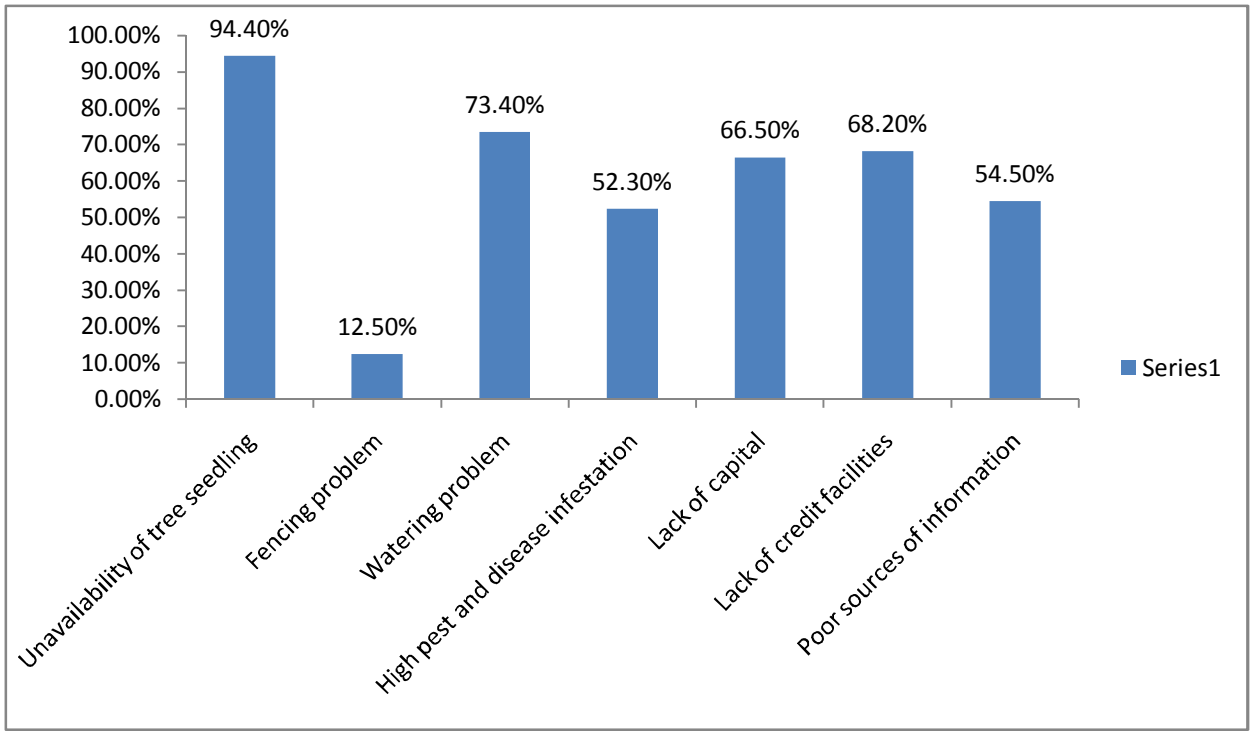
Benefits derive from tree-planting	Number of respondent	Percentage (%)
Wood and other product	117	97.50
Shelter against wind	98	81.67
Provision of shades	95	79.17
Soil conservation	82	68.33
Livestock feed	53	44.17
Employment opportunities	25	20.83
Erosion control	19	15.83
Recreation	8	6.67

4.4 The Constraints Militating against Tree Planting in the Study Area

This indicate that 94.40% of the respondents complained about the unavailability of tree seedling. While, 73.40%, 68.20%, 66.50%, 54.50% and 52.30% complained of watering problems, lack of credit facilities, lack of capital, poor sources of information and high pest and diseases infestation respectively as constraints militating against tree planting. Only 12.50% complained of fencing problem.

It is observed that farmers in the area find it difficult to get seedlings like mango, guava, cashew and citrus. This trees are said to give quick and higher returns if farmers in the area are provided with the seedling furthermore, farmers complained about serious damages caused to tree seedlings by livestock especially at the early stages. Farmers complained that some of their planted seedling used to die as a result of drought during the dry season especially during the first year of planting. Some of the respondents also complain that trees compete with crops for light. Water and nutrient, that they also attract birds and insects, pests or that they impede the flow of water when planted too close to irrigation channels.

4.4: Distribution of respondents according to constraints militating against tree-planting



CHAPTER FIVE

SUMMARY CONCLUSION AND RECOMMENDATION

5.1 Summary

This study examined agroforestry farmers (tree-planting) in Giwa Local Government Area of Kaduna State of Nigeria. Eight villages were purposively selected out of 20 villages in the area for the purpose of data collection. They include; Kaya, Galadimawa, fatika, yakawada, kararaw, salanke, gangara and Gardagau.

Primary and secondary data were used in the study. The primary data was derived through field and questionnaire survey. In all 120 respondents were selected for the study. The data obtained was analysed using descriptive statistics.

On the basis of the results, 91.66% were males farmers, while 8.33% were females reflecting a disparity in gender involvement in farming in the Local Government. About 40.00% of the respondents did not have formal education, 10.83% attained territory education, while the rest had primary, secondary and or quranic education.

The occupational distribution of the respondents showed that 80.8% had farming as their primary occupation, while only 19.10% practiced it as a secondary occupation. 53.33% of the respondents were found to practice mixed cropping in the area.

The result also showed 74.23% know about tree-planting as an agroforestry practice. The most commonly trees planted by the farmers include, neem, Guava, citrus, mango, cashews, tomarindusindica (tsamiya), acacia Senegal (gum arabic), vitellariparados (kandanya) and adansoniadigitata (kuka). The major purpose for planting such trees include; for provision of fire wood, vegetable, nutrient regeneration, livestock, feed, wind break and shelter.

The major problems militating against tree-planting as an agroforestry practice by the farmers include, lack of capital to support large scale farming, poor sources of information, high pest and diseases infestation, watering problem, fencing problems and unavailability of tree seedling.

5.2 Conclusion

This study has clearly shows that farmers in Giwa Local Government Area of Kaduna State have for long engaged in one form of agroforestry practice or the other. Due to some constraints, however, modern agroforestry practices with regard to tree planting are rare in the area. This make the area to be subjected to continual degradation of appropriate checks and not put in place. Scientists have for long identified aforestation as a viable means of reducing this problem, and research has proven agroforestry to be an afforestation option to improve land for crop and/or livestock production. However, farmers' perception of agroforestry as a modern technology remains and misleading information. This study found out that farmers need and will practice agroforestry if given the right information coupled with government assistance.

5.3 Recommendation

Based on the findings of this study. The following recommendations are important for appropriate corrections and directions in enhancing tree-planting as an agroforestry practice by farmers in the area.

i. The farmers need education and training in forestry/agroforestry practices. This means that the forestry/agroforestry component of the unified extension system will need to be reinforced with adequate personnel who will train the extension workers.

ii. The farmers, in addition to being supplied with tree seedlings, will need training in the operation of community nursery as well as nursery techniques to that they would be able to raise their seedling on their own in the long run.

iii. Planting of tree/agroforestry practices should be introduced at primary and secondary schools and at higher institutions of learning within the state and other parts of the country. Formation of foresters and farmers clubs, women groups and co-operatives to promote tree-planting in the state should be encouraged.

iv. Create marketing facilities for firewood or where markets are inadequate involve the government in purchasing wood directly from farmers at prevailing market prices.

v. Convince political and religious leaders to initiate community tree planting projects that could service as demonstration to farmers.

vi. Develop trained manpower in agroforestry through post-graduate studies in the local and foreign universities.

vii. Strengthen the agroforestry programmed of national organization specifically; the coordinated research project on agroforestry should become one of the organisation's regular activities.

viii. Increase collaboration in agroforestry research and development with appropriate national and international organizations.

ix. Provision of adequate and cheap alternative sources of cooking/heating energy to lessen dependence on fuel wood.

x. Enforcement of aforestation and conservation laws by the forestry department.

xi. Increase public awareness through extension activities and use of information media.

xii. Provide incentives by giving rebates on water and taxes to farmers who plant trees

xiii. Creation of more grazing reserves by the state government to cater for livestock controlled management and avoidance of and use clashes.

xiv. Excessive pruning of trees and bark removal should be discouraged.

xv. Provision of earth dams and hand pumps to assist farmers on irrigation difficulties.

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APPENDIX I

DEPARTMENT OF AGRICULTURAL ECONOMIC AND RURAL SOCIOLOGY, AHMADU BELLO UNIVERSITY, ZARIA.

TREE PLANTING AS AN AGROFORESTRY PRACTICES IN GIWA LOCAL GOVERNMENT AREA OF KADUNA STATE: A SOCIO-ECONOMIC APPRAISAL.

SECTION A: Personal Data

1. Age:

   a) Below 30 [ ] b) 30-40 [ ] c) 41-50 [ ] d) 51-60 [ ]

   e) 60 and above [ ]

2. Sex: Male [ ] Female [ ]

3. Marital Status:

   a. Single [ ] b. Married [ ] c. Divorced [ ]

   d. Widowed [ ] e. Others (please specify)_____

4. What is the highest education you have attained?

   a. Quranic[ ] b. Primary [ ] c. Secondary [ ] d. Tertiary [ ]

   e. None [ ] d. Others (please specify)_____

5. What is your major occupation?

   a. Farming [ ]b. Business [ ] c. Livestock rearing [ ]

   d. Civil servant [ ] e. Others (please specify)_____

6. What are your other sources of income?

   a. Farming [ ]b. Business [ ] c. Livestock rearing [ ]

   d. Civil servant [ ] e. Others (please specify)_____

7. Are you a household head?

   a. Yes [ ] b. No [ ]

   i). Number of family size_____

8. Do you have access to extension services?

   a. Yes [ ] b. No [ ]

9. If yes, how many times has extension visited you for farming education during the last 12 months_____

10. Do you belong to cooperative society?

    a. Yes [ ] b. No [ ]

11. If yes, how many years have you been in the cooperative society?_____

12. What is your total farm size?_____

13. How many years have you been in farming?_____

14. How did you get the land?_____

15. How do you maintain the land quality?

    a. Using fertilizers [ ] b. Using manure [ ] c. Crop rotation [ ] d. Bush fallow [ ] e. Other (please specify)_____

16. What types of crops do you farm?

    a. Arable farming [ ] b. Vegetables [ ] c. Trees Crops [ ]

    d. Others (please specify)_____

17. What cropping system do you practice?

    a. Crop rotation [ ] b. Mix cropping [ ] c. Fallow system [ ]

    d. Others (please specify)_____

18. Do you know about agroforestry?

a. Yes [ ] b. No [ ]

19. If yes, how did you hear about it?

a. Radio [ ] b. Friend [ ] c. Extension [ ] d. ADP [ ]

e. State forestry service [ ] f. Others (please specify)_____

20. Are you into tree planting?

a. Yes [ ] b. No [ ]

21. If yes, what type?

a. Local [ ] b. Exotic [ ]

22. If local, how did they come?

a. Planted them [ ] b. Bought them [ ] c. They grew on their own [ ]

d. Others (please specify)_____

23. If planted, how did you get the seed or seedling?

a. I bought it [ ] b. From the government [ ] c.From a friend [ ]

d. Others (please specify)_____

THE TYPES OF TREES THAT ARE COMMONLY PLANTED BY THE FARMERS AND FOR WHAT PURPOSES

24. What are the commonly types of trees do you plant in the farm or field?

a. Mango [ ] b. Neem[ ] c. Mahogany [ ] d. Guava [ ] e. Parkiabilglobosa (dorowa) [ ] f. Cashew [ ] g. Citrus [ ] h. TamarindusIndica (tsamiya)[ ]

i. Acacia Senegal (Gum Arabic)[ ] j. Barassusaqcthiopium (giginya) [ ]

k. Adansoniadigitata (kuka)[ ] i. Barasssusacthiopium (giginya) [ ]

m. others (please specify)_____

25. For what purpose do you plant trees on the farm land?

a. For shelter [ ] b. For food [ ] c.For vegetation [ ] d.For livestock feed [ ]

e. for nutrient regeneration [ ] f. for fire wood [ ] g. For wind break [ ]

h. others (please specify)_____

SOCIO-ECONOMIC AND ECOLOGICAL BENEFITS DERIVED BY THE FARMERS THROUGH TREE-PLANTING

26. Kindly indicate the socio-economic and ecological benefits derived from tree planting in the area.

a. Soil conservation [ ] b. Soil improvement [ ] c. Provision of shades [ ]

d. Wood and other product [ ] e. Employment opportunities [ ] f. Recreation [ ]

g. Livestock feed [ ] h. Erosion control [ ] i. Shelter against wind [ ]

j. for nutrient regeneration [ ] k. Others (please specify)_____

CONSTRAINTS MILITATING AGAINST TREE PLANTING

27. Kindly indicate the types of constraints militating against tree planting

a. Unavailability of tree seedling [ ] b. Fencing problems [ ] c. Watering problems [ ] d. Poor soil fertility [ ] e. High pest and diseases infestation [ ]

f. Lack of capital [ ] g. Lack of credit facilities [ ] h. Poor sources of information [ ] i. Others (please specify)_____

28. Please, kindly suggest five possible ways you think trees-planting as an agroforestry practice can be promoted

i._____

ii._____

iiii._____

iv._____

v._____