USMANU DANFODIYO UNIVERSITY, SOKOTO
(POSTGRADUATE SCHOOL)

ASSESSMENT OF EFFECTIVENESS OF EXTENSION SERVICES AMONG CASSAVA FARMERS IN ZONE I OF NIGER STATE AGRICULTURAL DEVELOPMENT PROJECT, NIGERIA

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DEDICATION

I dedicated this project to my parents Late Alhaji Muhammadu Jiya Saidu and Hajiya Hajarat Muhammadu Jiya

CERTIFICATION

This dissertation by Jiya, Gimba (1421061619011) has met the requirements for the award of Degree of Master of Science (Agricultural Extension) of the Usmanu Danfodiyo University, Sokoto, and is approved for its contribution to knowledge.

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ACRONYMS

NGOs:- Non – Governmental Organizations

RMRDC:- Raw Material Research Development Council

GDP:- Gross Domestic Product

NPC:- National Population Commission

NAFPP:- National Accelerated Food Production Programme

ADP:- Agricultural Development Project

NCRI:- National Cereals Research Institute

IAR:- Institute of Agricultural Research

NCRCP:- National Coordinated Research on Cassava Project

NSS:- National Seed Service

IITA:- International Institute For Tropical Agriculture

OFN:- Operation Feed the Nation

REFILS:- Research Extension Farmers Input Linkages

NRCRI:- National Root Crops Research Institute

FAO:- Food and Agricultural Organization of United Nation

NAERLS:- National Agricultural Extension and Research Liaison Services

UNPFA:- United Nations Population Fund Agency

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ABSTRACT

This study assessed the effectiveness of extension services on cassava production in ADP Zone I of Niger State, Nigeria. Multi stage sampling technique was used for the study. Structured questionnaire was used for the collection of data. Descriptive and inferential statistics were used to analyze the data obtained. Findings of the study show that most (67.5%) of the cassava farmers were married, 57.5% of them were male, with some (47%) within the age range of 33 – 39 years. Majority (76%) of the cassava farmers cultivated other crops (sorghum, maize, millet and cow pea) and most (60%) of them had formal education. Sources of technologies utilized by the farmers include Research Institute, farmers market, Agricultural Development Project (ADP) and Agric business centers. The yield of cassava farmers was higher (23.5 tonnes) with the adoption of improved production technologies. Most farmers perceived extension services to improved crop yield (86%) and increased their income (79%). The findings also show, that there is significance difference (t = 21 73; P = 0.01) in yield before and after adoption of improved technologies. The major constraints faced by the cassava farmers in the study area were problem of land tenure system 30%, problem of herdsmen 25%, inadequate credit facilities 15%, inadequate extension services 12.5%, problem of transportation 10% and poor marketing system 7.5%. The study concludes that extension services rendered to the cassava farmers succeeded in increasing their yield. It is therefore recommended that there should be increase in frequency of extension contacts and proper training of extension Agents.

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background of the Study

Agriculture occupies a key position in the Nigerian economy, judging by its critical role of providing food security, employment, revenue generation and provision of raw materials for industrial development, and one of such very important crops enhancing food security is Cassava (*Manihotesculenta* Crantz). Cassava is the third most important food crop in the tropics after rice and maize, and is consumed daily by up to one billion people, mostly in sub-Saharan Africa (Eugene and Otim-Nape, 2012). Global cassava output in 2011 was expected to rise by over 6% from the previous year (2010), and to surpass 250 million metric tons for the first time (FAO, 2015). This is realizable because Nigeria has a well-developed agricultural research system with far reaching improved technologies capable of boosting farmers' output and enhancing economic development, (Eugene and Otim-Nape, 2012).

In order to ensure the effectiveness of research outcomes among cassava farmers, a number of institutional and government agencies have been established to ensure that farmers have access and adopt improved agricultural technologies that are relevant to their needs and situations. These agencies facilitate the dissemination of improved agricultural technologies through various methods, and these services are mostly rendered by the agricultural extension agents. The role of agricultural extension service is very crucial in improving agricultural development in Nigeria. It does this by facilitating the education of farmers to improve their skills, knowledge and attitude towards agricultural development policies. Extension agents transmit the result of research

purposely to solve farmers' problems and encourage the application of improved agricultural technologies. The extension agents take the farmers' problems to research institutions for solution. Extension agents convince farmers to adopt new improved technologies through utilization of demonstration farms, farm visits, audio visuals and other agricultural extension teaching methods (Jibowo, 2000).

In Nigeria, like other African countries, cassava is predominantly grown on small farms by numerous resources poor farmers, spread across the country. Production from various small holding aggregate to an annual estimate of 39 million metric tons makes Nigeria the world largest cassava producer ahead of other world producers like Brazil and Thailand (FAO, 2014). To meet such demand, therefore, improved varieties of cassava and science based agricultural production system need to be disseminated to the farmers, farmers must be better informed on the production, processing and marketing of cassava with a view to be more efficient than they have been in the past on a sustainable basis and this could only be achieved through efficient extension service delivery system.

1.2 Statement of the Problem

Despite the greater attention paid by Government, International Organizations, Non-Governmental Organizations (NGOs) and other institutions to agricultural extension services,

However, there are numerous problems facing the agricultural extension services. Even after communicating the ideas, some of the farmers cannot subsequently translate the idea into practice. In the same vein, most of the farmers are conservative and are not prepared to accept most positive changes. Furthermore, the farmers are poor to procure and put the disseminated ted inputs in to practice (Eugene and Otim-Nape, 2012).

Agricultural extension agents are also faced with varying problems and challenges. One of such problem is low ratio of extension agents to farmers' Despite the recommended extension agent – farmer ratio of one extension worker to 800 farmers, the ratio of extension agent – farmer ratio in Nigeria ranges from 1:2000 and in Niger State its about 1:3011 (NAERLS, 2012).Extension agents are also poorly motivated in terms of remuneration and provision of transport facilities to visit farmers and most them live far away from the farmers there by minimizing their contact with farmers.

Previous studies (Oladosu, 2010 and Ifejika, 2010) concluded that the status of agricultural information and training services offered to cassava farmers is laden with deficiencies and more so the cassava extension package is part of the general extension services package being operated in the study area. Most studies (Akintola, 2016; Okwache, 2012), on cassava farmers focused on the assessment of the adoption of modern cassava processing technologies among processors and the impact of extension services on cassava farming but this study therefore addresses the effectiveness of extension services among cassava farmers in Niger State, Nigeria. The basic issues with extension service delivery include, low yield of cassava as a result of inadequate extension services, poor training and information delivery, inadequate materials and logistics and poor infrastructures needed to reach the farmers. It is in light of the aforementioned problems that this study was designed to assess the effectiveness of extension services among cassava famers in Zone I, Niger State Agricultural Development Project and also to provide answers to the under listed research questions;

i. What are the socio-economic characteristics of cassava farmers in the study area?

ii. What are the sources of technologies utilized by cassava farmers in the study area?

iii. What are the differences in yield before and after extension contact in the study area?

iv. What are the cassava farmers' perceptions on the effectiveness of extension services offered to the cassava farmers in the study area?

v. What are the constraints militating against extension service delivery on cassava farming in the study area?

1.3 Objectives of the Study

The main objective of this study is to assess the effectiveness of extension services among cassava farmers in Zone I of Niger State Agricultural Development Project. While the specific objectives are to;

1. describe the socio-economic characteristics of cassava farmers in the study area.
2. Identify the sources of technologies utilized by cassava farmers.
3. determine the difference in yield of cassava farmers before and after extension contact
4. determine farmer's perception on the effectiveness of extension services offered to the cassava farmers.
5. identify the constraints militating against the effectiveness of extension services on cassava farming.

1.4 Hypotheses of the Study

H_{01}: There is no significance relationship between the selected socio-economic characteristics of the cassava farmers and effectiveness of extension services among the cassava farmers.

H_{02}: There is no significance difference in the ranking of the effectiveness of extension services offered to cassava famers in the study area.

1.5 Justification of the Study

This study provided insight for the authorities concerned in the formulation and designing of agricultural policy in line with the socio-economic factors and other related factors that will aid the effectiveness of extension services on cassava farming in the study area and Nigeria at large. The information from this work is expected to expose different opportunities that are embedded in modern cassava farming technologies and the need for effectiveness of extension services provided to the cassava farmers.

The findings of the study will also serve as a guide for the extension personnel and ADPs in carrying out their extension services effort in such a way that will be widely accepted by the target audience in Nigeria.

1.6 Scope and Limitations of the Study

This study was restricted to only zone I of Niger State Agricultural Development Project due to abundance of cassava farmers within the zone and only the cassava based famers were considered for the study.

The limitation of the study is the inability of the researcher to cover all the cassava farmers in the zone. To overcome such problems, data collection was based on random sampling and interview schedule was used to elicit information with the assistance of trained enumerators who are versed in local language of the farmers.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Origin and Distribution of Cassava

Cassava which is also known as *Manihot* spp is botanically called *Manihot esculenta* belongs to the family Euphorbiaceae (Colin and Basil, 1985). The different types of cassava are described by the term cultivars or varieties. The different varieties of cassava can be distinguished by such features as size, colour and shape of leaves, branching habit, plant height, stem colour, tuber shape and size, root maturity and yield, resistance of the plant to certain diseases and weeds, and the hydrogen cyanide content of the tubers which categorize the tubers in to sweet and bitter cassava. (Fredrick, 2011; Rogers, 2014).

Cassava has its origin in tropical America (Rogers, 2014; Fredrick, 2011) from where it spread to other parts of the South and North America. It was dispersed to other parts of the world by Portuguese explorers during the last part of the 16th century to Africa (Jonnes, 1959) and quickly adapted into the traditional tropical Africa farming system. Cassava cultivation in Africa was dated back to 1558 where its consumption was introduced to people living along the African coast and nearby islands. Africans further diffused the use of cassava and is now widely distributed in tropical and sub-tropical regions of the world and highly produced and consumed in Africa, America, Europe, Asia and the Oceania (Fredrick, 2011). Cassava has since become staple foods for Africa and accounts for approximately one third of the staples produced in the continent (FAO, 1986). Cassava introduced to Nigeria over 300 years ago although its systemic cultivation was never generally accepted practice until the late 1980s. A little over 150 years ago, it

became fully accepted and integrated into the farming systems of the Southern Nigeria. (Fredrick, 2011).

Today, Nigeria is the world's bigest producer of cassava in terms of volume of production that is. land area cultivated (Eze, 2007). This situation could be attributed to the varieties of cassava in Nigeria, farming practices being adopted. Almost every state of Nigeria grows cassava and its primarily grown for food in its various forms. It is processed into 'Gari', cassava flour, tapioca, cassava pellets and chips. It is also a good source of animal feed (Onwueme, 2014).

2.2 Cassava (Manihot Spp) Production in Nigeria

In Nigeria, cassava production is a widely cultivated crop in the southern and central regions of Nigeria. There are more than 40 cassava varieties in use. Alhough the crop is produced in 24 of the country's 36 states, cassava production dominates the Southern part of the country, both in terms of area covered and number of farmers growing the crop. Planting occur during four planting seasons in the various geo-ecological zones. The major states of Nigeria which produce cassava are Anambra, Delta, Benue, Cross River, Imo, Oyo and Rivers, and to a lesser extent Kwara, Osun and Ondo (Eze, 2007).In 1999, Nigeria produced 33 million tonnes, while a decade later, it produced approximately 45 million tonnes, which is almost 19% of production in the world. As at 2000, the average yield per hectare was 10.6 tonnes (Adeniji *et al.*, 2005)

Cassava is grown through the year, making it preferable to the seasonal crops of yam, beans and peas. It displays an exceptional ability to adapt to climate change, with a tolerance to low soil fertility, resistance to drought conditions, pests and diseases, and suitability to store its roots for long periods underground even after mature. Use of

fertilizers is limited, and it is also grown on fallow lands. Harvesting of the roots after planting varies from 6 months to 3 years (Asante, 2013)

The land holding for farming in Nigeria is between 0.5 – 2.5 hectare (1.2 – 6.2 acres), with about 90% of producers being small-scale farms. In order to increase production, several varieties of cassava have been developed which are pest resistant; production in the country is hampered by green mite insect, the cassava mealybug, and the variegated grasshopper. Diseases affecting cassava crop are mosaic disease, bacterial blight, anthracnose and root rot (Ojohomn, 2006).

2.3 Factors Affecting Cassava Production in Nigeria

The survey report of agro raw materials in Nigeria revealed that decline in production of which may be related to loss arising from livestock (mainly cattle), pests and diseases and/or declining soil fertility. Unless fenced round, cassava field could be destroyed by cattle and other domestic animals, such as goats and sheep especially during the dry season when pasture is scarce. . Also, as at present, there is relatively low industrial demand for cassava products (Raw Material Research Development Council, 2004).

2.4 Economic Importance of Cassava Production in Nigeria

Cassava (*Manihot esculenta*) is a popular crop grown in tropical regions. Cassava production in Nigeria is largely by subsistence farming and Nigeria is currently the largest producer of cassava in the world (Ohen, *et al*, 2014) It is the most extensively cultivated crop in the Southern part of the country and contributes largely to the country's Gross Domestic Product (GDP) and a major source of income to rural farmers. It is used in some industries for production of bio-degradable products/production of feeds for

livestock, this, could reduce unemployment rate and it is also a rich source of carbohydrates (Taiwo, 2006) Although, majority of farmers wish to cultivate cassava but land has been a major challenge to farmers, only few farmers have access to rural credits and lands..

2.5 Brief Historical Background of Agricultural Extension Services in Nigeria

In its global conception, agricultural extension was initiated with the intent of passing information to farmers who were not literate or who did not have any access to formal education. About 200 years ago, the word "extension'' (particularly in relation to education) was first used in referring to a formal means of disseminating useful information and transferring knowledge.

Today, agricultural extension goes a great length to involve the transfer of scientific knowledge farmers requires understanding the use of modern technology. Undoubtedly, farming is associated with problems and for local farmers to solve the farming problems within them, they need comprehensive information on the use of modern technology. In this regard, agricultural extension has gained grounds everywhere in the world as a helpful approach to solving farming problems.(Bene, *et al*.,1994)

In addition to its basic purpose, agricultural extension integrates innovations with agriculture in a way intended to promote agriculture and make it a lasting solution to crises such as food shortage and low level of agricultural production. Moreover, agricultural extension brings to the awareness of farmers, a variety of farming alternatives from which they can select their preferences. Candidly, the agricultural extension comes with a number of advantages most of which are targeted at farmers. Meanwhile, some of its advantages are but not limited to:

Giving farmers distinct insights into how farming problems may be solved

Helping farmers connect with one another to discuss the conditions surrounding their activities

Raising farmers' standards of living through collective reasoning

Disseminating information farmers need to diversify from crude farming to modernized farming

History of Agricultural Extension in Nigeria

Agricultural extension in Nigeria has lasted many years since its pre-independence evolution. During its infancy, the agricultural extension was an elementary scheme that focused primarily on crops. However, in recent times, it has been transformed into a professional scheme but with uncertainties surrounding its efficiency and effectiveness. Speaking plainly, Nigeria's current agricultural extension scheme which began precisely in the 1980's is yet to solve agricultural problems which can place it above an averagely-effective scheme. As regards its historical development, Nigeria's agricultural extension may be divided into three main eras namely:

The colonial cum immediate post-independence era

The Era of Oil Boom

The era of multi-state ADPs (Agricultural Development Projects)

The Colonial cum Immediate Post-Independence Era

This era began in 1893 and ended in 1968. It deserves the title “colonial cum immediate post-independence” because it started before Nigeria’s independence from British administration and was terminated only a few years after the independence. The extension approaches which took place during this era included:

1. The colonial commodity extension approach: This approach initiated scientific agriculture in Nigeria. It began in 1893 and ended in 1921 and stimulated Nigeria’s first experience of direct government intervention in agricultural development. Under the control of British colonialists, this extension approach was accompanied by an agricultural policy aimed majorly at cash crops (such as groundnut, cotton, cocoa, oil palm, and rubber) required to boost the development of European agro-industries.

2. The Ministry of Agriculture approach: This approach was initiated in 1921 particularly with the entrenchment of agricultural research stations in Samaru, Umudike and Moor in 1921, 1923 and 1924 respectively. Also, it welcomed the establishment of Regional Ministries of Agriculture in the western, eastern and northern parts of Nigeria.

3. The revitalized commodity extension strategy: This extension approach focused great attention on special cash crops particularly in the regions where they are best grown. There was concentration on groundnut in northern Nigeria while oil palm and cocoa were produced massively in the East and the former Western Region respectively. At the time, the government paid little attention to food crops at the expense of the nation.

4. The farm settlement/Institute Leavers’ Extension Strategy: This extension approach began in 1959 and collapsed as early as 1965. It was a developmental scheme aimed at encouraging community residents particularly young school leavers to uphold farming as

a source of livelihood. In addition, the approach was intended to function as models for intensive extension services.

The Era of Oil Boom

The era of oil boom began in 1970 and continued until 1979. As part of its drawbacks, it crippled the entrenchment of an operative extension strategy as well as dynamic research for the production of food crops. Sadly, it acted as a menace to the effective development of agriculture especially in the aspect of food crop production. The main extension approaches instituted during the era of oil boom included:

1. The National Accelerated Food Production Program (NAFPP): Through the adoption of agro-service centres, this strategy paved the way for an extension, research, and input supply.

2. Operation Feed the Nation (OFN):

Initiated under the 1976 military regime headed by Olusegun Obasanjo, OFN was an extension strategy that focused greatly on increasing the volume of food production. Sadly, it failed to materialize as a well-planned extension strategy and sooner than expected, it went into extinction.

3. The River Basin Development Authority strategies (RBDAs): The establishment of RBDAs came about in 1977 as an approach to making good use of water resources for irrigation purposes. However, around 1984-85, RBDAs were not appointed extension responsibilities and this resulted in their failure to cater for farmers' extension needs.

4. The Green Revolution: This extension approach was instituted in 1979 to serve as an effective replacement for the ineffective OFN (Operation Feed the Nation). Its main purpose was to help Nigeria achieve reasonable standards in food self-sufficiency within a five-year period. However, it eventually failed as a result of poor planning and lack of concentration amongst other factors.

5. The Pilot (Enclave) Agricultural Development Projects (ADPs):

This extension approach was launched in 1975 with pilot projects in Nigerian areas of Gusau (1975), Funtua (1975) and Gombe (1975),blossomed into Ayangba(1977),Lafia in 1977,Bida in 1979,Ilorin in 1980, Ekiti-Akoko in 1981 and Oyo-North in 1982 agricultural development projects.

The Era of Multi-States ADPS

This era of agricultural extension began in 1984 and has remained effective till the present time with an ADP (Agricultural Development Project) in each of Nigeria's 36 States including the Federal Capital Territory [Abuja].(Madukwe,1997)

2.6 Concept of Agricultural Extension

The crucial role of agricultural extension (i.e. farmer education) in the social and economic development of the nation cannot be over-emphasized. Never before in Nigerian history has the necessity for educating and raising the productive capacity of our farmers been of such importance as it is presently as such increased agricultural productivity depends primarily upon the acceptance of cultural and technological changes at the rural farm level (Maundar, 1984)

Thus, for Nigerian agriculture to improve, our farmers have no alternative but to learn and adopt recommended scientific farming techniques in place of their traditional practices. Perhaps, the slow development of Nigeria agriculture can be attributed to the inability of the Nigerian farmers to respond positively to new ideas, they must be properly educated on how best to apply the new ideas or practices to their farming activities. This is because the new ideas are often complex, technical and can hardly be understood by most of our farmers. Nigeria cannot achieve increased agricultural productivity on rural farm level, except through the provision of basic agricultural education, particularly the non-formal or extension type that will help move millions of the farmers from traditional to progressive farming thereby improving the overall quality of rural life. It is not very easy to define agricultural extension in a short concise phrase or statement. Any attempt to define it properly would involve lengthy explanation of several principles and philosophies. However, different authorities and experts have defined extension in different forms and ways leading to the improvement of the standard of living of the people. Fisher (2002) defined extension as a system of education extending beyond the classroom to individuals on the farms and is available to every member of the family. He, thus, analyzed extension in terms of family approach system whereby all members of the family are taken into consideration in planning extension programmes.

Vanden Ban and Hawkin (1988) defined extension systematically as a process which helps farmers to analyze their present and expected future situations, helps farmers to become aware of the problems which can arise in such an analysis, increase knowledge and develops into problems and helps to structure farmers existing knowledge, helps

farmers to acquire specific knowledge related to certain problems, solutions and their consequences so that they can act on possible alternatives, helps farmers to evaluate and improve their own opinion-forming and decision making skills.

Asiabaka (2002) tried to look at extension from modern perspective and thus explained it from the aim, which extension seek to accomplish, which is to teach both the rural and urban clientele how to determine their problems . He further explained extension as having three components, which involves changing the behavior complex and attitude of the people, economic dimension, which includes increased income of the clientele, increased crop yield, better financial management, better methods of food preservation, social dimension, which also includes improved health of the clientele, leadership development, better grooming, development cooperation, increased zeal for development.

Obibuaku (2010) perceived extension as an informal system of education meant to improve the living standard of the local people who did not have the opportunity for formal education. Maunder (2015) defined extension as a science which deals with the creation, transmission and application of knowledge designed to bring about planned changes in the behavioural complex of people with a view to help them live a better life through learning new ways of improving their enterprise and institution.

There are however, three basic concepts that classify the scope, understanding and meaning of extension. They are extension education process, which consists of four phases or steps, namely; knowing the rural/urban community, programme planning and development implementation or execution of the programme and evaluation of the programme. Extension as educational/change which means that extension brings about

change in the behavior, attitude and skills of the people and is done using a systematic and planned method, utilizing the basic principles of teaching and learning in extension education, extension as salesmanship which means that extension sells its ideas and knowledge to others to help them grow and improve.William (1979) summed up three basic tasks of extension as; disseminating useful information, applying it to analysis of practical problems,in order to help themselves. Extension today goes beyond informal, non-formal and formal forms of education as it fits in to the three forms of education known throughout the world.

2.7 Scope of Extension Services

Extension services are the different programmes/projects/recommendations which the extension service make available to their clientele through the use of extension education process. Agricultural extension services encompass all aspects of agriculture. It includes the provision of timely information, the linking of farmers with sources of farming inputs and credit facilities and most importantly, the provision of education services to farmers.

The mistake people have been making was that of limiting agricultural extension services to helping the farmers to procure their inputs needed on their farms; but people through experiences have come to realize the fact that for any agricultural project or programme to succeed, agricultural extensionists must be fully involved, so as to participate in all its activities from planning to execution. Modern agricultural extension work in Nigeria today covers a wide spectrum of services, which include; improvement in production, marketing, storage, processing, fish farming, agro-forestry, input supply and distribution, man-power development, home economics/ women in agriculture,

irrigation, land management, farm mechanization, erosion control, livestock management, human resource development, administration/management, programme planning and evaluation and youth development programmes (Anaeto, 2003).

It is important to emphasize here that extension is a weak instrument when it stands alone, but it becomes powerful when combined with price incentives, input supply, credit, seed multiplication. (Contado, 1997). This becomes an improvement on already known relationship between research-extension-farmer linkage thus resulting in birth of research-extension-farmer-input linkages (REFILS). The truth remains that even this linkage has not really improved the outlook of extension service, hence Anaeto (2003) mentioned the need for involving extension service in direct input distribution in addition to their educational services.

2.8 Role of Agricultural Extension Services

A role may be defined as a set of norms, values and interaction patterns associated with a given category of individuals. It is therefore the job or function attached to a given status. It can be clarified with the economic concept division of labour, which states that individuals work in different sectors of the economy. Agricultural extension service which could be from government agency or ministry are responsible for promoting the adoption and utilization of new scientific farming practices through educational procedures (Uwakah, 2013).

Many agricultural extension services could also be found in many non-governmental organizations (NGOs), many private firms and private organizations such as NTC, Coffee-Growers Association, Shell Corporation and Church organizations. Role of extension services therefore include; acting as an intermediary or even link between

agricultural development institutions such as research institutes, universities, colleges of agriculture and target groups (which may be the farmer, women group, youths,) carries out the formulated agricultural extension policies, provides educational services to farmers, and it plays active role in the rural community development of any nation (Anaeto, 2003).

This explains why it remains one of the strategies for rural development throughout the world, assisting people to re-appraise its work periodically , to provide maximum opportunity for the youth and the family to participate in attaining a better and more rewarding life, to maintain the highest level of proficiency in its workers by exposing them to relevant and continual training (Adams, 1982).

This is to encourage and aid in the wise use and conservation of all human and natural resources, to promote the use and development of volunteer leaders and help in the execution programs, to promote efficient agricultural production and the development of institutions to ensure proper handling of the products for welfare of both the producers and consumers, it aids through educational efforts, the diffusion among people of all appropriate research and practical information relating to agriculture, home economics, health and encourage their application and above all, it promotes the social and economic life of all people (Adams, 1982).

2.9 Role of Extension Officers

In most developing countries such as Nigeria, subsistence or traditional agriculture dominates the economy and for national progress to occur, change in agriculture is essential. Change is needed not only to increase production, but to liberate households from poverty. A great deal of responsibility for bringing about this change

rests on the shoulders of extension workers. That is the man and woman at the front line of the struggle for progressive change in agriculture. An extension worker helps farmers increase the productivity of their farms and improves their living standard. An extension worker has many roles. He is an adviser, a technician and a middleman operating between agricultural research institutions and the farm families. He is a change agent, consultant and advocate helping farmers to identify their problems and find their own solution. He works for the creation of community harmony essential for group projects. He is a manager planning and organizing his work and that of his assistants. (Offor, 1995)

2.10 Extension Efforts to Promote Cassava Production in Nigeria

The history of experimentation with alternative agricultural extension methods, however, started with early farm settlements schemes at Shendam and Mokwa in Northern Nigeria; and continued with farm settlement approaches in the former Eastern and Western regions (Adams, 1982). The seed of the widespread adoption of the cassava planting materials was however, sown under National Accelerated Food Production Programme (NAFPP). This programme commenced in 1972 and the aim was to design a program based on available component technologies of improved crop varieties, fertilizers, herbicides, .The programmewas a cooperative effort among research institutions,states and federal government extension services (Anojulo, 1982). However, three research centres in different agro-ecological locations were centers of NAFPP activities, these are; National Cereal Research Institute (NCRI) at Ibadan in the Southwest, Institute of Agricultural Research (IAR) at Samaru, Zaria and National Root Crops Research Institute (NRCRI) at Umudike in the South-east.

In addition, there were sub-centers; one in the south west, one in the south east and two in the north. The programme consists of research, extension and agro-service components. The research components designed the technological packages at various research centers and conducted ecological adaptive trials at the sub-centers. The agro-service components provide farm input delivery system as well as venue for marketing of farm produce. The extension components were responsible for the transfer of technological packages to the farmers. The transfer was carried out in three phases, on-farm demonstration in visible corner of different farmers' fields. Packages of alternative components were demonstrated side by side and farmers were expected to adopt the best package at their scales of operation. The programme allowed the farmers to be an active participant in the process of testing and selecting improved production practices. In 1985, NAFPP was working with 704,000 cassava farmers spread all over the nation. It also involved multiplication of planting materials of improved cassava varieties enough to cover 540 hectares at the rate of 10,000 set/ha (Williams, 1990).

As NAFPP started in 1972, the Federal Government set up another agricultural extension programme of equal magnitude, the Agricultural Development Projects (ADPs). In the same year, a World Bank team commenced investigation to identify and appraise suitable areas for Agricultural Development Projects. ADPs supplied improved planting materials of cassava and collect foundation planting materials for the National Seed Service (NSS); engaged licensed out growers to multiply the materials and use the commercial trade outlets to distribute the materials to farmers. Also in 1986, ADP distributed improved cassava (IITAs, TMS 30572) planting materials (enough to plant nearly 26,000ha) to 55,000 project farmers (Vanden, 1998).

The National Coordinated Research on Cassava Project (NCRCP), coordinated the on-farm adaptive research and demonstration of the research components of NAFPP zone centers, NCRCP overseen the testing of promising genotypes from Research Institutes for localized ecological adaptation. The best genotype was recommended to a Committee Variety Release (VRC) which made the final decision on official research of genotype to farmers. The cassava planting materials to various ADPs which then further multiplied using the contract farmers and distributed to farmers through established channels. As the research multiplication and demonstrations were practiced/performed in the farmers fields, the improved materials are spread even before they were officially released. In addition information was always circulating among people in the research institutes, NCRCP, NAFPP, VRC, NSS, ADP, at the farm level and also Non-Government Organizations (NGOs) contribute to the effort of spreading improved cassava varieties (Felix, 1996).

2.11 The Challenges of Agricultural Extension Services

There are evidences that the epidemic has changed the very fabric of the farming population, bearing implications for agricultural extension services. Apart from routine difficulties faced in daily work in rural areas by agricultural extension staff in developing countries, the challenges that most agricultural extension services face are mostly of a technical and logistic. Some examples are insect pest invasions, outbreaks of serious diseases, locust attacks, severe climate effects, natural disasters, or intensive campaigns for an increase in agricultural production. The challenge currently posed by the HIV/AIDS epidemic to agricultural extension organizations in sub-Saharan Africa, however, is quite unusual as it affects both staff and clientele and involves human

emotions to a depressing degree, that is, in addition to technical aspects. This challenge has at least three major dimensions, first, the very nature of the extension work; second, the impact of the epidemic on the extension organization itself and its staff; and the third, the impact of HIV/AIDS on the clientele of extension services (FAO, 2004).

2.12 Extension Teaching Methods

These are the techniques and activities involved in passing the message from the source to the receiver. They are links between the source of information in extension and the receiver. There are many techniques and activities used in communication of message in extension.

However, based on the size of the audience and distance between the source and receiver, basically there are three major extension teaching methods based on the number of individual reached simultaneously with particular message (Oladosu *et al*., 2004). These methods are:

i. Individual Teaching Methods (Person to Person): This is probably the most universally used extension methods in both developed and developing countries. The extension agents visit the farmers at home or on the farm on issues of mutual interest, giving the farmer both information and advice. The atmosphere of the meeting is usually informal and the farmer is able to benefit from the agent's individual attention. Individual meetings are probably the most important aspect of all extension work and invaluable for building confidence between the agent and the farmer.

Learning is very much an individual process and, although group methods enable the agent to reach a greater number of farmers, personal contact with and the individual

attention of the extension agent are important supports for a farmer. The personal influence of the extension worker can be a critical factor in helping a farmer through difficult decisions, and also be instrumental in getting the farmers to participate in extension activities. A farmer is often likely to listen to the advice given by the extension agent and will be grateful for his individual attention.

This individual contact between the extension agent and the farmer can take a number of forms, which include farm and home visits, office visit, telephone calls and personal letter (Contado, 1997).

ii. Group Method (Person to Group): The human being is a social animal living in groups, with the other family members or kinship. Group extension method tries to exploit this attitude of human being by bringing farmers together and teaching them in groups. For effective communication, it is usually suggested that the group should be between 10 and 20 people. Examples of group method are: informal group meetings, informal discussion groups, field days and tours, and demonstration.

iii. Mass Media Method: This method is used when the message is aimed to reach a large number of people at the same time. This method has the ability to spread information at a very fast rate . They could be used to notify farmers of new development and emergency situation such as disease outbreak. Mass media methods include newspaper, radio, television and publications.

2.13 Problems of Extension Services in Nigeria

These problems are different in nature, origin, severity and degree to which alleviation is possible (Oladosu *et al*., 2004). Yusuf (1998) stated that agricultural

extension is faced with a number of problems that usually militates against the success of many agricultural developments particularly in Nigeria..

Disproportionate extension agent to farm family ratio; this is a critical problem facing agricultural extension in Nigeria, the insufficient number of agricultural extension workers that provide service to large population of farmers. Agbamu (2005) reported that in 1995, Nigeria ADPs were able to cover 7,809,500 farm families . This underscores the need for more extension agents to be employed in Nigeria, so that they cope with the population of farmers.

Inadequacy of service amenities such as office accommodation, lack of transport facilities and essential equipment that seriously undermine the efficiency of the service, which restrict communication and limit the scope of operation. Ineffective agricultural linkages, the linkages between agricultural research and extension organizations are weak in some developing countries, weak research extension linkage affect the quality of knowledge generation and knowledge management upon which the success of extension organization depends. One of the factors that have led to ineffective research extension linkage is lack of undertaking staff exchange between agricultural research and extension organization (Agbamu, 2005).

Poor and inadequate funding; poor financing of extension programmes has been a long-standing problem facing the service. William (1989) stated that the problem of inadequate funding many years ago still persists till today. Financing is needed to purchase audio-visual aids and other communication related gargets for training farmers, pay salaries and allowance of staff in the service.

According to Benor *et al*. (1984), training and demonstration are the major problems of extension; training of extension is usually inadequate in terms of its frequency, timelines and relevance. Training efforts are generally concentrated on pre-service training, which is often theoretical and classroom oriented and frequently seeks to cover the whole range of crops and practices. Where extension agents are multipurpose workers, their training is further diluted by non-agricultural subjects. Once the extension workers have started work in the service, little effort is made to update their knowledge of new technology or development in agriculture.

Proliferation of programmes such as OFN, GR, RBDA, ADP, NAFPP, all these programmes were initiated by the government with the aim of improving agricultural production, but due to lack of good management, supervision only vary few being effectively implemented. Extension agents generally do not have schedule of work, if extension goals are set. They are often too broad and unrealistic to achieve. They are too vague to check and bear relevance local situation.

Education: This refers to the general level of education training that extension personnel have. Besides, the educational level of the society and farmers to whom the available technologies are to be transferred influence the nature of policy, philosophy and commitments of society to agricultural extension. The type and amount of education influence the level and type of research and technology that can be developed from within the society. These do in turn, influence the general attitude, management skills, cognitive and psycho-motive skills required in development and supply of inputs much required in technology transfer (Benor et al 1984).

2.14 Review of Empirical Research on Farmers Perception of Effectiveness of Extension Services.

There has been several research findings indicating that the extension agents sometimes shy away from their responsibilities or fail to make impact on their target groups (Danjuma, 1994). Similarly William (1978) asserted that most farmers attached great importance to service rendered to them by extension agents many were not satisfied with their made of operations. Many felt change agents do not pay them regular visits they needed so that they might learn how to put into practice improved farming techniques. He found out that the cause of the failure was considered to be due to the shortage of extension worker at local level and curtailment of traveling allowance to extension workers.

William (1978) further suggested that there is general impression that there is an appreciable need to upgrade the preparation of extension workers in a way that training received is more relevant to what is subsequently expected of them in the field or local problems often encountered Okwache and Asogwa (2012) They further Pointed out that more effort has been put into refining practice than refining theory. In that sense, extension often seems to be running behind application rather than guiding it (Aderson *et al,* 1966) They further noted that in stimulating response the desired changes, the characteristics of the agent and his innovation techniques are of utmost importance. If agricultural extension is to continue making impact on agricultural production in the future, more basic research is needed. There should be intensive study in traditional systems of agriculture, our village and social organization.

Danstop, e*t al* (2010) stated that certain socio – economic factor and personal characteristics seem to influence the adoption of agricultural innovation by farmers, such as social income, farm size . He further stated that adequate assessment of these factors by the concerned policy makers and change agents could significantly increase the adoption of agricultural innovations and utilization of information sources by farmers

Danstop, *et al*, (2010) emphasized that socio – economic characteristics such as farmers age, level of education, number of years of farming, number of plots owned were not statistically related with the use of extension agent as a source of information.

2.15 Theoretical Framework

The theoretical framework for this study was drawn from the following theories of effectiveness. These include; Organizational effectiveness Model and Goal Models.

Organizational Effectiveness Model

An organizational model is composed of many parts. In order to be effective, it is essential that each part be in good working order. Each part must fit and work conjointly with other parts in order for total organization to perform optimally. In an organization recognized for Excellence parts are aligned so that the whole is actually more effective of the sum of the parts.

The model provides a simple framework to view and asses any part of the entirely of an organization. This model is a tool that help any organization, regardless of its size, to more toward organization excellence. The model can help you align resources, in improve communication productivity and effectiveness; and achiever strategic goals.

Goal Model

The goal model relies on a vision of the organization as a rational set of arrangements oriented toward the achievements of goals. Effectiveness is measured in terms of a accomplishment or outcomes. The focus is exclusively on the ends achievement of goad, objectives and targets (Okwacha, 2012).

2.16 Conceptual Frame Work of the Study.

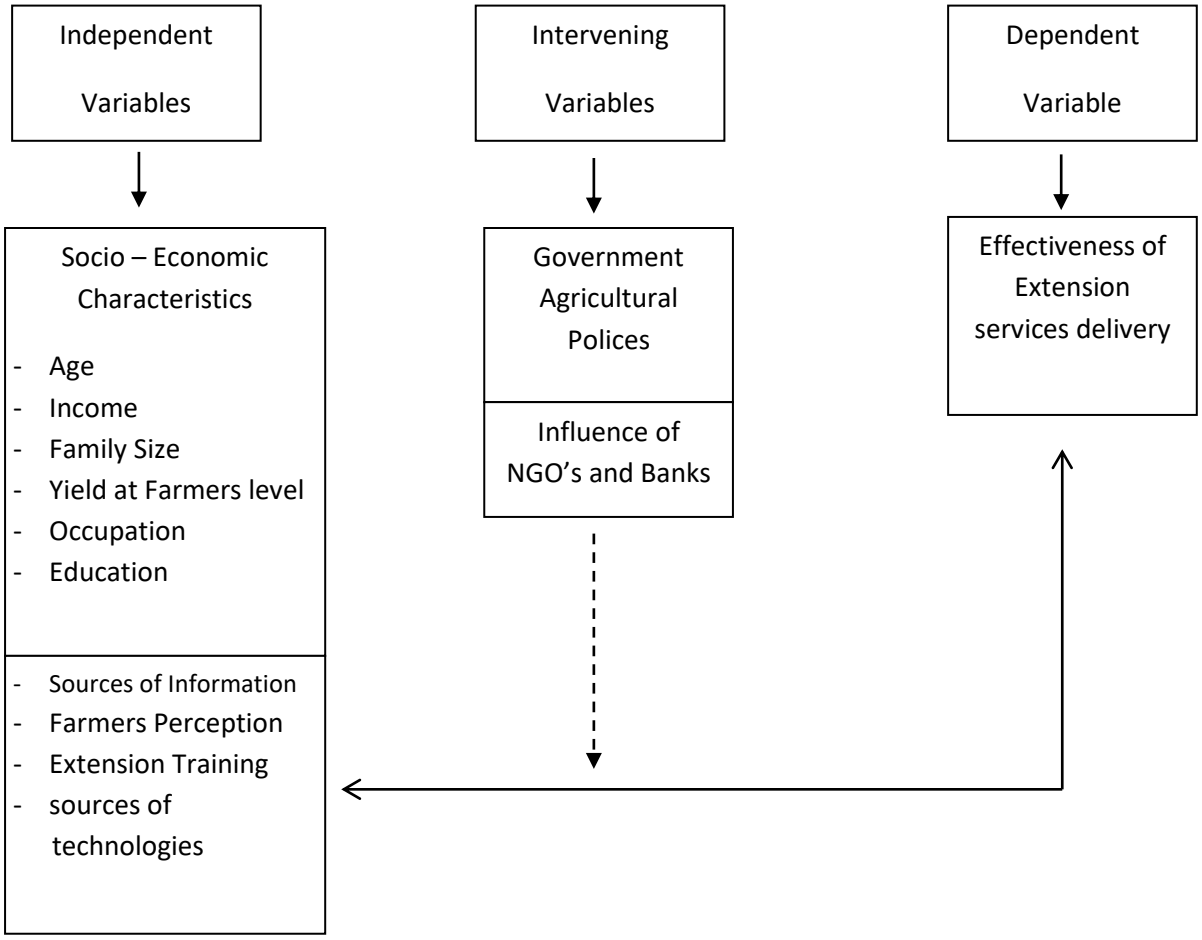

Figure 1*:* Schematic presentation of the Conceptual framework of the study

The conceptual framework of this study was divided into three phases, namely, the independence variables phase, the intervening variable phase and dependent variable

phase. The variable in independable phase (such as age, income, family size, yield at farmers level, occupation, education, family experience, farmer size, household size).

Similarly, certain variables or factors have been found to influence the relationship that exist between the independent variables and dependent variables, that is intervening variables which includes government agricultural policies and influence of NGO's and banks.

CHAPTER THREE
RESEARCH METHODOLOGY

3.1 Description of the Study Area

The study was conducted in Zone I of Niger State Agricultural Development Project, Nigeria. The state have three Agricultural Zones, Zone I with head quarters at Bida, Zone II with it head quarter at Kuta and Zone III with head quarter at Kontagora. The basis of conducting the study in Zone 1 is due to abundance of cassava farmers in the Zone. Niger State was created on 3rd February, 1976 from defunct North – Western State. The State is bordered to the North by Zamfara State, to the West by Kebbi State, to the South by Kogi State, to the Southwest by Kwara State, to the North East by Kaduna State and to the South East by Federal Capital Territory (FCT).The State shares an international boundary with Republic of Benin to the North West (NSMST, 2004).

Niger State has a population of 3,954,772 people (National Population Commission, 2006) with a projected population of 4, 687, 600 after ten years (UNPFA, 2016). The state is located in Guinea Savannah agro-ecological Zone of Nigeria. It lies on LSatitude 8^{o} to 10^{i} and 11^{o} 30^{i} North and Longitude $6^{o}20^{I}$E and 9^{o} 03i East (Ojohomon, 2006). The State experiences distinct dry and wet seasons with annual rainfall varying from 1,100mm in the Northern parts, to 1,600mm in the Southern part. The maximum temperature (usually not more than 38^{o}C) is recorded between March and June, while minimum temperature (Usually not more than 25^{o}C) is usually recorded between December and January. The rainy season last for about 150 to 210 days or more. The mean annual rainfall is 1,400mm and the mean annual temperature is 31.5^{o}C with relative humidity ranges between 60% – 80% in the month of July. Generally, the fertile soil and

hydrology of the State encourages the cultivation of most Nigerian's staple crops such as yam, guinea corn, millet, ground nut, cow pea, pepper and still allows sufficient opportunities for grazing, fresh water fishing and forestry development (Ojohomon, 2006).

The State also covered a land area of 76,363Km^2 (about 8.4% of the total land area of Nigeria) out of which about 85% is arable. There are three major ethnic groups (Nupe, Gbagyi, and Hausa) in the state, other tribal groups include Kadara, Koro, Baraba, Kakanda, GanaGana, Dibo, Kambari, Kamuku, Pangu, Dukawa, Gwada and Ingwai. Niger State has numerous settlers from other parts of the country living peacefully and contributing their quota to the development of the state (Niger State Ministry of Information, 2008).

3.2 Sample Frame of the Study

The sample frame for this study constitutes 4, 000 registered cassava famers from the study area. This record of the farmers was obtained from the Niger State Agricultural Development Project (NSADP) area office in Mokwa (NSADP, 2010).

3.3 Sampling Procedure and Sample Size

Multi stages sampling procedure were used to arrive at the sample size of the study. In the first stage, purposive sampling was used to select zone 1 of Niger State Agricultural Development Project (NSADP) due to abundance of cassava farmers in the area. In the second stage, five Local Government Areas were randomly selected out of the eight Local Government Areas in the ADP zone I. In the third stage, one Extension block was randomly selected from Mokwa, Lavun, Edati, Gbako and Katcha Local Government Areas. At the fourth stage, a random selection of two cells out of the eight cells in the

selected blocks was employed. The fifth stage involved a proportionate selection of 5% of the registered cassava farmers in the selected cells, making the sample size of the study to constitute two hundred cassava farmers for the study.

Table 1: Sampling procedure and Sample size.

Agricultural Development Project Zones in the State	ADP Zone Selected	Local Gov't Areas in the zone	Number of Local Gov't Areas Selected	Local Gov't areas selected	Blocks in each of the Local Gov't areas selected	Blocks Selected	Cells in each of the Local Gov't areas selected	Cells Selected	Number of Registered Cassava farmers in each cell	5% of registered cassava farmers
ADP Zone I ADP Zone II ADP Zone III	Zone I (Bida)	Bida Mokwa Lavun Edati Lapai Agaie Gbako Katcha	5	Mokwa	2	1	8	2	1046	52.3
				Lavun	2	1	8	2	682	34.1
				Edati	1	1	8	2	639	31.95
				Gbako	1	1	8	2	781	39.05
				Katcha	2	1	8	2	852	42.6
TOTAL									**4000**	**200**

Source: Field Survey, 2017

3.4 Instrument for Data Collection

Primary data of the study was collected through the use of structured questionnaire; copies of the questionnaire were administered to two hundred cassava farmers using interview schedule .Data collected were that of socio-economic characteristics of cassava farmers, cassava farmer's sources of information of improved technologies, extension services offered to cassava farmers, cassava farmers' perception of the effectiveness of extension services, effectiveness of training provided by the extension agents and cassava farmers' level of awareness of improved technologies associated with cassava production. Secondary information for the study was sourced

from published materials (journals, books and book of proceedings), unpublished materials (dissertations, Theses and B. Sc. projects) and internet sources.

3.5 Tests of the Data Collection Instrument

3.5.1 Validity test

The validity of the research instrument was determined through face validity test. Experts in agricultural extension and economics, research specialist in education and management sciences were provided with the copy of the instrument for their assessment before the final copy of the instrument.

3.5.2 Test of Reliability

The data on extension services disseminated on cassava production namely land preparation, herbicide ,fertilizer application, planting method, weeding, diseases and pest control and harvesting method, scored and the results correlated using pearsons product moment correlation and the r-value of 0.774 obtained was significant at 5% level ,.

3.6 Measurement of the Study Variables

The study has two variables; they are the Dependent and Independent variables.

Dependent variables

The dependent variable of the study is effectiveness of extension services. The dependent variable (effectiveness) was measured based on the number of extension conct. While the independent variables of the study includes the socio-economic characteristics of the cassava farmers such as age, sex, educational status, marital status, occupation, family size, income, farms size, farming experience, land acquisition, farmers'

association membership, farmers yield sources of information, farmers' perception on extension provided and source of cassava production technologies.

Age: -Was measured in years

Sex: -Was measured based on Male = 1and Female = 2

Marital Status: -Was measured based on the status of the cassava farmers as either they are Single = 1, Married =2, Widow = 3, Divorced = 4.

Household Size: -Was measured based on the number of people in the household

Level of Education: - This was measured according to Quranic education only = 1, Primary education = 2, Secondary education = 3 and Tertiary education = 4

Secondary Occupation: -Was measured in terms of Trading = 1, Millet/guinea corn = 2, Civil servants = 3 Others = 4.

Income: Was measured according to the respondent source of income in a year.

Yield at farmer's level: This was measured on conversion ratio of pick-up truck load of cassava to conventional measurement, which is equivalent to 12000kg (NSADP,(2015).

Extension services: This was measured based on the number of extension visits by the farmers based on daily = 1, weekly = 2, fortnightly =3, monthly =4, quarterly = 5 and yearly =6.

Sources of information: This was measured based on how the cassava farmer sourced their information either through mass media= 1, extension agents =2, neighbours = 3 and market middlemen = 4.

Farmers perception: This was measured using a 5 point Likert scale containing constructs that will address the variable. The possible responses were scored as; 5 points for Strongly agree, 4 points for Agree, 3points for undecided, 2 points for Disagree, and 1 point for Strongly disagree and vice versa.

3.7 Data Analysis

Data obtained for the study were analyzed using both descriptive (percentages, frequency counts, mean and standard deviations) and inferential (Chi-square and Kendal's Coefficient of Concordance) statistics. Descriptive statistics were used to achieve objective 1, 2,3 5and 6. T-test was used to achieve objective 4. While inferential statistical tools such as Chi-square and Kendal's Coefficient of Concordance) were used to test the study hypothesis

3.8 Model Specification

1. Kendall's coefficient of concordance

   Kendall' is used to determining the association between variables measured in (or transferred to) ranks. It is most commonly used to assesses agreement among raters

$$W = \frac{12S}{(m^2(n^3 - n))}$$

2. Chi – Square is used to determine whether there a significant difference between the expected frequencies and the observed frequencies in one or more categories.

$$\chi^2 = \frac{\sum(fo - fe)}{fe}$$

χ^2 = Chi – square symbols

O = observed value

E = expected value

Σ = summation symbol

3. T-test – t-test is an analytical tool used to determine the difference between two sample means from two normally distributed populations with unknown variances.

$$t = \frac{\overline{X}_1 - \overline{X}_2}{\sqrt{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2}}}$$

$\overline{X}_1$ = Mean of first set of values

$\overline{X}2$ = Means of second set of values

S_1 = Standard deviation of first set of values

S_2 = Standard deviation of second set of values

n_1 = Total number of values in first set

n_2 = Total number of values in second set

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Socio-economic Characteristics of the Cassava Farmers

This part of the result describes the socio-economic characteristics of the cassava farmers. The socio-economic variables considered for this study were age, sex, marital status, family size, educational attainment, farm size, farming experience, secondary occupation, mode of land acquisition and farmer's association membership.

4.1.1 Age of the Cassava Farmers

Result presented in Table 2a indicated that 47% of cassava farmers were within the age range of 33-39 years with average age of 41 years. The average age of the cassava farmers was found to be 41 years, which implies that most of the cassava farmers were still active and energetic enough to carry out farming activities. The active age seems to favour agricultural activities as it demands strength and fitness of people involved. This finding is in line with the report of Seriki and Oluade (2003) which found out that many rural dwellers are still in their active and energetic age and still find pleasure in agricultural activities. Yunusa (1999) also reported that this group of farmers may have wider contacts with outside farming and alternative employment opportunities. They are therefore much more willing to take risk in adopting new practices than older farmers.

4.1.2 Sex of the Cassava Farmers

As indicated in Table 2a, most (67.5%) of cassava farmers were male, while 32.5% were female. Females are mostly involved in other farm activities like processing and trading of agricultural produce. It may also be attributed to the fact that cassava farming is a male dominated activity due to its laborious nature (Okwache, 2012) It may

also be attributed to the fact that cassava farming is a male-dominated activity as a result of its physical energy requirements (Eugene *et al*., 2012).

4.1.3 Marital Status

Findings in Table 2a revealed that more than half (57.4%) of the cassava farmers were married, 32.5% were single and few (10%) of them were widows. This finding implies that married farmers are more likely to have more helping hands in carrying out their farming activities and this translate into better production with reduced labour cost. The prepondence of the married people could create potentials for increased farm labour supply which would contribute positively to cassava production.(Ohen et al, 2014 and Onumadu et al,2014)

4.1.4 Household Size

Results in Table 2a also show that 48.5% of cassava farmers had family size of 1-5 household members and 36.5% had 6-10 household members . Based on the findings of the study, an average of seven (7), indicating that the cassava farmers had moderate family size that assist in the provision of farm labour. The variation in their household size may depend on the basis for raising children, exposure and educational status of individual cassava farmer's sample. This is also in line with Awudu and Richard (2001) that large families appeared to be more efficient than moderate's families.

This finding is in conformity with Danstop and Diagne(2010) who reported that large household had propensity towards technology adoption which count on availability of labour force for farming.

4.1.5 Educational Attainment

Findings in Table 2a reveal that most (60%) of the cassava farmers had secondary school education . These findings implied that cassava farming in the study area was dominated by the educated class with highest among them having secondary school educational attainment. . The findings also imply that farmers with higher level of literacy and formal education are expected to be more inclined to acceptance of technological change in their farming activities and its ascertain the literacy level helps farmers to uptake innovations faster. In corroboration with the findings of the study, Adewumi *et al.* (2007) posited that literacy helps in the adoption of new technologies. Education was also found to help farmers to interpret the technology packages transferred to them by development agencies. Balarabe (2012) also reported that educational level does not only increase productivity but also increases ability to understand and evaluate information on new techniques and technologies being disseminated through extension services.

Table 2a:Socio-economic Characteristics of the cassava farmers (n = 200).

Variable	Frequency	Percentage	Mean	SD
Age(years)				
18 – 25	12	6.0	41.2	11.1
26 – 32	61	30.5		
33 - 39	94	47.0		
40 – 46	20	10.0		
47 and above	13	6.5		
Sex				
Male	135	67.5		
Female	65	32.5		
Marital Status				
Single	65	32.5		
Married	115	57.5		
Widow	20	10.0		
Household Size				
1 – 5	97	48.5	6.8	3.9
6 – 10	73	36.5		
11 household members and above	30	15.0		
Educational Attainment				
Qur'anic education only	33	16.5		
Primary school education	43	21.5		
Secondary school education	120	60.0		
Tertiary education	4	2.0		

Source: Field Survey, 2017.

4.1.6 Farm Size

Table 2b show the estimates of hectares of land own by individual farmers in the study area. The result indicates that the Cassava farmers had an average farm size of about 4.6 hectares. Majority (70.5%) of the cassava farmers had farm size of 1-5 hectares . This finding indicates that a greater number of cassava farmers in the study area cultivated small farmland. This may attribute to insufficient fund, land tenure system and labour force. This finding is in line with Ajibefun *et al. (*2006) who reported that the size of farm generally portrays the size of operation as it has major impact on the level of resource use of small scale farming. Farm size is an indicator of wealth, social status and influence within a farming community (Babatunde, 2003).

4.1.7 Farming Experience

Results in Table 2b reveal that 39% of the cassava farmers had 6-10 years of cassava farming experience. The average farming experience of cassava farmers in the study area was 13.6. This indicated that cassava farmers had adequate farming experience that could assist them to utilize agricultural information to them by the extension workers. This finding is in line with Abdoulaye *et al*. (2014) reported that farmers with high farming experience appear to have access to information and better knowledge and are able to evaluate the advantage of technologies disseminated to them. Balarabe (2012) also reported that experience is a form of knowledge and skills that facilitate the adoption of modern technologies. It is termed as the frequency of exposure to events and or activities from which an individual or group may gather knowledge, opinion, and skills.

4.1.8 Secondary Occupation

Table 2b indicated that majority (75.5%) of the cassava farmers had other crops (sorghum, maize millet and cowpea) farming as their secondary occupation .The findings of the study implied that the secondary occupation of cassava farmers is expected to earn them some income and experience that helps in adoption of modern cassava farming , because of the fact that the innovation provided by the extension agents would be more considered depending on the economic activities of the farmers. This finding is in line with Williams (2008) who reported that the major occupation of rural people is farming and also engage in non-farming activities to gain additional income.

4.1.9 Land Acquisition

Table 2b revealed that most (57%) of the cassava farmers acquired the land for cassava production through inheritance that is land is passed from generation to generation. Similarly, 18% of cassava farmers acquired their farm land through rent.. Land acquisition is the process through which individual farmers acquired farmland for their farming operations.

4.1.10 Farmers Association Membership

The results in Table 2b further revealed that most (66.5%) of the cassava farmers did not belong to any farmers' association, while 33.5% belongs to some farmer's association in the study area.

This is a voluntary participation in a group or society on the ground of common interest and similar belief. It was expected to assist farmers to get easy access to credit facilities and other production inputs. It can also enhance access to information about technologies. Membership of farmer's associations is important because it has been ascertained that

farmers within a group learn from each other especially on technologies disseminated and market price of agricultural produce (Odoemenem and Obine, 2010).

Table 2b:Socio-economic characteristics of the Cassava Farmers (n = 200).

Variable	Frequency	Percentage	Mean	SD
Farm Size (hectares)				
1 – 5	141	70.5%	4.6	6.8
6 – 10	54	27%		
11 hectares and above	5	2.5		
Farming Experience (Years)				
1- 5	38	19.0	13.6	10.1
6 – 10	43	39.0		
11 – 15	33	16.5		
16 – 20	14	7.0		
21 years and above	37			
Secondary occupation				
Trading	20	10.0		
Farming of other crops	151	75.5		
Civil Servant	20	10.0		
Others	9	4.5		
Land Acquisition				
Hired	36	18.0		
Purchased	17	8.5		
Borrowed	20	10.0		
Gift	13	6.5		
Inherited	114	57.0		
Farmers Association Membership				
Yes	67	33.5		
No	133	66.5		

Source: Field Survey, 2017.

4.2 Sources of Technologies Utilized by the Cassava Farmers

Result in Table 3 show that most (60%) of the cassava farmers sourced their planting materials from their fellow farmers, 16.5% of the cassava farmers sourced their planting materials from markets, 12.5% sourced the planning materials from Research Institutes and few (2%) of them sourced their planting materials from the last year's harvest.

Also the results in Table 3 show that 44% of the cassava farmers cultivated improved cassava varieties (TMS 92/005), most 59.5% of the cassava farmers cultivated TMS 30592 variety of cassava and 18.5% of them cultivated TMS 30211. These findings indicate that majority of the farmers cultivated improved cassava varieties with different characteristics such as early maturity, high yielding and those that are resistant to pest and diseases.

This finding signified that all the adopters of the improved cassava varieties have one reason or the other for cultivating the improved cassava varieties in the study area. These findings agreed with Ayanwuyi and Oladosu (2001) who reported that improved cassava varieties were widely adopted by farmers, because of their distinct associated factors, (characteristics).

Result in Table 3 further indicated the source of improved agricultural inputs by the farmers. The findings show that 44.5% of the cassava farmers obtained their inputs from previous stock; similarly 22% of the cassava farmers obtained their inputs from agricultural business centers. This result implied that all the sampled cassava farmers obtained their farm inputs from research and agricultural business centers which are

considered as agricultural extension outfits. This result is supported by Jock and GerShon (2003) who posited that service provided by the extension service had significant public good attribute.

Table.3: Distribution of cassava farmers according to Technologies Utilized, Technologies Adopted and the Mode of Inputs Acquisition (n = 200).

Sources of technologies	Frequency	Percentage
Source of planting materials		
Market	33	16.5
Research institute	43	12.5
Farmers	120	60.0
Last year harvest	4	2.0
Varieties commonly		
Adopted		
Early maturity (TMS 92/005)	44	22.0
High yielding (TMS 199/30572)	119	59.5
Resistance to pest/diseases (TMS 30211)	37	18.5
Source of improved agricultural inputs		
ADP	13	6.5
Market	20	10.0
Agricultural Business center	44	22.0
NRCRI	34	17.0
Previous stock	89	44.4
Mode of input acquisition		
Purchase	200	100
Gift	0	0

Source: Field survey, 2017

4.3 Amount Spent on Purchase of Inputs

Table.4 shows the amount of money spent on purchasing agricultural inputs for the cassava farming. The results show that 39% and 23% of the cassava farmer spent ₦15, 100 and ₦20, 000 on purchase of Cassava varieties respectively. Another 12.5% and 11% spent between ₦10, 600 to ₦15, 000 and ₦21, 000 and above respectively on the purchase of cassava varieties. The result reveals that ₦12, 858.95 as the average amount spent on purchase of cassava varieties.This indicates that cassava farmers that

spent on purchased cassava varieties are ones that used improved varieties whilethose that spend nothingon the purchased of varieties are those that get varieties from neighbours or previous stock.

4.3.1 Expenses on Purchase of Land Preparation Implements

Results further show that 33.5% of the cassava famers spent between ₦10, 000 – ₦20, 000 on land preparation. Similarly, 27% and 11% spent #21,000 and above and ₦5, 1000 - ₦10, 000 on land preparation respectively. The results indicate that ₦16, 983.69 was the average amount spent on land preparation. This implied that some cassava farmers spent much on the purchased of land preparation inputs as a result of high cost of the inputs, because they are crude and hand powered.

4.3.2 Expenses on Purchase of Agro-Chemicals

Results also show that 35.5%, 22.5% theand 15% of the cassava farmers spent between ₦5,100 – ₦10,000,₦10,000 and above and ₦1000 – ₦5,000 on purchase of herbicide respectively. The result indicates that ₦9, 162.32 is the average amount spent on cost of herbicides.(Paraqut dichloride, glyphosate, atrazine and butachloretc).

This indicates that few of the cassava farmers purchased chemicals for the control of disease and pest .This could be due to high price of the chemicals and inability of the farmes to purchase them.Using chemicals to control diseases and pests make positive significant contribution to output of the cassava products.This also agrees with Odi (2003) observations. That use of agro chemicals can lead to output maximization.

4.3.3 Expenses on Purchase of Fertilizer

In addition, results in table 4 show that 29%of the cassava farmers reported that they did not apply fertilizer to the cassava farm and as such they spent no amount on purchase of fertilizer, 27% spent ₦5, 100 – ₦10,000, 15.5% spent 0 – ₦5,000, 14% spent ₦10,100 – ₦15,000 and 5% spent ₦21,100 and above purchase of fertilizer. Most of fertilizer purchased by the respondents is urea and N.P.K respectively. The result indicates that an average of ₦8, 817.09 was spent on purchase of assorted fertilizers.

This implies that only few cassava farmers purchase fertilizer for their cassava farm, this could be due to the fertile nature of the farm land and could aiso be due to the inability of the cassava farmers to buy it, because of poverty and the distribution of fertilizer along party lines as was the case in the study area.

4.3.4 Expenses on Purchase of Disease and Pest Control Chemicals

Results also show that majority 45.5% of the cassava farmers spent nothing on the purchase of disease and pest control chemicals because they have not experience any of such infestation, 35.5% spent 0 – ₦5,000, 10% spent ₦5,100 – ₦10,000, 6% spent ₦15,100 and above, while 3% spent ₦10,100 – ₦15,000 respectively on purchase disease and pest control chemicals. The result reveals that an average of ₦3, 974.34 was spent the purchase of diseases and pest control chemicals e.g. Aluminum phosphide Lambda – Cyhalothrin, Chloropyritos and Crypermethrin etc.

This indicates that very few of the cassava farmers purchase chemicals for the control of disease and pest control, because there are no much infestations of diseases and

pest on cassava in the study area and also due to the expensiveness of the chemicals,can not be afford by some of the cassava farmers.

Table 4: Distribution cassava farmers on amount spent in purchase of cassava production Inputs (n = 200).

Variables	Frequency	Percentage	Mean	SD
Cassava varieties				
None	78	39.0	₦12,358.95	13345.8
0 – ₦5,000	10	5.0		
₦5,100 – ₦10,000	9	9.5		
₦10,100 – ₦15,000	25	12.5		
₦15,100 – ₦20,000	46	23.0		
₦21,000 and above	22	11.0		
Cost of Land Preparation				
None	53	26.5	₦16,983.69	13134.2
0 – ₦5,000	4	2.0		
₦5,100 – ₦10,000	22	11.0		
₦10,100 – ₦20,000	67	33.5		
₦21,000 and above	54	27.0		
Cost of herbicide				
None	54	27.0	₦9,162.32	9.51
₦1,000 – ₦5,000	30	15.0		
₦5,100 – ₦10,000	71	35.5		
₦10,100 and above	45	22.5		
Cost of fertilizer				
None	58	29.0	₦8,817.09	8804.6
0 – ₦5,000	31	15.5		
₦5,100 – ₦10,000	54	27.0		
₦10,100 – ₦15,000	23	14.0		
₦15,100 – ₦20,000	10	5.0		
₦21,000 and above	19	9.5		
Cost of disease/Pest control chemicals				
None	91	45.5	₦3,974.34	5666.3
0 – ₦5,000	71	35.5		
₦5,100 – ₦10,000	20	10.0		
₦10,100 – ₦15,000	6	3.0		
₦15,100 and above	12	6.0		

Source: Field survey 2017

4.4 Source of Farm Labour

Table.5, show that most (63.5%) of the cassava farmers in the study area hired labour for their farm operations. About 16.5% of them used family labour for their farm activities, and 20% of the farmers got their labour through community effort.

This implies that most of the cassava famers in the study area hired labour for their farm operations and few of them used family and community labour on their farm operations. It reinforces the observation by Erhabor and Omokaro (2008) that cassava is a low-labour crop since it is weed tolerant.

Table 5: Distribution of cassava farmers according to their source of labour (n = 200)

Variables	Frequency	Percentage
Family labour	33	16.5
Hired labour	127	63.5
Community labour	40	20.0

Source: Field survey, 2017

4.5 Amount Spent on Labour

Results in table 6 shows that 36.5% of cassava farmers spent ₦ 2,000-₦10, 000, similarly 35.5% and 18.5% respectively of cassava farmers spent , 20,000 - ₦ 10,000, ₦ 12,000 - ₦ 20,000 and ₦21,000 - ₦ 40,000 on clearing of their farm lands. This shows that cassava farmers in the study area spent low amount on labour on land clearing, this could be due to small farm scales farms, and some of them used family and communal labour on land clearing. This conforms to Erhabor and Omakaro (2008) that cassava is low –labour crop, since the crop is weed tolerant.

Result also reveals that the cassava farmers spent varying amount of money on other land preparation activities ranging from ₦3,500 - ₦10,000 and ₦45,000 - ₦60,000 respectively. This implies that majority of the cassava famer spent less money on labour for land preparation, most of them used family labour or communal effort for the land preparation.

Results further reveals that majority of cassava farmers (69%) spent ₦ 1,000 – ₦10,000 on labour for planting operations; while another 18% of the cassava farmers spent ₦11,000 – ₦20,000 on planting operations. This implies that some cassava farmers in the study area spent less amount on labour for planting operations, most of them used family labour to support.

On fertilizer application 11% of the cassava farmers reveal, that they spent nothing on labour for fertilizer application, majority (62.5%) indicates that they spent #800 – #10,000 on labour for fertilizer application. In addition, 16% and 10.5% of the cassava farmers spent #10,200- #20,000 and #24,000 - #50,000 respectively on labour for fertilizer application. This shows that some percentage of the cassava farmers do not apply fertilizer to their cassava, because of the fertile nature of the land and most of them that applied spent less amount on labour, on fertilizer application.

Results similarly show that 10% of the cassava farmers weed their cassava through family labour, 9.5% of the cassava farmers spent #2,000 – #10,000 on labour for weeding, another 27% and 32% spent #12,000- #20,000 and #33,000 – #45,000 on labour for weeding of cassava farms. This implied.

On harvesting of cassava, many 41.5% of respondents spent #12,000 - #20,000 on labour for cassava harvesting, 12%, 6.5% and 6% of the respondents spent #22,000 -

#30,000, #32,000 - #50,000 and #100,000 - #197,000 respectively on labour for cassava harvesting, while 9% of the cassava farmers reveals that they used direct labour from the family to harvest their cassava product.

Table 6: Distribution of cassava farmers according to amount spent on labour (n = 200)

Variables	Frequency	Percentage
Land clearing		
None	19	9.5
₦2000-₦10000	73	36.5
₦12000-₦20000	71	35.5
₦21000-₦40000	37	18.5
Landpreparation		
None	20	10.0
₦3500-₦10000	30	15.0
₦12000-₦20000	78	39.0
₦20500-₦40000	60	30.0
₦45000-₦60000	12	6.0
Planting		
None	20	10.0
₦1000-₦10000	138	69.0
₦11000-₦20000	36	18.0
₦24000-₦35000	6	3.0
Fertilizerapplication		
None	22	11.0
₦800-₦10000	125	62.5
₦10200-₦20000	32	16.0
₦24000-₦50000	21	10.5
Weeding		
None	20	10.0
₦2000-₦10000	19	9.5
₦12000-₦20000	54	27.0
₦21000-₦30000	64	32.0
₦33000-₦45000	33	16.5
₦46000-₦65000	10	5.0
Harvesting		
None	18	9.0
₦1000-₦10000	50	25.0
₦12000-₦20000	83	41.5
₦22000-₦30000	24	12.0
₦32000-₦50000	13	6.5
₦100000-₦197000	12	6.0

Source: Field survey, 2017

4.6 Sources of Capital

.Table 7 indicates that more than half (58.5%) of cassava famers largely depend on personal savings as their source of capital for cassava farming. Similarly, 24% of the cassava farmers depend on loan from the bank as their source of capital. Also 16.5% of the cassava farmers depended on co-operatives as their source of capital, while 1% depend on relatives to obtain capital for cassava farming.

This implies that most of the cassava farmers depend solely on their personal savings as their source of capital for cassava faming, because most of the cassava farmers do not have access to credit facilities and inadequate cooperative societies in the study area.

Table 7: Distribution of cassava farmers according to source of capital(n = 200)

Source of capital	Frequency	Percentage
Loan from the Bank	48	24.0
Personal savings	117	58.5
Co-operatives	33	16.5
Relatives	2	1.0

Source: Field survey 2017

4.7 Effectiveness of Extension Services to Cassava Farmers.

Table.8 show that majority (78.5%) of the cassava farmers reported that they were visited by extension agents while few (21.5%) of them claimed that they were not visited by the extension workers.

The result also show that majority (70.5%) of the cassava farmers had contact with extension agents on quarterly basis, 24% of them contacted extension agents on monthly basis, similarly (2%) of the respondents affirmed that they had contact with

extension agents on fortnightly basis and few(1.5%) and (1%) were contacted by the extension agents on weekly and yearly basis respectively. This signify that extension agents are not performing their duties effectively, because they did not abide by the fortnightly schedule of visits of farmers in the study area which could also be due to insufficient extension agent farmer's ratio and inadequate extension facilities and the transportation problems in the study area. In most developing countries such as Nigeria, subsistence or traditional agriculture dominates the economy and for national progress to occur, change in agriculture is essential. The change is needed not only to increase production, but to liberate households from poverty. A great deal of the responsibility for bringing about this change rests on the shoulders of extension workers. (Anaeto, 2003) Result in the Table 8 further indicates that majority (98.5%) of extension agents came from Agricultural Development Project (ADP), while few (1.5%) of them were from International Institute for Tropical Agriculture (IITA).

Result on extension services provided by the agents shows that 39.5% of the respondents were disseminated with improved agricultural inputs, 31.5% of them were taught on planting depth for cassava cultivation, 19% were on weed control techniques, 6% on harvesting techniques, 3% on agro chemicals applications and 1% on time of planting.

Results on extension teaching methods employed by the extension agents shows that 50% of the cassava farmers reported that the extension agents disseminated new technologies to them through individual extension teaching method, 45% of them opined that they were taught through group extension teaching method and few (10%) of them were of the

opinion that they were taught through the mass media, such as radio agricultural programmes, television agricultural programmes and town crier.

Table 8: Distribution of cassava farmers according to effectiveness of extension services tocassava farmers (n = 200)

Variables	Frequency	Percentage
Did extension agents visit you/your farm		
Yes	157	78.5
No	43	21.5
How frequent was the visit:		
Daily	2	1.0
Weekly	3	1.5
Fortnightly	4	2.0
Monthly	48	24
Quarterly	141	70.5
Yearly	2	1.0
Where does the extension agent come from?		
ADP	197	98.5
NRCRI	0	0.0
IITA	3	1.5
The extension services provider by the agents:		
Introduction of improved agricultural inputs.	79	39.5
Planting depth.	63	31.5
Weed control techniques.	38	19
Harvesting techniques	12	6.0
Time of planting	6	1.0
Chemicals	2	3.0
Extension teaching methods used to disseminate the improved technologies:		
Individual extension teaching method.	100	50.0
Group extension teaching method.	90	45.0
Mass media	10	5.0

Source: Field survey, 2017

4.8 Mass Media

Result in Table 9 shows that most (61%) of the cassava farmers were of the view that radio as a means of communication is very important to them in their agricultural practices. This finding implied that majority of the cassava farmers in the study area

enjoyed the agricultural programme aired and it helps them in improving their level of productivity and income. This finding is in agreement with Kuponiyi (2000) who reported that radio is the most highly used media in accessing development and agricultural information. Jock and Gershon, (2003) also reported that mass media was found to be a veritable tool for creating awareness and mobilizing farmers on the importance of change towards new science based agricultural findings.

Table 9: Distribution of cassava farmers according to mass media used by the extension officers. (n = 200)

Variables	Frequency	Percentage
Radio agricultural programs	122	61.0
Television agricultural programs	22	11.0
Print media	18	9.0
Theater center display	12	6.0
Town crier	26	13

Source: Field survey 2017

4.9 Effects of Extension Services on Cassava Yield

Table 10: Reveal that 34.5% of cassava farmers had 1.2-6.0 tones of cassava and 32.5% of cassava farmers had 7.2-12.0tones of cassava before adoption of improved technologies. While 74% of cassava farmers had 192,000kg and above of cassava after adoption of improved technologies to their cassava farming.

The average yield of cassava products before adoption of improved technologies was 13.8 tones and the average yield of cassava after adoption of improved technologies was 23.5 tones. T-test statistic calculated between the yield before and after

was (t= 21.73; (p = 0.01) this shows that there is significant difference in yield before and after adoption.

The result implies that potentials of improved productivity with effective extension support to cassava farmers 'are high. This support the finding of Jock and Gershon (2003), who stated that services provided by the extension agent have significant effect.

Table 10: Distribution of cassava farmers according to effect of adopting new technologies, on cassava yield before and after adoption. (n = 200)

Variables	Frequency	Percentage	Mean	SD	T-test
Yield of cassava before (tones)					
extension contacts					
1.2-6.0	69	34.5	13.8	14.9	21.73
7.2-12.0	65	32.5			
13.2-18.0	20	10			
19.2 and above	46	23			
Yield of cassava after extension					
contacts(tones)					
1.2-6.0	5	2.5	23.5	1.51	
7.2-12.0	25	12.5			
13.2-18.0	22	11			
19.2 and above.	14.8	74			

Source: Field Survey, 2017

4.10 Perception on the Benefit Derived from Extension Services

Result in Table 11 show the distribution of cassava farmers according to the benefit derived from adoption of new cassava production technologies. The finding reveals that the cassava farmers had mean value of 4.48 as the average benefit of improved crop yield, mean value of 4.43 for improved income, improved farm land

owned 3.43 and improved standard of living 4.35. The result implies that the Cassava farmers had some benefits from adoption of improved cassava technologies in the study area.These benefits that they have gained would influence positively in their output levels.

Table 11: Distribution of cassava farmers according to perception on the benefit derived from Extension contacts of new technologies on cassava farming (n=200).

Attitudinal statements	SA	A	UD	D	SD	Mean	Rank
Improved crop yield	95 (47.5)	77(38.5)	19(9.5)	7(3.5)	2(1)	4.48	1
Increase income	94(47)	64(32)	29(14.5)	10(5)	3(1.5)	4.43	2
Increased ownership of farmland	31(15.5)	47(23.5)	66(33)	44(22)	12(6)	3.43	2
Improved standard of living	92(46)	79(39.5)	24(12)	4(2%)	1(0.5)	4.35	3

Source: Field Survey: 2017 values in brackets are percentages (%)

4.11 Constraints Militating Against Cassava Farming

Table 12 shows some notable difficulties that militate against effective cassava farming in the study area. The Table revealed that 30% of the cassava farmers had problem of land tenure system, and this could be attributed to the nature of land ownership in the study area. Since most of the land in the study area are owned through inheritance, that is; land is passed from generation to another which does not allow those that have enough capital to invest on large parcel of land for agricultural production. Another 25% of cassava farmers were constrained by problem of herdsmen invasion of their farm 15% of cassava farmers was constrained by inadequate credit facilities, 12.5% faced problem of transportation and 7.l5% faced problem of poor marketing system.

Table 12: Distribution of cassava farmers According to Constraints Militating against Cassava Farming (n=200)

Constraints	Frequency	Percentage	Rank
Problem of tenure system	60	30	1st
Problem of herdsmen	50	25	2
Inadequate Credit facilities	30	15	3
Inadequate Extension Services	25	12.5	4
Transportation Problem	20	10	5
Poor Marketing system	15	7.5	6

Source: field survey, 2017

4.12 Test of the Research Hypotheses

Hypothesis 1: There is no significant association between the cassava farmers' socio-economic characteristics and effectiveness of extension services in the study area.

Result in Table 13 Show the result of association between farmers' socio-economic characteristics and their perceived effectiveness of extension services on cassava cultivation in the study area. The result reveals a significant association ($P<0.05$) between age of the cassava farmers and effectiveness of extension services. Also the findings reveal a significant association ($P<0.05$) between the cassava farmers, farming experience and effectiveness of extension services. However other socio-economic variables namely, marital status, sex, farm size, education, primary occupation and family size were not statistically significant. These findings indicate that age and farming experience of the cassava farmers are associated with the effectiveness of extension services. This may be attributed to the fact that the older the farmers are and the higher their farming experiences the more their level of exposure to various extension services. These findings are similar to those of Oladeji *et al.* (2017). Found significant association between access to extension education and some selected socio-economic characteristics namely age and farming experience of cassava farmers.

Table 13: Chi-square result of association between farmer's socio-economic characteristics and effectiveness of extension services.

Variable	χ^2 – value		P-value	Decision
Age	1.720		0.034*	S
Marital status	3.668		0.886	NS
Sex	7.989		0.433	NS
Farm size	1.096		0.334	NS
Education	21.423		0.163	NS
Primary occupation	6.086		0.638	NS
Farming experience	75.913		0.05*	S
Family size	51.851		0.764	NS

Field survey, 2017; Significant level P = 0.05; S= Significant; NS = Not significant; Df = Degree of freedom.

Hypothesis 2: There is no significance difference in the ranking of the effectiveness of extension services offered to cassava farmers in the study area.

The result of Kendall's (W) Coefficient of Concordance Test on hypothesis two indicates a Kendall's (W) value of 0.034 and Chi-square value of 60.41 at significance level of 0.05, indicating that significant differences exists in farmers' ranking of extension services provided to them. The result of Kendall's (W) test indicates farmers ranking of the extension services provided by extension agents in order of their accessibility to such services. Information on harvesting and planting method were ranked first and second respectively by the farmers. Furthermore, information on pest and disease management was ranked fourth, while information on weed management and time of planting were ranked fourth. Similarly, two extension services namely planting material and linkage with inputs were ranked fifth in the ordering.

Table 14: Result of Kendall's (W) Coefficient of Concordance Test

Variable	Mean Rank	Rank
Land preparation	4.92	8
Tractor hiring service	5.32	7
Fertilizer application	5.41	6
Planting material	5.42	5
Linkage with input	5.42	5
Weed management	5.54	4
Time of planting	5.54	4
Pest and disease management	5.64	3
Planting method	5.65	2
Harvesting	6.16	1

Test Statistics for Kendall's Test

N 200

Kendall's W 034

Chi – square 60.405

Df 9

Asymp sig 0.000

Source: Field Survey: 2017

CHAPTER FIVE

5.0 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary

This research work broadly assessed the effectiveness of extension service among cassava farmers in zone 1 of Niger State agricultural development project, Nigeria. The study in it specific objective describe the socio-economic characteristics of cassava farmers, identify the sources of technologies utilized by cassava farmers, determine the difference in yield of cassava farmers before and after extension contact, determine farmer's perception on the effectiveness of extension services offered the cassava farmers and identify the constraints militating against the effectiveness of extension services offered the cassava farmers and identify the constraints militating against the effectiveness of extension services on cassava farming. The study used structured questionnaire in the collection of data through the use of interview schedule. Multi stage sampling technique was used to have a sample size of 200 cassava farmers from five local government areas in zone 1 Niger state agricultural development project.

The study employed the following analytical tools in order to analyze the data collected from the field descriptive statistics such as frequency distribution, percentages, mean and standard deviation, were used to analyze the socio=economic characteristics for cassava farmers. Inferential statistics such as chi-square, + - test, was used to analyze the data while chi-square and kendall's coefficient of concordance were used to test the study hypotheses.

Findings of the study revealed that most (67.5%) of cassava farmers were marrised, 57.5% of the cassava farmers were male with some (47%) fall within the age

range of 33-3es, 9 years. Also, the findings indicated that majority 60% of the cassava farmers had formal education and majority (76%) of them engaged in farming as their primary occupation.

As indicated in the findings of the study, majority (78.5%) of cassava farmers confirmed that they were visited by the extension agents, while few (21.5%) of the cassava farmers had no contact with the extension agents throughout their cassava farming season. Also, the findings of the study indicated that the extension services provided by the agents were introduction of improved agricultural inputs (40%), planting depth techniques (32%) and (19%) of them were trained on weed control techniques. Findings on the use of extension service provided reveals that 83.5% of the cassava farmers use the extension services provided to them while few (16.5%) did not adopt the technologies disseminated.

The findings from the study also show that extension services provided to the cassava farmers were effective, because it have increased their yield and improved their income. The findings reveals that the cassava farmers had some benefits from extension contact on cassava farming because it increased their crop yield, improved their income and improved their standard of living.

The results of hypotheses show significant association ($P < 0.05$) between the age and farming experience of the cassava farmers. The findings of the Kendal's (W) Test of Concordance reveals that significant differences exist in farmers ranking of adoption of extension services provided to them.

5.2 Conclusion

Based on the major findings of this study, the study therefore, concludes that extension services provided to cassava farmer had significant impact on cassava production in the study area.

Age and farming experience were found to be important and significant factors influencing the effectiveness of extension services among the cassava farmers in the study area. In addition the following extension services were offered to cassava farmers in the study area namely, harvesting technique, planting method, fertilizer procurement, weed management techniques, pest and diseases management, improved planting material and linkage with inputs. The cassava farmers were however faced with the following constraints; Inadequate fund, lack of credit facilities, inadequate extension services, problems of land tenure system, transportation problems, lack of cassava farmers co-operative group and poor linkage to input acquisition.

5.3 Recommendations

1 The authorities concerned with organizing extension delivery should improve on the frequency of extension contacts in order to encourage farmers' participation in extension activities when the need arises in the study area

2 Extension agents should be properly trained and provided with all necessary technological packages required to teach and guide cassava farmers on improved technologies.

3 Farmers should be encouraged to seek more of formal education as it will further help them understand and take up innovation.

4 Farmers should be encourage to form co – operative societies as this will avail them the opportunities to asses financial support from financial organizations.

5 Efficient extension services should be provided to the cassava farmers.

6 Friendly policy to support private initiatives in extension delivery to compliment effort of the public extension is also advocates.

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APPENDIX

SURVEY INSTRUMENT

DEPARTMENT OF AGRICULTURAL EXTENSION AND RURAL DEVELOPMENT,

FACULTY OF AGRICULTURE,

USMAN DANFODIO UNIVERSITY, SOKOTO.

Sir/Madam,

I am a postgraduate student of the above named institution. Currently carrying out a research study on the Assessment of Effectiveness of Extension Services among Cassava Farmers in Agricultural Development Project (ADP) zone I of Niger State, Nigeria. I do assure you that the information you provided will be used for academic purpose only and would be treated confidentially.

SECTION A:- SOCIO – ECONOMIC CHARACTERISTICS OF THE RESPONDENTS

1. Local Government Area…….
2. Village……
3. Age……(Years)

4. Marital status (a) Single [ ] (b) Married [ ] (c) Widow [ ]
   (d) Divorced [ ]
5. Sex (a) Male [ ] (b) Female [ ]
6. Family size …….. (people
7. Farm size …….(ha)

8. Primary occupation (a) Trading [ ] (b) Farming [ ]
   (c) Civil servant [ ](d)Others (please Specify)……

9. Educational attainment (a) Qur'anic education only [ ]

(b) Primary school education [ ] (c) Secondary school education [ ] (d) Tertiary education [ ]

s

10. Years of farming experience ……(years)

11. Method of land acquisition (a) Hired [ ] (b) Purchased [ ]

(c) Borrowed [ ] (d) Gift [ ] (e) Inherited [ ]

SECTION B:- SOURCES OF TECHNOLOGIES UTILIZED

12. What are the sources of your planting materials (a) Market [ ] (b) Research Institute [ ] (c) Farmers [ ] (d) Last year's harvest

13. Which variety do you commonly use ?

(a) Early Maturity (TMS 92/005) [ ]

High yielding (TMS 30572) [ ] (c) Resistance to pest / diseases (TMS 30211) [ ]

14. What is the source of your improved agricultural inputs? (a) ADP [ ] (b) Market [ ] (c) Agricultural Business Center [ ]

(d) NRCRI [ ] (e) Previous stock [ ]

15. Mode of input acquisition (a) Purchased [ ] (b) Gift [ ]

16. If purchased (as in 15 above). How much spent on the inputs in the table

Inputs	Amount Spent (₦)
Cassava Variety	
Land Preparation	

Herbicides	
Fertilizer Application	
Diseases Control	
Chemical	

17. Source of labour (a) Family labour [ ] (b) Hired labour [ ]

(c)Community labour [ ](d)Others(please Specify)……

18. Specify Amount spent on labour ……

S/N	Job type	Amount (₦)
I	Land leasing/Hiring	
II	Land Clearing	
III	Land Preparation	
IV	Planting	
V	Fertilizer Application	
VI	Weeding	
VII	Harvesting	
	Total	

19. What is your Source of capital (a) Loan from the Bank [ ] (b)Personal saving []
(c) Co – operative [ ] (d) Relatives [ ]

SECTION C:- EXTENSION SERVICES OFFERED

20. Did extension agents visit you/your farm? Yes [ ] No [ ]

21. If yes, how frequent was the visit (a) Daily [ ] (b) Weekly [ ]

(c) Fortnightly [ ] (d) Monthly [ ] (e) Quarterly [ ]
(f) Yearly [ ]

22. Where does the extension agent come from? (a) ADP [ ]

(b) NRCRI [ ] (c) IITA [ ]

(d) Others (please specify) …….

23. What are the extension services provided by the agents? Tick as appropriate

(a) Introduction of improved agricultural inputs [ ] (b) Planting depth [ ] (c) Weed control techniques [ ] (d) Harvesting Techniques (e) Time of planting [ ] (f) Chemicals

(g) Fertilizer Application

24. Which extension teaching method was used by the extension workers to disseminate the improved technologies

(a) Individual Extension Teaching Method [ ] (b) Group Extension Teaching Method [ ] (c) Mass media [ ]

(d) Others (please specify).....

25. If mass media, tick the appropriate mass media used by the extension workers

(a) Radio agricultural programs [ ] (b) Television agricultural programs [ ]

(c) Print media [ ]

(d) Theater center display [ ] (e) Town crier [ ]

(f) Others (please specify)……...

SECTION D: FARMERS PERCEPTION ON THE EFFECTIVES OF EXTENSION SERVICES

26. Have you ever adopted the extension service provided?

(a) Yes [ ] (b) No [ ]

27. if yes to question 26 above, itemize the adopted technologies…….

……

28. Choose appropriate among the benefits derived from adoption

Statement	Strongly agree (5pts)	Agree (4points)	Slightly agree (3points)	Disagree (2 pts)	Strongly disagree(ppts) (1)
Improved crop yield					
Improved health care					
Improved income					
Improved farm land own					
Improved standard of living					

29. If no (in 26 above) why? Tick the appropriate column among the reasons below

Reasons for not adopting

Improved techniques	Too complex	Not compatible	Not triable
Cassava variety			
Land preparation			
Time of planting			
Method of planting			
Weeding control techniques			
Planting depth			
Fertilizer application			

Pest and disease control			
Harvesting			

30. Perception about effect on cassava production

Statement	Strongly agreed (5)	Agreed (4)	Slightly agree (3)	Disagreed (2)	Strongly Disagreed (1)
(1) Do you think that better yield was obtained from the new varieties introduced to you?					
(2) Do you think that better yield was obtained from new land preparation introduced to you?					
(3) Do you think that better yield was obtained from the planting depth introduced to you?					
(4) Do you think that better yield was obtained from the new weed control techniques introduced to you?					
(5) Do you think that better yield was					

obtained from the fertilizer application method introduced to you?					
(6) Do you think that better yield was obtained from the harvesting techniques introduced to you?					
(7) Do you think that better yield was obtained from the new time of planting introduced to you?					

31. (a) What was the estimated yield of your cassava during the last three years.

Farm size (ha)	Cassava yield (ha) 2014	Cassava yield (ha) 2015	Cassava yield (ha) 2016

32. (b) What was your yield before adopting improved techniques disseminated by the extension workers…….……(ha)

33. What is your yield after adopting improved techniques disseminated by the extension workers……..(ha)

34. Do you think the increase in yield has been enhanced by applying improved farming techniques disseminated by the extension workers in the study area?
(a) Yes [ ] (b) No [ ]

35. How can you rate the performance of the extension workers in disseminating and teaching farmers the improved technologies?

a) Perform highly

b) Performance was fair

c) Performance not appreciated

SECTION E: CONSTRAINTS MILITATING AGAINST CASSAVA FARMING

37. What are the constraints militating against your Cassava Farming?

a……..

b……...

c……

d……

e……