RELEVANCE OF AGRICULTURAL EXTENSION TOWARDS EFFECTIVE PARTICIPATION OF WOMEN IN AGRICULTURAL PRODUCTION IN FEDERAL CAPITAL TERRITORY (FCT)-ABUJA

BY

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DECLARATION

I, Andrew Ali WAKAWA, declare that this thesis titled "Relevance of Agricultural Extension towards Effective Participation of Women in Agricultural Production in FCT-Abuja, Nigeria" has been written by me in the Department of Vocational and Technical Education under the Supervision of Dr. B.I. Okeh and Dr. D.O. Oni. The information derived from the literature have been duly acknowledged in the text and a list of reference provided. There is no part of this Thesis that was previously presented for another degree or diploma at any university.

_____ _____

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CERTIFICATION

This thesis titled "Relevance of Agricultural Extension towards Effective Participation of Women in Agricultural Production in FCT-Abuja, Nigeria" by Andrew Ali WAKAWA, meets the regulations governing the Award of the Degree of Masters of Science Education (Agricultural Education) of Ahmadu Bello University, Zaria, Nigeria, and is approved for its contribution to knowledge and literacy presentation.

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DEDICATION

This work is dedicated to my late beloved parents Mr. and Ali Tapchi Wakawa.

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ABSTRACT

This study ascertained Relevance of Agricultural Extension towards Effective Participation of Women in Agricultural Production in Federal Capital Territory-Abuja, Nigeria. Four specific objectives were formulated. The specific objectives were to ascertain the extent to which agricultural extension is needed by women farmers. In line with these objectives, four research questions, and corresponding four Null Hypotheses were formulated. Related Literatures were reviewed. Descriptive research design method was adopted. The population consisted of 8,005 women farmers. 350 women farmers were selected from 12 villages/towns in the six Area Councils using stratified random sampling method based on age. Questionnaire was used for collecting data. Descriptive and Chi-Square Statistics were used in analyzing the data. All the Null Hypotheses were tested at 0.05 level of significant. Results of the mean scores revealed that women farmers needed agricultural extension for diffusion and adoption of new technologies. Results of the tested Null Hypotheses showed that need of agricultural extension significantly related with participation of women in agricultural production (P> O.O5). It was concluded that women performed a variety of operations in agriculture in the FCT however; certain factors limited them from effective performance. Agricultural extension was identified as a relevant strategy for enhancing their performance. Based on these findings, Agricultural extension organizations should design and deliver more appropriate programmes and transmit research results to them. Women farmers should embark on farming enterprises that require less land. Research Centres should develop suitable technologies for women farmers. Finally, understanding effective agricultural extension programming for women farmers was recommended for further study.

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DEFINITION OF TERMS

Adoption	Adoption is a concept which refers to the acceptance and continuous use of an idea or practice by single unit of a potential audience.
Contact Farmer	A farmer who acts as an intermediary between fellow farmers and the extension agency.
Diffusion	Diffusion is a concept which refers to the spread of idea, or practice through the whole of the potential audience or social systems
Farm inputs	Resources that are used in farm production, such as chemicals, equipment, feed, seed and energy.
Land tenure	Rules and arrangements connected with the ownership of land, especially land for farming.
Subject Matter Specialist (SMS)	Professional staff who provide technical back-up to extensionists.
Training and Visit System (T&V System)	An extension management system in which Village Extension Worker (VEW) regularly visit contact farmers after he/she has received training from the SMSs.
Village Extension Worker (VEW)	Extension agent at the local level, responsible for the first contact with farmers.

LIST OF ABBREVIATIONS

ADP	Agricultural Development Project
AMAC	Abuja Municipal Area Council
AMPEC	Agricultural Project Monitoring and Evaluation
ARMTI	Agricultural and Rural Management Training Institute
BSc	Bachelor of Science
FAO	Food and Agricultural Organization
FCT	Federal Capital territory
HND	Higher National Diploma
NCE	Nigeria certificate in Education
OND	Ordinary National Diploma
SMS	Subject Matter Specialist
SSCE	Senior School Certificate Examination
VEW	Village Extension Worker
WIA	Women in Agriculture
WDA	Women Development Agencies

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Information dissemination is a critical tool for promoting development. It is an essential input to production particularly when agriculture is being modernized. Camble (1992) asserted that man required information to be able to manipulate factors of production such as land, labour and capital resources into meaningful and productive use. This assertion was supported by Tripp (2006) who opined that information has an important role in all types of agricultural system. Providing information to promote agricultural development will increasingly require a systematic approach. Farmers, institutions and organization are all elements in one system, linked by the use, generation and diffusion of knowledge and information. Based on this understanding, the Federal Government has designed several structures to implement several programmes geared towards efficient and effective information dissemination with a view to improving agricultural production. Agricultural extension is one of the important tools governments have for effecting the system. It is an important instrument for stimulating agricultural development.

Agricultural extension involves disseminating information on agricultural technologies and improved practices to farm families and ensuring farmers' capacity building through the use of a variety of communication methods and training programmes (Agbamu, 2005). Agricultural extension is an out –of– school system of education for teaching farmers how to raise their standard of living by their own efforts and using their own resources by providing them with scientific knowledge to solve their farming problems (Williams, 1997). In line with this, Oladoja (1994) and Quamar

(2002) provided a related view and defined agricultural extension as a non-formal education programme designed to meet the information, inputs, services and skill requirements of farmers in a way to empower them to be able to continuously provide food for the people. Similarly, Ani (2004) defined agricultural extension as the provision of knowledge and skills necessary for farmers to be able to adopt and apply more efficient agricultural methods to improve their productivity and living standards.

Agricultural extension can increase agricultural productivity and farmers' income through increasing the technical knowledge and farming practices by farmers. Several studies showed that agricultural extension is generally cost-effective, and has a significant and positive effects on farmers' knowledge and adoption of new technologies and hence on farm productivity (Birhaeuser, Evension and Feder, 1991). Agricultural extension is particularly important where agricultural communities are heavily involved in subsistence agriculture and where large numbers of farmers are illiterates or unfamiliar with current technologies. Agricultural extension hence provide the means for increasing agricultural productivity due to the fact that it links the farmers with the outside world--the scientists, the creditors, and the consumers of his products (Saito and Weidemann, 1990).

Nigeria like most developing countries in Africa is basically an agrarian country. Agriculture remains the largest employer of labour in Nigeria and the developing countries of Africa, Asia, Caribbean and Pacific Countries (Abdullahi, 2001). It is the single most important vocation that remains intimate to the rural populace in the communities (Abba-Gana, 2003). This agreed with Crowder, Lindley, Bruening and Doron (1999) who stated that agriculture constituted the major economy of rural areas, and will remain for many years the major contributor to the economies of most

developing countries. Women across the world form one of the criteria that make up the human development index when comparing countries with each other (Axinn and Axinn, 1997).

Women are known to play active roles in the world's agricultural production system. They have been noted to play a pivotal role in agricultural production especially in less developed countries where their contribution is paramount (Banmeke and Olowu, 2005). According to Food and Agricultural Organization (FAO) (1998), women in developing countries hold the key to the future of the Earth's agricultural systems, food and livelihood. The report further noted that more than half of the world's foods were produced by women in rural areas of the developing world, where food production was the principal activity; women provide up to 80 percent of the food consumed in their own homes. In Nigeria, agriculture is the single most important occupation among women, where most of them are engaged in the production of food crops. Few of them cultivated large hectares and fewer still are engaged in cash crop production.

Women are at the heart of agricultural development in Nigeria. They form a considerable portion of Nigeria's population---about 49.6 percent of the total population (Federal Government of Nigeria) (FGN,2009). Women were responsible for as much as 70 percent of actual farm work and constituted up to 60 percent of the farming population (Mijindadi, 1993). Women actually constituted the bulk of the Nigeria food producers by predominating the agricultural sector in terms of numbers and task performed. Adisa and Okunade (2005) affirmed that the women fold constituted a formidable and significant part of the producers of Nigeria's primary production. It is therefore no exaggeration to say that women in developing countries are the backbone of food security, that is, agriculture is becoming feminized (Breth, 1997). This agreed

with Saito and Spurling (1992) who viewed that Africa is a region of female farming per excellence.

Women in the study area grow most of the food and sustain rural life, but lack critical support – land, fertilizers, credits, labour-saving technologies and political clout needed to maximize their pivotal role. The bulk of the total food production in the area came from resource-poor, technology deficient, poorly educated small scale women farmers with low farm and farmer productivity and small holdings, who made up 98 percent of the farming population and produced 70-80 percent of the total food and 100 percent of the marketed food surpluses. Despite the significant contributions of women to agricultural production in the area, they remained marginalized and have been constrained from contributing fully to development by the scarcity of efficient technologies and production inputs relating to their tasks as well as lack of access to those technologies that are available. They also received very limited agricultural extension services.

Most women have less access to and higher effective costs for information, technology, inputs and credit. As a result, their productivity is thereby depressed. A major approach to the development of women's agricultural productivity in the area is the provision of agricultural extension services. Dissemination of agricultural information through agricultural extension is crucial to agricultural productivity of women farmers. Through this means, they can learn about those things that they are not aware of and improve their production. Olawoye (1996) asserted that agricultural information through agricultural extension could enhance agricultural productivity of farmers when they have access to it. The moral is that if women farmers in the area have

same access to yield-increasing inputs as men, the small holder agricultural sector would achieve significant increases in agricultural productivity.

Women as key food producers in the study area need to have adequate access to resources, technology, information, and education. Their access to them can have effect on their agricultural production and earnings. When given adequate opportunities and resources, women in the study area are decisive partners in development. Their efficiency, dynamism and openness to innovation can turn the tide in the war against hunger. It is against this background that the study is set up to ascertain the relevance of agricultural extension towards effective participation of women in agricultural production in Federal Capital Territory-Abuja.

1.2 Statement of the Problem

It was observed that women farmers in Federal Capital Territory still used local methods of cultivation that resulted in low yields and required much labour. As a result, small-scale women farmers dominated agricultural production landscape in the area with low yields (Mundi, 2000). The researcher noticed that women in the study area have limited access to agricultural resources and services required to enhance the performance of their farm tasks. They cultivated small hectares because of limited land available to them.

Women in the study area were illiterates, engaged in subsistence agriculture and unfamiliar with current technology and were often perceived by male extension agents as being non-adopters (Mundi, 2000). Women in the study area often have been excluded from learning new technology and participating in capital-intensive schemes.

Also, they are inadequately served by extension services on farm production. Instead, extension advice directed at them hitherto has been on home economics and related topics that deal with the domestic roles of women. Mijindadi (1993) reported that the primary focus of extension services had been on men farmers. Similarly, Breth (1997) observed that women's access to technology is declining, while that of men is being enhanced. Given such differential access to technology, women's agricultural output will continue to be low. With low output, little income can be realized from whatever is marketed, and with little income women will have virtually nothing to invest into their economic activity.

Agricultural extension services in the study area are grossly inadequate and remain a male dominated profession, and extension officers direct most of their activities towards men. Contributions of women to agricultural development in the FCT has not been tremendous, as their works have been confined to traditional tasks utilizing primitive technology in the face of rapid technological innovations and modernization. They do not receive equitable opportunities or decision-making privileges as men and encounter more difficulty than men in gaining access to information, technology, land, inputs, credit, technical services, and commercial market outlets (Saito, Mekonne and Spurling, 1994 Alfred, 2004).

The researcher observed that the FCT as a whole has a problem of rich women farmers that are grossly underutilized. The problem here is therefore to find out how the extension services can reach the women.

1.3 Objectives of the Study

The main objective of the study is to ascertain the relevance of agricultural extension towards effective participation of women in agricultural production in Federal Capital Territory-Abuja.

The specific objectives are to:

1. ascertain the extent to agricultural extension is needed by women farmers in FCT-Abuja.
2. identify the different roles played by women farmers in agricultural production in FCT-Abuja.
3. identify factors limiting women farmers' production in FCT-Abuja.
4. identify strategies that will improve women farmers' production in FCT-Abuja.

1.3 Research Questions

1. To what extent is agricultural extension needed by women farmers in FCT-Abuja?
2. What roles do women farmers in FCT-Abuja play in agricultural production?
3. What are the major factors limiting women farmers' production in FCT-Abuja?
4. What strategies can be used to improve women farmers' production in FCT-Abuja?

1.4 Research Hypotheses

The following null hypotheses are formulated for testing.

1. There is no significant relationship between the need of agricultural extension services and participation of women in agricultural production.

2. There is no significant relationship between the roles played by women farmers in agricultural production and their access to agricultural extension services.
3. There is no significant relationship between factors limiting women farmers' production and their participation in agricultural production.
4. There is no significant relationship between the strategies used to improve women farmers' production and their participation in agricultural production.

1.4 Significance of the Study

Findings from this study will be invaluable to Women Development Agencies in the FCT whose mandate is the creation of programmes aimed at building the capacity of women farmers in the study area. The study will generate interest among Federal Capital Territory (FCT), Agricultural Development Project (ADP) and Women In Agriculture (WIA) that are involved in delivering extension services to women farmers and guide them in their quest to provide solutions to women's farming problems in the FCT. Furthermore, the findings will serve as a guide to extension organizations on how to provide extension services in a cost-effective way to women farmers in the territory and foster a better understanding of the appropriate strategies to effectively reach women with production enhancing innovation.

The results of the study will sensitize government of the FCT on the need to promote education, training, and relevant information programmes for women farmers. Finally, the findings will serve as terms of reference for future researchers interested in women in agricultural development in the area and also bridge the vacuum created by previous studies.

1.7 Basic Assumptions of the Study

The study was carried out with the following assumptions, that:

i. women farmers play some important roles in agriculture in the FCT.

ii. women farmers in FCT need agricultural extension services to improve their productivity.

iii. there are some factors militating against women's productivity and access to extension services in the FCT.

iv. there are strategies that will improve women farmers' productivity and access to extension services in FCT.

1.8 Delimitation of the Study

The study was delimited to relevance of agricultural extension towards effective participation of women in agricultural production. It dwelt on women farmers in the FCT-Abuja. It also focused on the six Area Councils in the FCT-Abuja.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

The related literatures were reviewed under the following sub-headings:

21. Theoretical Framework

2.2 Concept of agricultural education

2.3 Personal characteristics of women farmers.

2.4 Roles women played in agriculture.

2.5 Need of agricultural extension to women farmers

2.6 Factors limiting women farmers' production and access to agricultural extension services

2.7 Strategies for improving women farmers' production and access to agricultural extension services

2.8 Empirical Studies

2.9 Summary of Literature Reviewed

2.1 Theoretical Framework

The theory on which this study is premised is that of social change. The theoretical framework is drawn primarily from empirical research, generalizations and conceptualization from adoption-diffusion studies in rural sociology. The theoretical framework for this study therefore will be social change theory with specific emphasis on the diffusion and adoption of innovation. This is expected to form the basis for the empirical analysis of this study.

2.1.1 Social Change

When people adopted innovations, diverse socio-economic changes do occur. The changes affect the socio-economic and socio-cultural institutions. Inusa (2008) defined change as the significant alterations of structures. While Rogers (1995) defined social change as the process through which alterations occur in the structure and functions of a social system. According to Mohammed (2010), social change is the significant alteration of social structure, including consequences and manifestations of such structure embodies in norm, values and cultural products and symbols.

Changes can be planned or unplanned. Planned change involves direct human intervention in directing the change towards predefined goals. Unplanned change includes accidental changes that happens suddenly and are beyond human control.

Social change takes the following forms according to Mohammed (2010):

1- Modification in human attitude and behavioural pattern as a result of education

2- Alteration in social condition as a result of changes in the policies of a social organization

3- Effecting reforms in major legal and functional system of a society like land use decree or fertilizer distribution policy

4- Change in material culture.

In this case, social change denotes the planned change. Agricultural extension is the interventionist aimed at enhancing the women farmers. In this study it implies outcomes of the social change (enhancement/ improvement) of the target population. Most of the social changes in many known societies are a social group, a community, a town, city or even a nation developed through diffusion of cultures from other

societies. The theory of social change within the framework of this study will us to understand the social reality, which demonstrates the changes that have taken place through diffusion and adoption of agricultural innovations.

Inusa (2008) suggested three routes to the process of agricultural modernization:

1- Creating a macro-environment that makes change possible and encourages the ultimate decision makers to modify farming pattern.

2- Building a body of useful technology and available requisites production inputs that fill the modernization requirement, and

3- Optimizing an extension education system that effectively relates these conditions and resources to each other and watering them in a way that stimulates innovation with progressively over achievement disparities common to traditional agriculture.

The overall goal of any change programme, particularly in modernizing agriculture is to increase productivity and income of the farmer and make them highly dynamic, able to shift rapidly in adjustment to changes in technology, prices and market demand (Sanni, 2002). In line with this, Inusa (2008) suggested that outcome of a social programme could be determined by the following indicators:

1- Changes in knowledge and attitudes

2- Mediating behaviour outcomes (information seeking activities)

3- Changes in individual behavioural towards the programme activities (trial adoption)

4- Resulting social indicators effects (indices of economic or general well-being of the recipients).

2.1.2 Diffusion and Adoption Perspectives

Diffusion of innovations is a process by which an innovation spreads (Ani, 2007). Diffusion involves four essential elements according to Inusa (2008):

(i) innovation

(ii) its communication from one group to another

(iii) a social system within which this process occur; and

(iv) the time period over which the process is effected.

Adoption is a process to continue full use of an innovation (Ekong, 2003). Adoption is not a sudden event, but a process. Farmers do not accept innovations immediately; they need time to think things over before making a decision. The decision to use or adopt an improved technology by a farmer involves series of stages which include: Awareness, Interest, Evaluation, Trial and Adoption (Sanni, 2002).

The Classical Diffusion-Adoption theory is made up of two components:

1. The diffusion process
2. The adoption process. According to Odoemenem (2007), the distinction made between diffusion and adoption concepts is that, "diffusion is a concept which refers to the spread of idea, or practice through the whole of the potential audience or social systems; while adoption is a concept which refers to the acceptance and continuous use of an idea or practice by single unit of a potential audience".

2.2 Concept of Agricultural Extension

Agricultural extension sought to impart the necessary skills to the farmers for understanding improved agricultural operations, to make available to them timely information, improved practices in an understandable form suited to their level of literacy and awareness, and to create in them a favourable attitude for innovation and change (Benor, Harrison and Bartex1984). Agricultural extension assists farm people, through educational procedures, in improving farming methods and techniques, increasing production efficiency and income, bettering their levels of living and lifting the social and educational standards of rural life (Baxter, 1989).

Agricultural extension is essentially the means by which new knowledge and ideas are introduced into farming areas in order to bring about change and improve the lives of farmers and their families. It is central in the agricultural development process, both in terms of technology transfer and human resources development (Samanta, 1993). Oyebanji (1996) stressed that agricultural extension provides farmers with the necessary education, skills and technical information to enable them to take effective farm management decisions to enhance their daily practices. It is an effort that relates education to the needs of human life and the application of science to practical affairs.

Adedoyin (2002) defined agricultural extension as a comprehensive programme of services deliberately put in place for expanding, strengthening and empowering the capacity of the present and prospective farmers, farm families, other rural economic operators and farmer associations with managerial and communications skills that they need to succeed in farming and farm related occupations. According to Research and Extension (2002) agricultural extension is a service that is committed to expanding human capacity by delivering educational programmes and technical information that

result in improved leadership skills in the areas of communication, group dynamics, conflict resolution, issue analysis and strategic planning that can enhance the economic viability and quality of life in communities.

Agricultural extension is an educational system that provides farmers with technical advice required to increase their agricultural production and incomes (including advice on credit, other inputs and markets). It also provides agricultural service organizations (such as those for research and credit) with information on farmer conditions, constraints and priorities so that these organizations can serve the farmers better (Ogunbameru, 2005).

2.3 Personal Characteristics of Women Farmers

The personal characteristics of the women farmers were discussed under the following sub-headings:

2.3.1 Education

Education creates a favourable condition for effective communication and dissemination of technologies and adoption of the technologies. A positive relationship between level of education and adoption of innovation has been established. Atala and Maigana (1994) reported that education narrowed the gap in access to information between the literates and illiterates and equipped people (women) with ability to take advantage of developmental programmes. Federal Government of Nigeria (FGN) (2004) reported that there were about 61 percent adult women illiteracy rate in Nigeria compared to about 38 percent of male adult population. The illiteracy rate increased as one moved towards the northern part of the country. This situation according to Atala and Maigana (1994) had been unfavourable to effective technology transfer.

Education plays a prominent role in the determination of the level of participation in any development process. This has affected women who particularly have the highest percentage of illiteracy especially adult illiteracy (Mundi and Zakariah, 2007). NPC (2001) observed that for every 100 literate males, only 73 females were literate, and more urban males and females were literate compared with their rural counterparts. The level of education of every member of household affected the level of adoption of innovation of that household. Women have little access to education and more adult women that men in the developing world were illiterate (68 percent compared to 48 percent). They are far less likely to have attended school (FAO, 1984; Okunlola and Alfred, 1998). Women were denied the principles of equal opportunity and easy access to education enshrined in the national policy on education. This stems largely from cultural beliefs and attitudes which value women's domestic role (Adeyemo, 1991).

Illiteracy rates among women were variously estimated at between 55 percent and 65 percent and women tended to be concentrated in the lower – skilled and low-paying levels. This was partly a result of their generally low levels of education. Literacy status of the Nigerian population revealed that only about 52 percent was literate of which, women were less than men. 65.6 percent of the men were adjudged literate while there are only 30 percent literate women (Adeyemo, 1991 and Ijere, 1991). Entry into activities that provided higher returns depended on dissemination of information about such opportunities and on well-functioning labour and capital markets (Gittinger et al, 1990). One of the main sources of information was formal education. Evidence showed that better educated farmers were more likely to enter export agriculture due to the fact that education appeared to increase the ability and willingness to reallocate resources efficiently when prices or technology change. UN (1997)

reported that countries which promoted women's access to resources and schooling not only had lower poverty rates but had faster economic growth. The report further concluded that agricultural productivity in Africa could increase if women have improved access to education, land and fertilizer.

2.3.2 Age

In many societies, age was associated with status. In some communities, it was said that wisdom comes with age and was accorded great respect. It was also believed in such communities that because older people have lived long and passed through different experiences, have developed and acquired ways of coping with situations and they would generally weight situations before taking any decisions. In comparison, younger people were believed to be immature and have less experience to base their decision on. Adoption of new ideas, especially in agriculture has been associated with age. Adopters of new agricultural innovators have been found to be younger than non-adopter (Atala and Maigana, 1994).

Study with Hausa women in the Northwest zone of Nigeria by Atala and Maigana (1994) showed that younger women tended to socialize more within their age group which they used as a means for circulating information on new innovations, especially if it was tried and proved successful by a younger person that was well-known to them. Such a person according to Atala and Maigana became a role model. Women in the age bracket of 45 and 50 no longer have desire to adopt any new technology. Such women were rigid and conservative in their attitude towards change.

2.3.3 Marital Status and Religion

In most societies in Nigeria, marriage placed an individual in a position of responsibilities. For most women, marriage gave them higher status than those who were not married. Atala and Maigana (1994) observed that most women would not involve in new ventures or occupation without first discussing and seeking permission from their husbands. This was particularly in societies where women's movement beyond their compounds was restricted. Annabel (1991) said that in most Muslim communities, majority of the women observed purdah (wife seclusion) and might not leave their compounds except with permission of the husbands. Purdah, a religious factor, which restricted women from going out, has been observed to influence introduction of technology, because technology meant for an outdoor activity could not be utilized by majority of the women that were in seclusion (Atala and Maigana, 1994).

Experience in most communities where wife seclusion was observed showed that majority of them were not involved in activities that were outside their compounds. They were not readily accessible for introduction of technology involving outdoor activities. Religious value was a cultural factor that can influence the introduction of technology. Any technology related to production of swine would not be adopted by people who practiced religion that forbidden touching or consumption of pork. Similarly, Atala and Maigana (1994) noted that extension staff from different religious background with the recipient might not be welcomed. This might be due to the mode of dressing of such staff.

A Muslim man might expect a non-Muslim woman extension agent to cover her body with 'gele' (a covering cloth used by Muslim women) when she was working with Muslim women. When the extension agent failed to do this, the men might not allow her

access to their compounds to enable her work with the women. Some Muslim men might not understand why non-Muslim husbands should allow their wives to work as extension agents. The Muslim men might think such extension staff have come to poisoned the minds of their women, as a result of this misconception, they might not allow access to their women for introducing useful technologies.

Similarly, some religious sects taught their followers that collecting interest on money kept in banks is bad. Women with such background would not want to have anything to do with taking a loan from banks nor keeping money in the bank that would gain interest. Some women's groups encouraged their members to engage in business activities individually. Sometimes, such members might not have capital to start the business. Often times, members might tax themselves to raise capital and loaned it out to themselves with interest in a rotation system. If women, who did not believe in earning interest on loaned money, were among such groups, it would be difficult for them to reach any consensus (Atala and Maigana, 1994).

2.4 Roles of Women in Agriculture

Women farmers have been found to play significant roles in all spheres of agricultural production. Their areas of involvement were discussed under the following sub-headings:

2.4.1 Food Production

Women are known to play active roles in the world's agricultural production system. It was estimated that about 40 percent of the world's work force in agriculture were women. In the developing countries about 50 percent of the food was produced by women, and the percentage could be as high as 80 percent in some African countries

(NPC, 2001). About one-third of all rural households were managed by women in the less developed countries, while in sub-Saharan Africa and the Caribbean, between 60 to 80 percent of basic foodstuffs were produced by women. In Asia, they provided more than 50 percent of the labour required in intensive rice cultivation (Mundi and Zakariah, 2007). Olaleye (1999) estimated women's domestic food production at 80 percent in Africa, 60 percent in Asia and the pacific and 40 percent in Latin America. Studies showed that more women than men engaged in food production. Eshete (1992) indicated that the size of women labour force in agriculture ranged from 30 to 50 percent and it can be as high as 90 percent in food production.

The International Labour Organisation (ILO) (1998) estimated that 78 percent of women in Africa were active in agriculture compared with only 64 percent of the men. Studies also showed that African women were responsible for 100 percent of the work in food processing, 50 percent in animal husbandry and 60 percent in marketing (Egunjobi, 1991). FAO (1996) in validating this assertion noted that women farmers were responsible for 100 percent of the processing of basic foodstuff and about 80 percent of storage and transportation. Over 90 percent of economically active women engaged in one form of agricultural production or the other. Of the 10 linkages in the food path---clearing and harrowing of fields, planting, weeding, harvesting, transportation, processing, distribution, marketing, storage, and cooking, only the first two are dominated by men. The next two were solely done by women, while 70 percent of other activities were carried out by women along with their usual domestic burden (Ogunleye, 1985; Egunjobi, 1991 and Williams, 1997).

Women are the world's principal food producers. They were involved in every stage of food production and in addition to food production activities; they have the

burden of preparing and processing the food. Women played a pivotal role in producing staple crops such as rice, wheat, maize, which provided up to 90 percent of the food intake. Women played a pivotal role in agriculture. This is true not only of food production long recognized as women's activity, but also of other agricultural activities, such as cash cropping and livestock production. In Nigeria, it was estimated that about 44 percent of farm labour in the Southern states, 45 percent in the Eastern states, 13 percent in the Middle Belt states and 51 percent in the Northern states were done by women (Alfred, 2004).

Mijindadi (1993) reported that in Nigeria, women were responsible for as much as 70 percent of actual farm work and constituted up to 60 percent of the farming population. Jiggins and Olawoye (2000) in collaborating this assertion noted that out of the 95 percent small scale farmers in Nigeria who actually feed the nation, 55 percent of them were women. Recent findings indicated that Nigerian women constituted 49.6 percent of the total population and were found to be responsible for 60 to 80 percent of the food produced in the country in addition to the traditional reproductive and community management roles (Ajala, 2004; Adisa and Okunade, 2005). Women played a pivotal role in producing staple crops such as rice, wheat and maize which provided up to 90 percent of the rural poor's food intake. Women were mainly responsible for sowing, weeding, applying fertilizer and pesticides and harvesting and threshing (FAO, 1998). Women's contribution to crop production, such as legumes and vegetables was even larger.

A study in Eastern Nigeria found that home gardens occupying only two percent of a household's farmland accounted for half of the farm's total output. Similarly, home gardens in Indonesia were estimated to provide more than 20 percent of household

income and 40 percent of domestic food supplies. Women in Nigeria according to Jafry (2000) contributed significantly to the Nigerian economy in their roles as food producers, processors and sellers, in addition to their traditional role as home makers.

2.4.2 Livestock

Across most of the developing world, women raised poultry and small animals such as sheep, goats, rabbits and guinea pigs and small animal husbandry was often one of the few sources of income that were fully under their control. In Nepal, collecting fodder for buffalo was exclusively a woman's job. In Pakistan, women performed between 60 and 80 percent of cattle cleaning, feeding and milking activities (FAO, 1998 Asa, Etim,Akankpi and Okijie, 2007).

2.4.3 Fisheries

In most regions, the large boats used to fish coastal and deep-sea waters have male crews, while women managed small boats and canoes. In addition, women were mainly responsible for performing the skilled and time-consuming jobs that took place on shore such as net making and mending. In several countries, most of the inland fishing form-- rivers and ponds, backwaters, canals and lagoons were carried out by women, who have also assumed a leading role in the rapid growth of aquaculture (FAO, 1998 and Asa and Akankpo, 2006). Women processed the catch by sun drying, salting, smoking and preparing fish and fish derived foods, and they were normally the ones who subsequently sold these products. Women worked as wage labourers in large-scale processing industries and in some developing regions, they have become important fish entrepreneurs (FAO, 1998 and Asa and Akankpo, 2006).

2.4.4 Forests/Trees Production

Throughout the developing world, whether it is in nurseries, plantation, logging or wood processing activities, a significant proportion of the forest industry workforce was made up of women (FAO, 1998). Women played the lead role in caring and for using forests. They gathered food to feed their family, fuel for cooking, fodder for livestock and compost for fields and they collected bark, roots and herbs to use for medicines. They managed nurseries for income, conserve valuable forests species, plant trees to prevent soil erosion and floods (FAO, 1996, 1998 and Asa, Etim, Akankpo and Okijie, 2007). In many regions, women grew trees together with other crops in their gardens. In the home gardens of a single village in Thailand, 230 different plant species were found. And in a single African home garden, more than 60 species of food producing trees were counted. Women's knowledge of forest resources was extensive. Tribal women in India have medicinal uses for almost 300 forest species (FAO, 1998).

2.4.5 Food Processing

Across the developing world, most food processing activities were performed by women. In parts of North Africa, women were estimated to spend four hours a day grinding wheat for couscous alone. In Asia, women's post-harvest tasks of preparing food for the table or the market stall included transforming paddy into rice by milling in Indonesia, making popped rice in Nepal, chopping bamboo shoots for pickling and canning in Japan, processing oilseeds in China, cleaning and slicing fruits and vegetables for canning in India, drying fish in Sri Lanka, making kimchee pickle in Korea and canning tuna in Thailand. Women in fishing communities in Ghana used special smoking ovens that allowed them to process and distribute 60 to 90 percent of all fish farmed or caught (Saito and Weidemann, 1990; FAO, 1996; FAO, 1998 and Daman, 2003).

2.4.6 Storage and Marketing

It was mainly women who prepared food for storage and who maintained and used storage stocks and facilities. All over the world, women were actively involved in the trade of food products. In West Africa, women traders handled 60 to 90 percent of domestic produce from the farm gate to the consumer, and they have similarly significant role in many countries. Their participation was generally greatest where trade was not highly commercialized or industrialized. Women often traded and sold vegetables, fruits and other products destined for local consumption. Nearly all local marketing activities were carried out by women (FAO, 1998).

2.5 Need of Agricultural Extension by women farmers

Relevance of agricultural extension services for effective participation of women farmers lies in the following sub-headings:

2.5.1 Agricultural Extension Would Help Women Farmers in the Adoption and Diffusion of New Technology

Agricultural extension becomes a practical approach to solving most of the farming teething problem among our farmers. This was sequel to the fact that the adoption of new ideas, techniques and innovations to improving farming of rural life depends largely on agricultural education. Agricultural education would bring information and technology to women farmers and teaches them how to use it to improve their productivity. Agricultural extension also provides effective transfer of relevant information and technology to women farmers (Ani, 2007). The relevance of agricultural extension to women farmers lies in teaching them how to raise their own standard of living by adopting innovations and proven technologies in their farming practices.

Agricultural extension would equally help women farmers accept new agricultural technology for obtaining higher yields and changing the age-old concept of low yields (Ani, 2007). Agricultural extension would motivate them to adopt new innovations. Rai and Mauria (2006) opined that the innovators are of no use unless they are practically used by the women farmers. Agricultural extension transmits the desired information in an effective manner to the women farmers. Celis, Millimo and Wanmali (1991) reported that contact with agricultural extension in Zambia positively affected the diffusion and adoption of new agricultural technologies, especially for specialized commodities such as tobacco, cotton, sun flower, and soya beans among women farmers. Study by Saito, Mehonen and Spurling (1994) revealed that agricultural extension encouraged women farmers to informally test, adapt, and adopt the technologies, leading to improved productivity.

2.5.2 Agricultural Extension would change women farmers' attitudes, knowledge, skills and outlook through education

Increased agricultural productivity depends primarily upon the acceptance of cultural and technological changes in the farm level. Small scale women farmers can receive higher farm yield only if they adopt recommended farming techniques in place of their traditional practices. However, new practices are complicated. They are based on complex scientific knowledge and therefore, difficult for illiterate women farmers to understand. To adopt and successfully use improved farming techniques, the women farmers must understand them and to understand them requires effective teaching by agricultural extension. Ani (2007) revealed that education was basic for improving living conditions. Schooling or literacy has been widely recognized as a means of increasing knowledge about new opportunities in the community. Education did not only create a favourable mental atmosphere for the acceptance of new ideas, but

positively changes the overall attitude of the individual woman's farmer towards change.

Ani also opined that we cannot achieve agricultural development on farm level except through the provision of basic agricultural education, particularly the informal type that would help move our women farmers from traditional agriculture to progressive. Women farmers needed to learn skills to enable them have regular income. They also needed skill in harvesting and post-harvest care of crop produce. Agricultural extension would provide the needed skills for women farmers. The knowledge imparted would bring about behavioural changes in the desired direction. The women farmers would improve their skills through learning by doing (Rai and Mauria, 2006). Alfred (2000) and Ani (2007) revealed that agricultural extension would help increase women farmers' production by persuading them to adopt improved knowledge and their households.

Rai and Mauria (2006) said that all material development could be achieved only if there were change in the entire outlook and attitude of the women farmers. According to Rai and Mauria, agricultural extension would help bring about these changes through education. Studies by Birkhaeuser, Evenson and Feder (1991) showed that agricultural extension was generally cost-effective, and has a significant and positive impact on women farmers' knowledge and adoption of new technologies and hence on farm productivity.

2.5.3 Agricultural Extension Would Help Women Farmers Get Necessary Inputs

Women farmers need to have some kind of agricultural networks that would facilitate their interaction with the latest agricultural technology and provide them with the needed agricultural information. They also need credit services and help with

financial issues (Tinker, 1990). Women need to be empowered to seek and use these services. Studies by Rivera and Corning (1990); Faris and Khan (1993); Craig (1993); Ali and Swan (1995); Axinn and Axinn (1997) and FAO (1998) revealed that agricultural extension would provide useful information for women farmers regarding several agricultural inputs, services and available training; and help generate demand for purchased inputs, providing farmers with information on where and how to apply for credit, and how such credit and inputs could be used to augment their incomes.

According to Saito and Weidemann (1990), women access to agricultural extension was an integral part of their access to available resources, such as land, capital, information, education, technical assistance and other elements that contribute to the improvement of the economic and social –well being of the individual. Oakley and Garforth (1983) asserted that agricultural extension was of critical importance, without it, women farmers would lack access to the support and services required to improve their agriculture and other productive activities. Similarly Rai and Mauria (2006) asserted that in developing countries, where agricultural supply and services were limited, agricultural extension was required to get the necessary inputs and other requirements needed for agricultural production.

2.5.4 Agricultural Extension Would Help Women Farmers Visualize Their Farming as a Profitable Occupation

Agriculture today is not only farming, it is also a business and a good agricultural extension education programme trained the individuals for a rewarding business in farming. The farmer must, in addition to being a good herdsmen and women or crop producer, be able to buy and sell on the most favourable terms, manage labours efficiently, and be able to organize his/her farm so that production costs are as low as possible. Training for today's farmer should make him/her aware of all the latest

technical aids, materials and techniques and when they can be profitably utilized. The art of successful farming is to know and be able to evaluate the risks of all the natural factors, to be able to turn them to advantage and, when necessary, combat problems effectively. These according to Olaitan (1984) are the key requirements for agricultural extension education. Olaitan further affirmed that the goal of agricultural extension education was to help individual farmer to acquire adequate skills to make a living and advance progressively in farming.

Rai and Mauria (2006) reported that agricultural extension would help them have an insight or self-analysis of their own farm situations and available resources, and select the relevant technology or practice for obtaining higher yields and supplementing their income. Also, it would help women farmers understand their own situation and resources and critical analysis would help them take rational decisions for the best use of the available resources (Jones and Garforth, 1997).

2.5.5 Agricultural Extension Would Train Women as Farm Leaders and Progressive Women Farmers

There are always some women farmers who were consulted by other women farmers as a source of valuable information. The role of agricultural extension therefore is to identify such women farm leaders, give them suitable training and encourage them to adopt modern farm technology, so that they became the torch bearers for diffusing these technology among other women farmers (Saito and Weidemann, 1990). Rai and Mauria (2006) also affirmed that extension workers can organize special training programmes for progressive women farmers and women farmers belonging to special interest groups.

2.5.6 Agricultural Extension Would Help Women Farmers in Decision Making Process

Agricultural extension studies the individual farm situation of women farmers and helps the women farmers in adopting the appropriate and relevant technology according to their needs and aspirations. Also, agricultural extension would help the women farmers study the individual farm conditions to take rational decisions according to their needs, aspirations and resources (Saito and Spurling, 1992 and Rai and Mauria, 2006). Olaitan (1984) opined that agricultural extension would provide farmers with the knowledge upon which to base their production decisions, like how to react to fluctuations in product prices and select the enterprise best suited to their lands. Ani (2007) reported that agricultural extension provides farmers with the necessary education, skill, and technical information to enable them take effective farm management decisions to enhance their farm practices.

2.5.7 Agricultural Extension Would Bridge the Gap between the Scientists and the Women Farmers

The main function of agricultural extension is to bridge the gap between the scientists on the one hand and the women farmers on the other hand. This is done by taking new farm technology and innovations to the farmers' door –step and helping them adopt these useful innovations (Rai and Mauria, 2006). Agricultural extension also bring the farmers' problem to the research stations for further investigation, and back to the farmers for their adoption after solution by the scientists. The farmers' problems are brought to the research station for further investigation and find out the required solutions (Jiggins, 1994). Adedoyin (1990) noted that a steady flow of accurate understanding and factual information link the scientist with the farmer.

2.5.8 Agricultural Extension Would Show Women Farmers How to Set (Plan) what they want

Once the women farmers' needs are determined, agricultural extension will help them find out the necessary technical know-how as well as inputs and apply these technologies to their own situations. Olaitan (1984) postulated that agricultural extension would teach farmers the principles of harmonious property relations in the use of agricultural resources so that farmers could pool the ownership and operation of adjoining land for greater production and to select the enterprise best suited to their lands. Ani (2007) revealed that agricultural extension would help farmers to satisfy their needs, interests and desires. It would also enable women farmers to organize, plan, coordinate and execute plan successfully (Ekwo, 2006).

2.5.9 Agricultural Extension Would Provide the Desired Information to the Women Farmers

Agricultural extension will create a congenial learning environment situation in which women farmer learn 'what to do' and 'how to do', and will able to work out ways and means to satisfy their felt need with the desired information. Kaniki (1989) and Aina (1991) observed that agricultural extension would provide information to women on sources of credit facilities, land ownership, marketing of agricultural produce, control of major pests and diseases, proper handling of insecticides and best cropping methods. In collaborating this assertion, Banmeke and Olowu (2005) said that agricultural extension would provide technical information on improved seeds/seedlings, storage methods for crops, disease and pest control and processing of agricultural produce. Also, economic information relating to cooperative societies, market location and income generating activities.

2.6 Factors Limiting Women Farmers' Production and Access to Agricultural Extension

The factors that limited women farmers' productivity and access to extension services were discussed under the following sub-headings:

2.6.1 Inadequate Land for Agricultural Use

Land is a major production resource and access to this important resource has been a major limiting factor to women's productivity. Women in developing countries have no clear legal status because inheritance and tenure laws prohibit women's ownership and use of land. Traditional land – tenure systems in Africa have made most women little more than temporary custodians of the land as it passed from father to male heir. In most parts of Nigeria, land is predominantly patrilineally inherited and where it is not, it is legally allocated and distributed through lineage (FAO, 1998; Mundi and Zakariah, 2007). Land availability and tenure is a problem for women, they tend to have less secure tenure. Women's relatively less favourable access to land can be a strong disincentive to adopting new techniques or investing in the land. On their part, agricultural extension agents may be reluctant to work with distant plots (Saito and Weidemann, 1990).

When women do have their own plots, they are invariably small, dispersed, remote and less fertile than those owned by men. Women's labour productivity is reduced and their management problems are magnified when their holdings are geographically dispersed. They need more time to commute between plots, and must transport tools, inputs or harvested produce longer distance. Child care is particularly difficult when field are far, women must decide whether to take their children to the fields or make child care arrangements. As a result, women may simply not have the time to travel to distant fields to carry out recommended agricultural extension practices.

This not only reduces women yields through diseconomies of scale, but causes agricultural extension agents to dismiss women as non-adopters (Saito and Weidemann, 1990).

This will further discourage their participation in agricultural support services, particularly agricultural extension education and credit (FAO, 1983; Gittinger, et al 1990). In some countries, land ownership is a requirement for contact farmer selection under the Training and Visit (T&V) system. This clearly reduces the odds that women will be selected as contact farmers. Moreover, in most countries, title to land is required collateral for obtaining credit from formal lending institutions and sometimes also for cooperatives. Women's insecure access to land makes it harder for them to obtain the credit they may need to fully implement agricultural extension advice (Saito and Weidemann, 1990).

2.6.2 Inadequate Technology

Labour–saving technologies are important factor in increasing production and improving people's quality of life, as technological advances may have a high payoff in terms of improving food availability. More often women's voices are not heard when research programmes are designed, and agricultural technology development consequently occurs in spite of the needs and priorities of women. Women have little possibility of adopting modern innovations and practices that could lighten their load and improve the returns from production activities as results of traditional technology and it's used (Annabel 1991 and FAO 1998). Lack of suitable farm and household technology impairs women's efficiency, restricts their time, and saps their energy for participating in agricultural extension and other development programmes (Saito and Weidemann, 1990).

In Africa, women spend an average of 8 hours a day collecting fuel and water, 4 hours on food preparation and 2 hours on household chores. Only after 14 hours spent completing these tasks do the women have time for their own farming activities or agricultural extension programmes (Woods, 1989). Technologies to improve crop production were also lacking for small holders in general, and for women in particular. Technology development in response to the needs of commercial farmers – who are mostly men, actually works to the disadvantage of women, particularly those from poor, landless or smallholder families (Saito and Weidemann, 1990). The use of animal traction can substantially reduce the demand for women's labour.

Animal traction can double or triple rates of return by freeing up labour (Allen, 1984), but the high cost of buying animals and equipment deters many low-resource farmers from adopting (Office of Technology Assessment (OTA) (1988). For resource-poor women farmers the cost barriers is compounded by the additional obstacle of cultural traditions discouraging women's use of animal traction. Women's access to animal traction, tractor and fertilizer is more limited and costly than men's (GARD, 1988 and Breth, 1997).

2.6.3 Inadequate Credit and Inputs

Credit and inputs are other constraints to maximizing benefits of agricultural extension. Women have no access to the credit and capital required to increase production. Farmers need short-term credit to buy improved seeds, fertilizers, insecticides and herbicides and to hire farm labourers to work the fields and help with post –harvest operations. They need long–term credit to invest in more efficient technologies--irrigation, labour-savng tools and implements and transport (Williams, 1997 and FAO, 1998).

Women are bypassed by formal credit systems for a number of reasons- lack of collateral (usually land title); need for a male co-signer; lower levels of literacy, numeracy and general education; lack of information; distance and cost of travel to credit institutions; and the small scale of many women's operations (Saito and Weidemann, 1990).

It is not so much that formal laws prohibit women obtaining credit, but rather that these factors discourage their access to it. An analysis of credit schemes in Kenya, Malawi, Sierra Leone, Zambia and Zimbabwe revealed that women received less than 10 percent of the total amount of the credit awarded to small holders and 1 percent of the total amount of the credit directed to agriculture. In Jamaica, women account for only 5 percent of loans granted by the Agricultural Credit Bank (FAO, 1998). Study has revealed that men rather than women were given access to the basic yield-increasing inputs (land, labour, capital or credit, fertilizer or manure, high-yielding seeds, agricultural extension training), plus access to education, the market and the political arena (Due, 1991; Goheen 1991; Guyer, 1991 and Saito, 1994). This was due to the fact that who got access to productive inputs was a political question -- the result of a power negotiation and not just an economic question (Bates, 1983); and in a power negotiation, women lose out to men with greater power, status, and prestige (Saito and Weidemann, 1990).

Without credit, women are less likely to be able to afford the high cost of inputs recommended by extension agents. This can lessen their chances of having contact with extension agents. Farmers who cannot afford inputs and who cannot pay for hired labour are less likely to be interested in extension activities, likewise, agricultural extension agents are less likely to target this group as a result of their inability to respond to

recommendations to purchase inputs and additional labour. Over half of the women interviewed in Kenya (World Bank, 1989), said lack of cash kept them from using more improved varieties of seeds, fertilizer and other inputs. In Cameroon, agricultural extension agents made more visits to the farms of those who purchased inputs than to those who did not, and men were more likely than women to be purchasing inputs (Koons, 1989; Saito and Weidemann, 1990)

2.6.4 Illiteracy

Modern farming is an economic activity which involves the acquisition of new knowledge by the farmers, and the understanding of the reasons for applying new techniques and the ability and skill to transfer this information into practical activity (Akinyosoye, 1999). Mundi and Zakariah (2007) explained that education plays a prominent role in the determination of the level of participation in any development process. Education exposes women to new skills and ideas and this will enhance their efficiency, quality of life and productivity. Education will equip them with new skills and knowledge of how to use new technologies like farm inputs such as fertilizers, tractors and improved seeds. Saito and Weidemann (1990) expressed that throughout most of Sub-Saharan Africa, the adult male literacy rate is almost twice that of females. Males are almost twice as likely to be enrolled in secondary school. Moreover, gender-based educational discrepancies tend to be greater in countries where incomes are lower.

In his study of agricultural extension for women in five African countries, Gill (1987) reported that the vast majority of rural women were illiterate. According to Ani (2007) illiteracy is a major factor militating against agricultural transformation. It is perceived that there is lack of functional literacy among adult people, hence the inability of taking advantage of modern and scientific discoveries that are designed to improve

the quality of life. Lack of or low educational attainment by women is responsible for their absence from the formal sector of the economy. Women's low level of education affects their access to information, vocational skills, and training. There is lack of information about institutional credit, inability to meet collateral requirements, incapability to meet application procedures for credits and inability to speak the lingua franca, which agricultural extension agents generally use (Prah, 1995). Women's access to agricultural extension and their ability to comprehend and use technical information is compromised when they lack basic education.

As a result of their lower level of education, women are less able than men to respond to written agricultural extension materials. Moreover, the ability to read and write is a criterion for the selection of contact farmers in the T & V extension system in some countries in Africa. Studies supported by the World Bank have demonstrated the critical link between farmer efficiency and farmer education (World Bank, 1989).

2.6.5 Shortage of Mobility and Time

Women have multiple roles as mothers, homemakers, producers, farm labourers, and processors and marketers of agricultural produce. They are overburdened and time-short. Findings continue to point to the fact that women generally spend greater part of their time performing domestic chores, leaving very little time for other income generating activities. Surveys found that women in rural areas spent more than 20 percent of their time on collecting water taking as much as 10 to 20 hours per day (Breth, 1997). A time allocation study in one Gambian village reported that women performed 53 percent of agricultural and 73 percent of domestic work compared to 33 percent and 6 percent respectively for men. Women were responsible for 58 percent of the total village time allocated to productive activities compared to 25 percent for men

and 17 percent for children (Bastone, 1987). In Congo, women spend one-third of the day processing and preparing food (Eele and Newton, 1985). Available data in Kenya indicated that women spend one-third of working hours on food preparation and child care which stretches their working day to 13 to 14 hours. Most of them spend three hours a day fetching water (World Bank, 1989).

Women tend to be less mobile and have less uncommitted time than men. The time and energy involved in providing the family with food, fuel and water leave little time to participate in regular agricultural extension education programmes and inhibit women's ability to respond to opportunities. Saito and Weidemann (1990) opined that women are less mobile, because they have less time, less cash for transportation, and less likelihood of owning transport. In some countries, socio-cultural and religious barriers limit their mobility as well (Annabel, 1991). This limits their ability to attend training courses outside their villages/homes (Quisumbing, Brown, Feldstein, Lawrence and Pena, 1995).

2.6.6 Socio -cultural Factors Affecting Transmission of Information

Women often encounter discrimination outside the household, which limits their access to resources and information. Women suffer from cultural and social structural bias. In most countries, cultural norms circumscribe male-female interaction. These tend to be more restrictive in rural than urban areas, and in traditional than modern societies (Saito and Weidemann, 1990). In Islamic societies, prohibitions tend to be more rigid (Annabel, 1991). These norms may or may not be codified into law. In some countries the gender of agricultural agents does not appear to be an overriding issue. In many African countries, it does make a difference. Even where women have equal legal status,

rural women may be shy and reluctant to speak up in agricultural extension meetings in the presence of male agents or men from the same village (Annabel, 1991).

Krogh (1988) and Evans (1989) observed that women lack confidence as a result of lower educational levels and less contact with the outside world. Men are seen as authority figures whose decisions are to be followed. Men extension agents, raised in the same cultural traditions, often expect women farmers to follow their directions and do not encourage the questions. Development planners assumed that information given to male farmers will be passed along to other farming members of the household. This is not often the case. Spring (1985) and Saito and Weidemann (1990) observed that agricultural knowledge acquired by males often does not "trickle across" effectively to females in the family. Men are usually not expected to share their information, especially in a polygamous household. Spring, Saito and Weidennan also observed that it would be improper for a wife, especially a junior wife, to query her husband about what he learned from the agricultural extension agent that day.

Men are less likely to pass information along to women when crops or tasks are gender-specific, which is the case in much of Africa. In Malawi, wives of agricultural extension group members said their husbands rarely passed advice on to them. If they did, the women had difficulty understanding the advice second hand or did not find it relevant to their needs (Evans, 1989). Even if men were willing to teach their wives, they may simply not be familiar enough with an agricultural operation or crop to effectively transfer the information.

According to Quisumbing et al. (1995), there are basically four primary constraints that limit women's access to agricultural extension services.

a. cultural restrictions that prevent male agricultural extension officers from meeting with women farmers.
b. domestic responsibilities that limit women's mobility, making it harder for them to attend meetings and courses away from home.
c. women's inability to speak the lingua franca, which agricultural extension agents generally use.
d. few female agricultural extension agents. Closely related to this is the lack of agricultural research and in agricultural decision- making bodies (Prah, 1995).

2.7 Strategies for Improving Women Farmers Production and Access to Agricultural Extension

Women are undoubtedly a force to reckon with in agricultural development process. Mundi and Zakariah (2007) suggested that for any meaningful and far reaching agricultural development to take place in this country, women's education through agricultural extension is a condition 'Sine qua non' that must be fulfilled. Mundi and Zakariah further said that any programme aimed at improving the status and increasing the productivity of women in agriculture, must incorporate strategies for handling pervasive gender issues through the promotion of gender equality. Given this scenario, women farmers can be reached with innovative agricultural extension education with respect to different productive sources through the following strategies.

2.7.1 Free access to land through land reform

Women should be given free access to land through land reforms to allow them to hold independent land titles. The rights of women to be part–owners of land belonging to their husbands either in their life time or after the demise of the latter

should be given legal backing. In order to alleviate the effects of cultural limitations on women owning land, Williams (1997) postulated that communal land allocated to women farmers should either be cultivated individually or together by women in groups. Also, educating the populace on inheritance patterns can lower the barriers to women inheriting land. Women- In- Agricultural (WIA) extension agents should located small plot adoption techniques on women's farms.

They should also encourage women farmers to embark on farming enterprises that require less land such as poultry, fishery and rabbit production. Women agricultural extension agents should teach women farmers how to convert refuse dumps to compost heaps or pits, as this will generate manure for soil fertility and reduce dependence on government distribution of fertilizer, which has become a racket in developing countries.

2.7.2 Provision of Credit and Loans

In order to ensure that women farmers have access to credit and loans for their farming activities, Breth(1997)said this could be achieved through:

1. Ensuring that loans to women farmers are available in small amounts (large sums require a male co-signer or collateral).
2. Establishing women's credit groups to take advantage of small loan period so that repayment is not due before crops with longer growth duration to mature.
3. Providing loan facilities for women's agricultural work including processing activities, which are mainly women's work.
4. Encouraging banks (agricultural and commercial) to find a niche for women farmers in their operations.

5. Establishing formal and informal co-operatives in their operations provided they can be as effective as women only groups have proved to be.

2.7.3 Equal Access to Labour-Saving Technology

Women should be given equal access to labour-saving technologies in their economic, agricultural and domestic activities, such as fuel cooking stoves in place of fuel wood, water points closer home instead of going to streams far away from home, low-cost labour and time-saving food processing technologies (Mundi and Zakariah, 2007). This will save women a lot of energy and time that would utilized in other agriculture activities. According to Williams (1997), Women farmers should be provided with appropriate technologies that are less strenuous. Tools and equipment should be easily fabricated with local materials or junk motor parts. The height of equipment such as grinders, shellers and extractor should not exceed the elbow for easy handling and maintenance. The use of animals either for traction or transportation can be explored. The introduction of cheap and nontoxic herbicides will save women's time, in weeding, one of their principal farm tasks.

2.7.4 Provision of Suitable Technology

As agricultural research development improved technologies intensifies, women farmers stand a chance of benefiting. However, Williams (1997) observed that the acceptability of these technologies for women's enterprises and the accessibility, affordability, unavailability of technological devices including spare parts should be considered. Asiabaka, Odu and Njoku (1998), reported that 56.7 percent of women farmers agreed that lack of improved technology brings drudgery and low productivity in agriculture. They concluded that availability of improved technology plays a vital role in the level of women participation in agriculture. They further advocated the

development of women-oriented technologies. This according to Ajala (2004) would make women participate more in agricultural activities and increase agricultural production.

Gittinger, et al (1990) suggested that any proposed technological introduction should be appropriate to the social and economic setting where it is to be introduced. It should also be appropriate for the intended user. Unless proposed technological innovations are better than what is already in use, they will not be acceptable. Policy makers should ensure that these technologies are part of the assistance that governments supply.

2.7.5 Education and Training of Women Farmers

There is a great need to develop women farmers through education, since education is very crucial for agricultural development and for improvement of the standard of living of the farming population. This means that women's education should not only be given top priority in our educational system but some of the obstacles to their education have to be addressed through intensifying advocacy to promote women education. Mundi and Zakariah (2007) opined that there is the need to train more women in institutions of agriculture. Where interested girls cannot afford the cost of training, scholarships should be made available to them to enable them have access to education. Similarly, Williams (1998) opined that education and training of women farmers should be multidisciplinary in approach, using functional literacy where applicable.

There should be flexibility in venues, relevant contents, and teaching aids, ensuring that recommendations are made in visual and oral forms. In order to provide high quality and timely education for women farmers, women workers in community

development, health and home economics should be redeployed to provide agricultural extension. Ajala (2004), affirmed that in order to update the knowledge and skills of women farmers, female agricultural extension agents should be trained to help women farmers in handling modern equipment and adopt new improved techniques in farming and functional literacy programme be developed for women on how to use simple tools.

2.7.6 Proclamation of Women Legal Rights

In order to ensure the right public perception of women's contribution to development, there is need for a proclamation of women's legal rights.

Williams (1997) affirmed that this can be brought about through:

1. Massive and extensive education on women's rights
2. Review of existing laws that are inadequate for the protection of women--- such as marriage, inheritance, revenue and residence laws.
3. Re-orientation of family and social attitudes towards gender roles.
4. Refuting the view that women's rights are privileges, so that they will not be subjected to political changes.

Mundi and Zakariah (2007) suggested that there should also be a redesigning of service delivery programme to facilitate equal access. By this, the problem of inadequate capital for investment in agriculture will be eliminated and this will give women the encouragement to contribute their best in agricultural development. They also said that culture- in--motion must have the ability to get rid of negative laws and practices and those aspects of culture that discriminated and perpetuate the debasement of women's status and rights to property, should be reformed to give women equal status with men.

2.7.7 Design, Timing and Location of Extension Programmes should consider Women's Multiple Roles

Women farmers' propensity to mobility and leisure is very low. This is obvious in their roles, which combine domestic chores with production practices. Women agricultural extension agents also have lower status, less influence in the extension service hierarchy and less logistical support particularly transport to perform their services. The design, timing, and location of training programmes do not consider women's agricultural roles or their multiple responsibilities for food processing and storage and care staking within the family. Frequently, farmer training centres do not have facilities for women and their children and do not address the need for child care (Gittinger, Chernick, Horenstein and Saito, 1990). According to agricultural extension education approaches to reach women farmers should decentralized programmes and break them into short modules. The establishment of programmes that address women's need will be an avenue to reach them. When enterprises of interest to women are established, their attention is also drawn. Also, the timing and location of programme must take account of women's multiple roles and responsibilities, particularly the severe constraint on their time and mobility (Gittinger et al, 1990).

2.7.8 Policy and Research for the Advancement of Knowledge on issues relating to Women

Women's access to technology to improve national food security is a complex issue necessitating support from many quarters to be effective. According to Williams (1997) an enabling environment will require policies as well as research for the advancement of knowledge on issues related to women which include the following:

1. Proper representation of women at decision-making levels
2. Changing society's view about women's role
3. Favourable policies towards women's activities
4. Women's activities should be an appendage of main development programme

5. Funding of more research on women's activities
6. Transmitting research results through WIA programmes.

2.7.9 Use of Women's Groups

Groups, whether male, female, or mixed, facilitate adoption of new technique, foster peer learning, allow members to pool resources for production, and allow reaching a large group of farmers using limited resources. Williams (1997) affirmed that in cultures where husbands may be opposed to their wives working with male agricultural extension agents individually, they may be less likely to object if their wives as a group meet with agricultural extension agents. According to Safilios-Rothschide (1986) and Saito and Weidemann (1990), in women only groups, women tended to be more outspoken than in mixed groups or when working individually with male agricultural extension agents.

2.7.10 Gender Targeting

A lot of technological innovation in agriculture has passed over the heads of female farmers because in some cultures women are not allowed to interact directly with males who are not family members (Annabel, 1991). Information on innovations has been given to the heads of households, who generally are men. It is assumed that they will pass on the message to their female household members. This according to Saito and Weidemann (1990) has not happened. Where it has happened, information has been diluted, wrongly interpreted or further sieved to that which is thought to be of interest to women.

In order to redress these tendencies, Williams (1997) remarked that the strategy was to reach the women farmers through their own kinds, that is, female agricultural extension agents. This strategy according to Williams was based on the concept of

homophily developed by Rogers (1973) that the more alike two people are, the more likely they interact and empathize with each other and vice versa. Being the same sex, the women farmers are more likely to understand female agents and communicate better and more freely than with the opposite sex (Saito and Weidemann, 1990; Endeley, 1992). There is a high potential in the use of female agents to reach women farmers

2.7.11 Using Male Extension Agents to Reach Women Farmers

Female agents (redeployed home economics agents and female agents directly recruited into extension), even if increase tenfold, their numbers will in no way be proportional to the ratio of women in the farming populations. Yet there exists a large cadre of male agents, with higher qualifications and more field experience than female agents, who could be used to reach women farmers, given the proper orientation (Williams, 1997). Spring (1985) reported that Malawi began with a study on the situation of women farmers, their roles in reproduction and production, their resource bases, their situation regarding extension, need for extension, and appropriate methods to reach women. An intensive nationwide campaign was lunched to legitimize interaction of male agents and women farmers.

After a few years, a follow-up study was done to determine the impact of the training on women farmers' access to extension. It showed that male agents, if effectively trained and sensitized, backed by a realistic incentive system, can work effectively with women farmers. The number of women serving as contact farmers and the number of women farmers' group and cooperators were found to have greatly increased. In Cameroon, it started by using small number of female agents to serve women farmers (Walker, 1990). These agents helped the groups to gain confidence in dealing with extension agents and establishing group dynamics. They also built agents'

trust and credibility with these groups. With a supportive and highly motivated group, the female agent gradually introduced the group to the male agent responsible for that geographical area. The female agent then moved on to work with other women's groups

2.7.12 Changing Attitudes and Institutions

Complementary strategies to bring about changes in attitude and behaviour within institutions are required. Poats (1990) and Rao, Appel, Moore and Feldstein (1994) opined that gender sensitization training have been used to initiate the task of attitude change within male dominated extension and research bureaucracies and donor agencies. Paris and Frio (1994) and Feldstein (1994) said that training materials and methods have been developed and were in widespread used. Specialist materials for training of trainers have also been developed and were beginning to spread through agricultural training institutes, colleges and universities (Rao et al, 1994).

Spring (1986) demonstrated in Malawi the range of critical adjustment which could increase women's access to and the relevance of extension significantly, even where most field agents were male, which included:

1. Male extension agents were encouraged to ask their contact farmers to include their wives during visits, demonstrations, or farmers' meeting;
2. Village leaders (typically men) were asked to identify women needing extension services, field agents were required to devote a gender percentage of their time to working with women's groups.
3. Women farmers' seminars were organized for women to share with researchers and field staff their solutions to the technical problems specific to women farmers production systems and

4. Women's field days were organized to celebrate and legitimate women farmers' successive and to promote farmer-to-farmer exchange among women.

2.8 Empirical Studies

The researcher reviewed journals; theses and researches related reports and came up with the following related studies on the topic.

Manju (1995) conducted a research on Improving the Relevance and Effectiveness of Agricultural Extension Activities for Women Farmers in Thailand, Trinidad, Syria and Nigeria. The objectives were to develop a concrete understanding of women farmers as clientele of the agricultural extension system and to determine the capacity of agricultural extension service to provide advisory services to women farmers. To make an analysis of the agricultural extension programmes and the extent of women farmers' participation; to determine the constraints of the agricultural extension services in reaching women farmers and to make some suggestions to improve the relevance and effectiveness of agricultural extension activities in reaching women farmers.

Descriptive research design was used. The sample size comprised of eighty women farmers selected from Trinidad and Thailand each and one hundred and sixty selected from Nigeria and Syria each making a total of four hundred and eighty women farmers; eight extension agents selected from Thailand and Trinidad each; ten and sixteen selected from Nigeria and Syria respectively, making a total of forty-two extension agents; eight Subject Matter Specialists selected from Trinidad and Thailand each, twelve selected from Nigeria and Syria making a total of forty SMSs and eight Administrators/Supervisors selected from Thailand, ten from Trinidad, twelve from

Nigeria and eighteen from Syria, making a total of fifty-eight Administrators/Supervisors.

The total sample size was six hundred and twenty made up of women farmers, EAs, SMSs and Administrators/ Supervisors who were randomly selected. Four interviews –cum structured questionnaire were designed and used to collect information and data for the study. Descriptive statistics, categorization, rankings, percentages, standard hectares, Likert five-point scale, frequency tables and socio-economic status scale were used to understand women farmers' age groups and size of land holdings; to measure the attitude of extension personnel towards them; to compare their socio-economic conditions, involvement and participation in decisions and access to production resources; to analyze agricultural extension programmes and the extent of their participation and to determine the constraints of extension services in reaching them.

The findings of the study revealed that more than 55% of the women farmers fell between 15 and 45 years. More than 60% of the women farmers were married. Only 26% of the women farmers in Trinidad were household head. Nearly 63% of the women farmers were illiterates in Syria and 60% in Nigeria. More than 69% cultivated less than 3 hectares of land. About 51% and 48% of the women farmers were from the middle socio-economic group, while over 81% and 66% were from the low socio-economic group. Majority of women farmers were found to contribute to the agricultural labour force regularly, and prepared meals for their families and dealt with house maintenance. More than 60% of the women farmers collected wood for fuel and water for daily use and took care of children and were saddled with a double workload – farm as well as home activities.

About 23% had land ownership entitlements. Most of them did not use modern tools and farm implements. Those who were 47.5% hired manpower mainly for land preparation, 11.88% of them had limited access to sources of finance and 1.25% - 3.75% received loans from agricultural banks. 82.5% expressed a preference for female extension agents, more than 70% of the extension personnel indicated favourable attitude towards women farmers. None of the study countries included women farmers in extension planning and programme development. Lack of time and proper incentives were identified as reasons for low participation of women farmers in extension activities and lack of demonstration materials and appropriate technology suitable for women farmers were ranked as the greatest problems in reaching them.

Manju (1995) study was on improving the relevance and effectiveness of agricultural extension activities for women farmers. The present study conducted a research on relevance of agricultural extension towards effective participation of women in agricultural production. The past researcher used women as subjects, descriptive research design, questionnaire, frequency counts and percentages to analyze the data. The present study shared similarities with the past researcher in the sense that it used women as subjects, descriptive research design, questionnaire, frequency counts, and percentages to analyze the data.

The major differences in the two researches were that Manju's research used 620 respondents as subjects; the present research will use 350 respondents. The previous research was carried out in 4 countries (Nigeria, Syria, Thailand and Trinidad), but the present research was carried out in FCT – Abuja. The researcher observed that no inferential statistics were used to analyze the data; only descriptive statistics were used.

The present research used chi-square for testing the Null Hypotheses to find out the significant relationships between the variables.

Farinde, Jibowo and Odejide (1995) conducted a study on extension activities of WIA agents for enhancing food security among women farmers in Osun State. The study identified the WIA agents' extension activities in crop and livestock production, home economics and food processing among women in Osun State. Extension teaching methods used in reaching women farmers as well as the extension problems encountered by WIA agents in reaching women in agriculture in Osun state were also identified. The study used a descriptive research design. The numbers of respondents were 29 WIA agents in Osun State.

The instrument used for data collection was questionnaire. The findings indicated that majority of the WIA agents were young and holders of Nigeria Certificate of Education (NCE) in disciplines related to Home Economics and made an average of four visits to women farmers per week on motor cycles and group contact methods were mostly used by the WIA agents. The findings further indicated that the agents taught the women farmers all the management and cultural farm practices involved in effective and efficient production of crops and animals and processing and storage techniques of food production. Problems of inadequate means of transportation, good access roads, inadequate teaching materials, and non–challant attitude of women farmers were encountered by majority of the WIA agents in reaching women farmers. Also, positive and significant relationship existed between some selected characteristics of WIA agents and their extension activities.

Farinde et al (1995) research was on extension activities of WIA agents for enhancing food security among farmers. The present study will be on relevance of

agricultural extension for effective participation of women in agricultural production. The extension activities of WIA research and the present study shared similarities as the present study used women farmers as subjects. The past study used descriptive research design, questionnaire and Null hypotheses while present study used the same. The major differences in the two studies are that the Extension Activities of WIA Agents research used 29 women agents as sample size in Osun state. The present study used 350 women farmers in FCT, Abuja. The previous study was analyzed with standard deviation and co-efficient correlation statistical analysis, while the present study was analyzed statistically using descriptive statistics and chi-square.

Joe-Yahaya (1997) conducted a study on the role of agricultural extension among rural women in Zaria Local Government Area, Kaduna State. The objectives were to identify the role of extension agents in extension programmes, to find out women's participation in these programmes and to identify problem encountered by extension staff and women farmers in their tasks. The study used descriptive research design; the sample consisted of 60 respondents – 50 women farmers and 10 extension agents in five (5) selected villages and Maigana zone.

The findings revealed that majority of the women were married with more than 3 children and the family was the major source of labour for all agricultural practices. 40% source of information of improved agricultural practices to the farmers was radio, 10% from cooperative groups. 40% did not have access to any source of information. The findings further revealed that 70% of the women farmers were not aware of any extension services in their area. More than half did not participate in any ADP programmes and some were not interested, while some, their husbands did not grant them permission. Women that formed groups had more access, participated in the

programmes actively and knowledge received help to increase their production and income. The extension agents made only 40-60% of the scheduled visits to farmers due to high extension –farmer ratio.

The previous study was conducted to identify the role of agricultural extension among women farmers, while the present study was conducted to ascertain the relevance of agricultural extension for effective participation of women in agricultural production. The previous study and the present study shared similarities in the use of women as subject and descriptive research design. It was observed that no Null hypothesis was formulated for the previous work. It was also discovered that no inferential statistics was used for the previous study. The present study used chi square for testing the Null hypotheses formulated. The previous study made use of 60 samples from five villages in Zaria Local Government Area, while the present study used 350 samples from FCT-Abuja.

Banmeke and Olowu (2005) conducted a study on agricultural information needs of women farmers in south-western Nigeria--lessons for effective extension delivery. The general objective of the study was to determine the agricultural information needs of women farmers across the agro-ecological zones in south western Nigeria. The specific objectives were to determine the personal characteristics of women farmers, to ascertain the major crops grown by the women farmers and to investigate the specific agricultural information needs of women farmers in the study area. The study was descriptive research study and the number of respondents was 347 women farmers that were duly registered with ADP in Ogun, Oyo, Ondo and Delta states. Questionnaire was used as instrument for data collection. Frequency counts,

percentages, chi-square statistics and analysis of variance (ANOVA) were used in analyzing the generated data.

The findings revealed that 43.3% of the respondents were between 41 and 50 years, and 83% were married. Cassava and maize were the major crops the findings revealed that women farmers to a large extent need information pertaining improvement grown by the women farmers (100%). Furthermore, of seeds (64%) and co-operative association (57.3%), while 56.8% did not need information on government regulations. Results of inferential statistics indicated that educational level was not significantly related to agricultural information needs. There was a significantly relationship between age and women farmers' agricultural information needs and there was also a significant difference in the agricultural information needs of women farmers in the Rain Forest and Savannah zones.

Banmeke and Olowu (2005) study was on agricultural information needs of women farmers in south western Nigeria. The present study was on relevance of agricultural extension towards effective participation of women in agricultural production in FCT-Abuja. The two studies shared similarities. The present study used women farmers as subjects and descriptive research design, questionnaire, Null hypotheses, frequency counts, percentages and chi-square statistics in analyzing data generated. The measuring instrument for this study was pre-tested and reliability of the instruments was conducted using split-half method to get the reliability coefficient. Item analysis was conducted just like the previous study. The major disparity between the two studies were that the previous study on agricultural information needs of women farmers used 347 women farmers as respondents, the present study used 350

respondents. The previous study made use of ANOVA in analyzing the generated data; the present study did not use ANOVA.

Felix (2008) conducted a study on role of rural women in decision-making process in agriculture in Kwande Local Government Area of Benue State, Nigeria. The objectives were to examine the extend of participation of rural women in decision-making process in different areas of agriculture; analyze the pattern of women decision-making in different areas of agriculture; determine the factors affecting women's participation in the decision-making process in agriculture and to identify the constraints to women's participation in agriculture. Descriptive research design was adopted. The sample size comprised of 40 women farmers. Structured questionnaire were used to collect data for the study. Descriptive statistics and Multiple Regression analysis were used to analyze the data.

The finding of the study showed that between 20 and 48% of respondents were consulted in decision-making process in different areas of agriculture; between 10 and 55% had their opinion considered and between 5 and 25% participated in the final decision-making. With regard to pattern of decision-making, the result revealed that between 3 and 18% took decision on their own; 13 and 38% took decisions with their husbands, 10 and 25% took decisions with their husbands and other family members while between 3 and 8% took decisions with other family members. Result of regression analysis showed that only household size and source of credit were found to be significantly related with women participation in decision-making. Lack of finance, inadequate storage and processing technologies, small farm size and poor transportation were the most important constraints to women's participation in agriculture.

Felix (2008) study was on role of rural women in decision-making process in agriculture. The present study was on relevance of agricultural extension towards effective participation of women in agricultural production. The previous researcher used women farmers as subjects, descriptive research design, questionnaire and descriptive statistics to collect and analyze the data. The two studies were similar in these aspects. The major differences with the two studies were that Felix's study was carried out in Kwande Local Government Area of Benue State. The present study was carried out in FCT-Abuja. The previous studies used 40 women farmers as samples and multiple regression analysis to analyze the data. The present study used 350 women farmers and Chi-square statistics to test the Null Hypotheses.

Ndukwe (2008) conducted a research on the Effectiveness of the Agricultural Development in Nigeria (ADENI) Project in Nigeria on Rural Women Empowerment in Ungwan-Usman Dogo, Faskari Local Government Area, Katsina State, Nigeria. The objectives were to identify the socio-economic and felt needs of the participating women; the activities set up by ADENI to meet those needs and empower the women; the extent to which those activities empowered and met the needs of rural women, and the constraints faced by the project facilitators in empowering the women.

The study used descriptive research design; the sample consisted of 40 participating women and 5 facilitators. The result of the study indicated that the most felt needs of the participating women were: storage facilities (100%); threshing and milling machines (90%); extension contact (85%); health facilities (75%); education (73%) and infrastructural facilities (65%). The facilities set up by ADENI to empower and meet the needs of participating women were: training programme, workshops, seminar, inventory credit scheme and farmer-field school. 80% of rural women who

participated in these activities confirmed these activities and have benefited from them. The multiple regression analysis showed that the significant and positive activities by ADENI were the inventory credit scheme, training / seminar / workshop and farmer-field school. The major problems faced by ADENI included inadequate funding, poor logistic support and lack of independency.

The previous study was conducted to determine the effectiveness of ADENI on rural women empowerment, while the present study was to ascertain the relevance of agricultural extension towards effective participation of women in agricultural production. The previous and present studies shared similarities in the use of women as subject, descriptive research design, questionnaire and descriptive statistics. It was observed that no Null Hypothesis was formulated for the previous work, while the present study formulated Null Hypotheses. It was also discovered that multiply regression analysis was used for the previous study. The present study used Chi-Square for testing the Null Hypotheses. The previous study interviewed 40 participating women and 5 facilitators, while the present study used 350 women farmers as respondents.

Hussaini (2010) conducted a study on the Effect of Extension Services and Socio-Economic Characteristics of the Farmers on Poultry Production in Lapai Local Government Area, Niger State. The objectives were to describe the socio-economic characteristics of the poultry farmers; determine the influence of extension services and other socio-economic factors of the farmers on poultry production; determine the profitability of poultry production in the study area and to determine the constraints militating against poultry production in the study area.

The study was a descriptive research study and the number of respondents was 80 poultry producers (men and women) in Lapai LGA, Niger State. Questionnaire was

used as instrument for data collection. Descriptive statistics, Chi-Square, Pearson Product Moment Correlation, Multiple regression and Gross Margin Analyses were used to analyze the data. The finding revealed that most of the poultry farmers were between 36 and 45 years, 81.25% were married, 85% had formal education. Only 22.5% were full time farmers; 53.8% had extension visitation and almost all embarked on small scale poultry farming. 87.5% benefited from their poultry production consequently extension visitation improved their output.

Hussaini (2010) study was on the effective of extension services and socio-economic characteristics of the farmers on poultry production in Lapai LGA, Niger State. The present study was on relevance of agricultural extension towards effective participation of women in agricultural production in FCT-Abuja. The two studies shared similarities in the use of descriptive research studies design, questionnaire and descriptive statistics. The major disparity between the two was that the previous study used 80 poultry farmers (men and women) as respondents; the present study used 350 women farmers. The previous study use Pearson Product Moment Correlation (PPMC), Multiple Regression and Gross Margin Analysis in analyzing the data. The present study did not use them.

2.9 Summary of Literature Reviewed

The chapter reviewed the concept of agricultural extension and the relevance it has on effective participation of women farmers in agricultural production. The literature review explained that agricultural extension and training have a significant and positive impact on women farmers' knowledge and adoption of new technologies by providing useful information for them regarding agricultural inputs and services. The

chapter also discussed the personal characteristics of the women farmers which included age, educational levels, farm size and marital status.

The review identified the roles women farmers played in agricultural production in area of food production, fishery, animal production, poultry production, and forestry. The review further identified and explained the factors limiting women farmers' productivity and access to agricultural extension and strategies for improving their productivity and access to extension. Related literature on past studies of relevance of agricultural extension were reviewed and compared with the present study in terms of similarities and differences.

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

This chapter explained the methodology and procedures that was used in the study. The main focus of the chapter was presented under the following sub-headings:

3.1 Research Design

3.2 Population for the Study

3.3 Sample Size and Sampling Procedure

3.4 Instrument for Data Collection

3.4.1 Validity of Instrument

3.4.2 Pilot Study

3.4.3 Reliability of the Instrument

3.5 Procedure for Data Collection

3.6 Procedure for Data Analysis

3.1 Research Design

Descriptive research design in form of survey, where data were collected from subjects using questionnaire was used. According to Ekeh (2003) descriptive research was used to describe an event, situation or phenomenon as it was, at the time of study. Since the study was on relevance of agricultural extension towards effective participation of women in agricultural production in the Federal Capital Territory Abuja, descriptive survey method was considered appropriate for use in this study.

3.2 Population for the Study

The total population for this study comprised of all women farmers in the Federal Capital Territory, Abuja. The total population of women farmers from the six

Area Councils as obtained from FCT-ADP was 8005. The breakdown was shown in Table 3.1.

Table 3.1: Population for the Study

S/N	Area Councils	Population
1	Abaji	1395
2	Abuja Municipal Council	1050
3	Bwari	1230
4	Gwagwalada	1450
5	Kwali	1380
6	Kuje	1500
	Total	**8005**

Source: FCT Women-In-Agriculture (2011).

3.3 Sample Size and Sampling Procedure.

The six area councils in FCT-Abuja were used for the study. Two villages/towns each were randomly selected from the six area councils using "hat drawn" method. These made up the 12 towns/villages for the study. The population of women farmers in these 12 villages / towns was 4119 according to FCT ADP WIA, Abuja. 350 respondents were used as samples for this study. This figure was based on Krejcie and Morgan (1970)'s recommendation that 350 were accepted for a large population of 4119. Stratified random sampling techniques based on age was used to select samples for the study as described by Miles (2001), Ekeh (2003) and Abiola (2007) which gave every member of the population equal and independent chance of being selected or included in the sample.

Table 3.2: Sample Size for the Study

S/N	Name of Town	Population	Sample Size	Percentage (%)
1	Abaji	288	24	6.9
2	Dangara	295	25	7.2
3	Karshi	333	28	8.1
4	Pyakasa	250	21	6.1
5	Bwari	280	24	6.7
6	Kubwa	253	21	6.1
7	Gwagwalada	460	39	11.2
8	Tunga-Maje	300	26	7.3
9	Kuje	550	47	13.4
10	Kuchiakwo	440	38	11
11	Kwali	400	34	9.4
12	Yangoji	270	23	6.3
	Total	**4119**	**350**	**100**

3.4 Instrument for Data Collection

The instrument used for data collection for this study was questionnaire. The questionnaire was developed by the researcher based on the specific objectives of the study. The questionnaire was divided into two sections 'A' and 'B'. Section "A" elicited personal data of the respondents such as educational qualification, age, marital status and farm size. Section "B" contained 9 questions designed to elicit information on need for agricultural extension services, 7 on roles played in agricultural production, 10 on factors limiting agricultural production and access to extension services, and10 on strategies for improving production and access to extension services.

The questionnaire was closed ended type. Respondents were restricted to Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD) response options. To determine the degree of agreement or disagreement to each of the items, nominal values were assigned to the different scaling items as follows:

SA=4

A=3

D=2

SD=1.

This permitted consistency in scoring and did not give any indication of superiority, magnitudes or preference of one item to the other as observed by Ekeh (2003) and Abiola (2009).

3.4.1 Validation of the Instruments

The questionnaire was validated by 4 experts in Vocational and Technical Education Department. A copy of the self-constructed questionnaire was given to each of them for corrections and any possible suggestions after scrutiny. The researcher used the corrections and suggestions to improve the questionnaire for the study and proceeded to pilot study.

3.4.2 Pilot Study

A total of twenty copies of questionnaires were administered to 20 selected women farmers in Madalla, Niger State not included in the study by the researcher. The duly completed questionnaire were then collected and subjected to Split half and Spearman Brown Coefficient in order to determine the reliability coefficient of the instrument.

3.4.3 Reliability of the Instrument

The Split-half method was used with Spearman Brown to determine the reliability coefficient of the instrument that was used for the pilot study. The reliability coefficient obtained was 0.835. This was in agreement with Mukherjee (1980)'s preposition that value of correlation must be around 0.80. This preposition was supported by Mahim & Birtch (1998) who stated that a reliable test should have a correlation of + 0.8 or +0.9. With this, the instrument was said to be reliable.

3.5 Procedure for Data Collection

The researcher and trained research assistants visited the towns/villages and personally administered the questionnaire to the women farmers. Completed copies of the questionnaire were collected back after completion to ensure high return of duly completed instruments. This was done for a period of 4 weeks.

3.6 Procedure for Data Analysis.

Personal characteristics data were analyzed using frequency and percentage. Data for answering the Research questions were analyzed using weighted mean score and standard deviation. Items that their means fell under the range of "Strongly Agree" and "Agree" were considered "Agreed", while those with means in the range of "Strongly Disagree" and "Disagree" were considered "Disagreed". The Null Hypotheses were tested using Chi-Square statistics to show the relationship between the variables. All Null hypotheses were tested at 0.05 level of significance. By this, Null Hypothesis with value lower than the level of significance set for this study ($P< 0.05$) was retained, while the one with value higher than the level of significance ($P>0.05$) was rejected.

CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS

This chapter contained the results and interpretation of statistical analysis of data collected from the women farmers for this study under the following sub-headings:

4.1 Data and Interpretation

4.2 Analysis of Data to Answer Research Questions

4.3 Testing of Null Hypotheses

4.4 Summary of Major Findings

4.5 Discussion of Findings

4.1 Data and Interpretation

Analysis of data and the interpretation of findings from the study were carried out on the basis of the responses collected from the questionnaire administered to women farmers. Data on personal characteristics were presented in tables of frequencies and percentage.

Table 4.1.1: Age Distribution of Respondents

Age	Frequency	Percentage
Below 30	69	19.7
31-40	140	40
41-50	100	28.1
51-60	60	17.1
Above 60	39	11.1
Total	**350**	**100**

Table 4.1.1 showed that 40% of the women farmers in FCT were in the age group of 31-40 years. This was followed by those of 41-50 years which had 28.6%. 19.7% of the respondents were below 30 years of age. A total of 17.1 % and 11.1% were

within the ages of 51-60 and above 50 years respectively. This result showed that majority (87.8%) of the women farmers were below 50 years. This revealed that young women were the most active in agricultural practices in the study area.

Table 4.1.2: Educational Level of Respondents

Level Education	**Frequency**	**Percentage**
B.Sc/HND	02	0.6
OND/NCE	06	1.7
Secondary	55	15.7
Primary	174	49.7
None	113	32.3
Total	**350**	**100**

The data in Table 4.1.2 revealed that 49.7% of the women farmers had primary education, while 32.3% did not have any formal education and 15.7% had secondary education. The responses further revealed that 1.7% and 0.6% went to polytechnics and College/University respectively. This finding showed that majority (65.4%) of the women farmers included in this study had low level of education.

Table 4.1.3: Marital Status of Respondents

Marital Status	**Frequency**	**Percentage**
Single	37	**10.6**
Married	140	**40**
Divorced	60	**17.1**
Widowed	113	**32.3**
Total	**350**	**100**

Table 4.1.3 showed the marital status of the respondents. This revealed that 40% of them were married. This was followed by those that were widows (32.3%) and

divorced (17.1%). The least percentage of them (10.6) was single. This showed that majority (40%) of the women farmers included in this study were married.

Table 4.1.4: Size of Landholdings of women Farmers

Size of Land in hectares	Frequency	Percentage
Less than 3	148	42.3
3-5	133	38
Above 5	69	19.7
Total	**350**	**100**

The total size of available cultivated land for women farmers in the study area were shown in Table 4.1.4. This indicated that 42.3% of them cultivated less than 3 hectares of land. This was followed by those who cultivated 3-5 hectares (38%). Those that cultivated the least hectares were those above 5 hectares (19.7%). Table 4.1.4 indicated that majority (80.3%) of the women farmers were engaged in subsistence agriculture due to inadequate land.

4.2 Analysis of Data to Answer Research Questions

The major objective of this study was to ascertain relevance of agricultural extension towards effective participation of women farmers in agricultural production. This major objective was further simplified (broken) into four specific objectives to provide adequate room for its attainment. Each of the objectives was addressed by presenting the relevant items in mean score and standard deviation (s.d.). Items that scored 2.5 and above were considered “agreed”, while those that score below 2.5 were considered “disagreed”.

Research Question One: *To what extent is agricultural extension needed by women farmers in FCT Abuja?*

To answer this research question, mean score was employed. The result was shown in Table 4.2.1 below:

Table 4.2.1: Mean Response on the Extent Agricultural Extension is needed by Women Farmers

	Response Categories						
Need Category	**SA**	**A**	**D**	**SD**	**Mean**	**s.d.**	**Remark**
Diffusion and adoption of new technologies	200	98	40	12	3.39	0.356	Agreed
Knowledge and skills through education.	122	102	99	28	2.91	0.481	Agreed
Gaining access to farm inputs	201	21	121	7	3.21	0.482	Agreed
Visualize farming as profitable occupation	116	96	44	100	2.68	0.496	Agreed
Train women farmers to be progressive farmers.	91	18	54	95	1.77	0.499	Disagreed
Bridge the gap between scientists and women farmers	101	98	40	111	2.54	0.493	Agreed
Decision making process	95	69	76	110	2.42	0.493	Disagreed
Desired information	77	85	109	79	2.45	0.495	Disagreed
Planning	115	30	115	90	2.48	0.500	Disagreed

The result in Table 4.2.1 showed that majority of the respondents with the highest mean response of 3.39 said agricultural extension would help them in diffusion and adoption of new technologies while those with second highest mean response of 3.21 said agricultural extension would help them in gaining access to farm inputs and the respondents with third highest mean response of 2.91 agreed agricultural extension would help them with education and training. Respondents with fourth highest mean of 2.68 affirmed agricultural extension would help them to visualize farming as a profitable

venture and those with fifth highest mean response of 2.54 affirmed agricultural extension would bridge the gap between them and scientists.

The mean responses in Table 4.2.1 therefore showed that women farmers in FCT needed agricultural extension for diffusion and adoption of new technologies, gaining access to farm inputs, education/training, visualize farming as profitable venture and to bridge the gap between them and scientists. The mean responses for all these items were above 2.5 which indicated the least level of agreement on the four point scale.

Research Question Two: *What roles do women farmers in FCT play in agriculture?*

To answer research question 2, the researcher made use of mean score. The breakdown was revealed in Table 4.2.2:

Table 4.2.2: Mean Responses of Women Farmers' Role in Agriculture

Area of Involvement	Response Categories				Mean	s.d.	Remark
	SA	A	D	SD			
Food Production	66	194	21	69	2.73	0.438	Agreed
Processing	115	135	37	63	2.86	0.452	Agreed
Marketing	211	16	12	111	2.93	0.478	Agreed
Fish Production	55	145	141	9	2.70	0.496	Agreed
Animal Production	133	17	121	79	2.58	0.496	Disagreed
Gardening	13	40	116	181	1.67	0.359	Disagreed
Forest Production	18	91	95	54	1.77	0.499	Disagreed

The data analysis in Table 4.2.2 revealed that majority of the women farmers who had the highest mean score of 2.93 indicated that they were involved in marketing of agricultural produce while those who had the second highest mean of score 2.86 were engaged in processing of agricultural products. Women farmers who had the third highest mean score of 2.73 were involved in food production and those who had the fourth mean score of 2.70 were engaged in fish production. Those with the least mean

score of 2.58 were involved in animal production. The mean responses in Table 4.2.2 therefore revealed that women farmers in FCT played significant roles in marketing, processing food and animal productions as mean scores for all these items were above 2.5.

Research Question Three: *What are the major factors limiting women farmers' Production in FCT?*

Mean score was employed to answer research question 3. The result was shown in Table 4.2.3:

Table 4.2.3: Mean Responses of Factors limiting Women Farmers' Production and Access to Agricultural Extension

Factors	Response Categories						
	SA	A	D	SD	Mean	s.d.	Remark
Land availability	200	90	36	24	3.33	0.377	Agreed
Farm input supply	177	83	33	27	3.00	0.421	Agreed
Technology problem	51	200	21	78	2.64	0.451	Agreed
Illiteracy	180	111	102	57	2.89	0.499	Agreed
Inadequate mobility and time	82	100	99	69	2.55	0.500	Agreed
Socio-cultural factor	41	59	101	149	1.97	0.452	Agreed
Gender of extension agents	65	55	130	100	1.24	0.475	Disagreed
Inadequate extension programmes	71	102	84	93	2.43	0.501	Disagreed
Too many clients for EAs	88	86	99	97	2.58	0.501	Disagreed
EAs doing other official jobs	75	101	109	66	2.53	0.501	Agreed

The data in Table 4.2.3 showed that majority of the respondents with the highest mean score of 3.33 said inadequate land hindered them from effective participation in agriculture and from gaining access to available extension services while those with second highest mean score of 3.00 said inadequate farm inputs limited them from effective participation in agriculture and access to extension services. Women farmers with third mean score of 2.89 agreed illiteracy constrained them from effective

participation in agriculture and gaining access to extension services while those with fourth mean score of 2.64 affirmed inadequate technology limited them from performing effectively in agriculture and access to extension.

The data further showed that respondents who had fifth mean score of 2.58 stated that too many clients for extension agents hindered them from gaining access to available extension services in the FCT while those of them who had sixth highest mean score of 2.55 claimed inadequate time militated against their effective participation in agriculture and extension programmes. The respondents who had the least mean score of 2.53 stated that extension agents doing other official jobs constrained them from gaining access to extension services in the FCT. The mean responses in Table 4.2.3 therefore revealed that illiteracy; too many clients for extension agents, inadequate land, technology and time were the major factors that limited the respondents from effective participation in agriculture and gaining access to available extension services in the FCT. The mean scores for all these items were above 2.5 which indicated the least level of agreement on the four point scale.

Research Question Four: *What strategies can be used to improve women farmers' production in FCT*?

In answering this research question, mean score was also employed by the researcher. The result was revealed in Table 4.2.4:

Table 4.2.4: Mean Responses of strategies for Improving Women's Production

Strategies	Response Categories SA	A	D	SD	Mean	s.d.	Remark
Access to land	188	100	12	50	3.02	0.382	Agreed
Farm inputs/credit supply	200	50	49	51	3.48	0.452	Agreed
Improved technologies	110	90	120	30	2.80	0.496	Agreed
Education and training	115	80	15	140	2.51	0.497	Agreed
Mobility and timing	30	160	100	60	2.45	0.499	Disagreed
Suitable technology for women	20	150	50	130	2.17	0.501	Disagreed
Proclamation of women's rights	101	70	109	70	2.58	0.501	Agreed
Involve in decision making	83	90	77	100	2.44	0.501	Disagreed
Using male extension agents	74	100	106	70	2.50	0.501	Agreed
Gender targeting	170	5	15	160	2.54	0.501	Agreed

The data contained in Table 4.2.4 revealed that majority of the women farmers with the highest mean score of 3.48 agreed that access to farm inputs and credit would improve their participation in agriculture and extension programmes in the FCT while those with the second highest mean score of 3.02 said access to land would enhance their participation in agriculture and extension programmes. Women farmers with the third highest mean score of 2.80 indicated that supply of improved technologies would enhance their participation in agriculture and extension. The data further revealed that the respondents having the fourth and fifth mean scores of 2.58 and 2.54 affirmed that proclamation of women rights and gender targeting respectively would improve their access to extension and performance in agriculture.

Those who had the sixth mean score of 2.51 said that education and training would enhance their participation in extension and agriculture while the respondents with least mean score of 2.50 stated that using male extension agents to reach them would improve their access to extension and participation in agriculture. The mean responses in Table

4.2.4 therefore revealed that the women farmers agreed access to farm inputs and credit, land, supply of improved technologies, proclamation of women rights, gender targeting and training/education would improve their participation in agriculture and access to extension services in the FCT. The mean scores for all these items were above 2.5 which indicated the least level of agreement on the four point scale.

4.3 Testing of Null Hypotheses

Four (4) null hypotheses were formulated for this study. Each Null Hypothesis was tested in this section using Chi-Square (X^2) Goodness-of-fit statistics at 0.05 level of significance to ascertain the relationship between the variables.

Hypothesis One: *There is no significant relationship between the need of agricultural extension services and participation of women in agricultural production.*

To test this null hypothesis, chi-square test was used to relate the need of agricultural extension services with participation of women in agricultural production. Need of agricultural extension was computed as the aggregate score to which women farmers needed extension services for effective participation in agricultural production. The results were tabulated in Table 4.3.1.

Table 4.3.1: Summary of Chi-Square Analysis of Need of Agricultural Extension Services by Women Farmers

Item	Cal. X^2	Tab. X^2	D f	Remark
Need of Agricultural Extension Services	93.31	15.51	8	S

D f = Degree of Freedom S = Significant

It was observed that need of extension services significantly relate with participation of women in agricultural production in the study area since the value of X^2 calculated (93.31) was greater than X^2 tabulated (15.51) at 0.05 level of significance (P>

0.05). This means that agricultural extension was relevant for effective participation of women farmers in agricultural production. Therefore, the null hypothesis was rejected.

Hypothesis Two: *There is no significant relationship between the roles played by women farmers in agricultural production and access to agricultural extension services*

Null Hypothesis II was tested based on the expressed opinions of the women farmers on roles they play in agricultural production. Table 4.3.2 showed a summary of the chi-square test.

Table 4.3.2: Summary of Chi-Square Analysis of Roles Play by Women in Agriculture

Item	X^2 Cal.	X^2 Tab.	D f	Remark
Roles of Women in Agriculture	362.15	11.07	5	S

Table 4.3.2 indicated that the roles women farmers played in agriculture significantly relate with access to agricultural extension services as the calculated value of X^2 (362.15) was higher than X^2 critical (11.07) at 0.05 level of significance (P> 0.05). This implied that agricultural extension was relevant for women farmers to play significant roles in agricultural production in the study area. As a result, the null hypothesis earlier formulated was rejected.

Hypothesis Three: *There is no significant relationship between factors limiting women farmers' productivity and their participation in agricultural production.*

Table 4.3.3: Summary of Chi-Square Analysis of Factors Limiting women's Agricultural Production

Item	X^2 Cal.	X^2 Tab.	D f	Remark
Factors Limiting Women Farmers	423.97	16.92	9	S

Result of the test revealed that the factors limiting women farmers' productivity significantly relate with their access to agricultural extension services since X^2 calculated (423.97) was greater than X^2 tabulated (16.92) at 0.05 level of significance (P> 0.05). This means that women farmers in the study area were constrained or limited by some factors. The null hypothesis formulated was therefore rejected.

Hypothesis Four: *There is no significant relationship between strategies used to improve women farmers' productivity and their participation in agricultural production.*

To test this null hypothesis chi-square test was conducted. Table 4.3.4 presented the result.

Table 4.3.4: Summary of Chi-Square Analysis of Strategies Used to Improve Women's Agricultural Production

Variable/item	X^2 Cal.	X^2 Tab.	D f	Remark
Strategies For Improving Women Productivity and Access to Extension.	225.31	16.92	9	S

The computation in Table 4.3.4 indicated the strategies used to improve women's agricultural production significantly relate with their access to agricultural extension services as X^2 calculated (225.31) was higher than X^2 tabulated (16.92) at 0.05 level of significance (P>0.05). This pointed out that agricultural extension was relevant for effective participation of women in agricultural production in the study area. As a result of this, the null hypothesis earlier formulated was rejected.

4.4 Summary of Major Findings

The following are summary of major findings of this study:

The Mean responses showed that:

1. women farmers in FCT needed agricultural extension for diffusion and adoption of new technologies, gaining access to farm inputs, education/training, visualize farming as profitable venture and to bridge the gap between them and scientists.
2. women farmers in FCT played significant roles in marketing, processing, food and animal productions.
3. illiteracy; too many clients for extension agents, inadequate land, technology and time were the major factors that limited the respondents from effective participation in agriculture and gaining access to available extension services in the FCT.
4. access to farm inputs and credit, land, supply of improved technologies, and training/education would improve women's participation in agriculture and access to extension services in the FCT.

Result of tested Null Hypotheses showed that:

1. need of extension services significantly related with participation of women in agricultural production in the study area since the value of X^2 calculated (93.31) was greater than X^2 tabulated (15.51) at 0.05 level of significance (P> 0.05).
2. roles women farmers played in agriculture significantly related with access to agricultural extension services as the calculated value of X^2 (362.15) was higher than X^2 critical (11.07) at 0.05 level of significance (P> 0.05).

3. factors limiting women farmers' productivity significantly related with access to agricultural extension services since X^2 calculated (423.97) was greater than X^2 tabulated (16.92) at 0.05 level of significance (P> 0.05).
4. strategies used to improve women's agricultural production significantly related with access to agricultural extension services as X^2 calculated (225.31) was higher than X^2 tabulated (16.92) at 0.05 level of significance (P>0.05).

Results of the inferential statistics therefore showed that all the Null Hypotheses I-IV formulated were rejected.

4.5 Discussion of Major Findings

The purpose of this study was to ascertain relevance of agricultural extension services towards effective participation of women farmers in agricultural production in FCT-Abuja. The findings of the study were discussed in line with the stated objectives and Null Hypotheses. The result showed that majority of the respondents with the highest mean response of 3.39 said agricultural extension would help them in diffusion and adoption of new technologies. Celis, Millimo and Wanmali (1991) discovered that contact with agricultural extension positively affected the diffusion and adoption of new agricultural technologies among women farmers in Zambia.

The study revealed that the respondents with second highest mean response of 3.21 said agricultural extension would help them in gaining access to farm inputs In line with this, Williams (1997) and FAO (1998) pointed out that farmers needed short-term credit to buy improved seeds, fertilizers, insecticides and herbicides and to hire farm labourers to work the fields and help with post-harvest operations. They also needed

long-term credit to invest in more efficient technologies irrigation, labour-saving tools and implements and transport.

The findings also revealed that women farmers with third highest mean response of 2.91 agreed agricultural extension would help them with education and training. Based on this, Ani (2007) stated that we cannot achieve agricultural development on farm level except through the provision of basic agricultural education, particularly the informal type that would help move our women farmers from traditional agriculture to progressive. The study showed that the mean responses in Table 4.2.2 revealed that women farmers in FCT played significant roles in marketing, processing food and animal productions. This agreed with the findings of Jafry (2000) and Akpabio (2005) who affirmed that women performed increasingly indispensable roles in agriculture and contributed significantly to the Nigerian economy in their roles as food producers, processors and sellers (marketers).

The data in Table 4.2.3 showed that majority of the respondents with the highest mean score of 3.33 said inadequate land hindered them from effective participation in agriculture and from gaining access to available extension services. This was in line with Saito and Weidemann (1990) who revealed that land was a major production resource and access to this important resource has been a major limiting factor to women's productivity. The findings also revealed that the respondents with second highest mean score of 3.00 said inadequate farm inputs limited them from effective participation in agriculture and access to extension services. Manju (1995) revealed that high cost of farm inputs and lack of improved technology tools and implements were the main problems faced by women farmers in Nigeria, Syria, Thailand and Trinidad.

The study indicated that women farmers with third mean score of 2.89 agreed illiteracy constrained them from effective participation in agriculture (Table 4.3.2). Ajala (2004) stated that women's access to agricultural extension and their ability to comprehend and use technical information was compromised when they lack basic education. The study also indicated that women farmers with fourth mean score of 2.64 affirmed inadequate technology limited them from performing effectively in agriculture and access to extension. Ajala (2004) pointed out that lack of technology to improve production were lacking for small holders in general and for women in particular.

Similarly, the study showed that women farmers with mean score of 2.55 claimed inadequate time militated against their effective participation in agriculture and extension programmes. This was in agreement with the findings of World Bank (1990) that women farmers in Nigeria and Kenya were unable to attend training due to lack of time. The findings also observed that the mean responses in Table 4.2.4 revealed that the women farmers agreed access to farm inputs and credit, land, supply of improved technologies, and training/education would improve their participation in agriculture and access to extension services in the FCT. Nawaye (1991) predicted that traditional agriculture was approaching its technological limit and we might not continue to rely on the small scale farmer for a very long time to come.

The results of Null Hypothesis I showed that need of agricultural extension significantly relate with participation of women farmers in agricultural production in the study area ($P>0.05$). Therefore, the Null Hypothesis I formulated was rejected. It was also observed that the roles women farmers in the study area played in agriculture significantly relate with their access to agricultural extension services ($P>0.05$). Thus, the Null Hypothesis II earlier stated was rejected. It was also discovered that the factors

limiting women farmers' production significantly relate with their access to agricultural extension services (P>0.05). Hence, Null Hypothesis III was rejected. The results also pointed that the strategies used to improve women farmer's production significantly relate with their access to agricultural extension services (P>0.05). Therefore, the Null Hypothesis IV stated was rejected.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

The information needed in this chapter was presented under the following sub-headings:

5.1 Summary

5.2 Conclusion

5.3 Recommendations

5.4 Implication of the Study

5.5 Limitation of the study

5.6 Suggestions for further study

5.1 Summary

The study was conducted to ascertain the relevance of agricultural extension towards effective participation of women in agricultural production in FCT-Abuja. Four (4) specific objectives were formulated. The specific objectives were to ascertain the need of agricultural extension by women farmers in the study area, to identify the roles played by women farmers in the area. In addition, the objectives were to identify the factors limiting/militating against women farmers' production and access to extension, and to identify strategies/measures that will improve women farmers' production and access to extension in the area. In line with these objectives, four (4) research questions, and corresponding four (4) null hypotheses were formulated.

The results of the tested Null Hypothesis I showed that need of agricultural extension services significantly related with participation of women in agricultural production ($P>0.05$). This means that agricultural extension was relevant for effective participation of women farmers in agricultural production in the study area. As a result,

the Null Hypothesis I formulated was rejected. Null Hypothesis II indicated that the roles played by women in agriculture significantly relate with their access to agricultural extension services (P>0.05). That is, agricultural extension encouraged women farmers in the study area to play significant roles in agriculture. As a result of this, the Null Hypothesis II earlier formulated was rejected.

The results of the tested Null Hypothesis III ascertained that the factors militating women's production significantly relate with their access to agricultural extension services (P>0.05). This implied that participation of women in agriculture and access to extension services were constrained by some factors in the study area. Therefore, the Null Hypotheses III earlier formulated was also rejected. The results of Null Hypothesis IV showed that the strategies used to improve women's agricultural production significantly relate with their access to agricultural extension services (P>0.05). This pointed out that agricultural extension was relevant for effective participation of women in agricultural production in the study area. Therefore, the null hypothesis earlier formulated was rejected.

The study pointed that the mean responses in Table 4.2.1 showed that women farmers in FCT needed agricultural extension for diffusion and adoption of new technologies, gaining access to farm inputs, education/training, visualize farming as profitable venture and to bridge the gap between them and scientists. The mean responses for all these items were above 2.5 which indicated the least level of agreement on the four point scale. The results showed that the mean responses in Table 4.2.2 pointed that women farmers in FCT played significant roles in marketing, processing food and animal productions as mean scores for all these items were above 2.5.

The findings also revealed that the mean responses in Table 4.2.3 revealed that illiteracy; too many clients for extension agents, inadequate land, technology and time were the major factors that limited the respondents from effective participation in agriculture and gaining access to available extension service in the FCT. The mean scores for all these items were above 2.5 which indicated the least level of agreement on the four point scale. Finally, the results showed that the mean responses in Table 4.2.4 revealed that the women farmers agreed access to farm inputs and credit, land, supply of improved technologies, proclamation of women rights, gender targeting and training/education would improve their participation in agriculture and access to extension services in the FCT. The mean scores for all these items were above 2.5 which indicated the least level of agreement on the four point scale.

5.2 Conclusion

Women farmers in the study area constituted the bulk of agricultural production and labour supplies. They were known to play major roles in all processes of agricultural production ranging from food and animal productions, processing and marketing at a subsistence level. The women farmers identified some factors that limited them from participating effectively in agriculture in the area. Agricultural extension was found relevant for enhancing the participation of women farmers in the study area.

It can therefore be concluded that women were found to perform a variety of operations in agriculture in the study area. However, there were certain factors such as inadequate land and farm inputs supply, illiteracy, inadequate technology and time that militated against effective performance of these women farmers. Agricultural extension was identified as a relevant strategy to enhance women farmers' productivity in the FCT.

5.3 Recommendations

Based on the findings of this study, the following recommendations were put forward in order to improve women farmers' productivity and access to extension services in the study area:

a. FCT Government should recruit more trained male and female extension agents to assist women farmers effectively with agricultural problems. Agricultural extension organizations should design and deliver more appropriate and meaningful programmes for women farmers, transmit research results to women farmers and field agents should devote a gender percentage of time to working with women farmers groups.

b. Women farmers should embark on farming enterprises that require less land such as poultry, fish, snail, bee and rabbit productions. Women farmers should establish formal and informal cooperation and establish women credit groups to take advantage of small loan periods.

c. Inadequate land, farm inputs supply and technology were the most factors limiting women farmers in the study area. Based on this, Government of the FCT should provide farm inputs to the women farmers at subsidized prices and at right time; tractors should be given out and hired to the women farmers at low price; Research Centres should develop suitable technologies for women farmers and these should be available to extension staff for communicating message to women farmers.

d. ADP and WIA should organize women farmers' seminars for women to share with researchers and field staff their solutions to the technical problems specific to women farmers' production systems. They should also educate women farmers on formation of strong and virile women farmers' association. Women farmers should

visit ADP for professional advice / training and to gain access to more inputs and better cost- effective technology available and to patronize Nigeria Agricultural and Cooperative Bank (NACB) and other commercial banks for loans to enhance their agricultural productivity.

5.4 Implication of the Study

There is a great need to develop women farmers through education, since education is very crucial for agricultural development and for improvement of the standard of living of the farming population. This means that women's education should not only be given top priority in our educational system but some of the obstacles to their education have to be addressed. Also, Women farmers should be seen as a very important target group, with the same rights as male farmers for land ownership, access to input, credit, acquisition of knowledge and skills for agriculture, marketing facilities in order to effectively improve the extension services for women farmers.

5.5 Limitation of the Study

The conduct of their research was limited/constrained by some factors, these were: Access to the women farmers for administration of questionnaire was very difficult due to inaccessibility. Some villages in the study area were not connected with good motor able roads. The researcher had to make several trips to some of the villages before gaining access to some of the women farmers. This delayed the administration of the questionnaire to the women farmers. Similarly, socio-cultural, religious as well as some traditions which prevent participation of women in social and economic processes of change in some villages and communities were serious setbacks to this study as direct contact between the women and the researcher was prohibited. Also, majority of the women farmers in the study area could not read and write in English due to illiteracy so

an oral interview was conducted for them. The questions were translated into the local languages (Hausa and Gbagyi) and their responses were recorded by the research assistants. This extended the period of the study. However, despite all these limitations, the study was successful.

5.6 Suggestions for Further Study

Based on the findings and conclusions of this research, understanding effective agricultural extension programming for women farmers was recommended for further study.

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APPENDICES

APPENDIX I

QUESTIONNAIRE FOR WOMEN FARMERS

Agricultural Education Section,
Department of Vocational and Technical Education,
Faculty of Education,
ABU, Zaria.

Madam,

Request to Fill Questionnaire

I am a postgraduate student of the above named Department presently carrying out a study on the topic "Relevance of Agricultural Extension towards Effective Participation of Women in Agricultural Production in Federal Capital Territory Abuja Nigeria".

Kindly assist to complete the attached questionnaire. Your frank response will help this study a great deal. The study is purely for academic purpose and the information provided will be treated as confidential only.

All questions asked are purely for the assessment of the real situation. Please be as accurate as possible to enable the researcher get valid information.

Thanks for your anticipated cooperation.

Yours Sincerely,

Andrew Ali WAKAWA.

APPENDIX II

SECTION A: Personal Characteristics of Women Farmers

INSTRUCTION: Please tick (√) where appropriates.

1. Name of village: **…….**

2. Age (in years):

    a. below 30 [ ]

    b. 31-40 [ ]

    C.41-50 [ ]

    d. 51-60 [ ]

    e. above 60 [ ]

3. Level of education:

    a. none [ ]

    b. primary school [ ]

    c. secondary school [ ]

    d. OND/NCE [ ]

    e. HND/BSC [ ]

4. Marital status:

    a. single [ ]

    b. married [ ]

    c. divorced [ ]

    d. widowed [ ]

5. Size of land (in hectares):

    a. less than 3 [ ]

b. 3-5 [ ]

c. Above 5 [ ]

SECTION B: Questionnaire on Need of Agricultural Extension, Roles Play in Agricultural Production, Factors Limiting Productivity and Access to Extension Services, and Strategies for Improving Productivity and Access to Extension Services.

INSTRUCTION: Tick (√) the most appropriate response option in your case. The full meaning of the response options are as follows:

SA=Strongly Agree
A=Agree
D=Disagree
SD=Strongly Disagree

S/No	A. Need of Agricultural Extension to women farmers	SA	A	D	SD
1.	Agricultural extension will help in the diffusion and adoption of new technology				
2.	Agricultural extension will help to change attitude, knowledge, skills and outlook through education				
3.	It will help in getting access to necessary inputs				
4.	Agricultural extension will help women farmers to visualize their farming as a profitable occupation				
5.	Agricultural extension will help to train women farmers to be farm leaders and progressive farmers				
6.	It will help women farmers to improve in their decision making process				
7.	Agricultural extension will help to bridge the gap between scientists and the women farmers				
8.	Agricultural extension will help to show women farmers how to set or plan what they want				
9.	Agricultural extension will help to provide the desired information to women farmers				

	B. Roles women play in agriculture	SD	A	D	SD
10.	Food production				
11.	Involved in home gardening				
12.	Involved in Animal production				
13.	Involved in Fish production				
14.	Involved in forestry				
15.	Carry out Food processing				
16.	Participate in Storage and marketing				
	C. Factors limiting women farmers and access to agricultural extension	**SD**	**A**	**D**	**SD**
17.	Land availability and tenure system				
18.	Shortage of suitable technology in agriculture for women farmers				
19.	Inadequate farm credit and farm inputs				
20.	Illiteracy				
21.	Inadequate mobility and time for women farmers to participate in agricultural extension programmes				
22.	Socio-cultural factors affecting transmission of information (cultural norms circumscribe male-female interaction)				
23.	Coverage of too many target groups by one extension agent				
24.	Extension agents assigned to many other official jobs in addition to field work				
25.	Inadequate programmes for women farmers' participation in agricultural extension programmes				
26.	Gender of extension worker				
	D. Strategies for improving women farmers and access to agricultural extension	**SA**	**A**	**D**	**SD**
27.	Free access to land through land reforms				
28.	Provision of agricultural loans and farm credit				
29.	Equal access to labour-saving technologies				
30.	Provision of suitable improved technologies				
31.	Development of women farmers through education and training				

32.	Proclamation of women's legal rights				
33.	Timing and location of extension programmes should consider women's multiple roles				
34.	Proper representation of women at decision-making level				
35.	Gender targeting (reaching women farmers through their kinds (females))				
36.	Using male extension agents to reach women farmers				