CONTRIBUTIONS OF AGRICULTURAL EXTENSION WORKERS IN PROMOTING SUSTAINABLE AGRICULTURAL DEVELOPMENT AMONG FARMERS IN KADUNA STATE, NIGERIA

BY

SHAGBOH Bulus Nuhu
(M.SC./EDUC/46838/12-13)

DEPARTMENT OF VOCATIONAL AND TECHNICAL EDUCATION
FACULTY OF EDUCATION, AHMADU BELLO UNIVERSITY, ZARIA

December, 2014

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A THESIS SUBMITTED TO THE SCHOOL OF POSTGRADUATE STUDY, AHMADU BELLO UNIVERSITY, ZARIA IN PARTIAL FULFILLMENT OF THE AWARD OF M.SC AGRICULTURAL EDUCATION

DEPARTMENT OF VOCATIONAL AND TECHNICAL EDUCATION
FACULTY OF EDUCATION
AHMADU BELLO UNIVERSITY, ZARIA, NIGERIA

December, 2014

DECLARATION

I, Shagboh, Nuhu Bulus declare that this research work titled "CONTRIBUTIONS OF AGRICULTURAL EXTENSION WORKERS IN PROMOTING SUSTAINABLE AGRICULTURAL DEVELOPMENT AMONG FARMERS IN KADUNA STATE, NIGERIA" was conducted by me in the Department of Vocational and Technical Education under the supervision of Dr D.O Oni and Dr. Ben I Okeh. The sources from which the literature information were extracted have been duly acknowledged in the text and list of references. There is no part of this Thesis that has been presented for the award of another degree at any university.

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Bulus Nuhu Shagboh M.SC./EDUC/46838/12-13	Signature	Date

CERTIFICATION

This thesis titled "Contributions of Agricultural Extension workers in Promoting Sustainable Agricultural Development among Farmers in Kaduna state, Nigeria" written by Nuhu Bulus, Shagboh meets the regulations governing the award of the degree of Master of Science in Agricultural Education of Ahmadu Bello University, Zaria and it is approved for its contribution to knowledge and literary presentation.

Dr. D.O. Oni	----------	----------
Chairman, Supervisory Committee	Signature	Date
Dr. Ben I. Okeh	----------	----------
Member, Supervisory Committee	Signature	Date
Prof. A. A. Udoh	----------	----------
Head of Department, Vocational and Technical Education	Signature	Date
Prof. A. Z. Hassan	----------	----------
Dean, School of Post Graduate Studies	Signature	Date

DEDICATION

This research work is dedicated to my late mother Nack Nuhu and to my family.

ACKNOWLEDGEMENT

First of all, I want to acknowledge Almighty God for the gift of life and provisions to complete this study. May His name be praised. I am indebted to my school, Ahmadu Bello University, Zaria for the admission and enabling environment to carry out this work. The same gesture goes to my distinguished supervisors, Dr. D.O Oni and Dr. Ben I. Okeh who employed their scholastic prowess to guide me throughout the period of this research study. Much gratitude is owed to them for their advice, encouragement and patience that have facilitated the successful completion of this work, to them I say a very big thank you.

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To my beloved late friend Mr. Bala Katoh and to Mr. Fidelis Dutse, Mr. Dada and my brothers and sisters, I say a big thank you for your patience, encouragement, moral and financial supports all of which led to the successful completion of this work. Also to other who have in one way or the other contributed to success of the study, but their names are not mention, I say God bless you all.

ABSTRACT

The study was carried out to determine the contributions of agricultural extension workers in promoting sustainable agricultural development among farmers in Kaduna State, Nigeria. Six specific objectives were raised. Descriptive survey research design was adopted. The population of farmers in the three senatorial districts were 4,056 and sample size of 333, were randomly selected. Structured questionnaire were used to collect data. Analysis of Variance (ANOVA) was used to determine the responses of farmers. The result reveals that 59.5 percent of the respondents are between the ages of 20 to 34 years, about 58% of farmers are male, and less than 70% are married. Majority of the farmers are educated (75%). Agricultural Extension Workers contributed through the control of erosion in the farm land, that farmers were influenced by Agricultural Extension Workers by disinfecting their store houses against pest and diseases before storage with 67% of the respondents agreed to the statement. There was significant difference in the opinions of farmers on the contribution of Agricultural Extension Workers on soil and water management practices among farmers in promoting sustainable agricultural development in Kaduna State having 51% disagreed to the stated statement. But the differences were traced to Northern and Central districts for five items and one to Northern and southern districts. In view of the findings, it was concluded that agricultural extension workers have influenced farmers positively (67%), which led to better management of soil, water, animal production practices and others. It was recommended that Agricultural Extension Workers should organize public enlightenment campaign on soil and water management to create more awareness among rural farmers.

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LIST OF ABBREVIATIONS

S.R Stimulus and Response

ADP Agricultural Develovpment Project

DFRRIDirectorate of Food, Road and Rural Infrastructure

ANOVA Analysis of Variance

S.E Standard Error

S.D Standard Deviation

CHAPTER ONE : BACKGROUND OF THE STUDY

1.1 INTRODUCTION

Agricultural extension is an applied behavioural science, which is applied to bring about desirable changes in the behavioural complex of farming community, usually through various strategies and programmes of change, by applying latest scientific and technological innovation (Bokor, 2008). According to Iwena (2008), agricultural extension is a process whereby modern farming techniques and research findings are taking to the farmers through extension and problems of the farmers are taken to research institutions for solution. Iwena, (2008) added that, agricultural extension is an informal, out of school voluntary agricultural education involving the spread or dissemination of information, recent improved development in agriculture from researchers to the farmers through extension agents.

Agricultural extension workers teach farmers about marketing and help farm groups organize both buying and selling cooperative. Extension workers help farmers grow crops, home owners plan and maintain their homes, and children learn skills to become tomorrow's leaders. Extension teaching is the process through which the extension workers stimulate interest in the learning more by using various teaching methods, tools and techniques to improve the situation. The essential role of agricultural extension workers is to create an effective learning situation. Other roles played by extension workers according to Iwena, (2008) include the following:

Providing agricultural consultancy services, planning and executing programmes, organizing and supervising farmers groups, conducts and organizing training for farmers, liaising with other agencies, assisting in improving famers outlook, acting as intermediary between researchers and farmers, teaching farming practices, evaluating extension programmers and locating marketing channels.

Agricultural extension workers used the following methods in teaching farmers, according to Iwena (2008). The methods are:- (1) individual method, which can be sub-divided into:

a. Home visit

b. Office visit

c. Telephone call

d. Correspondence

e. Result demonstrations (2) Group methods which include: Field trips, Symposia, Group, Demonstration plots, Lecturing, Excursion, Agricultural show, Debate

3. Mass Media, this is divided into:

a. Electronic

b. Prints Media

Agricultural extension workers in Kaduna State live in localities where the secondary schools are cited (Iwena, 2008). Therefore, it is expected that they do make contributions on the agricultural activities of farmers in their communities. Idowu (2006) said that a community is a group of people living together and having many things in common. Both farmers and agricultural extension Workers live in the same communities and it is hoped that both interact and benefit from one another in terms of agricultural development. Idowu further stressed that agricultural Science as a community based educational programme should focus on the needs of the local community and when the needs of the farmers are being met, development takes place.

Sustainable development is one of the fundamental challenges confronting humanity (Seema, 2007). Seema defined sustainable development as meeting the needs of the present without compromising the ability of the future generation to develop. According to world commission on environment and development (2007) sustainable development is that which meets the needs of the present without compromising the ability of future generation to meet their own needs. Sustainable development is generally thought to have three components, namely: environment, society and economy. Meeting the needs of the generation depends on the sustainability in agricultural products because human beings depend on agriculture for food and fibre. Sustainable development in agriculture is the ability of farmers to produce farm products continuously without causing irreversible damage to the ecosystem (Rodney 2008). All agricultural land needs to be sustained to be able to produce the needed food for the growing population.

Sustainable farming and natural resource management is relatively knowledge intensive' requiring the application of general ecological principles to a specific situation. Joint problem solving with clients, leading to an enhanced ability to identify and solve problems, will be an appropriate way of influencing their future behaviour. Extension objectives can range from the effective transfer of technology to the building up of strong rural organisations which can exert influence over future research and policy agendas, and also take and enforce collective decisions over natural resource management. A shift towards the latter will promote more sustainable agricultural development. Most extension agencies have concentrated on influencing clients' decisions in respect of land and other resources at the individual household scale. Many of the environmental problems which affect small-scale farmers, however, can only be solved through

collective decisions and action. Extension personnel may need to spend more time supporting collective decision-making and facilitating follow-up action.

Seema (2009) stated that agricultural sustainability is a means of producing sufficient qualities of safe and healthy food, while improving the livelihood of farmers and preserving precious environmental resources for future generation of farmers and consumers. Majority of food produced in Nigeria is gotten from small scale farmers. This implies that the agricultural development in Nigeria depends on the production in the local communities. Ojipon (2009) opine that Nigerian agriculture comprises mainly of small scale farmers who still use traditional farming methods to till the soil for seed planting.

Therefore, it is important to point out that attaining the goal of sustainable agriculture is the responsibilities of all participants in the systems, including farmers, laborers, policy makers, researchers, retailers, agricultural extension workers, consumers and the community. Each group has its own part to play, and its own unique contribution to make in order to strengthen the sustainable agriculture community (David, 2010). It is against this background that this study was conducted to examine the contributions of agricultural extension workers in promoting sustainable agricultural development in Kaduna State.

1.2 Statement of the Research Problem

Even though agriculture is the backbone of Kaduna State economy, its sustainability in the country's rural poor farming communities through agricultural development programmes is yet to be achieved. The major challenge in Kaduna State's economy is that the bulk of the agricultural produce (about 70 percent) is obtained from the smallholder farmers most of which

are vulnerable to prevailing government policies and strategies. According to Iwena (2008) many farmers did not apply the knowledge which extension agents taught them. Iwena (2008) also points out that majority of farmers do not know how to market their produce for profit because, farmers lack knowledge of the time when produces are more demanding in the markets.

According to Adamu (2008) many farmers in Kaduna state still adhered to their old system of farming instead of the modern systems of farming, which can bring more yield in their crop production. Adamu (2008) also pointed out that many farmers in Kaduna were not able to process their farm produce very well, and this led to spoilage and destruction by pest and diseases. Adamu (2008) added that many farmers in Kaduna were faced with the problem of soil management and control of erosion in their farms and they need to be shown a way out of how to control these problems. Farmers in Kaduna State were having problems of keeping animals and at the same time having problem in, cultivating land for crop planting, they lack the principle (s) involved in the mixed farming as a system of farming.

The challenge, however, is to make these agricultural development programmes sustainable so that there is improvement in the lives of the poor. Empirical evidence tend to show that for any development to achieve high level of food production and become self-sustaining, it will have to include the rural areas in general and the agricultural sector in particular (Todaro and Smith, 2009). This requires employing strategies that should be sufficient enough to generate the level of economic activity among smallholder farmers. Such strategies include sustainable poverty reduction and lessening continued dependence on foreign aid for food security through empowering the socially and economically poor farming communities. Thus, sustainability in agriculture development programmes can be achieved if the government provides strategies that

build the local capacity and that empowers the smallholder farmers to sustain high levels of agricultural productivity.

The researcher's personal observation and experience showed that farmers in Kaduna State are faced with problems ranging from soil water management, storage produce, systems of farming, rearing animals, processing and preservation of crops produce proper marketing channels. It was based on these observed problems that the researcher undertook this research work so as to find out the contributions of agricultural extension workers in promoting sustainable agricultural development among farmers in Kaduna State.

1.3 Research Questions

The study sought answers to the following research questions:-

i. What are the contributions of agricultural extension workers on soil and water management practices among farmers for promoting sustainable agricultural development in Kaduna State?

ii In what ways have agricultural extension workers contributed to livestock production practices among farmers for promoting sustainable agricultural development in Kaduna State?

iii To what extent has extension workers contributed to crop production practices among farmers for promoting sustainable agricultural development in Kaduna State?

iv What contributions have agricultural extension workers made on crop processing practices among farmers for promoting sustainable agricultural development in Kaduna State?

v In what ways have agricultural extension workers contributed to crop preservation and storage practices among farmers for promoting sustainable agricultural development in Kaduna State?

vi What are the contributions of agricultural extension workers to agricultural marketing strategies among farmers for promoting sustainable agricultural development in Kaduna State?

1.4 Objectives of the Study

The general objective of this study was to determine the contributions of agricultural extension workers in promoting sustainable agricultural development among farmers in Kaduna State, Nigeria.

The specific objectives were to:-

i determine the contributions of agricultural extension workers on soil and water management practices among farmers.

ii establish the contribution of Agricultural extension workers to livestock production practices among farmers;

iii. determine the contributions of Agricultural extension workers on crop production practices;

iv evaluate the contributions of agricultural extension workers in crop processing practices among farmers;

v assess the contributions of agricultural extension workers to storage and preservation of agricultural products; and

vi. assess the contributions of agricultural extension workers on agricultural marketing strategies among farmers.

1.5 Significance of the Study

The findings of this study will help the farmers to see the need to appreciate the contributions made by Agricultural extension workers in the area of soil and water management practices in promoting sustainable agricultural development in Kaduna state. This is because the study will bring out the activities of Agricultural extension workers in this direction.

The findings of this study will help for possible intervention strategies that will address the problem of wrong attitude of farmers towards Agricultural extension workers. It is expected that the finding of the study will encourage farmers to seek for the advice of Agricultural extension workers before carrying out their activities. The study will also give farmers and the local communities the incentives to appreciate the contributions of Agricultural extension workers in the society in the area of animal production practices, crop processing practices, agricultural marketing strategies and others.

The study contributes in analysing an agricultural policy that sustains high levels of agricultural productivity given the decline in commercial estate activities and the decreasing smallholder farm sizes due to rapid population increases hence fragmentation of customary land. In the past, the development of commercial estate agriculture was the backbone of agricultural development such that the Government subsidised commercial estate agriculture while small-scale farmers were neglected. By so doing, the Government contributed to urban sector development.

The study expects to contribute not only to the already existing body of knowledge but also on how the policy environment created by the government affects the sustainability of agricultural development programmes in the smallholder sector. Consequently, this study provides additional insights and understanding to the government, the private sector, Non

Governmental Organizations, policy makers, farmer organizations and various other stakeholders in the agricultural sector in Kaduna about the agricultural transformation in the country. The government and policy makers will further benefit through various agricultural policy option suggested by the research. The findings of this study will enable the state government to take decisive and urgent actions to assist Agricultural extension workers so that they can put more efforts in promoting sustainable Agricultural Development in Kaduna State. It is also hoped that the findings of this study will motivate agricultural science students to consider agriculture as positive future career and this is bound to lead to a developed and self-reliant society.

1.6 Delimitation of the Study

This research study was delimited to the contributions of Agricultural extension workers in promoting sustainable agricultural development in area of soil and water management practices, animal production practices, crop production practices, Crop processing practices, preservation and storage of agricultural products, and marketing strategies of farm produce due to time and financial constraints. The study was also delimited to full time farmers in the three (3) senatorial zones of Kaduna State, in which nine (9) local government areas was selected. It was also delimited to the contributions of agricultural extension workers in Kaduna State. The choice of the local government was based on the fact that farmers in these local government areas keep records and also farmers in these areas involved in extension work (Adamu, 2008).

CHAPTER TWO: THEORETICAL FRAME WORK AND LITERATURE REVIEW

2.1 Theoretical Frame work

The theoretical framework of this study was based on the theory of connectionism by Thordike (1874-1949). Thordike was the first American psychologist among stimulus response (S–R) theorist, who conducted experiments on learning with animals. Thordike introduced the concept of reward in learning. Today, Throdike is considered as a reinforcement theorist (Chauhan, 1978). This theory was chosen because of the availability and utilization of agricultural extension workers who served as a motivation for effective teaching and learning to famers in Kaduna state. The theory of connectionism states that all learning is the formation of bonds or connections between stimulus and response (S-R) (Chauhan, 1978). The reinforcement

theorists concern themselves with the attitudes, feelings, or absence of the motivator – the stimulus, as well as its effect in the connecting force on to the response.

Little cited in (D‟haese and Kirstein, 2003) states that until the 1950‟s, very little was written on the role of agriculture in development. Never the less, most governments‟ policies and agricultural development programmes in developing countries have principally been influenced by a variety of rural development ideas as they evolved over the years. These ideas include the modernisation approach, basic needs approach and the integrated rural development, among others. All these affected agricultural productivity levels because agriculture has always been recognized as a key sector for economic development (D‟haese and Kirstein, 2003:22).

Accordingly, agriculture can make a major contribution to overall development because most of the resources are available at relatively low opportunity cost. Therefore, the major task of agriculture in development was recognized as being the mobilization of resources and increasing efficiency in production. An increased production is needed because any increase in the population and per capita income leads to an increased demand in food of a better quality. Even establishment of a non-agricultural sector requires a high input of resources, which mostly comes from agriculture. Johnston and Mellor cited in (D‟haese and Kirstein, 2003) also recognized agriculture as a provider of food and raw materials for other sectors, as an earner of foreign exchange and as a source of demand for other sector‟s output, among others.

However, Delgado (1995) points out that the choices in African agricultural strategies have been influenced by dominant paradigms of agricultural development from the colonial era to the mid 1990s. Delgado (1995) identified growth and industrialisation as being the primary objectives of the early phase of commercialisation via cash cropping, with equity considerations

appearing in the 1970s and conservation in the 1990s. Intermediate stages include emphasis on basic human needs in the 1970s, and a series of paradigms related to structural adjustment in the 1980s. This chronology illustrates the parallel evolution of dominant development paradigms (that is, modernizations, integrated rural development, liberalization as well as sustainable agricultural development) and the thinking about agriculture. Therefore, the thinking about agriculture has almost always reflected development ideas more generally. Another psychologist, Piaget (1969) in Nnoji (1992), observes that a teacher cannot further understand a child simply by talking to him. A good teaching strategy must be involved by presenting the child with situations involving practical experiments, which in the broadest sense is termed "learning by doing". A good agricultural extension worker will provide farmers with skills and practical knowledge that will assist them in performing their farm operations . In other words, farmers learn more effectively from concrete objects and situations. Hence, the availability and utilization of a good strategy will encourage agricultural extension workers to procure and use the resources available to them for effective teaching. The role of the teacher from the Piagetan point of view is not only from transmitting ready – made knowledge to students but that of helping the students or helping the farmers to develop their own practical skills and knowledge through practical teaching and learning.

2.2 Agricultural Development

Many small farmers in rural areas depend on agricultural production for their livelihood and large numbers of poor families rely on agricultural products for daily nourishment. Unfortunately, in many poor regions, soil conditions, seed supply and other factors are not ideal for successful farming, which leads to poverty in the developing world. Agricultural development promotes the proper conditions for farming so that planting, harvesting and

processing of crops can be done effectively, which ultimately can reduce poverty and save lives, (Adeniyi, 2001). Bondon (2003), looks at agricultural development as the process of promoting the proper condition for farming, so that all that is needed for crop and animal production is achieved.

Bondon (2003) further states that agricultural development is a process of helping small farmers with agricultural developing initiatives so that they can improve on their production capacities. Adeniy (2001) states that agricultural development is the process of promoting the proper conditions for farming so that more food will be provided for more people. Okorie (2002) sees agricultural development as providing formal agricultural education and training in the theory and practice of small stock production. He also saw agricultural development as all that is done to sustain a community, country or nation in terms of food production and raw materials for industries.

2.3 Agricultural Extension Workers

According to Roling (1988) agricultural extension worker is found throughout the world, usually working for government agencies. Nafes (2005) defines agricultural extension worker or agent as a university employee, a farmer who is trained under the principle of extension, who develops and delivers educational programmes to assist people in economic and community development, leadership, family issues, agriculture and environment. Adams (2008) sees extension workers as people who teach farmers how to adopt new systems of farming and how to control pests and disease on their farm. They are also involved on teaching farmers how to apply fertilizer in their farm. He also points out that extension workers do more of teaching to farmers in the area of control of erosion, and marketing products, and processing of farm products.

In an attempt to state the roles of an extension worker. Roling (2009) states the following:-

(i) Providing agricultural consultancy services: He consults and reflects on rural or agricultural development projects for the farmers.

(ii) Planning and executing programmes: He plans and executes farming educational programmes.

(iii) Organizing and supervising farmers' groups: i.e., meeting, co-operatives and their workers' meetings.

(iv) Conducting and organizing training for farmers:

(v) Liaising with other agencies: He liaises with other agencies that may have influence on the rural environment and the farmers,

(vi) Assisting in improving farmers' out-look: He helps to improve the outlook of farmers towards their problems or difficulties,

(vii) Acting as intermediary between researchers and farmers: He acts as a connecting link (intermediary) between the researchers and the farming communities.

(viii) Teaching improved farming practices to farmers,

(ix) Evaluates agricultural extension programmes and projects.

(x) Supervising the utilization of agricultural loans,

(xi) Assisting farmers to locate marketing channels for farm produce.

(xii) Assisting farmers to source for in put like fertilizers, seeds, and chemicals .

(xiii) Assisting farmers to source for loans to enable them buy various input and produce crops and livestock.

The problems facing agricultural extension worker varies with one another.

In the light of this Adams (2008) states the following problems:

i. high level of farmers' illiteracy: the –high level of illiteracy among farmers may affect their rate of adoption of new farming techniques

ii. absence of credit facilities: the Absent of credit facilities to farmers make them unattested and prevent the implementation of cepted innovations.

iii. insufficient motivation of extension agent: Insufficient motivation of the extension workers by way of better renumeration for their efforts tends to retard their performance.

(iv) inadequate of resources: Extension workers do not have adequate resources such as money to travel or enough materials to support their target farmers.

(v) unfavourable attitudes of farmers: unfavourable attitudes of rural farmers toward government programmes, tends to make extension work a bit difficult

(vi) inadequate of trained extension agents: Inadequacy of well trained extension staff makes the extension worker have a wider area and more farmers than he can cope with,

(vii) uncoordinated efforts by government agencies: Uncoordinated efforts by government agencies may lead to confusion and rejection by farmers.

(viii) poor transportation network: Poor transportation network which covers lack of vehicles and motor able roads militates against the performance of an extension worker,

(ix) inadequate of evaluation machinery: Lack of evaluation machinery makes it difficult for the agent to assess their own achievement or otherwise.

(x) non-involvement of farmers in planning programmes: in Rural farming programmes, the ultimate consumers of extension programmes are not involved in planning programmes which results in non-commitment to such programmes when they are introduced.

(xi) Language barrier: Language barrier leads to improper communication or dissemination of new innovations by the extension worker.

(xii) inadequate publicity: Mass media are not fully utilized in publicising extension programmes

2.4 Soil and Water Management Practices

Soil being the medium where agricultural activities take place should be well managed for high productivity. A productive soil is a rich soil for crop and animal production (David, 2008).

Further David (2008) observes that soil erosion continues to be a serious threat to our continued ability to produce adequate food. Numerous practices have been developed to keep soil in place, which include reducing or eliminating tillage, managing irrigation to reduce run – offs, and keeping the soil covered with plants or mulching. Johnson (2008) observes soil management as a common philosophy among sustainable agriculture practitioners and that healthy soil is a key component of sustainability, that is, a healthy soil will produce healthy crop plants that have optimum vigor and are less susceptible to pest. While many crops have key pests that attack even the healthiest of plants, proper soil, water and nutrient management can help prevent some pest problems brought by crop stress or nutrient in balance. Kaziwe (2008) explain that soil as a fragile and living medium that must be protected and nurtured to ensure its long term productivity and stability. Methods to protect and enhance the productivity of the soil include using cover crops, compost manures, avoiding over grazing by animals and use of mulch materials Regular addition of organic matter or the use of cover crops can increase soil aggregate stability, soil tilt and diversity of soil microbial life.

2.5 Crop Production Practices

Crops are classified into two major types, which includes, classification based on their life cycle and based on their uses. These crops have different cultural practices which they undergo before production. Some of these practices include:- transplanting, shading, supplying, nursery, seed

rate, thinning, weeding, mulching, spacing, staking and pruning. Jaycox (2007) reports that sustainable production practices involve a variety of approaches and also specific strategies which must be taken into account, such as topography, soil characteristics, climate, availability of inputs and the individual farmers' goals. Despite the site-specific and individual nature of sustainable agriculture, several general principles can be applied to help farmers' select appropriate management practices (Roberts, 2004) namely; Selection of species and varieties that are well suited to the site and to the conditions in that area, diversification of crops and cultural practices to enhance the biological and economic stability of the area, management of the soil to enhance and protect soil quality, efficient and human use of inputs, and conservation of farmers goals and life style choices

Preventive strategies adopted early can reduce inputs and help establish a sustainable production. When possible, resistant crops should be selected which are tolerant to existing soil or site conditions. When site selection is an option, factors such as soil type and depth, previous crop history, and location should be taken into account before planting. Diversified farms are usually more economical and ecologically resistant while mono-cultural farming has advantages in terms of efficiency and ease of management. The loss of the crop in any one year could put a farm out of business or seriously disrupt the stability of a community dependent on that crop. By growing a variety of crops, farmers spread economic risks and less susceptible to the radical price fluctuation associated with changes in supply and demand.

In annual cropping systems, for example, crop rotation can be used to suppress weeds, pathogens and insect pests. Also, cover crops can have stability effects on the agro-ecosystem by holding soil moisture with mowed or standing dead mulches, and by increasing the water infiltration rate and soil water holding capacity. Jacox (2007) noted that for a good yield, a farm

needs good tilling of the land and good weeding even if there is no fertilizer, crops will survived. Efficient use of inputs and practices by conventional farmers are also used in sustainable agriculture. Some of the inputs used by farmers include fertilizers, seeds and chemicals. Preventive strategies and other alternatives should be employed before using chemical inputs from any source.

2.6 Animal Production Practices

Animal production practices are many and wide, that farmers are involved in animal production has to follow carefully in order to get the best from their animal. Bukar (2007) observed that even with the growing specialization of livestock and crop producers, many of the principles outlined in the crop production section apply to both groups. The actual management practices will of course be quite different. Some of the specific points that livestock producers need to address included:- livestock selection, livestock nutrition, reproduction, herd health and grazing management

Management planning including live stocks in the farming system increases the complexity of biological and economic relationship. The mobility of the stock, daily feeding, health concerns, breeding operations, seasonal feed and forage sources, and complex marketing are sources of this complexity. Therefore, a successful ranch plan should include enterprise calendars of operations, stock flows, forage flows, labour needs, herds' production records and land use plans to give the manager control and means of monitoring progress toward goals. The annual enterprise must be appropriate for the farm or ranch resources. Farm capabilities and constrain such as feed and forage sources, landscape, climate and skill of the manager must be considered in selecting which animal**s** to produce (Mowen, 2007).

For example, ruminant animals can be raised on a variety of feed sources including range and pasture, cultivated forage, cover crops, shrubs, weeds, and crop residues. There is a wide range of breeds available in each of the major ruminant species i.e. cattle, sheep and goats (Bukar, 2007). Livestock nutrition, feed costs are the largest single variable cost in any livestock operation. While most of the feeds may come from other enterprise on the ranch, some purchased feeds are usually imported from off the farm. Feed cost can be kept to a minimum by monitoring animal condition and performance and understanding seasonal variations in feed and forage quality on the farm.

Reproduction- use of quality germ-plasma to improve herd performance is a key to animal reproduction in combination with good genetic stock, adapting the reproduction season to fit the climate and sources of feed and use of forage to reduce health problems and feed cost. Most adverse environmental impacts associated with grazing can be prevented with proper grazing management. First the number of stock per unit area must be correct for the land scape and the forage sources. These need to be compromised between the convenience of tilling large, unfenced land and the fencing of livestock operations (Oluyemi, 2009).

2.7 Sustainable Agriculture

The term sustainable agriculture can be defined from several perspectives; hence, its interpretation is open depending on the angle from which it is being viewed. For instance, agriculturists equate sustainable agriculture with food sufficiency, which in a way represents a desire to consolidate and build upon the achievements of the green revolution. Thus, it embraces any means towards an end. To environmentalists, the means are very crucial such that, sustainable agriculture represents a way of providing sufficient food and fibre that complements and enhances natural resource endowment of forests, soils and wildlife. To an environmentalist

therefore, sustainability means responsibility for environment and stewardship of natural resources. On the other hand, sociologists view sustainable agriculture as a reflection of social values, as such; it is defined as a development path that is consonant with traditional cultures and institutions. Finally, economists view sustainability as an aspect of efficiency, not only in the short run but it also encompasses the use of scarce resources in a way that benefits both the present and the future generations. All of these goals are desirable.

While it is relatively straightforward to attain one or two such goals in a project, Conway and Barbier (1990) further argue that it becomes practically and progressively difficult as more and more objectives are included in programme and project designs. Thus, there are trade-offs in terms of labour, time, skills and capital, for the project and programme implementers as well as for the farmers themselves. This means choices have to be made such as productivity at the expense of equity or sustainability at the expense of productivity. In this study, sustainability has been viewed within the context of overall agricultural production; meaning that for its success, agriculture depends on the exploitation of natural and human-made resources using human skills and labour. The outputs of this exploitation are products in the form of food or fibre and their production. These products together with those of non-agricultural goods and services help to secure both national economies and the livelihoods of individual households.

Therefore, sustainability of the resource base needs to be addressed in agriculture production systems. Due to the obvious implications on sustainability, a conventional distinction between non-renewable and renewable resources is required. Non-renewable resources are those that are basically exhaustible and hence they cannot be indefinitely sustained; these include resources such as fossil fuels which drive farm machines and

produce agro-chemicals. Therefore, benefits from current exploitation of non-renewable resources can only be sustained if the profits are invested in such a way as to provide sustainable long-term returns. Such investment may be in industrial technologies, or in human skills, or in technologies for sustainable renewable resource exploitation.

2.8 Agricultural Sustainability as a Determinant of Agricultural Development

Conway (1987) defines sustainability as the ability to maintain productivity, whether of a field, farm or nation, in the face of stress or shock. A stress can be increasing salinity, erosion, debt; each is frequent, sometimes continuous, relatively small, predictable force having a large cumulative effect. A shock could be a major event such as a new pest or a rare drought or a sudden massive increase in input prices. In other words, a shock is a force that is relatively large and unpredictable. Following stress or a shock, the productivity of an agricultural system may be unaffected, or may fall and then return to the previous level or trend, or settle to a new lower level, or the system may even collapse altogether. Sustainability, therefore, determines the persistence or durability of a system‟s productivity under known or possible conditions. It is a function of the fundamental characteristics of the system, that is, the nature and the strength of the stresses and shocks to which it is subject as well as the human inputs which may be introduced to counter these stresses and shocks. An example could be related to
a common input like biophysical subsidy, in form of fertiliser application which is intended to counter the stress of repeated harvesting. In this case, sustainability is maintained only by renewed fertiliser application.

Another common form of input is a control agent such as a pesticide to counter pest or disease attack. In this case, sustainability may necessitate repeated pesticide application, but an alternative strategy may be the introduction of a biological control agent, such as a parasitic

wasp, which may permanently alter the basic sustainability characteristics of the system so as to prevent the need for further intervention. This exemplifies the process of building sustainability in a system, thus, substituting internal resources for external resources. Controlling pests by pesticides can be sustainable provided the pesticides are affordable and used selectively. However, the value of introducing a biological control agent is that it exploits a renewable natural resource (parasite or predator), hence it is relatively cheap and basically a sustainable process. Other agricultural technologies that have high potential for sustainability includes intercropping, crop rotation, agro forestry, green manuring, integrated pest management, among others.

2.9 Crop Processing, Preservation and Storage

Crop processing is done to make crops ready for consumption and use. Different crops undergo different ways and methods of processing. For example, in rice production the following methods of processing are done. According to Iwena (2008) sun – drying, threshing, winnowing, parboiling, hulling, and polishing. It is preserved in jute bags, silos, sack, and even tins. According to Oluyemi (2009) some common methods of processing agricultural produce include the following: drying, shelling, cotton in ginnery, some processed into juice, or paste, breaking of pods, fermentation, and the storage is done in jute, tins, and sacks. The most common method of processing is through sun- drying, most agricultural produce undergo sun – drying.

Acot (2008) points out that some crops undergo storage through, refrigeration, sliced and dried seeds kept in containers, sacks, bags, drums and some kept at the fire place. Most others like fruits are processed through canning and concentrated juice and bottling. Both crops and Animal products under go preservation, processing and storage for future use. It is necessary that surplus perishable products of crops and animals should be processed, preserved and stored.

Acot pointed out some reasons for processing, storage and preservation as to maintain the good quality of crops produce, maintain the good quality of crops produce, avoid scarcity of agricultural produce, maintain the taste and flavour of such produce and that such produce can be use for a longer period, and to avoid the wastage of such crops during the time of harvesting such produce.

2.10 Priorities and Conditions for Improving Agricultural Sustainability in Developing Countries

The sustainability of agricultural development in the developing countries is crucially dependent on the international relationships and world trade. Declining commodity prices and terms of trade coupled with problems of debt, exchange rate and financial instability are serious constraints to orderly or rapid development. World Bank cited in (Conway and Barbier (1990:59) underlines the fact that growing populations also places fundamental stress in developing nations and this factor compounds the effects of adverse international relationships. As a result, there are increased total food demands which exceed the growth of food output in all developing regions. Thus, as the per capita food production continues to decline, many developing countries also continue to be dependent on food imports, and in some instances external assistance to meet domestic consumption requirements.

The lack of food security in developing countries arises from a lack of purchasing power on the part of the nations and households rather than from inadequate global food supplies. Food security is defined here as the access by all people at all times to enough food for an active healthy life (Leonardo, 1986). The roots of most solutions to overcoming chronic food security will have to be sought at the national level; these may include policies to ensure sustainable increases in food production in low-income food deficient developing countries among others.

However, there are also serious constraints at the international level which are equally crucial and need to be resolved; these include poor purchasing power of developing countries and their lack of financing of food purchases. Thus, individual developing countries have little control over their external environment and they are highly vulnerable to a range of external stresses and shocks. These shocks arise from adverse developments in the world of agricultural markets and trade, and those from adverse developments in the world of economy as a whole (Conway and Barbier, 1990).

Even though the constraints at international level appear formidable but as to whether they become binding depends, largely, on the national policies and strategies which the developing countries adopts. If national agricultural strategies and targets fail to take account of the conditions required for sustainability and equitability, especially the need for proper resource management, the long-term prospects for agricultural development may be seriously undermined. Among key issues that need to be considered in appropriate agricultural strategies and targets for developing countries include; exports versus food crop productivity, large versus small-scale farming, the role of marginal versus more favourable agricultural lands, the role of external assistance and the role of the private versus the public sector. Either explicitly or implicitly, all these raise problems of natural resource management or environmental degradation on one hand, and social justice, distribution and participation.

Sustainable agriculture ultimately depends on the individual day-to-day actions of the farmers and their families in pursuit of a variety of strategies aimed at securing their livelihoods. Therefore, it is inevitable that the major proportion of developments funding and effort goes to executing projects whose primary focus is an identified group of farmers in a particular area to help them satisfy their needs in ways that are efficient and sustainable. Although the complexity

of farms, households and livelihoods is a daunting prospect for the designers and managers of development projects; however their solutions lies in the use of relatively quick, multi-disciplinary techniques of analysis and appraisals. The most compelling solutions lies in involving farmers and their families themselves in the design, selection and management of innovation intended to improve their lives (Chambers, 1983). This is because; the farmers live with the complexities of their physical and social environment and even with the need to make difficult trade-off decisions on a daily basis. In addition, they have a deeper and more insightful understanding of their own situation. There is also substantial evidence of the capacity of farmers to respond positively to innovations and new opportunities if they see the benefits in both the short term and the long term.

2.11 Agricultural Marketing Strategies

Agricultural marketing are the activities involved in the flow of goods and services from the producers to the final consumers, which includes farm inputs. Iwena (2008) pointed out that agricultural marketing channels cover the producers, wholesalers, market, cooperative societies, middlemen, commissioned agent, and marketing exporter. These are the ways that agricultural produce pass through before getting to the final consumers. According to the Food and Agricultural Organization report (2008), agricultural production can only be really efficient if the accompanying marketing and post harvest system are also efficient. Well – functioning marketing systems are essential to increase production.

Extension workers and agricultural science teachers can play an important role in ensuring that the marketing system works for the benefit of farmers and consumers. Experts in the field of agriculture are to develop skills for marketing agriculture and be able to advice

farmers on where to sells their grains. (F.A.O 2008) reports emphasizes on horticultural marketing. This is because, until recently, the marketing and storage of the major grain crops in most African countries tended to be in the hands of government agencies. Farmers simply delivered their maize to the marketing board or cooperative and later, they were paid. They encountered relatively few problems in marketing their crops and as a consequence there was little need for those extension workers who served farmers in grain – producing areas to know much about marketing. The situation is now changing, many countries in Africa are gradually moving to a system where private traders buy crops from farmers, transport those crops to the cities and sell them to processors, millers and consumers, (F.A.O, 2008). These changes mean that agricultural extension workers will have to develop new skills. They have to be in a position to advice farmers on what crops to grow, on how and where to sell their crops and on how to store their crops. They need to be able to answer farmers' questions about prices, about whether to store crops or sell immediately and about where to buy and how to pay for inputs such as fertilizer and seeds.

As a result of recent changes, farmers can no longer rely on finding a willing buyer at a market board or cooperative depot; instead they now have to look for buyers and hence need an understanding of the way the market functions and prevailing market conditions. When crops are in surplus, farmers can not even be sure of finding buyers, (Iwena 2008). Under the old system, marketing board usually bought the maize soon after harvest. Under the new system, trader will only buy to meet their immediate sales requirement. This means that farmers have to store the crops and sell at much higher prices later. Under the old system, there was usually just one buying price which applied to all the country through out the year. Under the new system, prices

vary according to location and season. Even at the same location, the prices offered by different traders may vary noticeably (F.A.O, 2008).

2.12 Sustainable Agricultural Development

Sustainable agricultural development is an integral system of plant and animal production practices having a site – specific application that will, over the term on satisfying human food and fiber needs, enhance environmental quality and the natural resources based upon which the agricultural economy depends, sustain the economic viability of farm operations, and enhance the quality of life for farmers and society as a whole. A variety of philosophies, policies and practices have contributed to these goals. People in many different capacities, from farmers to consumers, have shared this vision and contributed to it.

Sustainable rests on the principles that we must meet the needs of the present without compromising the ability of future generations to meet their needs. Therefore, stewardship of both natural and human resources is of prime importance. Stewardship of human resources include consideration of social responsibilities such as working and living conditions of laborers, the needs of rural communities, and consumers' health and safety both in the present and the future. The transition to sustainable agriculture normally requires a series of small, realistic steps. Family economic and personal goals influence how fast or how far participants can go in the transition. It is important to realize that, each small decision can make a difference and contribute to advancing the entire system further on the sustainable agriculture (David, 2008).

It is important to point out that reaching toward the goal of sustainable agriculture is the responsibility of all participants in the system, including farmers, laborers, agricultural extension workers, researchers, retailers and consumers. Each group has its own part to play, its own unique contribution to make to strengthen the sustainable agriculture in the community.

Sustainability in agriculture production and developments means producing selfsufficient and healthy food, (Johnson, 2008). Promoting sustainable agricultural production and development in rural communities requires a collective effort by all concerned. The agricultural extension workers must be seen to deliver the ideas of agricultural production to make it attractive to the teaming youths.

2.14 Empirical Studies

A study was conducted by Dajwat (2003) on the impact of agricultural development project on farmers' awareness and adoption of agricultural innovation in Mangu LGA in Plateau State. The objective of the study was to determine the impact of Agricultural Development Project on farmer's adoption of agricultural innovation and productive level and conditions of living. The population of the study involved small scale farmers and large scale farmers which put together gave a population of 160 farmers. The sample size used was one hundred and thirty farmers (130). The specific objectives were to determine the level of awareness by farmers about the programme, to determine the level of success of ADP in executing their programmes and to determine the extent to which ADP has met farmer's demands for inputs, innovation and adoption

The six (6) null hypotheses and research questions were formulated and tested. The study under reviewed did not take into consideration the problems of farmers and also why some farmers find it difficult to adopt some innovations. The study is relevance because it shade more light to the present study.

Ezeobi (2003) studied the impact of Directorate of Food, Road and Rural Infrastructure (DFRRI) towards rural development in Nigeria, A case study of Giwa Local Government area in Kaduna state. The objectives of the study were to determine the level of commitment of the Federal and State Government in terms of funding the programme, to determine the extent to which DFFRI has improved the standard of living of people of Giwa Local Government Area. He reported that both Federal and State Governments had contributed immensely to the success of this programme and also the dwellers of these areas really enjoyed the work of DFRRI. The study was on one local government area while the present one is on nine Local Government Areas in Kaduna State.

The objectives were to identify the perception of secondary schools agricultural teachers regarding sustainable agriculture, assess the extent to which sustainable agriculture was being taught in the secondary schools agricultural curriculum. Descriptive survey was used and the population of the study was 2, 799 agricultural teachers. A sample of 298 was drawn from the population. Questionnaires were used for collection of data. Chi – square statistics was used to analyze the data. The results showed that of the teachers' respondents, 59.1% had taught agricultural science for 10 years or more. The present study is similar to previous study in that it studied the contribution of Agricultural Extension Workers in promoting sustainable agricultural development. Farmers were used as respondents. A population (16,186) similar to that of the previous study was used. A survey design was used for conducting the present research. Both studies used descriptive survey method of research. The study used 2,799 agricultural teachers, while the present study used 4,056 farmers. Chi-square statistic was used to analyze data, while the present study used analysis of variance[ANOVA]for testing of Null Hypotheses

Kingman (2005) studied the impact of crop production and marketing contest on student learning. The objectives were to obtain the highest profit making team, it was also to increase students knowledge of production in agriculture. Four teams were involved in the objectives not specified on this empirical study and as well the findings. The contest, input cost and selling price were used to determine contest winner. Results from the contest showed that students or participants in the contest increased their confidence when discussing production agriculture with farmers and agricultural professional and also improved their leadership skills. Students also stated that they were more aware of many products and marketing practices including tillage, fertilization, seed selection, row spacing, planting population dates, harvest and market strategies, which makes it similar to the contributions of agricultural extension workers.

Ilufoye (2006) studied the impact of practical work in teaching of agricultural science in the secondary schools in Oyun Local Government Areas in Kwara state. The purpose of the study was to create awareness on the part of the students and the importance of practical agriculture and its position in the national development. The objectives of the study were to determine student's interest in practical work in agricultural science, also to determine the relationship between practical work and student's performance in agricultural science. Questionnaires were used for collecting data for the study. The population of the study was 10,640 students in the Local Government Area, and a sample of 200 students were selected from the population. A survey design was used. The study revealed that practical work in agriculture played an important role in understanding of agricultural science subject in all secondary schools. Choosing just one Local Government Area for the study is not enough to generalize findings to the whole state. The present study used nine [9] Local Government Areas as a sample of the population. Descriptive Survey design was used for the study. The present study

also used descriptive survey design. The previous study was conducted in Kwara State, while the present study was conducted in Kaduna State.

CHAPTER THREE: RESEARCH DESIGN AND METHODOLOGY

3.1 Research Design

The researcher used descriptive survey research design. Descriptive survey research design is a systematic collection of data from population through questionnaire techniques.

3.2 Population of Study

The target population for this study comprised of all the full time farmers in 23 Local Government Areas from the three senatorial districts in Kaduna state. The northern senatorial districts has eight (8) LGAs, the central senatorial districts has six (6) LGAS, while the southern senatorial districts has nine (9) LGA. According to records from the office of statistics and Agricultural extension unit of Ministry of Agriculture, Kaduna State, the numbers of farmers were estimated to be 16,186 farmers.

3.3 Sample Size and Sample Procedure

A random sampling selection was used to select nine (9) LGAs from the tree senatorial districts by lottery.

Three LGAs were picked randomly from each senatorial district. Thus, nine (9) LGAs were randomly selected. The LGAs drawn from northern senatorial districts were Giwa, Kudan and Sabon-Gari. Those drawn from central senatorial districts were Chukun, Igabi, and Kaduna South, while those from Southern Senatorial Districts were Kachia, Kaura, and Kauru.

333 full time farmers were selected as samples for this study. The number gave 15% from each of the sampled local government areas. The numbers of the full time farmers were representative enough to produce a distribution curve.

(Krejcie and Morgan, 1970) This number (333) was in line with the figure proposed by Uzoagulu (1998) which stated that when population is between 10,000 and 50,000 a percentage in the range of 10% to 15% is ideal. The sampled L.G.A are shown in Table 3.1.

Table 3:1 Sample Size for the Study

S/N	LGAs	Population	Samples
	Northern Senatorial Districts		
1.	Giwa	850	70
2.	Kudan	505	53
3	Sabon-Gari	400	30
			153
	Central Senatorial Districts		
4.	Chukun	300	25
5.	K/South	300	25
6.	Igabi	300	25
			75
	Southern Senatorial Districts		
7.	Kachia	400	30
8.	Kaura	601	45
9.	Kauru	400	30
			105
	Total	**4,056**	**333**

Source: Field survey, 2012

3.4 Instrument for Data Collection

The instrument for data collection was a structured questionnaire. The questionnaire was made up of 33 items, which were sub-divided into two parts ‘A’ and ‘B’. Part ‘A’ consisted of personal data of the respondents, while Part ‘B’ consisted of six sections as follows:

Section A: contributions of agricultural extension workers to soil and water management consisting of 7 items.

Section B: On contributions of Agricultural extension workers on animal production practice, consist of 5 items.

Section C: On contributions of Agricultural extension workers on crop production practice, 6 items.

Section D: contributions of Agricultural extension workers on crop processing practice 5 items.

Section E: On contributions of Agricultural extension workers on agricultural storage and preservation practice 4 items.

Section F: On contributions of Agricultural extension workers on marketing strategies of agricultural produce, 5 items.

The items were rated on a 4 point scale, thus:

SA	–	Strongly Agreed	4 points
A	–	Agreed	3 points
D	-	Disagreed	2points
SD	–	Strongly Disagreed	1 points

This therefore means that the mean of scores will be as follows;4+3+2+1/4=2.5.This means that any factor with 2.5 or above as mean should be regarded as positive and therefore accepted, while those less than 2.5 should be regarded as negative and hence rejected.

3.4.1 Validation of Instrument

The instrument was validated by three experts in the field of Agricultural Education from the Department of Vocational and Technical Education A.B.U Zaria. They validated the face and content validity of the instrument. Their comments helped the researcher to restructure the questionnaire for the external study.

3.4.2 Pilot Study

A pilot study was conducted in Zaria Local Government Area of Kaduna. Zaria local government area was chosen as the pilot study area because it is not part of the study area. In conducting the pilot study the researcher used 50 farmers.

3.4.3 Reliability of the Instrument

The reliability coefficient of the instrument was determined by the statistical analysis of the data collected from the pilot study. The split-half method was used to determine the reliability coefficient of the instrument. The instrument was divided into two halves of odd and even numbers. The spearman Rank order correlation coefficient was used to calculate the reliability coefficient estimate of one half (odd numbers) and Spearman Brown Prophecy formula was used to calculate the reliability coefficient estimate of 0.98 for the instrument. This reliability coefficient was positive and high, hence the instrument was adjudged reliable and stable based on Nworgu (2006) recommendation, which stated that a reliability estimate of 0.60 to 0.80 is high and the instrument for which it is calculated is reliable and stable.

3.5 Procedure for Data Collection

The administration of the questionnaire was done in the selected areas by the researcher and three research assistants. The researcher presented a letter of introduction from the Department of Vocational and Technical Education, ABU, Zaria. The 333 farmers used as samples selected in the nine Local Government Areas were given a copy of the questionnaire to fill which they did and returned to the researcher after 3 weeks. This was to ensure that none was missing or unreturned. The researcher spent one week in each senatorial zone and the whole exercise of data collection lasted for three weeks.

3.6 Procedure for Data Analysis

Data were analyzed using frequencies, means, standard deviation and standard error for answering the research questions. Analysis of Variance (ANOVA) was used.

CHAPTER FOUR: DATA PRESENTATION AND ANALYSIS

4.1 INTRODUCTION

This chapter deals with the analysis, interpretation and discussion of the data collected from a research work on “access and utilization of antenatal care services”, the data were analyzed and presented using sample frequencies and percentages.

4.2 DEMOGRAPHIC AND SOCIO-ECONOMIC CHARACTERISTICS OF RESPONDENTS

4.2.1 Age, Sex, Marital and Education Distribution

Table 4.1 shows the distribution of respondents by age. The result reveals that 59.5 percent of the respondents are between the ages of 20 and 34 years, while 27 percent are in the age group of 35 years and above. Less than 4 percent are below 15 years. This distribution is to be expected as the study targets women attending ante-natal care services and this age distribution is typical of women in reproductive age group. In terms of agricultural development, it shows that these people are energetic enough hence they form a very productive labour force in the agricultural sector which if utilized efficiently could contribute positively to development.

Table 4.1: Distribution by Age, Sex, Marital Status and Education

AGE	FREQUENCY	PERCENTAGE

<15	11	3.3
15- 19	34	10.2
20- 34	198	59.5
>35	90	27.0
Total	**333**	**100**
Sex		
Male	193	58
Female	138	42
Total	**333**	**100**
Marital Status		
Married	231	69.4
Single	14	4.2
Widowed	19	5.7
No response	36	10.8
Total	**333**	**100**
Education		
None	13	3.9
Koranic	45	13.5
Primary	26	7.8
Secondary	106	31.8
Tertiary	140	42.0
No response	3	0.9
Total	**333**	**100**

Source: Field survey, 2012

The distribution of respondents by sex is shown that majority (58 percent) of the respondents are males as against 42 percent females. This is in line with the findings of Abu (2010) in Kaduna State and it is because majority of the respondent were heads of household.

Distribution of farmers by marital status and by type of marital union. Out of the total of 333 majority of the respondents (69.4 percent) are married, 9.9 percent are divorced, 5.7 percent are widowed

and 4.2 percent are single. In all 10.8 percent did not respond. The high proportion of married women is not unexpected as data from the 2006 census indicate that majority of the households in Kaduna State were in marital union (National Population Commission, 2009).

It is observed that, out of the total of 333 farmers, 3.9 percent do not have any form of education at all, 13.5 percent have Koranic education, 7.8 percent of the respondents have only primary education, 31.8 percent have secondary education, and 42 percent have tertiary education. Education is internationally accepted as one of the major determinant of living standards and it is an essential factor in planning and evaluating policies.

The high proportion of secondary (31.8 percent) and tertiary education (42 percent) shows that majority of the farmers are well-educated. This may be attributed to the fact that a well educated people may have a better job and earn more money, which improves the agricultural productivity. This is similar to what Benefo, (2006), Wong *et al*., (1987) and Awusi *et al*., (2009) found in Ghana, the Philippines and Nigeria respectively indicating that education has a strong positive impact on agricultural sustainability.

4.3 The contribution of agricultural extension workers on soil and water Management in promoting sustainable agricultural development in Kaduna State.

The crucial role of agricultural Extension (i.e. farmer education) in the social and economic development of the nation cannot be over-emphasized. Never before in Nigerian history has the necessity for educating and raising the productive capacity of our farmers been of such importance as it is today. Increased agricultural productivity depends primarily upon the acceptance of cultural and technological changes at the rural farm level. Thus, for Nigerian agriculture to improve, our farmers have no alternative but to learn and adopt recommended scientific farming techniques in place of their traditional practices. Perhaps, the slow development of Nigerian agriculture can be attributed to the inability of the Nigerian farmers to

respond positively to new ideas or innovations. For farmers to respond positively to new ideas, they must be properly educated on how best to apply the new ideas or practices to their farming activities. This is because the new ideas are often complex, technical and can hardly be understood by most of our farmers. Nigeria cannot achieve increased agricultural productivity on rural farm level, except through the provision of basic agricultural education, particularly, the non-formal or extension type that will help move millions of the farmers from traditional to progressive farming, thereby improving the overall quality of rural life.

Agricultural extension workers teach farmers about marketing and help farm groups organize both buying and selling cooperative. Extension workers help farmers grow crops, home owners plan and maintain their homes, and children learn skills to become tomorrow's leaders. Extension teaching is the process through which the extension workers stimulate interest in the learning more by using various teaching methods, tools and techniques to improve the situation. The essential role of agricultural extension workers is to create an effective learning situation.

Extension is done not only by extension agencies but also by farmers, scientists, commercial companies and mass media organizations. Traditionally extension has been linked with production objectives. More recently, food security, improved nutrition, equity and poverty alleviation have become part of the agenda of organizations providing extension services. Sustainable farming and natural resource management is relatively knowledge intensive' requiring the application of general ecological principles to a specific situation. Joint problem solving with clients, leading to an enhanced ability to identify and solve problems, will be an appropriate way of influencing their future behaviour.

Extension objectives can range from the effective transfer of technology to the building up of strong rural organisations which can exert influence over future research and policy

agendas, and also take and enforce collective decisions over natural resource management. A shift towards the latter will promote more sustainable agricultural development.

Most extension agencies have concentrated on influencing clients' decisions in respect of land and other resources at the individual household scale. Many of the environmental problems which affect small-scale farmers, however, can only be solved through collective decisions and action. Extension personnel may need to spend more time supporting collective decision-making and facilitating follow-up action.

Table 4.2 Contribution of agricultural extension workers on soil and water management practices among farmers

VARIABLES	SA	A	D	SD
Agricultural Extension workers always encourage farmers on the use of irrigation systems in their farms	66	16	09	09
Farmers learnt construction of contour ridging from Agricultural Extension workers farms	54	07	24	15
Agricultural Extension workers influence farmers on the method of	09	33	51	07

controlling erosion in their farms.				
Farmers are encouraged by Agricultural Extension workers to adopt planting of cover crops in their farms	67	16	09	08
Farmers are encouraged to use organic matters in their farms to increase soil fertility	10	16	33	51
Agricultural Extension workers use appropriate tillage practices in their farms, which farmers learnt from them.	54	07	24	15
Farmers learnt the construction of wells for irrigation purposes from Agricultural Extension workers.	67	16	09	08

Source Field survey, 2012

With response to our respondents, were asked about their perceptions regarding the agricultural Extension workers always encourage farmers on the use of irrigation systems in their farms which are shown in Table 4.2. More than half of respondents 66 percent strongly agreed with the encouragement of workers on the use of irrigation system to farmers on sustainable agricultural development. The adoption of farmers learnt construction of contour ridging from agricultural extension workers 54 percent strongly agreed with this statement. The agricultural extension workers influence farmers on the method of controlling erosion in their farms 51 percent disagreed, while 67 percent of the farmers agreed that they are encouraged by agricultural extension workers to adopt planting of cover crops in their farms. Farmers also that confirm that they been using organic matters in their farms to increase soil fertility disagreed with 51 percent, 54 percent confirmed that agricultural extension workers used appropriate tillage practices in their farms, which farmers learnt from them. About 67 percent of farmers

strongly agreed that farmers learnt the construction of wells for irrigation purposes from agricultural extension workers.

Agricultural extension could play a key role in fostering sustainable agricultural development programs through its Training programs, but there has been a growing realization that traditional extension models have not been sufficiently effective in promoting adoption of sustainable agricultural practices (Allahyari, 2009). Extension organizations face several challenges in applying including: Lack of training for farmers, lack of knowledge and skills among employees, high cost of buying and maintaining hardware and Software and Legislative, policy and regulatory hurdles, the adoption of technology requires the existence of appropriate financial recourses which are usually with farmers (FAO, 2002). In addition poor infra structure, absence of participation of local organizations in planning and implementation process of sustainable agricultural development programs (Kalantari *et al.* 2008). In addition, there is a fundamental lack of appropriate training in the roles and responsibilities of agricultural extension officers on sustainable agricultural development (Azizah, 2011).

Also the numbers of field staff working in the agricultural extension management are not enough when compared to the large number of farmers. This is because of the very low salary and the lack of incentives for field staff (Cho *et al*. 2004). There is a need for educational Programs and training courses for farmers on sustainable agricultural, because farmers lack the skill and knowledge on improved agricultural practices .This had resulted in deficiencies in some technical and managerial skills of farmers because they were unable to access production information routinely (Owona *et al.* 2010).

Table 4.3 Contribution of Agricultural Extension Workers on Animal Production Practices

VARIABLES	SA	A	D	SD
Farmers are advised by Agricultural Extension workers to rear the best breeds of livestocks.	09	33	51	07
Agricultural Extension workers do encourage farmers to keep animal pens clean.	67	16	09	08
Agricultural Extension workers advise farmers to vaccinate their animal against diseases.	10	16	33	51
Farmers are encouraged by Agricultural Extension workers to keep disease resistant livestock.	54	07	24	15

Agricultural Extension workers do influence farmers to use balanced rations in feeding their animals	67	16	09	08

Source: Field survey, 2012

The analysis on Table 4.4 revealed that farmers are not advised by agricultural extension workers to rear the best breeds of livestocks (51 percent disagreed). Agricultural extension workers do encourage farmers to keep animal pens clean with 67 percent of farmers concord that statement while 51 percent strongly disagreed that agricultural extension workers do not advise farmers to vaccinate their animal against diseases but 54 percent of farmers agreed that farmers are encouraged by Agricultural Extension workers to keep disease resistant livestock. About 67 percent of respondents agreed that agricultural extension workers do influence farmers to use balanced rations in feeding their animals.

Farmers appear to use more traditional knowledge in India than the Philippines, perhaps because areas in India which have not been caught up in the green revolution have long been settled by people who have inherited knowledge about the area, whereas in the Philippines many of the rainfed and most vulnerable areas are inhabited by immigrant farmers. This requires a more supportive extension role to help upland farmers develop appropriate farming systems.

Where agricultural information systems are dominated by government research and extension organisations, the resource poor who are often more in need than others of information on sustainable and low external input technologies are least likely to gain access to it. This was seen particularly in Tamil Nadu (Lawrence, 1996), where the channels of information accessible to the resource poor delivered information on new varieties and fertiliser recommendations, while the richer farmers had access to information on a much wider range of technologies

through subscription journals and newspapers. This skewed availability of information is reinforced by informal communication networks which do not generally cross socio-economic boundaries. The challenge for information providers external to the local social system is to enable key actors in all local networks to access information which may be relevant to network members.

There is relatively little information available through the mass media to help farmers decide how to improve the sustainability of their farming practice. Mass media organisations in the study areas do not actively seek out relevant technical information, or take account of farmers' views and their solutions to local problems and situations. The mass media can be a powerful tool for exchange of views and sharing of information within a rural population, but are seldom used in this way. In both print and broadcast mass media, there is little attempt to involve the users in the design and production of media content, an essential step if information is to become more relevant, useful and accessible to farmers.

Table 4.4 Contribution of Agricultural Extension Workers on Crop Production Practices among Farmers in Kaduna State.

VARIABLES	SA	A	D	SD
Farmers are influenced by Agricultural Extension workers to carry out clearing before tilling their farm land.	09	33	51	07
Agricultural Extension workers taught farmers to adopt correct spacing in planting, which farmers adopt same from them.	67	16	09	08
Agricultural Extension workers advised farmers to shift from the use of chemical fertilizers to organic fertilizers	09	33	51	07
Farmers are advised by Agricultural Extension workers to plant	67	16	09	08

on time for seasonal crops				
Farmers are encouraged by Agricultural Extension workers to weed their farms on time.	10	16	33	51
Agricultural Extension workers encouraged farmers to harvest crops only when they mature.	54	07	24	15

Source: Field survey, 2012

Table 4:4 showed a proportion of farmers (51 percent) disagreed that farmers are influenced by Agricultural Extension workers to carry out clearing before tilling their farm land. Farmers, 67 percent strongly agreed that agricultural extension workers taught farmers to adopt correct spacing in planting, which farmers adopt same from them. On the other hand farmers disagreed that agricultural extension workers never advised farmers to shift from the use of chemical fertilizers to organic fertilizers while 54 percent agreed that Agricultural Extension workers encouraged farmers to harvest crops only when they mature in promoting sustainable Agricultural Development in Kaduna State.

A financial resource, as one of the main factors of production, is necessary to purchase farm inputs and to undertake development work necessary to enhance the competitiveness of farms. The degree of access to this resource will undoubtedly influence farming decisions. Where capital is not easily available from Farmers resources, credit is an alternative (Ganpat *et al.* 2000). Issues surrounding credit use very limited is available from commercial banks and individuals, and only at high interest rates. This situation is even worse for small farmers who cannot provide the credit guarantees required by creditors (Betru, 1996). Also unavailable Procedures for payment of Agricultural Credit loans are still very distressing and need to be streamlined (FAO, 2002). In addition to Market failures also result from the limited capacity of

Farms to pay for services and the imperfections prevailing in output, input and credit markets. Market imperfections severely limit farmers' ability to access new technologies, equipment and inputs (Rivera *et al.* 2004).

Table 4.5 Contribution of Agricultural Extension Workers on Crop Processing among Farmers in Kaduna State.

VARIABLES	SA	A	D	SD
Agricultural Extension workers told farmers to use different methods of crop processing.	09	33	51	07
Farmers are encouraged by Agricultural Extension workers to hire threshers to thresh their farm produce.	67	16	09	08
Farmers are encouraged by Agricultural Extension workers to acquire skills in processing farm produces	09	33	51	07
Agricultural Extension workers teach farmers how to operate different machines for processing of their farm produce	67	16	09	08
Agricultural Extension workers advised farmers to preserve farm produce for future use	67	16	09	08
Farmers are encouraged by Agricultural Extension workers to store grains in good condition in their farm produce stores.	09	33	51	07
Agricultural Extension workers do influence farmers to disinfect their store houses against pests and diseases before storage	09	33	51	07
Agricultural Extension workers advised farmers to keep their store	67	16	09	08

house clean and neat				
Agricultural Extension workers advised farmers to preserve their farm produce for use.	09	33	51	07

Source: Field survey, 2012

Table 4.5 revealed that agricultural extension workers do not teach farmers (51 percent disagreed) to use different methods of crop processing while 67 percent agreed that farmers are encouraged by agricultural extension workers to hire threshers to thresh their farm produce. About 51 percent disagreed that Farmers are encouraged by Agricultural Extension workers to acquire skills in processing farm produces. On the perception that agricultural extension workers teach farmers how to operate different machines for processing of their farm produce and advised farmers to preserve farm produce for future use, 67 percent of farmers agreed to that statement while on the statement of farmers are encouraged by agricultural extension workers to store grains in good condition in their farm produce stores and influence farmers to disinfect their store houses against pests and diseases before storage have 51 percent of farmers disagreed to that statement. Agricultural Extension workers advised farmers to keep their store house clean and neat 67 percent of respondent agreed to the statement and only 51 percent of respondents disagreed that Agricultural Extension workers advised farmers to preserve their farm produce for use.

Many agricultural extension services could also be found in many non-governmental organizations (NGOs), many private firms and private organizations such as NTC, Coffee-Growers Association, Shell Corporation, Church organizations etc. Role of extension service therefore include; act as an intermediary or go between or even link between agricultural development institutions such as research institutes, universities, colleges of agriculture and

target groups (which may be the farmer, women group, youths etc.), carries out the formulated agricultural extension policies, links the farmer with sources of farming inputs and credit facilities, provide the timely information on new innovations and practices meaningful agricultural development, provides educational services to farmers, and plays active role in the rural community development of any nation. This explains why it remains one of the strategies for rural development through out the world, assist people to determine their own problems, help them find desirable solutions and encourage them to take action, foster beneficial changes in the outlook of all people, re- appraise its work periodically to meet changing conditions and to modify its programs to suit the changing conditions, to provide maximum opportunity for the youth and the family to participate in attaining a better and more rewarding life, to maintain the highest level of proficiency in its workers by exposing them to relevant and continual training, to encourage and aid in the wise use and conservation of all human and natural resources, to promote the use and the development of volunteer leaders and help in the execution of extension programs, to promote efficient agricultural production and the development of institutions to ensure proper handling of the products for welfare of both the producers and consumers, it aids through educational efforts, the diffusion among people of all appropriate research and practical information relating to agriculture, home economics, health and encourage their application and above all, it promotes the social and economic life of all people (Adams, 1982).

Agricultural extension methods and organizational characteristics encompass a diverse range of socially sanctioned and legitimate activities which seek to enlarge and improve the abilities of farmers to adopt more appropriate and often new practices and to adjust to changing conditions and societal needs (Swanson et al., 1997). Agricultural extension employees using the individual extension method, farm and home visits as well as to the use of group extension

methods, such as group meetings, field demonstrations for farmers' training by Field schools and Local leaders. The Agricultural Extension management organizes to put up posters along the main roads where farmers can easily see them, and broadcasting the agricultural information through the television and radio in the agricultural section. The agricultural newsletters and pamphlets are distributed to farmers during the seasonal crop production periods (Cho and Boland, 2004). This depends on collaboration among research, extension-education organizations, and farmers' associations, and rural credit (Agricultural Banks) (Allahyari et al., 2008). The focus on the farmers' skills and education is the most important role for extension systems for accomplishment of dimensions and policies of Sustainable agricultural development. The development and implementation of sustainable agricultural practices require active involvement, by research centers and Private sector organizations and agricultural organizations and agricultural extension management in Extension Methods for creating awareness among the farmers about improved agricultural technologies (Chaudhry et al., 2006

Table 4:6 Contribution of agricultural extension workers on marketing strategies

among farmers

VARIABLES	SA	A	DA	SD
Farmers are advised by Agricultural Extension workers to study the market situation before selling their produce	09	33	51	07
Farmers are advised by Agricultural Extension workers to sell their excess produce during scarcity period	67	16	09	08
Farmers are encouraged by Agricultural Extension workers to sell their produce when the price is high for more profits.	67	16	09	08
Farmers are encouraged to form cooperative societies for selling their produce by Agricultural Extension workers.	09	33	51	07
Farmers are advised by the Agricultural Extension workers to follow the channels of marketing for selling their farm produce.	67	16	09	08

Source: Field survey, 2012

Agricultural extension could play a key role in fostering sustainable agricultural development programs but there have been major constraints of sustainable agricultural development Table. 4.6 as there is an absence of study the market situation before selling their produce and formation cooperative societies for selling their produce by Agricultural Extension workers 51 percent concord with this statement. Additionally, farmers are advised by agricultural extension workers to sell their excess produce during scarcity period and to sell their produce when the price is high for more profits in the planning process, to follow the channels of marketing for selling their farm produce and implementation of sustainable agricultural development programs 67 percent strongly agreed. In addition the model from the top to the bottom does not encourage feedback on the information because it creates a rigid hierarchy.

Also, farmers also disagreed that they are encouraged to form cooperative societies for selling their produce by Agricultural Extension workers with 51 percent confirmed the statement towards promoting sustainable agricultural development in Kaduna State. The data indicated that farmers learnt the processing of crops and acquired the skills in processing farm produce from agricultural extension workers. Farmers were encouraged to use threshers to thresh their farm produce by agricultural extension works.

4.4 Major Findings

The following were the major findings of this study:

1. Agricultural Extension workers contributed to farmers farm operations through the control of soil water erosion on the farms . Farmers were advised and guided by Agricultural Extension Workers on the irrigation system of farming.
2. Agricultural Extension Workers contributed to farmers knowledge the rearing of the best breeds of livestocks, by the farmers. Farmers were encouraged by Agricultural Extension Workers to also rear disease resistant livestocks
3. Farmers were advised and guided by Agricultural Extension Workers to carry out land clearing before tilling their farm land. Agricultural Extension Workers advised farmers to substitute using chemical fertilizers for organic fertilizers.
4. Agricultural Extension Workers operated different machines for crop processing, which farmers learnt from them.
5. Farmers were helped by agricultural extension workers to disinfect their store houses against pest diseases before storage.
6. Farmers were encouraged by agricultural extension workers to form

cooperative societies for market their produce better.

There was significant difference between the contributions made by agricultural extension workers on soil and water management practices by farmers in the three senatorial districts. There was significant difference between the contributions made by agricultural extension workers on animal production by farmers in the three senatorial districts. There was significant difference between the contributions made by agricultural extension workers and crop production by farmers in the three senatorial districts.

4.5 Discussion of Major Findings

The study found that agricultural extension workers contributed to farmers' knowledge on the control of soil water erosion in the farm land in Kaduna State. Soil is very important in farming and if it is well managed, there will be more land for agricultural activities leading to agricultural development. This finding is supported by Kingman (2005) who listed soil erosion as one of the problems hindering agricultural development in Nigeria.

The study also found that farmers were advised and guided by agricultural Extension Workers on the irrigation system of farming. The finding further revealed that farmers have started to use water streams and rivers for irrigation farming in promoting agricultural development in Kaduna State. This will lead to the availability of farm produce at any season, leading to agricultural development. This finding agreed with David (2000) who stated that irrigation system of farming will solve the problem of food shortage in the country.

The study revealed that farmers were advised and guided by agricultural extension workers to rear the best breeds of livestocks for sustainable agricultural development. Agricultural extension workers encouraged farmers to keep their livestocks' pen clean and also to vaccinate their animals against diseases so as to boost the production of livestock, Bukar

(2007) stated that animal production can boost Nigeria economy. The study also found that farmers were encouraged by Agricultural Extension Workers to rear disease resistant livestocks. Agricultural extension workers have influenced farmers on how to breed their animals (cattle, swine and others).

The study revealed that farmers were advised and encouraged by agricultural extension workers to carry out land clearing before tilling their farm land. Clearing of land is very important before tilling the land to ensure better yields of the crops. agricultural extension workers have been able to influence farmers in this direction through encouraging the farmers to space their crops when planting, carry out land clearing, harvest crops at maturity, and clear land before tilling. This is in line with what Jaycot (2007) pointed out that a farm needs no fertilizer for good yield for some crops like legumes and tubers if the farm is well weeded, and if it is a virgin land and good tillage practices are done. Agricultural extension workers advised farmers to use organic fertilizers e.g cow dung and poultry droppings instead of chemical fertilizers e.g nitrogen and urea to boost agricultural production.

The study revealed that agricultural extension workers operated different machines for crop processing, which farmers learnt from them. Agricultural extension workers have influenced farmers on modern method of crop processing. They have been able to achieve this through teaching farmers the ways to process their farm produce. For example, Iwena (2008) recommended that rice can be processed through sun-drying, threshing, winnowing, parboiling, hulling and polishing. Farmers were motivated by agricultural extension workers to use acquired skills in processing farm produce for promoting sustaining agricultural development. Also in the pursuit of sustainable agricultural development, it was also found that farmers were influenced by agricultural extension workers to disinfect their store houses against pest and

diseases before storage. This is in agreement with Acot (2008) who stated that those extension workers that stored grains were supposed to guide farmers in storing their grains in areas free of pest and diseases.

The study also found that farmers were advised by agricultural extension Workers to form cooperative societies to market their farm produce better. Agricultural extension workers always advised farmers to study the market situation before selling their produce, to sell their farm products, only when the price is high in order to make profit. Also all excess products are to be sold during scarcity period. This agreed with what Food and Agricultural Organization reports (2008) stated, "Agricultural extension workers will have to develop new skills and be in position to advice farmers on where to sell their products".

The study further revealed that there were significant differences found in all the variables tested vis-à-vis soil and water management, animal production, crop production, crop processing, storage and preservation and agricultural marketing strategies. The six null hypotheses tested revealed that significant different existed on the influence of agricultural extension workers on all the variables among the three senatorial districts in Kaduna State.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary

The study was carried out to determine the influence of agricultural extension workers in promoting sustainable agricultural development in Kaduna State. In order to achieve the objectives of the study, six specific objectives were raised which included, to determine the influence of agricultural extension workers on soil and water management practices by farmers in Kaduna State for promoting sustainable agricultural development. In line with these objectives, six research questions were formulated. Descriptive survey research designed was used for the study. A total of three hundred and thirty three (333) farmers were sampled from the

total population of four thousand and fifty six (4,056) farmers. Structured questionnaire was used to gather data from the respondents.

The findings of the study included that; agricultural extension workers advised and encouraged farmers on how to control soil water erosion on the farms; farmers were advised by agricultural extension workers on how to practice system of irrigation on their farms. Farmers were influenced by agricultural extension workers to rear the best breeds of livestock, farmers were encouraged by agricultural extension workers to also rear disease resistant livestocks and farmers were influenced by agricultural extension workers to carryout land clearing before tilling their farm land.

There was significant difference between the contributions made by agricultural extension workers on crop production by farmers in the three senatorial districts. There was significant difference between the contributions made by agricultural extension workers on crop processing practices by farmers in the three senatorial districts. There was significant difference between the contributions made by agricultural extension workers on storage and preservation practices by farmers in the three senatorial districts.

5.2 Conclusion

Major barriers hampering adoption of sustainable agricultural development, included little financial returns for farmers, low farmer knowledge with respect to sustainable agricultural development, problems of administrative , financial to agricultural extension management and low extension staff knowledge with respect to sustainable agricultural development, who found that management of agricultural extension needed more solutions with respect to sustainable practices particularly in the area of the economics of sustainable agricultural development, water

management, animal production, crop production, crop processing, storage and preservation and agricultural marketing strategies in promoting agricultural development.

5.3 Recommendations

Based on the findings and conclusion of this study, the following recommendations were made:

1. Agricultural marketing boards should be revived, so that agricultural products can be well managed.
2. Agricultural extension workers curriculum at all levels of education should be reviewed to meet up with the challenges of the modern technology, so that graduate teachers would be able to make realistic impact on farmers.
3. Agricultural extension workers should strengthen agricultural clubs (like Young Farmers Club) in schools by bringing students together to form agricultural clubs. This will go along way in promoting agricultural development.
4. Participation in the reform of agricultural markets to stabilize farmers' incomes, The use of direct funding for national priority programs, including the introduction of new technologies and developing production, Support of micro-credit institutions especially through linkage with commercial banks that would enhance credit delivery to farmers and women participation in agricultural practices should be encourage for sustainable development.

5.4. Limitation of the Study

The limitation of the study was the lack of cooperation from the respondents during filing and returning of the questionnaire. Another limitation of this study was the difficulty in re-printing

the questionnaire which was discovered badly at the point of administration. These led to the delay in the analysis and completion of this research work.

5.5 Suggestions for Further Research Studies

It was suggested that further study can be carried out on the same topic in other states to see whether similar results can be obtained and also in the following areas: effect of soil and water management on agricultural development in Kaduna State and influence of storage, preservation and marketing strategies of agricultural products on agricultural development in Kaduna State.

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Appendix I

Letter of Introduction

Agric Education Section,
Department of Voc. and Tech. Educ.
Faculty of Education,
Ahmadu Bello University,
Zaria.
Kaduna State.
Date:……..

Dear Respondent,

Request to fill questionnaire

I am a postgraduate student of Agric Education carrying out research work title "Contributions of Agricultural Extension workers in Promoting Sustainable Agricultural Development among Local Farmers in Kaduna State, Nigeria". This questionnaire is to solicit for your assistance and cooperation in providing the required information by ticking the items. It is purely an academic exercise for the award of Masters Degree in Agricultural Education. The information provided

shall be treated strictly for that purpose.

Thanks for your cooperation

Yours faithfully,

SHAGBOH, Nuhu Bulus

Appendix II
Farmers Questionnaire

PART A

Personal Data

Instruction: Please tick (√) the appropriate box as it applies to you.

Gender

(a) Male [ ]
(b) Female [ ]

Age (in Years)

(a) 21 – 30 [ ]
(b) 31 – 40 [ ]
(c) 41 – 50 [ ]
(d) 51 – 60 [ ]
(e) 61 and above [ ]

Marital status

(a) Married [ ]
(b) Single [ ]
(c) Separated [ ]
(d) Divorced [ ]

Education

(a) None [ ]

(b) Koranic School [ ]
(c) Primary [ ]
(d) Secondary [ ]
(e) Tertiary [ ]
(f) No response [ ]

PART B
QUESTIONNAIRE ON THE CONTRIBUTIONS OF AGRICULTURAL EXTENSION WORKERS
INPROMOTING SUSTAINABLE AGRICULTURAL DEVELOMENT AMONG LOCAL FARMERS IN KADUNA STATE, NIGERIA

Instruction: Please tick (√) under the column that best fits your opinion on each of the items in sections A-F. The response options are

SA	=	Strongly Agreed	4 point
A	=	Agreed	3 point
D	=	Disagreed	2 point
SD	=	Strongly disagreed	1 point

Section A: Contribution of Agricultural Extension Workers on Soil and Water Management Practices among Farmers in Kaduna State.

S/N	ITEMS	SA	A	D	SD
1	Agricultural Extension workers always encourage farmers on the use of irrigation systems in their farms				
2	Farmers learnt construction of contour ridging from Agricultural Extension workers farms				
3	Agricultural Extension workers influence farmers on the method of controlling erosion in their farms.				
4	Farmers are encouraged by Agricultural Extension workers to adopt planting of cover crops in their farms				
5	Farmers are encouraged to use organic matters in their farms to increase soil fertility				
6	Agricultural Extension workers use appropriate tillage practices in their farms, which farmers learnt from them.				
7	Farmers learnt the construction of wells for irrigation purposes from Agricultural Extension workers.				

Section B: Contribution of Agricultural Extension Workers on Animal Production Practices

S/N	ITEMS	SA	A	D	SD
9	Farmers are advised by Agricultural Extension workers to rear the best breeds of livestocks.				

10	Agricultural Extension workers do encourage farmers to keep animal pens clean.				
11	Agricultural Extension workers advise farmers to vaccinate their animal against diseases.				
12	Farmers are encouraged by Agricultural Extension workers to keep disease resistant livestock.				
13	Agricultural Extension workers do influence farmers to use balanced rations in feeding their animals				

Section C: Contribution of Agricultural Extension Workers on Crop Production Practices among Farmers in Kaduna State.

S/N	ITEMS	SA	A	D	SD
14	Farmers are influenced by Agricultural Extension workers to carry out clearing before tilling their farm land.				
15	Agricultural Extension workers taught farmers to adopt correct spacing in planting, which farmers adopt same from them.				
16	Agricultural Extension workers advised farmers to shift from the use of chemical fertilizers to organic fertilizers				
17	Farmers are advised by Agricultural Extension workers to plant on time for seasonal crops				
18	Farmers are encouraged by Agricultural Extension workers to weed their farms on time.				
19	Agricultural Extension workers encouraged farmers to harvest crops only when they mature.				

Section D: Contribution of Agricultural Extension Workers on Crop Processing among Farmers in Kaduna State.

S/N	ITEMS	SA	A	D	SD
20	Agricultural Extension workers told farmers to use different methods of crop processing.				
21	Farmers are encouraged by Agricultural Extension workers to hire threshers to thresh their farm produce.				
22	Farmers are encouraged by Agricultural Extension workers to acquire skills in processing farm produces				
23	Agricultural Extension workers teach farmers how to operate different machines for processing of their farm produce				
24	Agricultural Extension workers advised farmers to preserve farm produce for future use				

25	Farmers are encouraged by Agricultural Extension workers to store grains in good condition in their farm produce stores.				
26	Agricultural Extension workers do influence farmers to disinfect their store houses against pests and diseases before storage				
27	Agricultural Extension workers advised farmers to keep their store house clean and neat				
28	Agricultural Extension workers advised farmers to preserve their farm produce for use.				

Section F: Contribution of Agricultural Extension Workers on Marketing Strategies among Farmers in Kaduna State

S/N	ITEMS	SA	A	DA	SD
29	Farmers are advised by Agricultural Extension workers to study the market situation before selling their produce				
30	Farmers are advised by Agricultural Extension workers to sell their excess produce during scarcity period				
31	Farmers are encouraged by Agricultural Extension workers to sell their produce when the price is high for more profits.				
32	Farmers are encouraged to form cooperative societies for selling their produce by Agricultural Extension workers.				
33	Farmers are advised by the Agricultural Extension workers to follow the channels of marketing for selling their farm produce.				