# SOCIO-ECONOMIC CHARACTERISTICS OF WOMEN COOPERATIVE ORGANIZATIONS AS DETERMINANTS OF THEIR USE OF AGRICULTURAL EXTENSION SERVICES IN SOUTH EAST, NIGERIA

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***Abstract***

*This study dwelt on socio-economic characteristics of women cooperative organizations as determinants of their use of Agricultural Extension Services in South East Nigeria, focusing on the socio-economic characteristics of the members of the women agricultural cooperative in Southeast, Nigeria and determining the influence of the socio-economic characteristics of the members of the women agricultural cooperatives on their use of Agricultural Extension Services (AES). To achieve the objective of the study, multistage random sampling technique was adopted to select 399 respondents of women agricultural cooperative members. Primary data was sourced through the use of structured questionnaire. Data collected were analyzed with both descriptive and inferential statistics with the help of SPSS version 23 and strata 14 software. The descriptive statistics used include frequency distribution, percentages, and weighted mean. The result of hypothesis one revealed that the socio-economic characteristics of the members of the women agricultural cooperative have significant influence on the use of extension services. It is concluded that the socio-economic characteristics of the women had a significant effect on their use of the extension services. The study recommended that; women farmers should hold unto education and training for better understanding of extension services and programmes.*

***Keywords**; Extension, Agriculture, Socio-economic, Women, Cooperatives.*

## Introduction

Agriculture remains the nation's main economic bedrock, employing 70 – 80 percent of the total population, mostly on a subsistence level (Asiabaka & Owens, 2002). According to Agbamu (2005), sequel to the food situation in many developing societies, which is predominantly agricultural, finding means of raising productivity among the rural poor in these countries has become the most urgent problem confronting the International development community today. Agricultural development implies a shift from traditional methods of production to include new improved technological components such as new varieties, cultural practices, commercial fertilizers and pesticides, as well as new crops and new farming systems (Agbamu, 2005).Consequently, a wide range of policies and approaches have been formulated in most African countries (Nigeria inclusive) to reverse the worsening food and agricultural trends towards sustained agricultural growth.

Cooperatives are the most effective vehicles for efficient mobilization of production resources and accelerated rural development. In Nigeria, majority of the agricultural cooperatives at different levels are multipurpose in their function. Not only do they operate banking business, they also deal with other support services such as input supply, marketing and purchasing which are critical to agricultural development (Abdulquadri & Mohammed 2012). Through cooperatives, farmers could pool their limited resources together to improve agricultural output, and this will enhance socio-economic activities in the rural areas (Ebonyi & Jimoh, 2002).

The extension agents have to be made available, for imparting new technique and idea, to enhance their production. Cooperatives in general, offer its members an improved bargaining power with respect to services such as production, storage, processing and transportation which is capable of influencing market value and the members produce. The better the quality of value added to farm produce, the more farmers will be eager to make sales through their agricultural cooperative societies. This is because, it is possible to maintain services such as storage, extend credit, processing and transportation which a single farmer cannot make or achieve outside being in a group or cooperative (Bob Igwe, 2006).

The agricultural extension services operate from the back drop belief that increased agricultural productivity depends primarily upon the acceptance of improved cultural and technological changes at the rural farm level and that peasant farmers can achieve higher farm yield only if they adopt recommended scientific farming techniques in place of their traditional practices (Aphum & Obikhian, 2008).Unfortunately, these small scale farmers are subsistence farmers and use crude and traditional production techniques. This has contributed to the poor performance of the sector. Therefore, effective economic development strategy will depend critically on promoting productivity and output growth, particularly among small-scale producers since they make up the bulk of the nation's agricultural producers/farmers. In this regard, there are so many socio-economic characteristics that will enhance the recommended farming techniques in place of traditional method of farming. Some of these socio-economic characteristics range from age to farming experience.

Agricultural extension service facilitates the transfer of knowledge and good practices to farmers. The traditional agricultural extension is mainly done by an extension officer visiting a farmer or farmer field schools (Sanga, Kalungwizi, & Msuya, 2013). For the laudable objectives of agricultural extension to be achieved, extension agents have to play a vital role as they are responsible for transferring useful information necessary for "change" to the farmers (Oladimeji 2004).

Nigerian agricultural system has not been living up to expectations, despite the wide range of policies, programmes and approaches that have been formulated for enhancement and sustenance of agricultural growth. In Nigeria, there is a growing advocacy for achieving or finding appropriate institutions that will be used to

organize millions of farmers towards attaining the goals of maximal productivity, sustainable food security and expanding the opportunity for agricultural contribution to the nation's Gross Domestic Product (GDP).

Over the years, Nigerian rural farmers depend on indigenous or local knowledge for farming system. Such knowledge refers to skill and experience gained through oral tradition and practice over many generations, (Oyeoro, Adepogu, Oyewo & Adigun (2017). The acquisition of such generational skill by the rural farmers, as observed by Obidike, (2011) has not helped to improve agricultural yield. Therefore, all that is witnessed in the rural agricultural system range from the emergence of disease resistant weeds and pests, old farm implements, poor quality fertilizers, among others, leading to poor farm yields (Obidike 2011). Thus, this suggests the need for agricultural extension services delivery to the rural farmers for an improved farming system that will surely bring about improved performance in their farm enterprise.
The advocacy for agricultural extension services is yet to solve the major problem of how to develop appropriate organizational structures and platforms to mobilize and induce farmers in the agricultural sector, particularly women to greater productivity (Julie, 2014).

Farmers organization such as cooperatives have in recent times served as a veritable channel of delivering extension services, thus increasing and enhancing agricultural productivity (Onugu & Abdulahi, 2012).

According to Julie (2014) illiteracy (low educational background) high cost and inadequate awareness, trusts, as well as corruption have been identified as barriers hindering full use of extension services by women farmers. Women farmers in the technological, commercially- inclined and globally- integrated era of agriculture have little or no access to agricultural information provided by the extension officers (Julie, 2014).

Thus, this necessitates the need to investigate the socio economic characteristics of women cooperative organization as determinants of their use of agricultural extension services through their cooperative societies. Noteworthy also, that many works on literature have paid more attention to awareness of women on agricultural extension services, but little or none exist in understanding the extent of actual use, knowing that not all farmers that know or try an innovation adopt it.

Therefore, on this premise, the researcher provides answers to the pertinent questions that surround women's level of use of agricultural extension services that bother on what their socio economic characteristics are and what influence it has on them and, their actual level of use of agricultural extension services in the study area.

## Objectives of the Study

The broad objective of the study is to assess the socio-economic characteristics of women cooperatives as determinant of their use of agricultural extension services in South- East, Nigeria. The specific objectives are to:

(i) Describe the socio-economic characteristics of the members of the women agricultural cooperative in Southeast, Nigeria.

(ii) Determine the influence of the socio-economic characteristics of the members of the women agricultural cooperatives on their use of Agricultural Extension Services (AES).

## Hypothesis of the Study

$H_0$: Socio- economic characteristics of members of the women agricultural cooperatives have no significant influence on their use of agricultural extension services in South-east, Nigeria.

$H_1$: Socio- economic characteristics of members of the women agricultural cooperatives have significant effect on the use of agricultural extension services in South-east, Nigeria.

## Review of Related Literature

Review of related literature is discussed under the following sub-headings:

## Conceptual Review

## Women and Agriculture

Women have always played an important role in agriculture, undertaking a wide range of activities relating to food production, processing and marketing. Beyond the farm, women play a key role in land and water management in all developing countries. Women are most often the collectors of water, firewood and folder (Commowealth 2001). The key role played by women in agriculture was in the past largely unacknowledged in government statistics and decision making. This situation has started to change over the last two or three decades and much has been achieved in giving recognition to the importance of women in the agricultural sector in many parts of the developing world (World Bank, 2001).These factors have eroded gains and threatens a return to the situation where women's role is not fully recognized, and where gender blind policies and programmes fail to address the needs of women farmers (Commonwealth 2001). There also remain a number of areas where progress in advancing gender equality has not been significant and which represent challenges for the future. These include women's lack of access to land, resource entitlements and inputs such as credit, technology, the limited role played by women in planting and the formulation of policy in the sector .Women have also had less contact with extension services than men and generally use lower levels of technology because of problems of access, cultural restrictions on the use or lesser interest in doing research on women's crops and livestock (World Bank, 2000). Nevertheless, women had traditionally valuable income through the processing of food at the household level

for sale, but there are severe constraints on the expansion of this due to lack of information about markets, the absence of cold storage facilities, packaging technology and inability to obtain credit. These limitations are now understood and one challenge is to foster this business acumen and to encourage small-scale agro-processing (World Bank, 2000). Rural women play crucial roles in agricultural activities, in increasing food and nutrition security, as farmers/producers, workers and entrepreneurs. For example, because of legal and cultural constraints affecting land inheritance, ownership and use, worldwide, fewer than 20 percent of land holders are women. (FAO, 2011). In every Millennium Development Goal (MDG) indicator for which data are available, rural women are less than rural men and worse than urban women and men (Inter-Agency Task Force on Rural women, 2012) Obstacles to women's active participation are often structural and most are rooted in socio-cultural norms at the community and house hold levels. In the overwhelming majority of cases, men are the nominal owners of household assets and are recognized as such by law and custom. As a consequence women do not have equal access to benefit and income. This lack of access further weakens women self-confidence, resulting in women seldom reaching prominent positions in mixed cooperative and market-based agriculture (IFAD, 2012).

Yemisi and Aisha (2009) noted that women shoulder the primary responsibility for food security in Africa, yet development agencies have devoted minimal resources to researching the impact of their agricultural policies and new techniques on the well-being of African's women farmers. The supporting argument is that women are integral part of the African farming structure and that the dominant agricultural policies developed for Africa, with the disproportionate involvement and influence of external expert have ignored this gender dimension at a very real cost to African Agriculture and to gender equity within the continent (Yemisi and Aisha, 2009).

Chambers (2005) emphasized that the institutional reality remains that of operational in attention to gender issues in agriculture and related areas such as transport and micro finance. A disturbing feature of this inattention is that it co-exists with public statements that actively promote participation and consultation as part of the development agenda. Women have begun to make major demands for their participation and inclusion in the policy and economic process relevant to agriculture. Indeed, they have started to develop and promote local expert materials in the field of agriculture (Yemisi and Aisha, 2009). Through these materials being those which emerge out of consultation with women farmers on their needs and opportunities, we now know from existing evidence that there are gender differentiations of immense dimensions within African agriculture. Nevertheless, the position and capability of women meeting, the challenges of agricultural development cannot be over emphasized. Women make significant contribution to food production and processing, but men seem to take more of the farm decision and control the productive resources. In Nigeria, women play dominant role in agricultural

production, their active participation in African agriculture is also not new. This was confirmed by a study financed by the UNDP, which revealed that women make up 60% - 90% of the agricultural labour, depending on the region and that they produce two- third of food crops (Yemsi and Aisha, 2009).

They opined that beyond politics, the broad domains involving women of various classes are agriculture, urban workplace, the law and education. Women contribute tremendously to agricultural output but unfortunately, they hardly, until recently benefited from agricultural incentives and innovations because of economic suppression, social and traditional practices which undermine the constitutional provisions on the equality of men and women. (Yemsi and Aisha, 2000).

**Agricultural Extension Services**

Agricultural extension has been defined in different forms and ways by different authorities and experts, all endearing on the improvement of the standard of living of the people. Fisher (2002) defined extension as a system of education extending beyond the classroom to individuals on farms and is available to every member of the family. Agriculture for Impact (2018) defined Agricultural extension as the application of scientific research and knowledge through farmers to agricultural practice. Simply put, it is the delivery of information inputs to farmers. He went further to opine that the role of extension services is invaluable in teaching farmers how to improve their productivity. Extension is also critical to move research from the lab to the field and to ensure a return on investment in research by translating new knowledge into innovative practices. Montpellier (2016) opined that the UN High-Level Panel of Experts on Food Security and Nutrition (HLPE) argue that "extension systems need full attention and investments from governments and the donor community." Agricultural extension started as just extension with the aim of disseminating information to people who were not privileged to taste the four walls of the classroom. Extension was first used in connection with education over 150 years ago to describe the method of spreading knowledge. Okechukwu (2009) opined that Agricultural extension can be defined as an advice and assistance given to the farmers and his families through educational procedures on new farming methods and techniques in order to improve their production efficiency and income, bettering their level and uplifting the education and social standard of the farmers.

Essentially, agricultural extension provides farmers the scientific knowledge so that they could solve their problems Okechuku (2009).It is also the primary means of change, the reason for change, the value of change, the results you can achieve, the process by which it is arrived at and also the uncertainties inherent in this change. It helps the farmers to learn about what alternatives that exists in farming so that they can choose the best alternative for themselves. Agricultural extension agents help the farmers to discuss and air the conditions under which they do their farming process; to obtain a clearer inside to their problems and encourage farmers decide how to

overcome their problems either individually or collectively in order to achieve improved yield and living standard.

Again, agricultural extension is an approach that aims to provide uninformed farmers and their households with relevant information about new farming practices and techniques that can boost agricultural production and improve living standards (Sheriff, 2018). He went further to say, that it adopts education techniques in rendering assistance to farmers. Educational assistance or advice so acquired enables farmers to develop socially and understand how they can make agriculture a lasting source of substantial income. Agricultural extension in its global conception was indicated with the intent of passing information to farmers who were not literate or who did not have any access to formal education. He went further to say that about two hundred (200) years ago, the word extension was first used in referring to a formal means of disseminating useful information and transferring knowledge.

Sheriff (2018) continued to say that today agricultural extension goes a great length to involve the transfer of scientific knowledge. Farmers require understanding the use of modern technology. Undoubtedly, farming is associated with problems and for local famer's comprehensive information on the use of modern technology. In this regard, agricultural extension has gained ground everywhere in the world as a helpful approach to solving farming problems.

In addition, to its basic purpose, agricultural extension integrates innovation with agriculture in a way intended to promote agriculture and make it a lasting solution to crises such as food shortage and low level of agricultural production. Moreover, agricultural extension brings about the awareness of farmers, a variety of farming alternatives from which they can select their preferences. Frankly, the agricultural extension comes with a number of advantages, most of which are targeted at farmers. It is said that some of its advantages, are but not limited to: giving distinct insight into how farming problems may be solved; helping farmers connect with one another to discuss the conditions surrounding their activities, raising farmers' standard of living through collective reasoning and disseminating information farmers need to diversify from crude farming to modernized farming.

The crucial role of agricultural extension (i.e. farmer's 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 Nigeria agriculture to improve, our farmers have no alternative but to learn and adopt recommended scientific farming techniques in place of their traditional practices. For farmers to respond positively to new ideas, they must be properly educated on how best to apply the new ideas or practice to their farming activities. Nigerians 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. However, it is not easy to define agricultural extension in a short concise phase or statement. Any attempt to define it properly would involve lengthy explanation of several principles and philosophies. Different authorities and experts have defined extension in different forms and ways, all endearing on the improvement of the standard of living of the people. Fisher (2002) defined extension as a system of education extending beyond the classroom to individuals on farms and is available to every member of the family Asiabaka, Anaeto, Nnadi, Ajaero , Aja , Ugwoke, , Ukpongson and Onweagba, (2012) defined extension as involving the conscious use of communication of information to help people form sound opinions and make good decisions. They explained extension systematically as a process which helps farmers to analyse their present and expected future situations, helps farmers to become aware of the problems which can arise in such an analysis, increase knowledge and develop into problems and helps to structure farmer's existing knowledge, helps farmers to acquire specific knowledge related to certain problems, solutions and their consequences so that they can act on possible alternatives, helps farmers to evaluate and improve their own opinion, forming and decision making skills.

Asiabaka (2002) tried to look at extension from modern perspective and thus explained it from the aim, which seek to accomplish, which is to teach both the rural and urban clientele how to determine their problems and be able to rise to such problems, using their own resources. He further explained extension as having three important dimensions namely: educational components, which involves changing the behavior complex and attitude of the people, economic dimension which includes, increased income of the clientele, increase crop yield, better financial management, better methods of food preservations, social dimension, which also includes improved health of the clientele, leadership development, better grooming, development co-operation, increased zeal for development (Asiabaka *et al*., 2012).

Modern agricultural extension work in Nigeria today covers a wide spectrum of services which include, Improvement in production, marketing, storage, processing, Fish farming, Agro-forestry, input supply and distribution, Manpower development, Home Economics/Women- in- Agriculture, irrigation and management, Farm mechanization, Erosion control, Livestock management, Human resource/ development, Administration/ management, Programme planning and evaluation, Youth development programme etc. (Anaeto, 2003).

## Materials and Methods

### Research Design

Design in research connotes the approach researcher intends to take in carrying out her study. For the purpose of this study, survey research design was employed.

### Area of the Study

The area of the study is South-east Nigeria. It consists of five States, namely, Anambra, Imo, Enugu, Abia and Ebonyi. This area that was referred as Biafra during the civil war has 101 Local Government Areas that are split into 346 communities. Okechukwu (2014) had it that South-east of Nigeria was carved out of East Central State which was one of the twelve States created in Nigeria at the emergence of the Nigerian civil war in 1967. It is bounded in the east by Akwa Ibom and Cross River States, in the north by Benue and Kogi States, in the west by Edo and Delta States and in the south by Rivers and Bayelsa States. The area is inhabited by the Ibo race and the language is Igbo, though English is widely spoken and used as official language in governance. They are predominantly Christians. The Ibos are very daring, competitive, hard-working and enterprising. They can be found doing business virtually in all parts of the world. They are renowned in literature for commerce, adventure and dexterity. The population of the area, according to 2006 census, is 28,415,006. Literacy level of inhabitants stood at 38%, while 51% of the population are female. The region is arguable the most vibrant geographical zone in Nigeria, and it has the least poverty rate in the country. The region is blessed with natural minerals such as crude oil, coal, limestone, aluminion etc. The arable land made it a beacon of agriculture and unique in production of palm oil, cassava, yam, cocoyam, cashew nuts, vegetables and different kinds of fruits. Apart from numerous rivers which make fishing interesting for inhabitants, the Onitsha, Enugu, Aba and Nnewi trade clusters made the region a beehive of commercial activities. Interesting cities in the region include Awka, Enugu, Owerri, Umuahia and Abakaliki. Sixty percent of the inhabitants live in rural areas, and over 70% of rural dwellers depend on their farm for survival. Majority of these rural dwellers are women who formed themselves into cooperatives in order to access market opportunities. There are many women cooperatives in the area and they assist their members to access credit, inputs, processing of farm produce and marketing. Agricultural Development Programme offices are also located in various parts of the region, rendering extension services to individuals and corporate farmers.

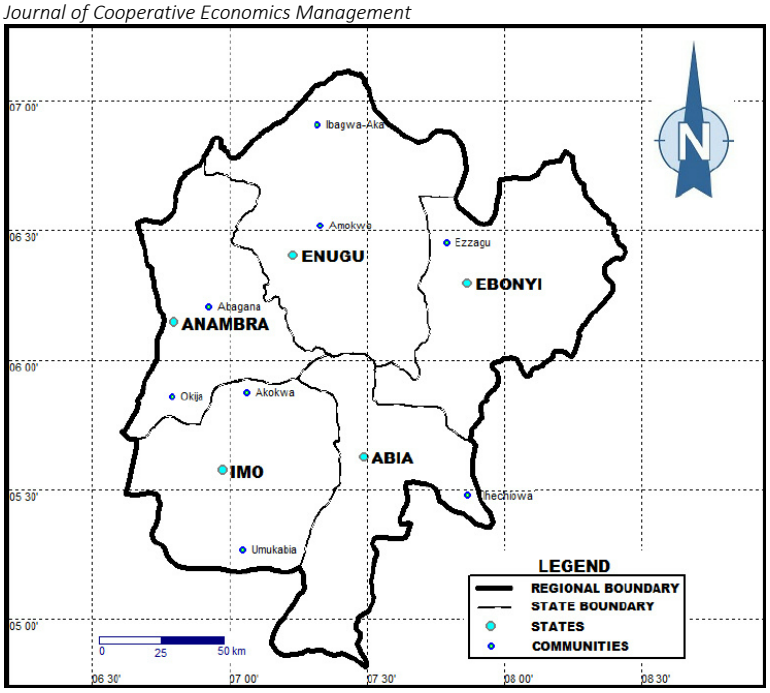


Fig.1: Map of Southeastern Nigeria showing the states
Source: World Igbo Congress Foundation (WICF),. 2014

This study covered the women agricultural co-operative societies in the South-east of Nigeria, made up of five states viz: Abia, Anambra, Ebonyi, Enugu and Imo States. According to Cooperative Departments from the five State capitals, there were 28,410 agricultural registered cooperatives in the area of study, out of which 6455 were women cooperatives. These women agricultural cooperatives had a total membership strength of 133,841. Therefore the 6,455 women agricultural cooperatives with their membership strength which was 133,841 constituted the population of this study.

**Sample Size Determination and Sampling Technique**

The number of women farmer's cooperatives in the five (5) States of South-East Zone was six thousand four hundred and fifty-five (6455) with the total membership strength of one hundred and thirty three thousand, eight hundred and forty-one (133,841). To get the sample size, the researcher used the Taro Yamane formula of

$$n = \frac{N}{1 + N(e)2}$$

Where n = sample size
N = population of the study
e = error of margin taking at 5% level.

$$n = \frac{133,841}{1+133,841\ (5\%)\ 2}$$

$$= \frac{133,841}{1+133,841\ (0.5)2}$$

$$= \frac{133,841}{1+133,841\ (0.0025)}$$

$$= \frac{133,841}{1+334.6025}$$

$$= \frac{133,841}{335.6025}$$

$$n = 398.8081138$$

= approximately 399 respondents

The sampling strategy that was used in this study was multistage and proportional sampling technique. Multistage sampling refers to a sampling method where the sampling is carried out in stages using smaller sampling units at each stage. Proportional sampling technique is a method where the samples are a proportional distribution across all units.

**Stage one:** Two Local Governments in each of these five States that were agrarian were selected. This is because the study is about agriculture and better result will be achieved if efforts are focused on agrarian communities where agricultural production takes place.

**Stage two:** Women cooperatives in these agrarian local governments were randomly selected. Efforts were made to include only women cooperatives that were functional and had years of contacts with agricultural extension workers.

**Stage Three**: Members of women agricultural cooperatives who have had at least five years contacts with extension officers were selected. This is shown in Table 3.1.

**Table .1: Distribution of women agricultural cooperative members selected from each state in South-East.**

| State | No. of Cooperatives | No. of members | No. of members selected |
|---|---|---|---|
| **Anambra** | | | |
| Ayamelum | 9 | 145 | 44 |
| Awka North | 10 | 172 | 52 |
| **Imo** | | | |
| Orlu West | 8 | 138 | 39 |
| Owerri West | 9 | 153 | 47 |
| **Enugu** | | | |
| Aninri | 10 | 197 | 51 |
| Udenu | 8 | 129 | 36 |
| **Ebonyi** | | | |
| Ivo | 7 | 111 | 29 |
| Izzi | 8 | 125 | 33 |
| **Abia** | | | |
| Bende | 6 | 84 | 27 |
| Isiala Ngwa | 7 | 112 | 41 |
| **Total** | **82** | **1366** | **399** |

Data were collected from basically primary sources. The primary data employed pretested and structured questionnaires set for recording information, and data were elicited from the cooperators (executives and members) who were the respondents for the study. However relevant secondary information was elicited from texts, journals, learned articles and websites of reputable institutions.

The copies of questionnaires were administered by the trained research assistan. Only 379 copies were diligently filled and returned.

**Method of Data Analysis**

The study utilized a combination of analytical tools such as SPSS version 23, Excel and STATA 14.0. Statistical tools used to achieve the stated objective and hypothesis to the study were descriptive statistics, Ordinary Least Square regression model, and inferential statistics. Descriptive statistics which includes frequency, percentage, and mean were used to achieve objectives 1while Objective 2 was achieved with Ordinary Least Square regression model, while the t-ratios from the results of the four functional form of multiple regression were used to ascertain the significance of hypothesis one.

## 4. DATA PRESENTATION AND ANALYSIS

**Socio-Economic Characteristics of the Women Agricultural Cooperative Members in the South- Eastern Zone of Nigeria.**

The Socio-Economic Characteristics of the Women Agricultural Cooperative Members in the South Eastern Zone of Nigeria is presented in Table 2.1.

**Table 2.1: Distribution of Women Agricultural Cooperative Members in the South -Eastern Zone of Nigeria according to their Socio-economic Characteristics (n = 379).**

| S/n | Variables | Frequency | Percentage (100%) | Mean (x) | Standard Deviation |
|---|---|---|---|---|---|
| 1 | **Age (Years)** | | | | |
| | 20 - 29 | 36 | 9.5 | | |
| | 30 - 39 | 108 | 28.50 | | |
| | 40-49 | 143 | 37.70 | **42.60** | **10.00** |
| | 50 - 59 | 76 | 20.10 | | |
| | 60 years and above | 16 | 4.20 | | |
| **2** | **Educational Qualification** | | | | |
| | No Formal Education | 20 | 5.30 | | |
| | First School Living Certificate | 51 | 13.50 | | |
| | Senior Secondary Certificate | 156 | 41.20 | | |
| | ON D/NCE | 79 | 20.80 | | |
| | B Sc/HND | 61 | 16.10 | | |
| | Masters of Science and above | 10 | 2.60 | | |
| | Mass Education | 2 | 0.50 | | |
| **3** | **Marital Status** | | | | |
| | Married | 272 | 71.8 | | |
| | Single | 67 | 17.7 | | |
| | Widow | 36 | 9.5 | | |
| | Single Mother | 4 | 1.1 | | |

***Source: Computed from Field Survey Data, December 2021.***

The Socio-Economic Characteristics of the Women Agricultural Cooperative Members in the South-Eastern Zone of Table 2.1 include Age, Education, Marital Status, Occupation, Family size, Income, Membership Experience, Farming Experience, and Farm size.

**Age:** The Table shows that majority (37.70%) of the women are within the age bracket of 40 – 49 years, while the remaining 28.50%, 20.10%, 9.50%, and 4.20%

are within the age bracket of 30 – 39 years, 50 – 59 years, 20 – 29 years, and 60 years and above respectively. The mean age was found to be 42.60. The women farmers are in their active farm age, and so adoption of agricultural innovation will be easy in the study area. This is totally in agreement with Nuhul*et al*,2014 in their study on barriers to women performance in agricultural development in Bauchi Local Government area of Bauchi State.

**Level of Education:** The Table shows that majority (41.20%) of the women attended secondary school and have senior secondary certificate, while the remaining 20.80%, 16.10%, 13.50%, 5.30%, 2.60%, and 0.50% had Ordinary National Diploma/National College of Education, Bachelor of Science/Higher National Diploma, First School Living Certificate, No Formal Education, Masters of Science and above, and Mass Education respectively. From these result, it becomes very clear that women farmers in the study area are not illiterate and so, they can easily assimilate what they are being taught. The women are not illiterate as reported by Adamu (2014), in her study on extension users' view on alternative sources of fund for extension services in Ogun State.

**Marital Status:** The Table shows that majority (71.80%) of the women are married, while the remaining 17.70%, 9.50%, and 1.10% are single, widows, and single mothers respectively. This is in agreement with Ugbaja (2014), in his study on the provision of credit and loan facilities by Nigerian agricultural cooperative and rural development bank Ltd (NACRDB) to farmers.




***Figure 1: Occupation of Cooperative Women in the South- East Zone.***

**Occupation:** figure 1 shows that the majority (44.60%) of the women's main occupation was farming, while the remaining 29.00%, and 17.90%, were civil service

and trading respectively. 5.30% of the women are unemployed by either government or private establishment, and 3.20% of them were retired from active service. The high numbers of civil servants into farming connotes the fact that farming was the only other engagement public servants prefer to do. The majority of the women were engaged in farming activities as their main occupation was in agreement with Bonabana-Wabbi (2012) in his study on the socio-economic factors influencing adoption of improved seedling among farmers in the Sahehe zone of Borno State.

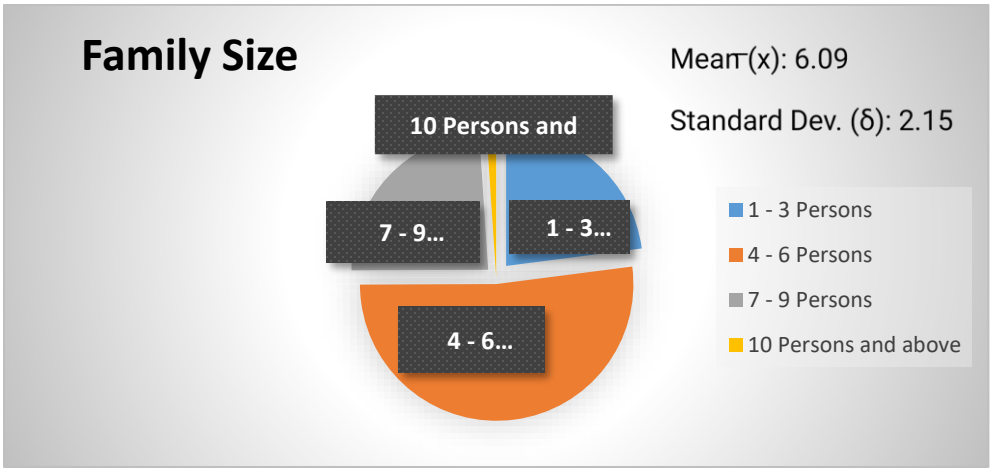


***Figure 2: Family size of Cooperative Women in the South East Zone.***

**Family size:** Figure 2 shows that majority (52.00%) of the women have a family size of 4 – 6 persons, while the remaining 24.00%, 23.00%, and 1.00% have a family size in the bracket of 7 – 9 persons, 1 – 3 persons, and 10 persons and above respectively. The mean family size was found to be 6.09. Large family size supplies household labour which helps to save cost incurred in hiring labour for farming activities. This is not in line with Nwalieji & Ajayi (2009).

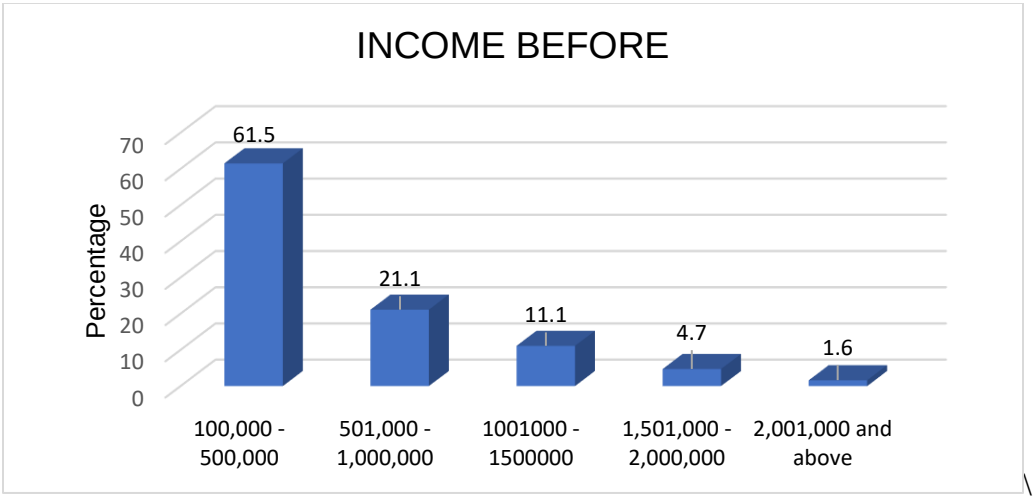

***Figure 3: Income range of Cooperative Women in the South -East Zone before the use of agricultural extension service.***

**Income of Women before the use of the Agricultural Extension Services:** Figure 3 shows that majority (61.50%) of the women's income before the utilization of agricultural extension in south-east were within the range of 100,000 – 500,000 thousand Naira only, while the remaining 21.10%, 11.1% 4.7)% and 1.60% had an annual income range of 501,000 – 1,000,000, 1001,000 – 1,500,000, 1,501,000 – 2,000,000, and 2,001,000 and above respectively. the mean income before was found to be ₦600,192.61.

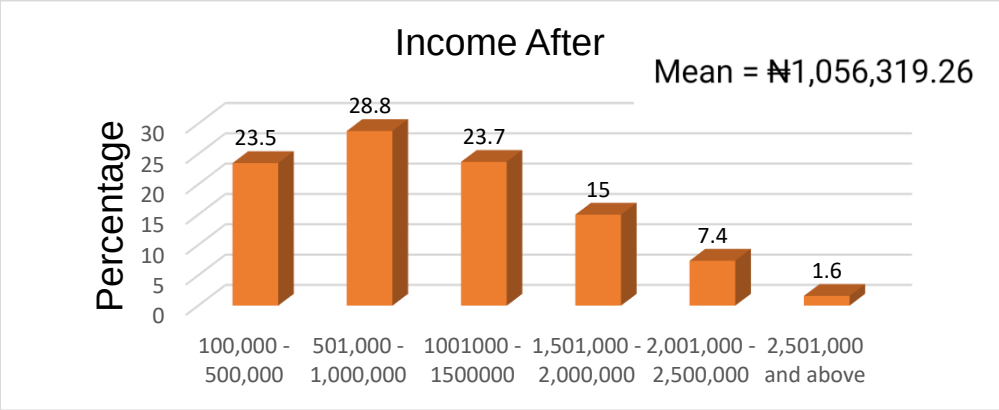


***Figure 4: Income range of Cooperative Women in the South- East Zone as a result of extension service.***

**Income of Women as a result of the use of Agricultural Extension Services:** Figure 4 shows that (28.80%) of the women's income as a result of agricultural extension service was in the bracket of 501,000 – 1,000,000 (Naira), while the remaining 23.70%, 23.50%, 15.00% and 7.40% had their income in the bracket of 1001,000 – 1,500,000 (Naira), 100,000 - 500,000 (Naira), 1,501,000 – 2,000,000 (Naira), and 2,001,000 – 2,500,000 (Naira) respectively. None of the women had their income within the range of 25,001,000 and above. The mean income was found to be 1,056,319.26 (Naira). This shows that the programmes had clear and physical evidence in the livelihood status of the women. Thus, using difference in mean, the use of agricultural extension services contributed extra ₦456,126.65 (75.80%) to the income level of the women in south- east.

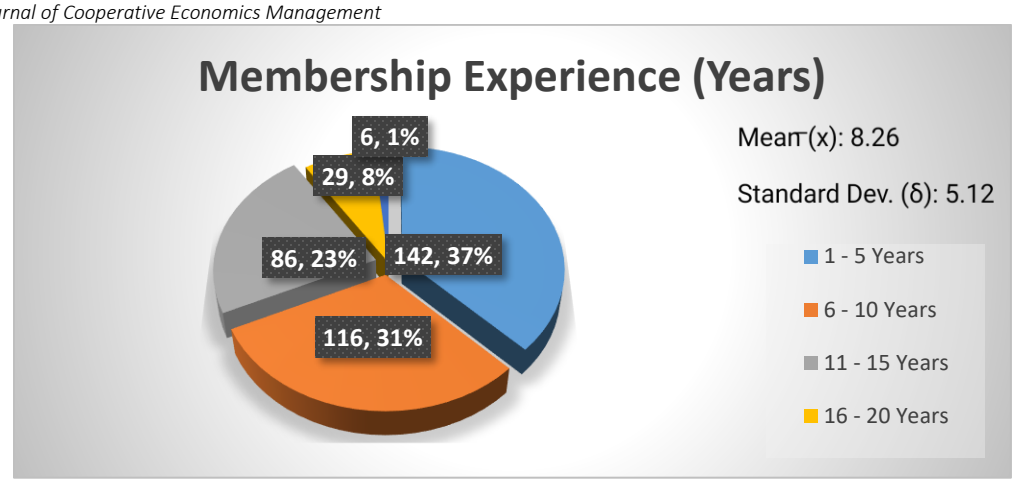


***Figure 5: Membership Experience of Cooperative Women in the South -East Zone.***

**Membership Experience:** Figure 5 clearly shows that majority (37.00%) of the women have had a membership experience in the bracket of 1 - 5 years, while the remaining 31.00%, 23.00%, 8.00%, and 1.00% have a membership experience in the bracket of 6 – 10 years, 11 – 15 years, 16 – 20 years and 21 years and above respectively. The mean membership experience was found to be 8.26. There is a mismatch with 15 years reported by Adamu (2014) in Ogun State.

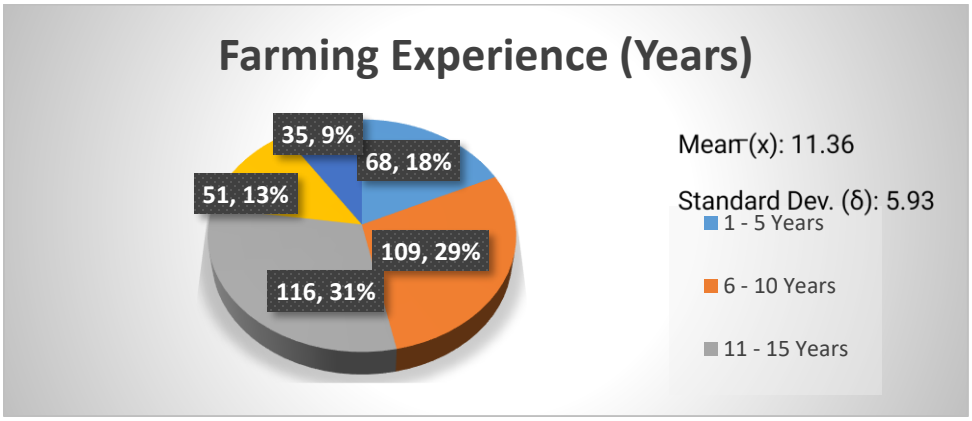


***Figure 6: Farming Experience of Cooperative Women in the South- East Zone.***

**Farming Experience:** Figure 6 clearly shows that majority (31.00%) of the women have had a farming experience in the bracket of 11 -15 years, while the remaining 39.00%, 18.00%, 13.00%, and 9.00% have a farming experience in the bracket of 6 – 10 years, 1 – 5 years, 16 – 20 years and 21 years and above respectively. The mean farming experience was found to be 11.36. This means that women farmers in the zone have better experience in agriculture, though this might pose a challenge to the use of extension services being rendered to them.

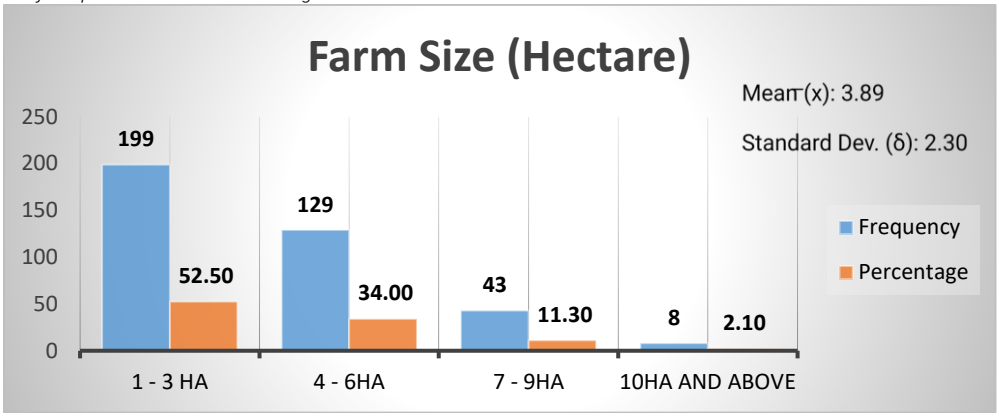


***Figure 7: Farm Size of Cooperative Women in the South- East Zone.***

**Farm size:** Figure 7 shows that majority (52.50%) of the women have a farm size in the bracket of 1 – 3ha, while the remaining 34.00%, 11.30%, and 2.10% have a farm size in the bracket of 4 – 6ha, 7 – 9ha and 10ha and above respectively. The mean farm size was found to be 3.89ha. This is justifiable as most agricultural programmes encourage the farmer to have contiguous land through the land development scheme. Agricultural mechanization is easier to adopt for practice on contiguous land. This was not in agreement with Nwalieji & Ajayi (2009) as the mean farm size of 3.82ha was far higher than their mean farm size of 0.88ha.

**Socioeconomic Characteristics and effects on the use of Agricultural Extension Services (AES) among women members of Agricultural cooperative South-East**

**Table 2.2 Socio-economic characteristic effect on extension use in South-East**

| Variable | Linear | Exponential | Semi Log | Double Log |
|---|---|---|---|---|
| Intercept | 3.57905 | 4.380602 | 1.259638 | 1.475716 |
| | (19.10) | (6.23) | (22.81) | (7.12) |
| Age ($X_1$) | 0.004854 | 0.245358 | 0.0012864 | 0.064225 |
| | (1.62) | (2.07)* | (1.47) | (1.84) |
| Level of education ($X_2$) | 0.064097 | 0.237086 | 0.0171816 | 0.0652342 |
| | (2.80)* | (3.39)** | (2.54)* | (3.17)** |
| Marital status ($X_3$) | 0.049597 | 0.107962 | 0.0191276 | 0.0392482 |
| | (1.38) | (1.76) | (1.81) | (2.17)* |
| Primary Occupation ($X_4$) | -0.058957 | -0.128431 | -0.0147036 | -0.0328504 |
| | (-2.36)* | (-2.46)* | (-1.99)* | (-2.14)* |
| Family size ($X_5$) | -0.031282 | -0.103426 | -0.0101988 | -0.0346622 |
| | (-2.51)* | (1.93) | (-2.77)* | (2.17)* |
| Income ($X_6$) | -1.63e-07 | -0.129809 | -4.32e-08 | -0.034662 |
| | (-3.68)** | (-3.25)** | (-3.30)** | (-2.95)** |
| Membership experience ($X_7$) | 0.0136529 | 0.025249 | 0.0014577 | 0.016599 |
| | (1.02) | (0.54) | (0.86) | (1.05) |
| Farming experience ($X_8$) | -0.003354 | 0.040739 | -0.000979 | -0.0067794 |
| | (-0.47) | (0.76) | (0.47) | (-0.47) |
| Farm size ($X_9$) | 0.013653 | 0.053165 | 0.003985 | 0.149418 |
| | (1.03) | (0.96) | (1.02) | (0.92) |
| $R^2$ | 0.1078 | 0.1092 | 0.0949 | 0.0964 |
| F-Stat. | 4.95** | 5.03** | 4.30** | 4.38** |
| N | 379 | 379 | 379 | 379 |

**Source: Computed from Field Survey Data, December 2021**.

Figures in parenthesis are t – ratios, * significant at 5%, ** significant at 1%.
The exponential function with the highest $r^2$ (0.1092), the highest number of variable significance and in conformity with the a priori expectation was chosen as the lead equation.

Thus; $Y = 4.380602 + 0.245358LNX_1 + 0.237086LNX_2 + 0.107962LNX_3 - 0.128431LNX_4 - 0.103426LNX_5 - 0.129809LNX_6 + 0.025249LNX_7 + 0.040739LNX_8 + 0.053165LNX_9 + 0.8908$.

The coefficient of multiple determinant $R^2$ (0.1092) indicates that 10.92% of the variation in the use of agricultural extension services (technology, advisory and facilitation) was explained by the joint action of the women farmers socio-economic characteristics, while the remaining 89.08% unexplained was due to error beyond the control of the women farmers, and the F-statistics of 5.03** indicates that the results were normally distributed.

The coefficient of Age (0.245358) was positive and statistically significant at 5% level of probability, indicating that a unit increase in the age of women farmers in the area will increase to a greater extent the use of agricultural extension services by

24.54%. This is in agreement with Ajayi & Gunn (2009), but not in line with Ajah (2012).
The coefficient of Level of education (0.237086) was positive and statistically significant at 1% level of probability indicating that a unit increase/change in the level of farmer's education will increase to a greater extent the use of agricultural extension services by 23.71%. This is in agreement with Ajayi & Gunn (2009), but not in line with Ajah (2012).

The coefficient of marital status (0.107962) was positive and statistically not significant at either 5% or 1% level of probability. This finding indicates that a change in marital status among women farmers in South-East will not significantly affect the level of use of agricultural extension services in South-East.

The coefficient of Primary occupation (-0.128431) was negative and statistically significant at 5% level of probability, indicating that anyone additional change in the occupation of farmers, say from farming to trading will reduce to a greater extent the use of agricultural extension services by 12.84%. This could probably mean that farmers will now pay less attention to farming activities since their time will be more dedicated to trading than farming.

The coefficient of family size (0.103426) was negative and statistically not significant at either 5% or 1% level of probability. This implies that a unit increase in number of family size will not have a significant effect in the level of use of agricultural extension service. This is not in line with the *a-priori* expectation since large family size supplies labour to the farm.

The coefficient of Income (-0.129809) was negative and statistically significant at 1% level of probability, indicating that one unit increase in the income of farmers will reduce to a greater extent the use of agricultural extension services by 12.98%. When the income of farmers increases, they probably might be engaged in other income generating activities other than farming. This will affect the use of agricultural extension service. This was not in agreement with Nuhul *et al,* 2014 whose income had a positive coefficient.

The coefficient of membership experience (0.025249) was positive and statistically not significant at either 5% or 1% level of probability, indicating that if there is a unit increase in membership experience among women farmers in South-east, there will be no significant effect in the use of agricultural extension services.

The coefficient of farming experience (0.040739) was positive and statistically not significant at either 5% or 1% level of probability indicating that one year increase in farming experience among women farmers in South-east will not affect the use of agricultural extension services in the area. This finding is not in agreement with Nuhul *et al,* 2014. By *a-priori* expectation, it is expected that increase in farming experience will equally increase the use of agricultural extension services.

The coefficient of farm size (0.053165) was positive and statistically not significant at either 5% or 1% level of probability, indicating that a unit increase in farm size among women farmers in South-east, there will be no significant effect in the use of agricultural extension service in the area. This is not in line with the *a priori* expectation. Ideally, use of agricultural extension services is expected to increase with hectare increment.

**Test of $Ho_1$; Socio-economic Characteristics of Members of the Women Agricultural Cooperatives have no significant effects on their use of Agricultural Extension Services (AES).**

Hypothesis one was tested from the t. ratio of regression result of objective two. Thus; hypothesis one ($Ho_1$) was rejected based on the variables that had a significant t-ratios and was accepted based on variables that were not significant at either 5% or 1% level of probability as shown in table4.5. Eze,. Onwubuya, & Ezeh , (2010) suggest the need for extension training focus on socio-economic characteristic of women in order to improve their productivity and understanding of marketing opportunities, cost and benefits in the marketing process, especially among the variables that were significant in the study.

**Table 2. 3: Decision table of the Hypothesis one**

| Variable | T – ratio | Decision |
|---|---|---|
| Age ($X_1$) | (2.07)* | Reject |
| Level of education ($X_2$) | (3.39)** | Reject |
| Marital status ($X_3$) | (1.76) | Accept |
| Primary occupation ($X_4$) | (-2.46)* | Reject |
| Family size ($X_5$) | (1.93)* | Accept |
| Income ($X_6$) | (-3.25)** | Reject |
| Farming experience ($X_7$) | (0.54) | Accept |
| Membership experience ($X_8$) | (0.76) | Accept |
| Farm size ($X_9$) | (0.96) | Accept |
| F – Stat. | 45.03** | |

***Source: Computed from Field Survey Data, December 2021.***

* Significant at 5% and ** Significant at 1% level of probability.

This chapter summarizes the findings of this study, thus providing the basis for drawing a conclusion on the product of the research and to make recommendations.

**Summary of the Findings**

The study was on socio economic characteristics of women agricultural cooperatives as determinants of use of agricultural extension services in South-East, Nigeria. Data were collected with a well-structured questionnaire from 399 randomly selected women farmers who are members of agricultural cooperative society in the study area. Data were analyzed using a combination of analytical tools such as Descriptive statistics, mean, multiple regression. The researcher found out that (37.70%) of the

women were within the age bracket of 40 - 49 years with a mean age of 42.60 which implies that the women were still in their active farm age, and 71.80% of the women are married, while majority (41.20%) of them attended secondary school. Despite their level of education, the majority (44.60%) of the women were mainly farmers, with a mean family size of 6.09. not minding the family size, their mean income before the agricultural extension package was delivered; the annual income before the package delivery was 600,192,61 (Naira) and 1,056,319.26 (Naira) after the extension delivery respectively. The research also revealed that the mean cooperative membership experience was 8.26years and the mean farming experience was 11.36 years, with an average of 3.89 hectares on a contiguous base.

**Conclusion**

The socio economic characteristics of women cooperative organization as determinants of their use of Agricultural Extension Services, Cooperatives in South-East, Nigeria cannot be overemphasized as the results are evident to draw conclusion.. The women annual mean income increased from 600, 192,61 (Naira) to 1,056,319.26 (Naira) as a result of the extension interventions. Conclusively; the researcher agrees that socioeconomic characteristics of the women had a significant effect on their use of the extension services based on those variables that were significant (Level of education, marital status, Main Occupation, Family size, and Annual income),.

**Recommendations**

The following recommendations were made based on the findings;

(i) Women cooperative farmers should hold onto education and training, for better understanding of extension services and programmes which will provide assistance to them for improved agricultural production..

(ii) Women agricultural cooperative members should be granted more access to farmlands for increased agricultural production for agricultural mechanization is easier to adopt on contiguous land.

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