International Journal of Trend in Scientific Research and Development (IJTSRD)
Volume 4 Issue 1, December 2019 Available Online: www.ijtsrd.com e-ISSN: 2456 – 6470

Effects of Agricultural Extension Services on the Performance of Members of Women Agricultural Cooperatives in South East, Nigeria

Okafor I. P.[1], Umebali E. E[2]

[1]Department of Cooperative Economics and Management,
[2]Department of Agricultural Economics and Extension,
[1,2]Nnamdi Azikiwe University, Awka, Nigeria

ABSTRACT

This study dwelt on Effects of Agricultural Extension Services on the Performance of Members of Women Agricultural Cooperatives in Southeast Nigeria. Nigerian agricultural system has not been living up to expectation, despite the wide range of programmes, policies and approaches that have been formulated for its enhancement and sustenance. Multistage random sampling technique was adopted to select 399 respondents of the 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 table, simple percentages, weighted mean and mean threshold of five point likert scale measure while inferential statistics used include regression, and ANOVA, which were used for the test of hypotheses formulated. The result of hypothesis one revealed that the socioeconomic characteristics of the members of the women agricultural cooperative have significant influence on the use of extension services with Age (2.07*),level of education(3.39**),main occupation(-2.46*) and income(-3.25.Hypotheses 2 and 3 also revealed that the level of use of agricultural extension services have significant effect on the women's income and output performance indices with F-statistics value of 107.42**,72.11** and r 0.4622,0.3658 respectively. It is recommended that women farmers need education and training for better understanding of extension services and programmes which will provide assistance to them, for improved agricultural production. Women agricultural cooperative members need training on financial inclusion that they can use all available sources of credit for enhancement of agricultural activities and this will boost food security in the Southeast and Nigeria in general.

KEYWORDS: *Agriculture, Extension, Cooperatives, Women, Extension Services and Perform*

How to cite this paper: Okafor I. P. | Umebali E. E "Effects of Agricultural Extension Services on the Performance of Members of Women Agricultural Cooperatives in South East, Nigeria" Published in International Journal of Trend in Scientific Research and Development (ijtsrd), ISSN: 2456-6470, Volume-4 | Issue-1, December 2019, pp.295-306, URL: https://www.ijtsrd.com/papers/ijtsrd29544.pdf

IJTSRD29544

INRODUCTION

Background to the Study

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 have become most urgent questions 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 of African countries (Nigeria inclusive) to reverse the worsening food and agricultural trends towards sustained agricultural growth. This has necessitated putting in place a combination of factors comprising the right technology, effective extension services, access to physical inputs, adequate market support services and some infrastructures to improve agricultural productivity and raise the standard of living of rural dwellers (Aphamu & Obikhian, 2008).

Cooperatives are one of the most effective vehicles for efficient mobilization of production resources and accelerated rural development. The importance arises from the fact that the small-scale individual capacity of the peasants production, cannot cope with technological and capital demands of modernized agriculture (Omotesho, 2008). Cooperative organizations play very important role in the socio-economic life of the nation. Cooperatives can be identified as an autonomous, association of persons united voluntarily to meet their common, economic, social and cultural needs and aspirations through jointly owned and democratically controlled enterprise. In Nigeria, majority of

the agricultural cooperatives at different levels are multipurpose in their function. Not only do they operate banking business, but they also deal with other support series such as input supply, marketing and purchasing which is critical to agricultural development (Abdulquadri & Mohammed 2012). Cooperative Societies in Nigeria like their counterparts all over the world are formed to meet people's mutual needs. Cooperatives are considered useful mechanism to manage risks for members in agriculture. 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).

Women Agricultural Cooperative Societies have created many outlets in the rural and semi urban areas of the South East, creating value chain and enhancing productive capacity and competitive ability among farmers' standards of farm produce. The various administrations of government are yet to improve the system of agriculture to a significant level. Majority of the benefits accrued from the government policies and programmes have been denied of the commercial farmers, who have adequate and enough resources for mechanical farming. 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 in 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)

In general, women agricultural cooperative and all other cooperatives help members to attain well-being satisfaction which they cannot achieve if they are to venture into agriculture singly or individually. Women farmers in Africa are productive force in subsistence agriculture participation, active in the primary production of food crops, animal production, and transportation of food crops from the farm to the house, processing, storage and marketing (Banji & Okunade, 2005).The contribution of women in agricultural development is an established fact. Women are equal partners to men in all chains or aspects of agricultural production. Women are responsible for at least 70% of food staple production in Africa (Okunade 2005). They are also important in other agricultural activities, including food processing, marketing, cash crop production and livestock. Women's involvement is significant not only in terms of their labour input, but also in terms of decision-making authority.

The agricultural extension services operates 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. Moreover, Aphum and Obikhian have posited that successful adoption of improved farming techniques is predicated upon rural farmers acquiring the knowledge and have better understanding of these technologies, a process most effectively accomplished by the Agricultural Development Programme (ADP) extension strategy to enhance productivity in order to raise the living standard of rural dwellers (Omoyemi & Yisa 2005).

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). The Federal Government introduced the Agricultural Development Programme (ADP) among others. The ADP is primarily an extension organ put in place by the Federal government to advance food and fibre production in Nigeria. The programme was launched in 1975 with the aim of accelerating food production and increasing farmers' income through an integrated farm inputs supply and overall development of agriculture. The state government, federal government and the World Bank tripartite fund the programme in order to address the problem of agricultural production and the role extension services play in the overall agricultural development. This makes the ADPs the main agent of extension delivery in the new system. 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. The extension agents also perform the function of counseling the farmers on how to make wise decisions in farm management. The extension agents are expected to play a significant role in the extension system, and they will be responsible in the dissemination of agricultural technologies to the farmers, link research and farmers,=(Oladimeji 2004).This study therefore seeks to examine the effect of extension services on the performance of women agricultural cooperative societies in the South-East, Nigeria.

Objectives of the Study

The broad objective of the study is to assess the effects of agricultural extension services on the performance of members of women agricultural cooperatives in South East, Nigeria. The specific objectives are to:

1. Find out the socio-economic characteristics of the members of the women agricultural cooperative in Southeast, Nigeria.
2. Determine the influence of the socioeconomic characteristics of the members of the women agricultural cooperatives on their use of Agricultural Extension Services (AES).
3. Determine the effect of use of Agricultural Extension Services (Technology, Advisory and Facilitation) by member of the women agricultural cooperatives on their performance (Output and income).

Hypotheses of the Study

1. H_0: Socio economic characteristics of members of the women agricultural cooperatives have no significant effect on their use of agricultural extension services.
2. H_0: The level of use of agricultural extension services does not have significant effect on income performance indices of the members of women agricultural cooperatives.
3. H_0: The level of use of agricultural extension services does not have significant effect on output performance indices of the members of women agricultural cooperatives.

REVIEW OF RELATED LITERATURE

Agriculture in Nigeria

Anyanwu (2000) defined agriculture as the use of land for raising plants and animals useful to man. It is the science or business of raising plant and animals useful to man. It implies the cultivation of the soil, the production and harvesting of crops, the care and breeding of livestock.

Agriculture is the use of land for farming or pasturage for production of food, forage and primary product for energy purpose or to further industrial improvement or preparation. Agriculture refers in the processes involved in the controlled production of plant and animal materials which are used by man (Nwosu, 2002) from the definition above, we may assume that production of food is solely for man's survival. Agriculture needs to be man transformed, not only for man's survival, but also, the improvement of the family in order to produce sufficient high commodities for export that will be in increase of the micro economic condition of the rural people and pulling them out of the vicious cycle of poverty (Nwosu. 2002), In Nigeria, farming is mostly performed by individual farmers who use obsolete technology for their farming practices and are unskilled themselves (Anyanwu, 2000). Successive government has engaged their attention to the development of the Nigerian agriculture. Many agricultural programmes and schemes have been launched. International donor, governments and nongovernmental organizations as well as famer's cooperatives had invested in the development of Nigerian agriculture (Mgbakor, Uzendu & Ogbumuo, 2013) and the establishment of agricultural research institutes at different sectors to enhance productivity. Agriculture is the main slay of National Economy. Farmers spend most of their manpower and energy in the endless quest for food but the farming conditions of the producer (the rural farmers) have been made worse by the nature of their farming implement and tools. To this effect, most people always work in the edge of poverty earning a living as he knows best with primitive implement (Mgbakor, Uzendu and Ogbumuo 2013). However, to solve the individual farmer's problem and society at large, the government has opened up an agency in the ministry of Agriculture and Natural Resources Extension services. This agency is responsible for extending scientific knowledge, improving the skills, changing the attitude of the rural farmers, increasing their income and enhancing their living standard by their own efforts, using their own resources, manpower and materials. (Nwachukwu, 2005) opined that, with assistance from government, but the ministry responsible for the execution of this idea did not live up to expectation. Hence farmers' cooperatives were organized by the extension services to serve as a link, through which individual farmer members' could be helped to accept improved technology on sustained basis.

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. Agriculture for Impact (2018), also stated that Extension Services are Classified into three types. They are: Technology transfer, Advisory and Facilitation.

Technology transfer according to him is the traditional model of the transfer of advice, knowledge and information in a linear manner; Advisory – the use by farmers of a cadre of experts as a source of advice in relation to specific problems faced by them while Facilitation – the aim of this model is to help farmers to define their own problems and develop their own solutions (Agriculture for Impact, 2018). 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."

Again, agricultural extension is an approach that aims to provide uninformed farmers and their household 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 agricultural extension going by formal standards; it adopts education techniques in rendering assistance to farmers. Educational assistance or advice so rehired 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 grounds 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.

MATERIAL AND METHODS

Area of the Study

The area of the study is Southeast 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 southeast 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 Igbo race and the language is Igbo though English is widely spoken and used as official language in governance. They are predominantly Christians. The Igbos are very daring, competitive, hard-working and enterprising. They can be found doing business virtually in all parts of the world. The Igbos 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 populations 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, aluminum etc. The arable land made it a beacon of agriculture and unique in production of palm oil, cassava, yam, coco yam, 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 farm for their 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. This study covers the women agricultural co-operative societies in the Southeast geo-political zone 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 6455 women agricultural cooperatives with their membership strength which was 133,841 constituted the population of this study. 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, Taro Yamane formula was adopted to get n = 398.8081138, n =approximately 399 respondents. Only 379 copies of questionaire were diligently filled and returned, after data sorting and filtering.

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,

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. 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 data for this study were analysed with both descriptive and inferential statistics. The descriptive statistics was used to analyse the set objectives of this study. Objective one was analysed with frequency table, simple percentage, as well as average mean. Objective 3 was subjected further to the mean threshold of 5 point likert scale. Objective 2 was achieved with ordinary least square regression while the t-ratio from the results of the four functional form of multiple regression were used to ascertain the significance of hypothesis one while A-one way ANOVA analysis was used to test the significance of hypotheses 2 and 3.The results were presented as follows.

RESULT AND DISCUSSIONS

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

Table1: 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 2018.

The Socio-Economic Characteristics of the Women Agricultural Cooperative Members in the South Eastern Zone of table 4.1 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.

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.

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

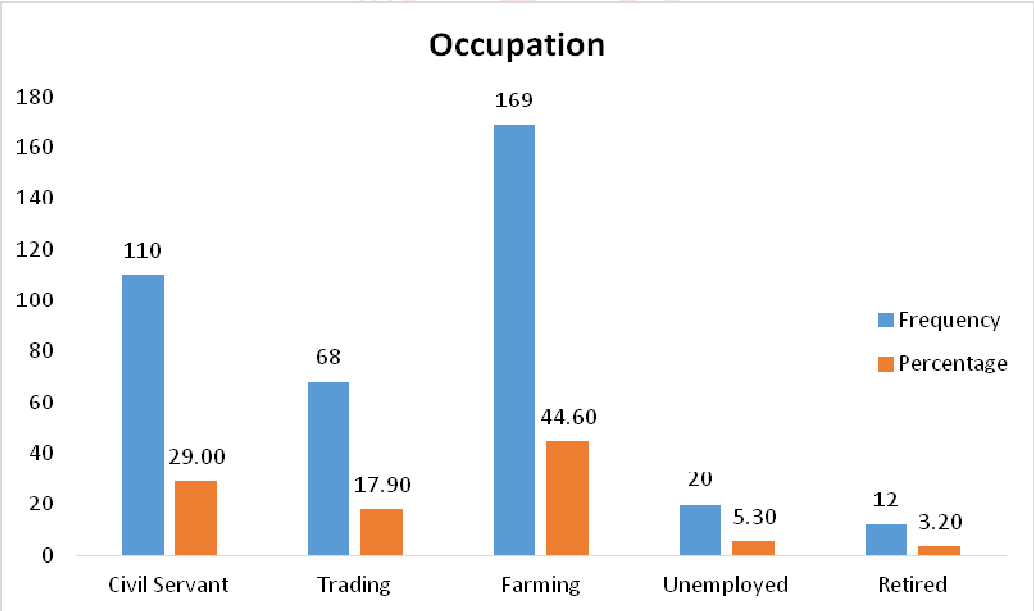

Figure 1: Occupation of Cooperative Women in the South East Zone.

Occupation: figure 1 above 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, 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.

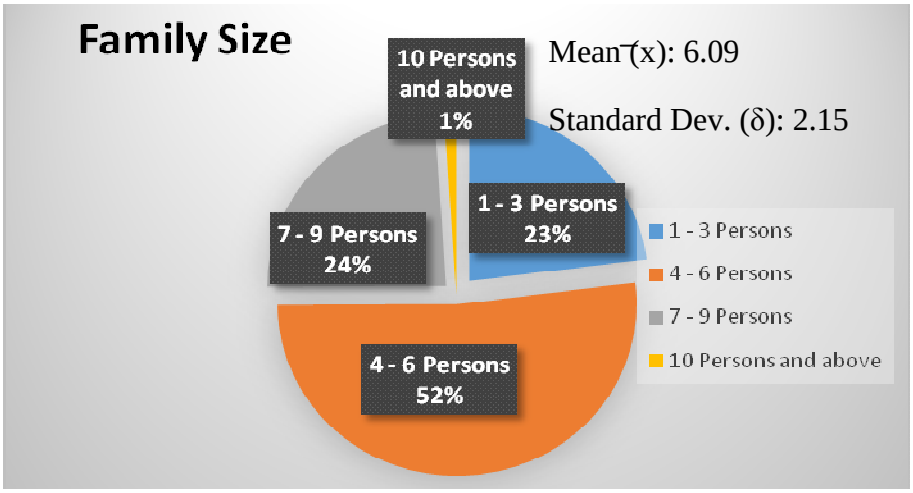

Figure 2: Family size of Cooperative Women in the South East Zone.

Family size: the figure 2 above 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.

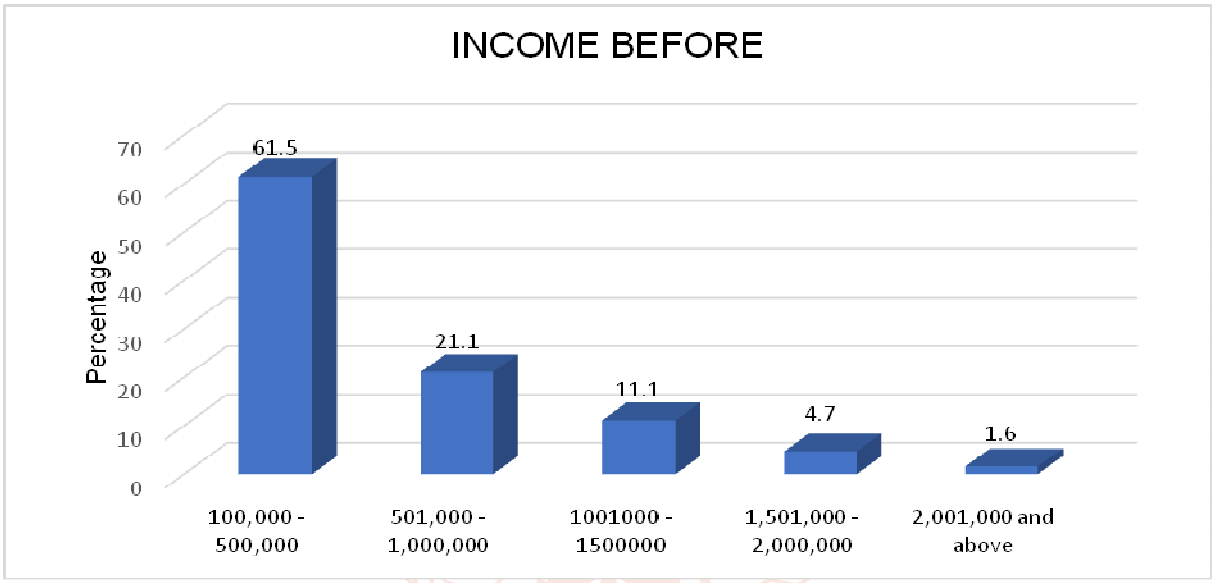

Figure 3: Income range of Cooperative Women in the South East Zone before the use of agricultural extension service.

Income of Women before the use of the Agricultural Extension Services: the figure 3 above shows that majority (61.50%) of the women's income before the utilization of agricultural extension in southeast 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.

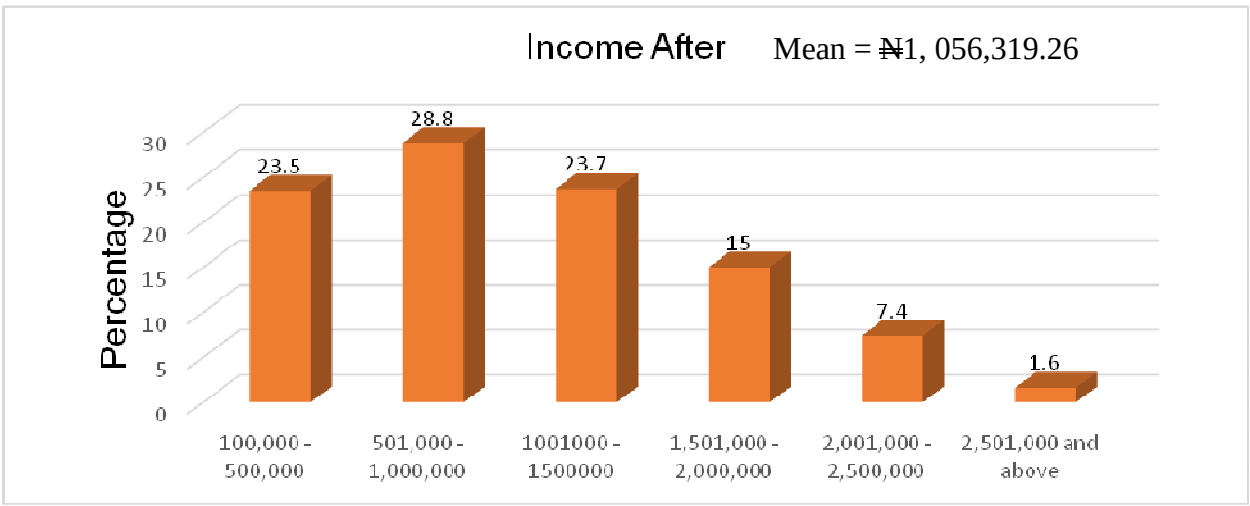

Figure 4: Income range of Cooperative Women in the South East Zone as a result of extension service.

Income of Women as a result of the use of Agricultural Extension Services: the figure 4 above shows that majority (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.

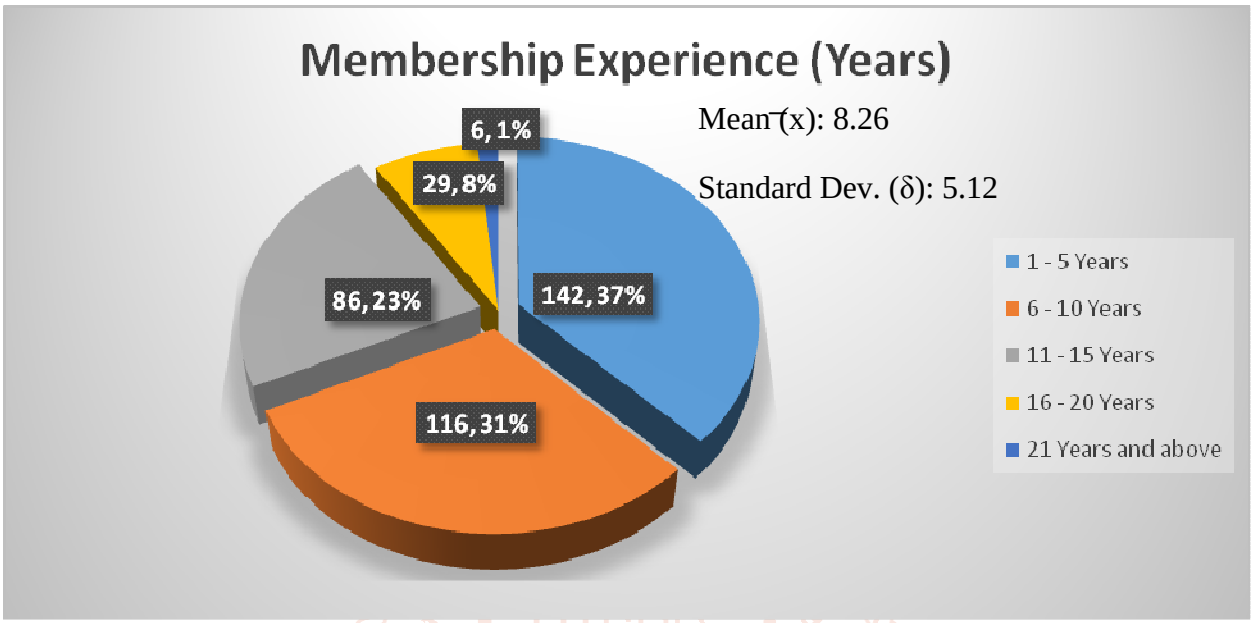

Figure 5 :Membership Experience of Cooperative Women in the South East Zone.

Membership Experience: the figure 5 above 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.

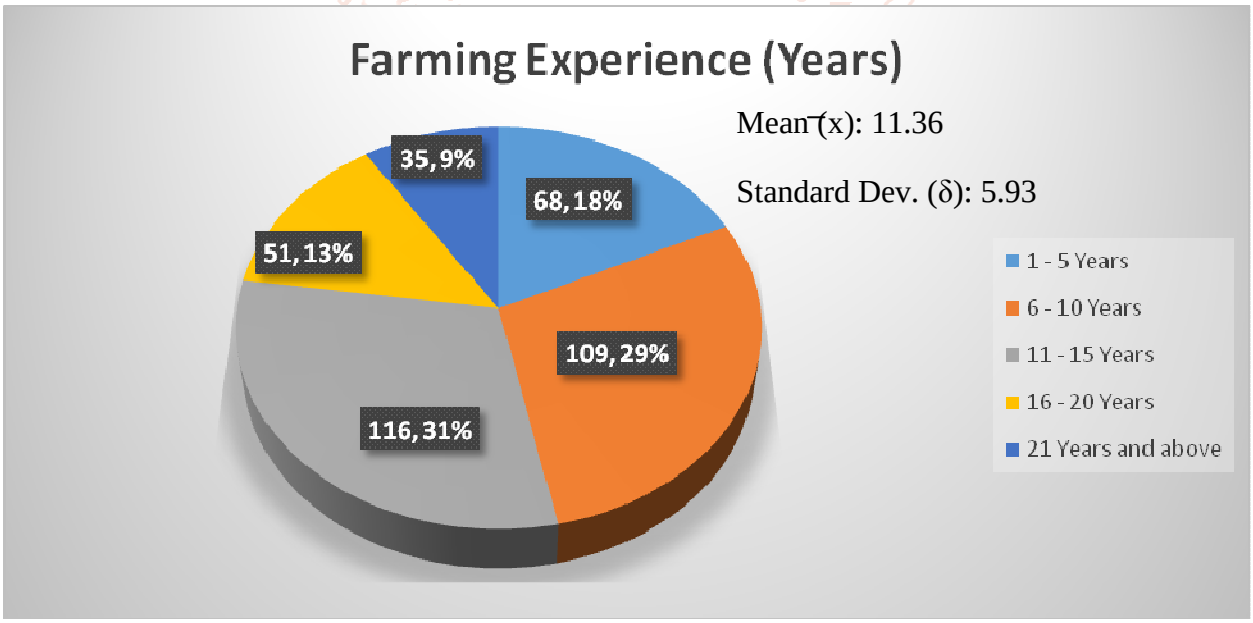

Figure 6 :Farming Experience of Cooperative Women in the South East Zone.

Farming Experience: the figure 6 above 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.

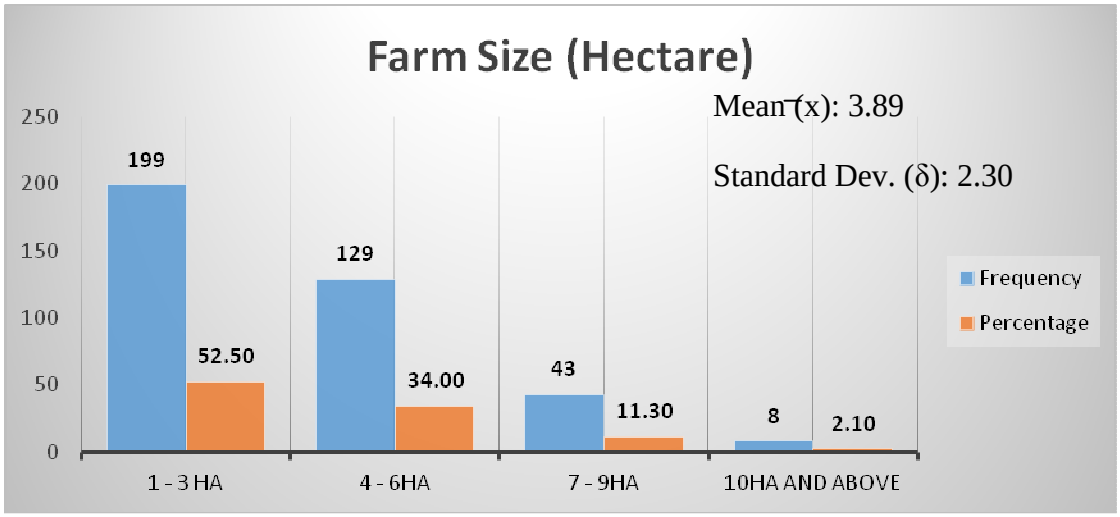

Figure 7: Farm Size of Cooperative Women in the South East Zone.

Farm size: the figure 7 above 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..

Socioeconomic Characteristics effects on the use of Agricultural Extension Services (AES) among women members of Agricultural cooperative Southeast

Table 2 Socioeconomic characteristic effect on extension use in South East

Variable	Linear	Exponential	Semi Log	Double Log
Intercept	3.57905 (19.10)	4.380602 (6.23)	1.259638 (22.81)	1.475716 (7.12)
Age (X_1)	0.004854 (1.62)	0.245358 (2.07)*	0.0012864 (1.47)	0.064225 (1.84)
Level of education (X_2)	0.064097 (2.80)*	0.237086 (3.39)**	0.0171816 (2.54)*	0.0652342 (3.17)**
Marital status (X_3)	0.049597 (1.38)	0.107962 (1.76)	0.0191276 (1.81)	0.0392482 (2.17)*
Primary Occupation (X_4)	-0.058957 (-2.36)*	-0.128431 (-2.46)*	-0.0147036 (-1.99)*	-0.0328504 (-2.14)*
Family size (X_5)	-0.031282 (-2.51)*	-0.103426 (1.93)	-0.0101988 (-2.77)*	-0.0346622 (2.17)*
Income (X_6)	-1.63e-07 (-3.68)**	-0.129809 (-3.25)**	-4.32e-08 (-3.30)**	-0.034662 (-2.95)**
Membership experience (X_7)	0.0136529 (1.02)	0.025249 (0.54)	0.0014577 (0.86)	0.016599 (1.05)
Farming experience (X_8)	-0.003354 (-0.47)	0.040739 (0.76)	-0.000979 (0.47)	-0.0067794 (-0.47)
Farm size (X_9)	0.013653 (1.03)	0.053165 (0.96)	0.003985 (1.02)	0.149418 (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 2018.

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) were explained by the joint action of the women farmers socioeconomic characteristics, while the remaining 89.08% unexplained was due to error beyond the control of the women farmers, while 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%. 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%. 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 southeast will not significantly affect the level of use of agricultural extension services in Southeast.

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%. 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%. The coefficient of membership experience (0.025249) was positive and statistically not significant at either 5% or 1% level of probability indicating that a unit increase in membership experience among women farmers in Southeast, 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 Southeast will not affect the use of agricultural extension services in the area.

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 Southeast, 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.

Determination of the Effect of Agricultural Extension Services on performance (Output indices) of Women Agricultural Cooperative Members in the South Eastern Zone of Nigeria

Table3: Effect of Agricultural Extension Services on Women Output indices

Serial No	Variables	Mean	Standard Dev.	Decision
	Output Performance Indices			
2	Dry season vegetable gardening has equally increased output	3.97	1.11	Agreed
3	Cassava/maize/vegetable intercropping has increased yield	4.25	0.82	Agreed
4	New technique on crop multiplication production has increased output	4.07	0.94	Agreed
5	New technique on production increased the hectare of land cultivated	3.93	1.10	Agreed
6	Seed treatment using dressing chemicals and insecticides has reduced waste and increased output	4.08	1.04	Agreed
7	Use of improved seeds and fertilizer application increased yield	4.25	0.88	Agreed
8	High opportunity for processing increased market output	3.99	0.89	Agreed
9	Knowledge transfer and facilitation enable stronger farm risk management and increased yield	4.03	0.92	Agreed
	Grand Decision	**4.07**	**0.71**	**Agreed**

Source: Computed from Field Survey Data, December 2018.

The mean threshold of the output indices of women members of an agricultural cooperative in South Eastern Nigeria was obtained with the aid of the 5 – point Likert scale, the mean thresholds were later interpreted as greater than or equal to 3.0 as Agreed and less than 3.0 as Disagree. Based on the nine (9) items of table 4.5 that identified the effect of agricultural extension services on the output of women farmers, 9 of them had a mean threshold of 3.0 and above. Thus; the women agreed that agricultural extension services received by the women had the following effect on their output indices; Vegetable storage has increased all year round availability of the produce, Cassava/maize/vegetable intercropping has increased yield, Seed treatment using dressing chemicals and insecticides has reduced waste and increased output, and Use of improved seeds and fertilizer application increased yield, among others as listed in table 4.5 above. The grand mean threshold was found to be **4.07** and a standard deviation of **0.71**. This means that the farmers strongly admitted that extension services had an effect on their output indices in southeastern state

Determination of the Effect of Agricultural Extension Services on performance (Income indices) of Women Agricultural Cooperative Members in the South Eastern Zone of Nigeria

Table4.: Effect of Agricultural Extension Services on Women Income indices.

Variables	Mean	Standard Dev.	Decision
Value-added products such as Zobo making, Soya milk, Fruit processing, Okpa; have indeed enhanced my income	4.05	1.16	Agreed
Processed fish has high rate of return on investment	3.76	1.04	Agreed
Vegetable storage facilities have indeed ensured all year round availability of produce for increased income	3.80	1.24	Agreed
Engaging in soap and pomade making from the residue of processed palm oil have diversified and enhanced my income	3.62	1.16	Agreed
Dry season vegetable gardening for steady income has been achieved	3.68	1.15	Agreed
Cassava/Maize/Vegetable intercropping reduced the amount spent on fertilizer and has enhanced my income	4.09	1.04	Agreed

New technique on cocoyam production has increased my output and increased income supply	4.00	0.98	Agreed
New technique on rice production has increased my crop yield and increased my income	4.11	0.96	Agreed
Seed treatment using seed dressing chemicals and insecticides have improved crop yield and my income	3.96	1.17	Agreed
Use of herbicides for clearing grasses has reduced money spent on labour and improved my income	3.96	1.18	Agreed
Broiler, Layer, Local chicken production and goat keeping are a good source of manure to my farm and also increased the income generated from farming	4.39	0.80	Agreed
Ground Decision	**3.95**	**0.88**	**Agreed**

Source: Computed from Field Survey Data, December 2018.

The mean threshold of the income indices of women members of an agricultural cooperative in South Eastern Nigeria was obtained with the aid of the 5 – point Likert scale, the mean thresholds were later interpreted as greater than or equal to 3.0 as Agreed and less than 3.0 as Disagree. Based on the eleven (11) items of table 4 that identified the effect of agricultural extension services on the income of women farmers, 11 of them had a mean threshold of 3.0 and above. Thus; the women agreed that agricultural extension services received by the women had the following effect on their income indices; Value-added products such as Zobo making, Soya milk, Fruit processing, Okpa; have indeed enhanced my income, Cassava/Maize/Vegetable intercropping reduce the amount spent on fertilizer, New technique on cocoyam production has increased output for increased income supply, New technique on rice production has increased my crop yield for increased income, Broiler, Layer, Local chicken production and goat keeping are good source of manure to my farm and also increased income generated from farming, among others as listed in table 4 above. The grand mean threshold was found to be **3.95** and a standard deviation of **0.88**.

Test of Ho_1; Socioeconomic 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 three. 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.

Table 5: 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 2018.
* Significant at 5% and ** Significant at 1% level of probability.

Table 6 Test of Ho_2: the level of use of Agricultural Extension Service (Technology, Advisory and Facilitation) does not have a significant effect on the women's income performance in the study area. ANOVA on Income and Extension use

Number of Observation = 379 Root MSE = 0.479581			R-squared = 0.4622 Adj R-squared = 0.4579		
Source	**Partial SS**	**DF**	**MS**	**F**	**Prob>F**
Model	74.119359	3	24.706453	107.42	0.000
Extension use	74.119359	3	24.706453	107.42	0.000
Residual	86.249132	375	0.22999769		
Total	**160.36849**	**378**	**0.42425527**		

Source: Computed from Field Survey Data, December 2018.

The one-way Analysis of variance (ANOVA) was carried out to ascertain the significant effect of the use of the 3 agricultural (Technology, Advisory, and Facilitation) extension services on the income performance indices by women members of cooperative society in South Eastern Nigeria. The researcher made use of the mean threshold of the income performance indices as a dependent variable, while the mean threshold of the 3 (Technology, Advisory, and Facilitation) extension services were summed and categorized into; to vary greatly utilized = 5, greatly utilized = 4, somewhat utilized = 3, seldomly utilized = 2, and not at all = 1. The analysis used equal sample size (379) of both dependent and independent variables. The result produced by Stata 14.0 software includes; F – statistics value of 107.42** and r^2 (Coefficient of correlation) 0.4622. This

signifies that 46.22% variation in the income performance indices was explained by the action of the agricultural extension use by women members of a cooperative in the study area, while the remaining 53.78% was as a result of the error beyond the control of the farmers. The F-stat. was significant at probability level of 0.000 which means the study on significant effect of extension use on income indices is normally distributed and the **null hypothesis rejected**

Table 7: Test of Ho_3: the level of use of Agricultural Extension Service (Technology, Advisory, and Facilitation) does not have a significant effect on the women's output performance in the study area. ANOVA on Output and Extension use.

Number of Observation = 379 Root MSE = 0.551876			R-squared = 0.3658 Adj R-squared = 0.3608		
Source	**Partial SS**	**DF**	**MS**	**F**	**Prob>F**
Model	65.883568	3	21.961189	72.11	0.000
Extension use	65.883568	3	21.961189	72.11	0.000
Residual	114.21287	375	0.30456766		
Total	**180.09644**	**378**	**0.47644561**		

Source: Computed from Field Survey Data, December 2018.

The one-way Analysis of variance (ANOVA) was carried out to ascertain the significant effect of the use of the 3 agricultural (Technology, Advisory, and Facilitation) extension services on the output performance indices by women members of cooperative society in South Eastern Nigeria. The researcher made use of the mean threshold of the output performance indices as a dependent variable, while the mean threshold of the 3 (Technology, Advisory ,and Facilitation) extension services were summed and categorized into; to vary greatly utilized = 5, greatly utilized = 4, somewhat utilized = 3, seldomly utilized = 2, and not at all = 1. The analysis used equal sample size (379) of both dependent and independent variables. The result produced by Stata 14.0 software includes; F – statistics value of 72.11** and r^2 (Coefficient of multiple determinant) 0.3658. This signifies that 36.58% variation in the output performance indices was explained by the action of the agricultural extension use by women members of a cooperative in the study area, while the remaining 63.42% was as a result of the error beyond the control of the farmers. The F-stat. was significant at probability level of 0.000 which means the study on significant effect of extension use on output performance indices is normally distributed and the **null hypothesis rejected**.

SUMMARY, CONCLUSION AND RECOMMENDATIONS

Summary of Finding

1. The researcher found out that majority (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 8.26 and the mean farming experience was 11.36, with an average of 3.89 hectares on a contiguous base.
2. The research equally revealed that the women output (Vegetable storage has increased all year round availability of the produce, Cassava/maize/vegetable intercropping has increased yield, Seed treatment using dressing chemicals and insecticides has reduced waste and increased output, and Use of improved seeds and fertilizer application increased yield, etc. and income (Value-added products such as Zobo making, Soya milk, Fruit processing, Okpa; have indeed enhanced my income, Cassava/Maize/Vegetable intercropping reduce the amount spent on fertilizer, New technique on cocoyam production has increased output for increased income supply, New technique on rice production has increased my crop yield for increased income, Broiler, Layer, Local chicken production and goat keeping are good source of manure to my farm and also increased income generated from farming, etc. performance indices had a grand mean threshold of 4.07 and 3.95 respectively.

Conclusion and Recommendations

The effect Agricultural Extension Services (Technology, Advisory, and Facilitation) have on the Performance of Members of the Women Agricultural Cooperatives in South East, Nigeria cannot be overemphasized as the results are evident to draw conclusion that, 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.). While the use of agricultural extension service significantly influences improvement in the output and income indices of the women. The following recommendations were made based on the findings; they include:

1. Women cooperative farmers need education and training, for better understanding of extension services and programmes which will provide assistance to them for improved agricultural production.
2. Women need training on financial inclusion so that they can exploit all available sources of credit, record has also shown that women farmers have more loan repayment history than their male counterpart, therefore; women agricultural cooperative members should be granted more access to credit to enhance agricultural production.

REFERENCES

[1] Agbamu, J. U. (2005); Problem and Prospects of Agricultural Extension Service in Development Countries in Agricultural Extension in Nigeria S. F. Afolayan (ed) Ilorin AESON, P. 159 – 169

[2] Agriculture for Impact (2018), Agriculture for Improving Growing Opportunity for Africa's Development, https://ag4impact.org

[3] Aphamu & Obikhhian (2008); Agricultural Extension Services Delivery and Adoption of Agricultural Technologies among Rural Women Cooperators in Ogbaru Local Government Area of Anambra State

[4] Asiabaka, C. C. & Owens, M. (2002); Determinants of Adoptive Behaviors of Rural Farmers in Nigeria. Proceedings of the 18th AIAEE Annual Conference Durban, South Africa

[5] Abdulquadri A. F & Mohammed B. T (2012); The Role of Agricultural Cooperatives in Agricultural Mechanization in Nigeria. National Centre for Agricultural Mechanization (NCAM), P.M.B. 1525, Abuja.

[6] Banji, O. A & Okunade, E. O. (2005); Women in agricultural and rural development, *Journal of agricultural extension society of Nigeria*, AMTI, Ilorin.: 69-76.London, Benson Publishers Ltd.

[7] Bob I. C (2006) Principles and Economics of Cooperation Enugu: Bob Billion Publishers, Enugu.

[8] Ebonyi, V. & J imoh, O. B., (2002) Cooperative Movements; A way out of Poverty. Lagos, Longman Publishers. *International Journal of Education and Development using Information and Communication Technology (IJEDICT), 2013, Vol. 9, Issue 1, pp. 80-99.*

[9] Oladimeji I.O (2004) Effect Of World Bank Loan Withdrawal On The Performance Of Agricultural Extension In Nigeria. *European Scientific Journal October edition vol. 8, No.24 ISSN: 1857 – 7881* (Print) e - ISSN 1857- 7431

[10] Omotosho, O (2008). Global Food Crisis and National Food Security: Strategic Options Nigeria. Paper Presented at the 2008 Annual Conference Held at the Orchid Hotels, Delta State, Asaba.

[11] Omoyemi B. A., &Yisa J. J. (2005). Enhancement of Fish Production in Bornu State with Extension Services. Federal College of Freshwater Fisheries Technology.PMB 1060, Maiduguri Bornu State.

[12] Sanga, C, Kalungwizi, V. J & Msuya C. P (2013) Building an agricultural extension services system supported by ICTs in Tanzania: Progress made, Challenges remain.