Agricultural Science Research Journal Vol. 7(6): 205 – 214, June 2017
Available online at http://resjournals.com/journals/agricultural-science-research-journal.html
ISSN: 2026 –6073 ©2017 International Research Journals

Full Length Research Paper

Analysis of Socio-economics factors affecting adoption of seed yam production using minisett technique by rural farmers in Etche Local Government Area of Rivers State of Nigeria

***Nwaiwu J.C[1] and Okeke Margaret Ngozi[2]**

[1]Department of Agricultural Economics, Extension and Rural Development, Imo State University Owerri

[2]Department of Agricultural Economics, Extension and Rural Development, Chukwuemeka Odumegwu Ojukwu University (COOU) Igbariam Campus, Anambra State, Nigeria

*Corresponding author: juanhyginus04@yahoo.com

Abstract

Nigeria produces about 70% of the world's yam accounting for about 39.9 million tonnes. The major constraint has been that of seeds which accounts for about one-third of the total production cost. In order to reduce this perennial production problem, yam minisett technology developed by National Root Crop Research Institute, Umudike was thought to be an alternative to solving the seed problem. The study sought to bring clarity to this discourse by analyzing socio-economic factors affecting adoption of seed yam production using minisett technique by rural farmers in Etche Local Government Area of Rivers State of Nigeria. The study examined the socio-economic characteristics of the farmers and identified the constraints to effective adoption of minisett technology. Fifty household yam farmers were selected using purposive random sampling technique from areas predominated in yam production. Well-structured questionnaire was the main tool for data collection. The mean age was 41.06 years, majority (76.00%) were males, greater proportion (74.00%) were married with an average household size of 6 persons. Farmers cultivated an average farm size of 1.41ha, average monthly farm income was ₦33, 520.00. Findings also revealed that majority of the respondents (82.00%) were members of cooperative society with extension contacts of once in a month. Estimated regression model showed that farmers' socio-economic characteristics affected adoption of seed yam minisett technology at 1% level of probability. The F-ratio was 11.436 revealing the overall significance of the regressor. However, farmers complained of inadequate fund and inadequate information barriers in adopting seed yam minisett technology disseminated in the area. This study therefore recommends that farmers' socio-economic factors should be considered necessary in designing any agricultural extension intervention strategies in the area. Government should rigorously address farmers' poor access to fund by granting farmers subsidy and soft loan at 0% interest rate.

Key Words: Socio-economic, Factors, Seed yam production, Minisett technique, Rivers State.

Introduction

Yam is one of the root crops produced in Nigeria and is the second most important tropical root crop in West Africa after Cassava (Osunde, 2008). It has as many as 600 species out of which six are economically important staple species. They are *Dioscorea rotundata* (white guinea yam), *Dioscorea alata* (yellow yam*), Dioscorea bulbifera* (aerial yam), *Dioscorea esculenta* (Chinese yam) and *Dioscorea dumetorum* (trifoliate yam). Out of these, *Dioscorea rotundata* (white yam) and *Dioscorea alata* (water yam) are the most common species found in Nigeria (Anozie *et al.,* 2014). Yams are grown in the coastal region in rain forest, woody savanna and southern savanna agroecology. Yam is in the class of roots and tubers that is staple of the Nigerian and West Africa diet, which provides around 200 calories of energy per capita daily. In Nigeria, in many yam-producing area, it is said

that “yam is food and food is yam” (Bolarinwa and Oladeji, 2009).

Seed yam otherwise called yam-planting material is the most essential input of yam tuber production. It constitutes over 40% of capital outlay in yam production in Nigeria (NRCRI, 2015). Sometimes the planting materials are not readily available as they may also be eaten. It is important in terms of quantity and quality. Seed yams are small yam tubers weighing between 600 and 800 gm. The major constraint to increased yam production therefore includes scarcity and high cost of seed yams. Seed yams are the planting materials used in the field production of ware yam consumed as food. The traditional way of yam cultivation entails cutting of big yam tubers into smaller pieces and planted directly in the field. This method makes the supply of planting materials to be very critical. This exposes the planting material to a lot of hazards and the yield obtained from the method will be very poor (Lawal *et al.,* 2014).

In the late 1970s, the minisett technique was developed and had since been shown to be a cost-effective way for yam farmers to grow their own seed and plant more yams than traditional methods (Oguntade *et al*., 2010). Yam minisett technology provides seed yam rapidly. It is designed to alleviate the problem of seed yam scarcity, which has been identified as a major constraint to increased yam production. The technique utilizes a small (25-30g) part of a whole non-dormant tuber containing periderm and some cortex parenchyma. The minisett is sown and the resulting tuber is sufficiently large to serve as a seed tuber that is suitable for the production of food tubers. Yam production in Africa is constrained by several factors including the limited availability and loss of planting material as well as the high cost of labour for operations such as land preparation, staking, weeding, harvesting and storage (Oguntade *et al.,* 2010). Thus, the higher a farmers’ socio-economic status, the better his adoption behavior tends to blow when compared with other farmers.

Methodology

The study was conducted in Etche Local Government Area (LGA) of Rivers State of Nigeria. It is located in the northeast of Rivers State. It is bounded in the east by Abia State, in the north by Imo State, in the west by Ikwerre LGA and in the south by Obio-Akpor LGA (Rivers-ADP, 2012). It comprises of about thirty communities. Etche has a land mass of 97,500 hectares (376.5 square meters) with a population estimated to be about 600,000 (NPC, 2006; NBS, 2007). Etche is the fourth ethnic group in Rivers State mostly engaged in agriculture. Due to its fertile land crisscrossed by major fresh water rivers (Otamirioche, Ogueche and Imo River), farming is the major occupation of Etche people, which accounts for the dubbing of Etche as “bread basket” of Rivers State (http://www.thisdaylive.com/articles/etche). The crops commonly produced in Etche include yam, plantain, cassava, etc. The purposive and simple random sampling techniques were adopted for this study.

The study population included rural farmers whose lists were collected from Agricultural Development Programme in Port-Harcourt and from Etche Local Government Headquarter, Okehi. Ten (10) communities were purposively selected based on the fact that rural farmer who are into yam production are found in those communities. Five farmers were randomly selected from each community. This brought the total sample size of the study to fifty (50) farmers, who constituted the respondents for the study.

Data collected were analyzed using descriptive statistics such as means, percentages, frequency distribution and inferential statistics such as regression. The null hypothesis was tested using multiple linear regression model. The implicit model is given as follows:

$$Y = f(X_1,X_2,X_3,X_4,X_5,X_6,X_7,X_8,X_9 + ei)$$

where,

Y = Level of Adoption (4-point Likert Rating)

X_1 = Age (years)

X_2 = Farm size (Hectare)

X_3 = Educational level (years)

X_4 = Farming experience (years).

X_5 = Household size (Number of persons) Farm size (Hectare)

X_6 = Farm income (₦)

X_7 = Membership of Cooperative (Member = 1, otherwise = 0)

X_8 = Extension Agent Contact (Number of Visit per month)

e_i = error term

Results and Discussion

Age

The result of farmers’ distribution based on age is presented in Table 1. It shows that greater proportion (54.00%) of the farmers fell within the age bracket of 41-50 years. It also revealed that about 28.00% of the farmers were less than 40 years of age, while approximately 18.00% fell within the age bracket of 51-60 years. The mean age was 41.06 years. This is an indication that the majority of the yam farmers in the study area are in their agriculturally active years. The implication is that these younger farmers are likely to adopt yam minisett production techniques faster than the older ones in the area. This finding is in agreement with Waziri *et al.* (2014) who opined that majority of farmers within the age range of 41 to 50 years are still in their active age, more receptive to innovation, more technically efficient, effective and could withstand the stress and strain involved in seed yam minisett production. In a similar way, Okoro and Ajieh (2015) also reported that older farmers are known not to be enthusiastic about new farm technologies, especially if the benefits are not expected in the near future, but at the same time, farmers with advanced age are associated with more experience and thus likely to

adopt the yam minisett technology disseminated in the study area.

Table 1: Distribution of the Farmers by Age

Age (Years)	Frequency	Percentage (%)
Less than 40	14	28.00
41-50	27	54.00
51-60	9	18.00
Total	**50**	**100.0**

Mean($\bar{X}$) Age: 41.06 years; Source: Field Survey Data (2016)

Gender

The result of the farmers' distribution based on gender is shown in Table 2. It reveals that majority (76.00%) of the farmers were males while about 24.00% were females. The study implies that both genders are involved in agricultural production but males were more involved than the females. The probable reason for males large proportion may be that technical efficiency and productivity is expected to be higher because males have the tendency to be more labour efficient as opined by (Lawal *et al.,* 2014). This finding is in agreement with the study of Bolarinwa and Oladeji (2009) where yam was observed and considered to be males' crops in Africa because it is labour intensive. In the same vein, the result could also be attributed to the socio-cultural factor which gives males huge access to production variables such as farmland, labour and other productive inputs more than female as outlined by Anozie *et al.* (2014).

Table 2: Distribution of the Farmers by Gender

Gender	Frequency	Percentage (%)
Male	38	76.00
Female	12	24.00
Total	**50**	**100.0**

Source: Field Survey Data (2016)

Educational Level

The result of farmers' distribution based on educational level is presented in Table 3. It shows that majority (56.00%) of the farmers had secondary education, about 24.00% had primary education, and approximately 12.00% had tertiary education while 8.00% had no formal education. The mean educational level was 9.50 years. The implication of the findings is that approximately 92% of the farmers had training in formal educational institutions and hence increases literacy levels. This suggests that most farmers are likely to exhibit positive attitudes towards the adoption of new technologies since education influences adoption rates. It is also expected that the higher level of education will contribute significantly to decision making of a farmer. This suggests that higher educational level influenced efficiency and economics of yam production. The finding is in line with previous study of Nwaiwu *et al.,* (2015) who reported that education correlates positively with adoption of improved technologies. This also supports the findings of Ayoola (2012) that higher level of education determines the quality of skills of farmers, how well informed they are of the innovations and technologies around them in seed yam minsett production.

Table 3: Distribution of the Farmers by Educational Level

Educational Level	Frequency	Percentage (%)
No formal education	4	8.00
Primary	12	24.00
Secondary	28	56.00
Tertiary	6	12.00
Total	**50**	**100.0**

Mean($\bar{X}$) Educational level:9.50 years; Source: Field Survey Data (2016)

Marital Status

The result of farmers' distribution based on marital status is presented in Table 4 and Figure 1 which reveals that greater proportions (74.00%) of the farmers were married; about 18.00% were single while approximately 8.00% were widowed. The result depicts that seed yam minisett production is an enterprise for married individuals who are

seen to be responsible according to societal standards (Oguntade *et al.,* 2010). In similar vein, the large involvement of married farmers implies that yam is an important source of food and an income to the prospective families. This is in agreement with the findings of Augustine *et. al.* (2008) who found that over 70% of the married couples were involved in yam production in South Eastern Nigeria. This finding supports the result of Anyaegbunam *et al.,* (2009) that married farmers tend to have easy access to production variables such as land and large family size which are traditionally owned and provided by household heads (husbands) to compliment family labour to enhance production, reduce the cost of hired labour and resource use efficiency of the household farmers.

Table 4: Distribution of the Farmers by Marital Status

Marital Status	Frequency	Percentage (%)
Married	37	74.00
Single	9	18.00
Widowed	4	8.00
Total	**50**	**100.0**

Source: Field Survey Data (2016)

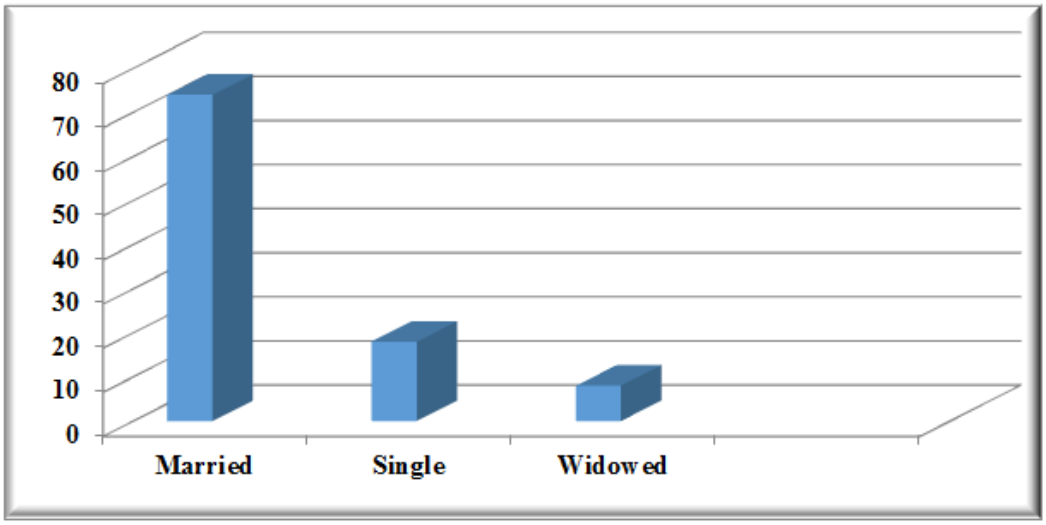

Figure 1: Bar Chart showing the Distribution of Farmers according to Marital Status*;*
Source: Field Survey Data (2016)

Farming Experience

The result of farmers' distribution based on farming experience is presented in Table 5. It indicates that greater proportion (52.00%) of the farmers had 10 to 15 years of farming experience. Approximately 18.00% had less than 10 years of farming experience, and while about 30.00% had between 15 and 20 years of farming experience. The mean farming experience was 12.65 years. This suggests that the farmers had been engaged in seed yam minisett production for a relatively long period of time in the study area. This result reveals that those who had spent more years in farming were more likely to adopt new technologies because farmers' previous experience with other innovations will likely influence their understanding of the gross margin of innovation. Experience also enables the farmer set realistic targets. This finding corroborates the earlier work of Waziri *et al.* (2014) and Ironkwe *et al.* (2007). They found that experience improves farmers' production skills such as good planting methods and the use of improved seed. This may enhance the profitability of the innovation which is an advantage to the adoption of innovation by the farmers.

Table 5: Distribution of the Farmers by Farming Experience

Farming Experience	Frequency	Percentage (%)
Less than 10	9	18.00
10-15	26	52.00
15-20	15	30.00
Total	**50**	**100.0**

Mean(X) Farming Experience: 12.65 years; Source: Field Survey Data (2016)

Household Size

The result of farmers' distribution based on household size is presented in Table 6. It reveals that majority (58.00%) of the farmers had household size of 6 to 10 persons while approximately 42.00% had household size of 1 to 5 persons. The mean household size was approximately 6 persons. This finding implies that farmers in the area have a relatively low household size. This relatively low household size of the farmers could be attributed to the high level of education among the respondents which have constrained them to have only the number of children they can cater for. This result suggests that the farmers in the area may require hired labour in order to increase their productivity/income since yam production is labour intensive. Lawal and Adigun (2012) opined that large household size ensures availability of labour and expansion of farm size. This finding also supports the result of Anozie *et al.* (2014) who reported that large household size compliment labor to enhance production and improve adoption of seed yam minisett technology.

Table 6: Distribution of the Farmers by Household Size

Household Size (Number of Persons)	Frequency	Percentage (%)
1-5	21	42.00
6-10	29	58.00
Total	**50**	**100.0**

Mean(X) Household Size: 5.0 persons; Source: Field Survey Data, 2016

Membership of Cooperative Society

The result of farmers' distribution based on membership of cooperative society is presented in Table 7 and Figure 2. It indicates that greater proportion (82.00%) of the farmers in the area belong to one form of cooperative society or the other, while the remaining 18.00% of the farmers do not belong to any cooperative society. It is expected that membership of cooperative will afford the farmers the opportunity of sharing information on modern production technique as well as exchanging labour and relevant ideas on seed yam minisett production. The implication of this result is that majority of the farmers have access to credit facilities through the cooperative society they belong, to enhance their production and boost their adoptive capacity to seed yam technology disseminated by extension agents in the area. Waziri *et al.* (2014) suggests that farmers belonging to a cooperative society will likely be exposed to the adoption of new technologies in their area.

Table 7: Distribution of the Farmers by Membership of Cooperative Society

Membership of Cooperatives	Frequency	Percentage (%)
Member	41	82.00
Non-member	9	18.00
Total	**50**	**100.0**

Source: Field Survey Data (2016)

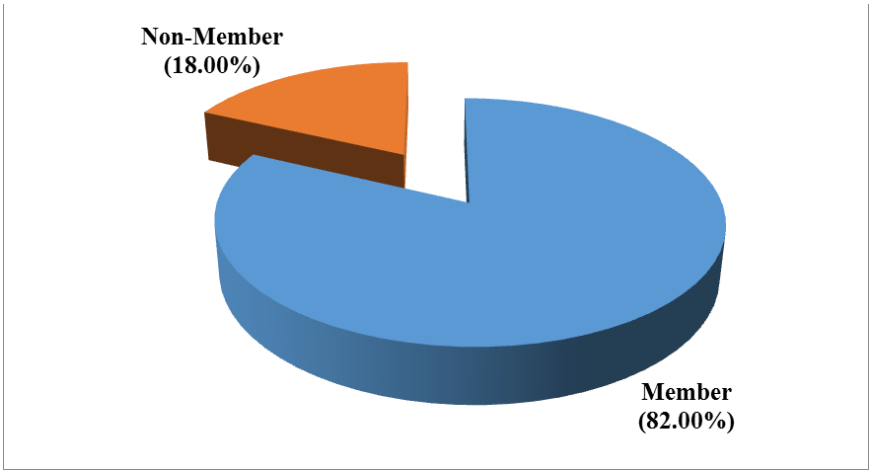

Figure 2: Pie Chart showing the Distribution of the Farmers according to Membership of Cooperative; *Source: Field Survey Data (2016)*

Extension agents Contact

The result of farmers' distribution based on extension agent contact is shown in Table 8. It revealed that majority (84.00%) of the farmers received 1-2 extension visits per month while the remaining proportion (16.00%) received 3 extension visits and above per month. The mean number of visits per month was once. The implication of the finding is that farmers in the study area are poorly visited by extension agents to ascertain their farming problems, know where they need assistance and pass across to them any new/improved technologies. These could negatively affect their adoptive capacity in seed yam minisett technologies. In similar way, this may also impede their effective production and hence profit realizable from the adoption of improved technology. A similar assertion was reported by Nnadi and Akwinu (2007) who claimed that low level of extension contact remained largely responsible for the low level adoption of new technologies. Furthermore, Ayoola (2012) asserted that steady extension agent contact helps to compliment farmer's effort in their quest to increase yield, income and aggregate food production in Nigeria.

Table 8: Distribution of the Farmers according to the Number of Extension Agent Visits received Per Month

Number of Visit(Per Month)	Frequency	Percentage (%)
1-2	42	84.00
3-5	8	16.00
Total	**50**	**100.0**

Mean($\overline{X}$) Visit: Once/Month Source: Field Survey Data (2016)

Monthly Farm Income

The result of farmers' distribution based on average monthly farm income is presented in Table 9. It shows that majority (64.00%) of the farmers in the study area had an average monthly farm income of between ₦21,000 and ₦40,000, 26.00% had between ₦40,000 and ₦60,000, while the remaining 10.00% had less than ₦20,000. The mean monthly farm income was ₦33, 520.00. The finding implies that farmers have a relatively low average monthly farm income. The study of Olaoye *et al.* (2013) asserted that farmers with higher farm income will perform better than those with lower farm income.

Table 9: Distribution of Farmers by Average Monthly Farm Income

Average Monthly Farm Income (₦)	Frequency	Percentage (%)
Less than ₦20,000	5	10.00
₦21,000 - ₦ 40,000	32	64.00
₦40,000 - ₦60,000	13	26.00
Total	**50**	**100.0**

Mean($\overline{X}$) Farm Income: ₦33,520; Source: Field Survey Data (2016)

Farm Size (Hectare)

The result of farmers' distribution based on farm size is presented in Table 10. It revealed that greater proportion (62.00%) of the farmers in the study area had farm size ranging between 1.0 and 2.0 hectares, 22.00% had a farm size of less than 1.0 hectare, while the remaining 16.00% had a farm size ranging between 2.1 and 2.5 hectares. The mean farm size was 1.41 hectares. This implies that the farmers in the study area are mainly smallholder farmers operating on less than or equal to 1.5 hectares of farmland. This could be as a result of land tenure system predominant in the area or due to the increasing population. This small landholding could probably not be favorable for the adoption of seed yam minisett technology disseminated in the area. This means that the hectarage devoted to minisett technology is still low in the study area indicating that many farmers will still depend largely on seed yam obtained from previous harvest. However, the study of Waziri *et al.* (2014) opined that adoption of crop-based technologies may not be greatly influenced by farm size since farmers with fragmented farm land often try to make maximum use of their plots.

Table 10: Distribution of Farmers by Farm Size

Farm Size (Hectare)	Frequency	Percentage (%)
Less than 1.0	11	2.00
1.0 - 2.0	31	62.00
2.1 - 2.5	8	16.00
Total	**50**	**100.0**

Mean($\overline{X}$): Farm size: 1.41 hectares; Source: Field Survey Data (2016)

Farmers Barriers in Adoption of Seed Yam Minisett Technology

The result of farmers' distribution based on the barriers in adopting seed yam minisett technology is presented in Table 11. It shows that greater proportion (96.00%) of the farmers identified inadequate fund as a barrier in adopting seed yam minisett technology disseminated in the area. This could be attributed to high cost of inputs. Inadequate fund hinders farmers from getting the necessary resources and technologies which assist them to produce efficiently and remain in production (Okoro and Ajieh, 2015). This constraint makes farmers unable to adopt seed yam minisett technology disseminated in the area as well as attain large scale production. About 91.00% reported inadequate information. This could be attributed to dearth in research on improved seed yam minisett technology as well as poor information dissemination on the part of the government information agencies such as the extension agents, thus, information is lacking in this area.

Approximately 86.33% identified poor extension contact. These negatively affected farmers' adoptive capacity in seed yam minisett technologies. In similar way, this also impede their effective production and hence profit realizable from the adoption of the improved technology. About 82% complained of high cost of inputs. The study of Anozie *et al.* (2014) asserted that adoption of any crop-based technologies requires substantial amount of funds to purchase the needed equipment to enhance easy adoption of technologies. Other entries resulting to 66.00%, 64.00%, 38.00% and 30.00% of the farmers identified pests and diseases infestation, poor access to credit, high cost of labour and limited availability of land, respectively. However, there is no doubt that this constraint is responsible for poor adoption of seed yam minisett technology seen in the area. Curbing these barriers will be vital in not just enhancing easy and efficient adoption of seed yam minisett technology but improving yam production in the area.

Table 11: Distribution of Farmers by Barriers to Seed Yam Minisett Technology Adoption

Barriers	Frequency	Percentage (%)
Inadequate fund	48	96.00
Inadequate information	45	90.00
Poor extension contact	43	86.00
High cost inputs	41	82.00
Pests and diseases infestation	33	66.00
Poor access to credit	32	64.00
High cost of labour	19	38.00
Limited availability of land	15	30.00

*Multiple Responses were obtained; Source: Field Survey Data (2016)

Regression Analysis of the influence of Farmers' Socio-economic Characteristics on Rate of Adoption

In order to determine the influence of farmers socio-economic characteristics on their rate of adoption of seed yam minisett technology as shown in Table 12, a multiple regression analysis was carried out in four functional forms, linear, semi-log, double-log and exponential forms. Based on the statistical significance of the coefficient and goodness of fit, the double-log function was chosen as the

best model equation because it had the highest coefficient of multiple determination (R^2) value of 0.851, F-Ratio value of 11.436 and highest number of significant variables (seven variables).

Table 12: Estimated Regression Analysis of the Influence of Farmers Socio-economic Characteristics on Rate of Adoption of Seed Yam Minisett Technology

Explanatory variables	Linear	Double-log	Semi-log	Exponential
Constant	4.210	9.267	7.719	65.972
	(3.150)***	(5.521)***	(2.515)***	
				(3.872)***
Age (X_1)	-0.038	-0.793	-3.236	-1.000E-013
	(-1.328)*	(-2.361)***	(-2.114)**	(-1.492)
Farm Size (X_2)	-0.801	0.108	-0.073	-11.903
	(-2.224)**	(3.283)***	(-0.338)	(-2.303)***
Educational Level (X_3)	-0.017	0.172	-0.086	-2.080E-005
	(-0.552)	(4.262)***	(-0.353)	(-0.646)
Farming Experience (X_4)	0.031	0.305	1.323	-1.092E-013
	(0.845)	(2.944)***	(1.567)**	(-1.143)**
Household Size(X_5)	0.219	0.564	1.146	0.005
	(2.064)**	(2.544)***	(1.703)**	(1.659)**
Farm Income(X_6)	-4.153E-006	0.061	-0.194	-4.475E-005
	(-0.484)	(3.495)***	(-0.626)	(-2.253)**
Membership of Corporative (X_7)	0.035	0.022	0.044	-5.235E-005
	(0.502)	(0.804)	(0.594)	(-0.180)
Extension Contact(X_8)	-0.261	0.197	-0.492	-1.051
	(-1.156)*	(2.472)***	(-1.382)*	(1.091)*
R^2		85.10	62.20	
	72.40			67.40
			60.10	
R^{2-}	70.30	83.70		63.30
F-Ratio	4.462***	11.436***	3.214***	5.936***

Source: Computer Printout of SPSS (2016); values in Parenthesis are t-values *Statistically Significant at 10%; **Statistically Significant at 5%; *** Statistically Significant at 1%

The R^2-value of 0.851 obtained for the best model equation is an indication that 85.10% of the variation in the adoption of seed yam minisett technology of the farmers was explained by the explanatory variables (socio-economic characteristics).

Hence the study presents the marginal effect as follows:

Age (X_1): The coefficient of age was negatively related to adoption of seed yam minisett technology in the area, implying that younger farmers adopted the technologies more and faster than the older farmers. This finding is in agreement with Waziri *et al.* (2014) who opined that majority of farmers within the age range of 41 to 50 years are still in their active age, more receptive to innovation, more technically efficient, effective and could withstand the stress and strain involved in seed yam minisett production. In similar way, Okoro and Ajieh (2015) also reported that older farmers are known not to be enthusiastic about new farm technologies, especially if the benefits are not expected in the near future, but at the same time, farmers with advanced age are associated with more experience and thus likely to adopt yam miniset technology disseminated in the study area. This relationship is statistically significant at 1% level of probability.

Farm Size (X_2): Farm size was found to be positively related with the rate of adoption of seed yam minisett technology. This implies that farmers who had larger farm size have the potential to adopt crop-based technologies than their counterparts with less farm size. An increase in farm size will increase the rate of adoption of seed yam minisett technology. The relationship is statistically significant at 1% level of probability. However, the study of Waziri *et al.* (2014) opined that adoption of crop-based technologies may not be greatly influenced by farm size since farmers with fragmented farm land often try to make maximum use of their plots.

Educational Level (X_3): Educational level had a positive coefficient with the rate of adoption and it is statistically significant at 1% level of probability. Farmers with formal education adopted the technology faster than those that had little or no formal education. This findings support the study of Chukwu (2013) who reported that higher level of formal education of the farmers determines the quality of skills, their allocative abilities, efficiency, and profitability and how well they were informed on the innovations and technologies around them.

Exposure to high level of education is positively and significantly related to seed yam minisett production. This suggests that higher educational level influenced efficiency and economics of seed minisett yam production. This finding is in line with the previous study of Nwaiwu *et al.* (2015) who reported that education correlates positively with adoption of improved technologies. This finding also supports Ayoola (2012) who stated that higher level of education determines the quality of skills of farmers, how well informed they are of the innovations and technologies around them in seed yam minsett production.

Farming Experience (X_4): Farming experience had a positive relationship with rate of adoption of the seed yam minsett technology and it is statistically significant at 1% level of probability. This implies that farmers with high years of experience adopted faster than their counterpart with little year of experience, this is because farmers with high years of farming experience knows the problems involved in agricultural production and are in a better position to overcome them and improve on the yield than those that had little years of farming experience. In similar way, this result reveals that those who had spent more years in farming were more likely to adopt new technologies because farmers' previous experience with other innovations will likely influence their understanding of the gross margin of innovation. Experience also enables the farmer set realistic targets.

This finding corroborates the earlier studies carried out by Waziri *et al.* (2014) and Ironkwe *et al.* (2007). They found that experience improves farmers' production skills such as good planting methods and the use of improved seed. This may enhance the profitability of the innovation which is an advantage to the adoption of innovation by the farmers.

Household Size (X_5): Household size had a positive relationship with rate of adoption of the seed yam minsett technology by the farmers and it is statistically significant at 1% level of probability. This means that farmers with large household size adopted the technology faster than their counterpart with smaller household size. This implies that farmers who have larger household size would have large pool of farm labour unlike their counterparts with smaller household size. Hence increase in household size accounts for decrease in hired labour needed for cultivation and expansion of farmland. This finding is in agreement with the study carried out by Anozie *et al.* (2014) who observed that large household size compliment labour to enhance production and improve adoption of seed yam minisett technology.

Farm Income (X_6): Farm income had a positive coefficient with the rate of adoption of the seed yam minisett technology and the relationship is statistically significant at 1% level of probability. This implies that farmers who realized high farm income adopted the technology faster than their counterpart with less farm income. The study of Olaoye *et al.* (2013) asserted that farmers with higher farm income will perform better than those with low farm income since seed minisett yam production.–the underlined statement is not flowing. It seems that something is missing.

Extension Agent Contact (X_8): Extension agent contact was found to be positively related to the rate of adoption of the seed yam minisett technology. This implies that farmers with more extension agent contact adopted the technology faster than their counterpart with less extension visit. The reason for this could be that those with more extension contact visit acquire new farming techniques than their counterpart with less extension contact. The relationship was significant at 1% level of probability. Chukwu (2013) noted that adequate extension agent contact have a positive relationship with increase in adoption of improved agricultural technologies since farmers requires sufficient information and improved agricultural technologies to increase their production.

Ayoola (2012) asserted that steady extension agent contact help to compliment farmer's effort in their quest to increase yield, income and aggregate food production in Nigeria.

The F-ratio (11.436), which determines the overall significance of the regression model, was highly significant at 1% level of probability. This implies that the explanatory variables jointly exerted great influence on the adoption rate of seed yam minisett technology. This compels the researcher to reject the first null hypothesis of the study which states that, ˜there is no significant relationship between farmers socio-economic characteristics and the rate of adoption of seed yam minisett technology˝. We now conclude that farmers' socio-economic characteristics are significantly related to the adoption rate of seed yam minisett technology.

Conclusion and Recommendation

In conclusion, the seed yam minisett technology was perceived to have good economic benefit. Estimated regression model showed that farmer's socio-economic characteristic affected adoption of seed yam minisett technology at 1% level of probability. The F-ratio was 11.436 revealing the overall significant of the regressor. However, farmers complained of inadequate fund and inadequate information as major barriers in accepting seed yam minisett technology disseminated in the area.

The study therefore recommends that:

i. Government (at all levels) investment strategies should rigorously address farmers poor access to fund by granting farmers subsidies and soft loan at zero percent interest rate.
ii. Farmers' socio-economic factors should be considered fundamental in designing any agricultural extension intervention strategies in the area.

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