EVALUATION OF FACTORS DRIVING THE ADOPTION OF YAM MINISETT TECHNOLOGY BY FARMERS IN ABIA STATE, NIGERIA.

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ABSTRACT

The study was carried out to evaluate the socio-economic factors influencing adoption of yam minisett technology by farmers in Abia State. 120 farmers were purposively selected from the three agricultural zones of the state namely Aba, Ohafia and Umuahia respectively. Primary data for the study were collected on respondents' socioeconomic characteristics, use of minisett technology and constraints militating the adoption of yam minisett technology using structured questionnaire. Data were analyzed using descriptive statistics such as frequency count and percentages. Ordinary least square regression analysis of the double log form was used to determine the socioeconomic factors influencing adoption of yam minisett technology by the respondent farmers. Results showed that farmers fall within the age brackets of 40-50 years. Farm size (t= 2.99), Educational level (t= 2.75) and credit availability (t = 3.03) are positive and significant. (P=0.05) The problems farmers encountered included high cost inputs, and unavailability of credit facility. Others are procurement of land and insufficient extension services in that order. Conclusion is drawn that farm size, educational level and credit availability are the socio-economic factors influencing the adoption of yam minisett technology. It is then recommended that Government should evolve positive policies which will ensure that soft loans are given to genuine farmers at minimal interest rate and the farmers should be monitored to properly use the loan. This will enable them increase their farm size, procure inputs, adopt innovations and consequently improve agricultural production.

KEYWORDS: *Socio-economic, Adoption, Yam Minisett,*

INTRODUCTION

Yam (*Dioscorea spp*) is an important tuber crop in Nigeria, where it is produced mainly as a source of food crop especially carbohydrate. The current annual production is estimated at 26.587 million metric tons (FAO, 2005). In 1997 alone, Nigeria accounted for 75% of the world production (Manyong *et al,* 2001. Although yam production in Nigeria is quite high there is still need for increased production to satisfy domestic and possibly export demand (Asumugha *et al,* 2004).

However, production of yam is highly expensive when compared with other root and tuber crops. This is due to costly input requirements, especially labor and planting materials (Ezeh, 1998). For both seed yam and ware yam production, planting materials may exceed 50% of production cost (Orkwor 1998.) A large quantity of edible yam up to 30% of the previous year's harvest may be used to plant a new crop (Okoli and Akoroda, 1995). This makes seed yams account for the high cost of total production cost.

The minisett technique involves the use of 25g of setts to produce whole tubers which serve as "seed" yam (Okoli and Akoroda, 1995). This technology was developed to address the problem of high cost of seed yam. Yam minisett technology is a package comprising of the following field operations (i)Land preparation (ii)use of minisett dust(iii) time of planting-when rains become stable(iv)sett size of 25g (v)seed bed preparation(vi)spacing of 25cm x1.0m(vii)use of fertilizer(Iwueke,1991). The rate of adoption of the minsett technique was low(,Iwueke,1991)The adoption rate was reported as low as 40%(Chikwendu et al.1994,Ogbodu,1995Anuebunwa et al 1998) This was partly because seed yams vary with ecological zones and farming systems in Nigeria(Asumugha and Eluagu,1999).The study therefore addresses the following

objectives;

i. Describe the socioeconomic characteristics of the respondents in the study area;
ii. Determine the socioeconomic factors influencing adoption of yam minisett technology by farmers in the study area;
iii Identify the constraints to the adoption of yam minisett technology
iv. State the policy implications of the study.

METHODOLOGY

Abia State was purposely chosen for the study because it is one of the major food producing states in Nigeria. The data for the study were collected through structured questionnaire. A multistage random sampling technique was used to select 120 respondents from the three agricultural zones of the state namely Aba, Ohafia and Umuahia. The analysis was done using descriptive statistics such as percentages, frequency counts and the ordinary least square regression model The model is expressed implicitly as follows:-

$Y = F(X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, +U)$
Index of adoption =1, No adoption =0)
X1 = Age of farmers (years)
X2 = No. of household members
X3 = Farm size (hectares)
X4 = Educational level (years spent in school)
X5 = Extension Contact (Number of frequency of visit)
X6 = Tenancy status (1 if the farmer owns land and 0 if otherwise)
X7 = Credit Availability (Naira)
X8 = Membership of cooperative society.(1=member,0=non member)
U = Stochastic or error term

The regression analysis was expressed in three functional forms namely Linear, Semi-log and double log. The lead equation (double log) was chosen based on the performance of R^2, F-ratio and parameter estimates.

RESULTS AND DISCUSSION

Table 1 summarizes the socioeconomic characteristics of Respondents in the study area. These include distribution according to Age of farmers, Household size, farm size, Educational level and Extension contact. Others are Tenancy status, credit availability and membership of cooperative society. The table shows that higher percentage of respondents fall within the 40-50 age brackets indicating highest adoption by middle age while youths comprised of 22.5% of the total respondents. The Household size of respondents range from 6-10 which is the highest (60.83%) while respondents with household size of above 10 was 4.17%.

Majority (41.67%) of the farmers have farm sizes ranging from 1.5-2.0 hectares while 35.83% of the respondents have farm sizes ranging from 0.5-1.0 hectares. This shows that farmers from these areas are small-scale farmers (Olayide, 1980). Distribution of respondents according to educational status reveals that the 18.33% respondents had no formal education (illiterates), 29.17% had primary education, while 52.50% of the respondents completed secondary and tertiary education implying the most of the respondents are literate. Education has an important role to play in the adoption of modern technologies. According to Chinaka *et al.* (1995), farmers' level of education influences his level of adoption of modern technologies.).Table 1 also explains that 87.50% of the farmers were visited 1-6 times by Extension Agents during a planting season. Visit by the Extension Agents to the farmers is very important. It will enable the Extension Agent Monitor the farmers closely to ensure that monitoring and evaluation processes which precede adoption stage are achieved. The implication is that the more regular the visit, the more the farmers adopt new ideas 77.5% of the farmers inherited their farm land, 5% got theirs from communal ownership and 28.33% rented theirs. This implies that farmers in the study area invested less in the procurement of farmland. This is due to the fact that they are poor

and cannot afford much in terms of finance to expand their farmland. They therefore rely on inherited parcels of land for their farming operations. About 73.33% of the respondents secured their funds from personnel savings while 26.67% borrowed money either from Isusu, money lenders or Banks to finance their farm operations. The distribution of the respondents according to membership of cooperative shows that 67.67% of the respondents never belonged to any cooperative while 33.33% belonged to one cooperative or the other.

Table 1: Summary of Socioeconomic Characteristics of Respondents in the study area

Variables	Frequency	Percentage (%)
Age:		
30-40	27	22.50
40-50	48	40.00
50-60	29	24.17
Above 60	16	13.33
Total	**120**	**100**
Household size:		
2-5	42	35.00
6-10	73	60.83
Above 10	05	4.17
Total	**120**	**100**
Farm size (hectare):		
0.5-1.0	43	35.83
1.5-2.0	50	41.67
2.5-3.0	17	14.17
3.5-4.0	10	07.50
Total	**120**	**100**
Educational Status:		
No Formal education	22	18.33
Primary	35	29.17
Secondary	40	33.33
Tertiary	23	19.17
Total	**120**	**100**
Extension Visits:	105	87.50
No. of visits 1-6		
7-9	02	1.67
Above 9	06	5.00
No visit	07	5.83
Tenancy Status		
Inheritance	80	66.67
Communal	06	5.00
Rental	34	28.33
Total	**120**	**100**
Source of finance		
Personal savings	88	73.33
Borrowed	32	26.67
Total	**120**	**100**
Membership of cooperative		
Members	40	33.33
Non members	80	66.67
Total	**120**	**100**

Source: Field Survey data, 2006

Table 2 highlights the results of the Regression Analysis using the Double Log. For a cross sectional analysis, the results indicate that the equation provided reasonably good estimate of the underlying socio-economic characteristics that influence the adoption of yam minisett technology (R= 0.515)

Examining the individual characteristic reveal that age of the farmers is not statistically significant at 5 percent level of probability. Though age of the farmers coefficient (3.7) is positive, it is not significant. It thus appears that age of the farmers is not an important determinant in adoption of yam minisett technology.

The regression result shows that household size is negative but strong. The household size coefficient is (-80.99) and statistically significant ($P \leq 0.5$). This did not agree with earlier work on adoption studies (Chinaka et al.1995and Imo, 2005) Labour as one of the factors of production tends to increase adoption when appropriately combined with other limiting factors of production. This is due to the fact that the required labour is supplied by the farmer's children and close relations. Hence this parameter is a strong determinant of adoption of yam minisett technology.

The relationship between farm size and adoption of yam minisett technology is strong and positive. It is statistically significant ($P<0.05$). Its coefficient is 38.56. The t (calculated) = 2.99 is greater than the t (tabulated) of 1.98.The implication is that farm size influences adoption of yam mini sett technology. This result agreed with a priori expectation that total farm size of farmers may influence adoption of new technology as owners of large farm usually have more resources than small-scale farmers,(Imo,2005);

Educational level is positive and strong. The coefficient (47.82) is significant ($P \leq 0.05$). This result indicates that educational status is a strong determinant of adoption of yam minisett technology. It implies that education removes conservative attitude of the farmers and increases the risk taking abilities of the farmers. Also it explained that the more educated a farmer is, the more receptive he is to accept new ideas. (CIMMYT, 1993; Chinaka *et.al* 1995) The number of extension contacts (x_5) did not have a significant effect on the adoption of yam minisett technology at the 5 percent level. The coefficient (+11.25) is relatively strong and positive. This suggests that the extension agents were very ineffective in the discharge of their duties. This may be due to the conflicting demands on their times and job as they are required to service a great number of farmers over a large geographical area.

The relationship between tenancy status of farmer and the adoption of yam minisett technology is negative. The co-efficient (-18.20) measuring the dummy variable is not statistically significant at 5 percent level of probability. Hence tenancy status is not a determinant of adoption level of yam minisett technology.

The results of the analysis also reveal that those farmers with access to credit are better adopters than those without access. The coefficient (3.03) is strong and positive. It is significant at the 5 percent level. There is the existence of economics of scale in farming business this in agreement with earlier work on credit availability and adoption (Anyaegbunam *et al* .2006). The result of membership of co-operative society and the adoption level of yam minisett technology is weak and positive. The coefficient (0.38) is not statistically significant at the 5 percent level. Some explanations could be adduced for this weak relationship. The co-operatives in the area under study has been locked in series of leadership squabbles. This problem have resulted in the members not delivering the full benefits of co-operative because of lack of meetings and divided loyalty to different interest groups

Table 2: Summary of Regression Analysis (Double Log) on determinant of Adoption of yam minisett Technology

Determinant Variables	Coefficients
Constant	73.47(2.52)**
X_1 Age of farmers	3.7(0.16)
X_2 Number of household	- 80.99(-2.41)**
X_3 Farm size (Hectares)	38.56(2.99)**
X_4 Educational level(years spent in school)	47.82(2.75)**
X_5 Extension Contact (No of frequency of visit)	11.25(0.83)
X_6 Tenancy Status (1 if the farmer owns the land and 0 otherwise)	-18.20(-1.45
X_7 Credit Availability	18.31(3.03)**
X_8 Membership of cooperative society	0.38(0.03)
R^2	0.515

*Figures in parenthesis represent t-ratios, ** Significant at 5% level.*

Constraints to yam minisett adoption on the study area are shown on Table 3. High cost of inputs ranked first among the constraints. These inputs include fertilizer, minisett dust and other inputs. This is closely followed by unavailability of credit, possibly because the farmers are poor and lack the necessary collaterals. There are other problems of procuring land farming and insufficient extension services in that order.

Table 3: Constraints to the adoption of adoption of yam minsett technology.

Constraint	Frequency	*Percentage	Remark
High cost of inputs	110	91.67	1
Unavailability of credit facility	90	75.06	2
Problem of procuring land	70	58.33	3
Insufficient extension services	40	33.3	4

* Multiple responses recorded. Source: Field Survey 2006.

CONCLUSION

The findings show that the educational level of the respondents, farm size and availability of credit are significant factors or determinants influencing adoption of yam minisett Technology by farmers in Abia state. The coefficients (2.75, 2.99 and 3.03) are significantly positive (P=05). The findings also revealed that highest adoption was among the middle age farmers who are between 40-50 years The major constraint militating against the adoption of the technology is high cost of inputs followed by unavailability of credit facility .Others are problem of procuring land and insufficient extension services.. It is advised that. Government should evolve positive policies which will ensure that soft loans are given to genuine farmers at minimal interest rate and the farmers should be monitored to ensure that the loan is judiciously utilized. This will enable them increase their farm size, procure inputs, adopt innovations and consequently improve agricultural production.

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