SOCIO –ECONOMIC DETERMINANTS OF ADOPTION
OF YAM MINISETTT TECHNOLOGY IN
BOSSO AREA OF NIGER STATE

Tyabo, I. S., Muhammed, H.U., Umar,A. and Yusuf, L.T.
Department of Agricultural Economics and Extension Technology.

Federal University of Technology, Minna, Niger State.

Email – ibrahimtyabo @ yahoo.com

ABSTRACT

The paper examines the socio – economic determinants of adoption of yam minisett technology in Bosso LG area of Niger state. Multi - stage random sampling technique that involves purposeful selection of Bosso Local Government area where seven villages were randomly selected from ten districts of the LGA. A total of 140 farmers who were actively involved in yam production were also randomly selected as respondents. Data analysis was carried out using statistics such as frequency counts, percentages and probit model. The result shows that 85.7% were aware of the technology while only 55.7% adopted the technology. The probit model Analysis showed that some socio – economic variable that were positively related to adoption and will increases the probability of adoption of the improved yam minisett technology were age of the farmers, farm size, years of farming experience, amount of credit availability and, number of extension contact. In order to increase the rate of adoption of this technology there is need to intensify the rate of extension contact, increase the rate of credit availability and improve on the supply of inputs such as fertilizer and yam minisett dust to farmers.

INTRODUCTION

It is a known fact that yam is an important tuber crop in Africa and Nigeria produces most of the world's annual output of over 28 million metric tones which constitute 70% of the world's global harvest (International Institute of Tropical Agriculture, 1990). However, the white yam production in west Africa has been declining partly because the underground tuber which is the source of food is also the source of planting material and this forced the farmers to retain some parts of their harvest to use as planting materials for next years production (Welch, 2005).

The production of yam in West Africa has been declining partly because the underground tuber which is the source of food is also the source of planting material. In some parts of south – eastern Nigeria, farmers use small sets of 80 – 100kg tubers which

happen to be edible portion as planting material for yam seed production, thus farmers set aside one – quarter of their annual harvest for replanting (Madukwe, et al, 2000).

Research has shown that a major constraint in yam production is the requirement of large quantities of planting material on a per hectare basis, as much as 10,000 normal seed yams are required to plant an economic quantity of yam to improve income generation for yam farmer (Essiet and Udor, 1996), the scarcity and high cost of purchasing yam seeds aggravate this problem. In the traditional cropping system of yam, the farmers put aside as much as 30% of the harvest usually small sized tubers (200 – 1000g) as yam seed for the next cropping season. It has been estimated that planting material constitute over 33% of the cost outlay in yam production as such this inhibits the size of yam farm under traditional cropping method and thus the essence of yam minisett technology (Y.M.T.) (Madukwe, et al., 2000). However, the research stations and Agricultural Development Programmes (ADP) are still educating farmers on the benefits of yam minisettt technology, this will increase farmers' productivity to ensure stable supplies of yam, more income generation as well as alleviate poverty. In other to examine the socio –economic determinants of adoption of yam minisett technology in Bosso Local Government Area of Niger state, the following research questions are hereby put forward:

What are the socio – economic characteristics of the farmers in the study area?

What is the level of awareness of farmers on yam minisett technology in the study area?

What is the rate of adoption of yam minisett technology in the study area?

What are the socio – economic factors that affect the adoption of yam minisett technology in the study area?

OBJECTIVES OF THE STUDY

The main objective of the study is to examine the socio – economic determinants of adoption of yam minisett technology in Bosso area of Niger state. The specific objectives are to:

(I)   examine the socio – economic characteristics of the farmers in the study area

(II)   determine the level of awareness of farmers on yam minisett technology

(III)   determine the level of adoption of yam minisett technology

(IV)   examine the socio – economic factors that determine the adoption of yam minisett technology

METHODOLOGY

The study was carried out in Bosso Local Government Area of Niger state, Nigeria. The study area falls in guinea savannah zone with an annual rainfall of between 1100mm – 1600mm and has an average temperature of 35ºC. Multi - stage random sampling technique was used that involve purposeful selection of Bosso Local Government area where seven villages were randomly selected from ten districts of the LGA and a total of 140 farmers who were actively involved in yam production were also randomly selected from the selected villages. Structured interview schedules were used to elicit data from the respondents. Data collected were analyzed using descriptive statistics. Regression analysis (probit model) was also used to estimate the factors that affect the adoption of yam minisett technology in the study area. It was hypnotized that adoption is influenced by some specific socio – economic variables of the farmers. Consequently the maximum

likelihood probit estimate was used to analyze the factors that determine the adoption of yam minisett technology. The model is expressed in its implicit form as;

$Y = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, X_9, X_{10}, X_{11}$ and $u)$.

Where:

Y = Adoption index (1 if adopted; 0 otherwise)

X_1 = Age of farmers in years

X_2 = Marital status (1 if married; 0 otherwise)

X_3 = Household size (numbers)

X_4 = Level of formal education (number of years spent in school)

X_5 = Farm size (Measured in hectares)

X_6 = Labour (man days)

X_7 = Years of farming experience (numbers)

X_8 = Tenancy status (1 for land owners; 0 otherwise)

X_9 = Membership to cooperative/ farmers association (1 for member; 0 otherwise)

X_{10} = Amount of credit received in the survey year by respondent (in naira)

X_{11} = Number of contact with extension agents

u = error term

RESULT AND DISCUSSION

Table 1: Socio-economic characteristics of respondents

Characteristics	Frequency	Percentage
Age (years)		
<30	36	25.71
31 – 40	67	47.86
41 – 50	27	19.29
>50	10	7.14
Education		
No formal education	52	37.1
Primary	31	22.1
Secondary	42	30.0
Tertiary	15	10.7
Years of farming experience		
! – 10	21	15.0
10 - 15	82	58.6
15 - 20	14	10.0
>20	23	16.4
House hold Size		
1 - 5	21	15
6 - 10	55	39.29
11 - 15	62	44.29
> 15	2	1.43

Source: Field survey, 2009.

From Table 1 the result shows that the majority of the adopters of yam minisett technology are concentrated within the age range of 30 - 50 years who are young adults capable of undertaking farming activities representing over 92.86% of the respondents interviewed. This indicates that the adopters are young and within the work force age, have the ability to bear risk, they are also venturesome and this tends to influence

adoption positively because farmers within this age are always opportunity seekers. This is supported by the reports of Clark and Akinbode (1998) that young farmers have more knowledge about new practice and are more willing to bear risk and less obliged to other responsibilities, more responsive to new agricultural packages because of anticipated lifespan within which investment in the new technologies will pay off. Results from Table 1 indicated that 22.1% had primary education, 30.0% had secondary education while only 10.7% had tertiary education. On the contrary 37.1% had no formal education. The trend of the results revealed that the educational level of the respondents was relatively low in the study area which may lead to low adoption of improved technology. The result from the table also indicated that majority of the respondents (58.6%) have farming experience of $10 - 15$ years, 10% had $15 - 20$ years of farming experience, 16.4% had above 20 years of farming experience while 15% had not more than 10 years of farming experience. Higher farming experience may likely lead to increase in indigenous skill and knowledge required in yam production which may encourage adoption of yam minisett technology. Results in Table 1 further indicated that 44.29% had household size of $11 - 15$ persons, 39.29% of the respondents had household size of $10 - 15$ persons, 15% of the respondents had household size of $1 - 5$ persons and only 1.43% of the respondents had household size that is above 15 persons. Atala et al., (2005) found that household size was statistically insignificant to new farm practices and that adoption is independent of household size.

Table 2 Distribution of Respondents According to Awareness and Adoption of the Yam Minisett technology

Variables	Frequency	Percentage
Awareness		
Aware	120	85.7
Not aware	20	14.3
Total	140	100
Adoption		
Adopters	78	55.7
Non – adopters	62	44.4
Total	140	100

Source: Field survey, 2009.

The result in Table 2 indicated that 85.7% of the respondents were aware of the improved yam minisett technology while 14.3% were not. Table 2 also revealed that 55.7% were adopters while 44.4% were not.

Table 3 Distribution of Respondents According to Reasons for Adoption and Non - adoption of the Yam minisett technology

Reasons	Frequency	Percentage
Adopters		
High yield	28	35.89
Early maturity	12	15.38
Increase market potentials	15	19.23
Reduced cost of producing ware yam	21	26.92
Increase income	25	32.05
Non – adopters		
Require special inputs	25	40.32
Inadequate ext. contact	13	20.96
Involve some technicalities	17	27.42
Ignorance about the technology	15	24.19

Multiple Responses; Source: Field survey, 2009.

The result in Table 3 revealed that 35.89% of the respondents adopted the improved yam minisett technology because of high yield, 32.05% of the respondents adopted the technology as a result of increase income from high yield, 26.92% of the respondents adopted the technology because it brings about reduced cost of ware yam which may reduce the cost of producing the seed yam. Other reasons for adopting the improved yam minisett technology were early maturity (15.38%) and increase in market potentials (19.23%). Showemino and Idem (2004) reported that improved varieties have advantages of early maturity, higher yield that will boost farmers' income and as well reduce poverty. On the contrary, the reasons given by non – adopters for not adopting the improved yam minisett technology include high requirement of inputs (40 .32%) especially fertilizer and minisett dust. Other reasons for not adopting the technology were ignorance of the improved yam minisett technology (24.19%), inadequate extension contact (20.96%), high technicalities involve in the adoption of yam minisett technology such as cutting of the setts and application of minisett dust (27.42%).

Table 4: Maximum likelihood probit estimate of Socio – economic Factors Affecting the Adoption of Yam Minisett Technology.

Parameters	Estimates	Std Error	T	Sig
Age (X_1)	0.061	.016	3.776[***]	.000
Marital status (X_2)	-0.034	.050	-.677	.498
Household size (X_3)	-0.017	.030	-.555	.579
Education (X_4)	-0.012	.084	-.859	.390
Farm size (X_5)	0.138	.021	6.452[***]	.000
Labour (X_6)	-0.013	.021	-.623	.533
Farming experience (X_7)	-0.052	.010	-5.042	.000
Tenancy Status (X_8)	0.137	.624	.219	.827
Membership				
to cooperative (X_9)	0.363	.180	- 2.010[**]	.044
Amount of Credit (X_{10})	0.009	.004	2.231[**]	.026
No. of Ext. contact (X_{11})	0.036	.020	1.819[*]	.069
Intercept	-4.945	.483	-10.234[***]	.000

Pearson Goodness of fit square = 13.064.263[***]

Sample size = 140

Degree of freedom = 127

Note: ***, ** and* implies statistical significant at 1%, 5% and 10% levels, respectively.

Source: Computed from survey data, 2009.

The results in Table 4 revealed the some socio – economic factors that influence the adoption of yam minisett technology in Bosso area of Niger state include age, farm size, years of farming experience, amount of credit available to farmers and number of extension contacts. Age of the farmers was observed to be positive and significant at 1% significant level. This implies that as the age of the respondents increases the tendency to adopt the yam minisett technology increases. This could be explained by the fact that as the age of the farmers' increases there is tendency of the farmer to gain more knowledge and become more specialized in the production process and willingness to adopt technologies that will essentially increase productivity and cash income. Farm size of the farmers was observed to be positive and significant at 1% significant level. This implies that as farm size increases the tendency of the farmers to adopt the yam minisett technology increases. The significant and positive value of farm size suggests that as farm size increases; farmers take more interest in their farms and would likely search for needed information on how to adopt yam minisett technology. This finding is in agreement with the findings of Agwu (2004) that increase in farm size and level of formal education positively and significantly influences the level of adoption of improved cowpea technology.

Amount of credit or loan available to farmers was observed to be positive and significant at 5% significant level. This implies that as the amount of credit or loan available to farmer increases the tendency of the farmers to adopt the yam minisett technology. This could be explained by the fact that availability of credit facilities would provide adequate capital to take care of the expenses involved in carrying out the new practice especially the purchase of inputs like fertilizer and yam seed dust. The number of farmers' contact with extension agents was observed to be positive and significant at 10% significant level. This implies that as the number of farmers' contact with extension agents increases the tendency of the farmers to adopt the yam minisett technology increases. Increase number of extension contact with farmers will provide the farmers the

9

forum to be advised and sensitized on the various advantages associated to adoption of improved yam minisett technology such as earlier maturity, higher yield that will boost farmers' income and improve their standard of living. This conformed to the findings of Onemolease and Alakpa (2009) that contact with extension agents increases the odds of adopting improved technologies. Membership of co – operative societies was observed to be negative and significant at 5% significant level. This implies that as membership of co – operative has no influence on the adoption tendency. This is not surprising as quite a number of farmers were not member of any cooperative society. This is finding is related to the report of Ibrahim et al., (2007).

CONCLUSION AND RECOMMENDATION

This study has revealed that despite the high potentialities of the technology, awareness of the technology is high but adoption of the technology in Bosso LGA is only slightly above average. The major factors that encouraged the adoption of the yam minisett technology were high yield and increased income. High requirement of inputs was identified to be the major constraints to the adoption of the technology. Analysis showed that some socio – economic variables that were positively related to adoption and will increases the probability of adoption of the improved yam minisett technology were age of the farmers, farm size, years of farming experience, amount of credit availability and number of extension contact. Based on the above, it is recommended that farmers should be encouraged to form cooperatives, the rate of extension contact with farmers should be intensified and adequate inputs especially fertilizer and minisett dust should be made available to farmers at subsidized rate.

REFERENCES

Agwu, A.E. (2004). Factors Influencing the Adoption of Improved CowpeaTechnology in Nigeria. *Journal of International Agriculture and Extension Education, Vol. 11(1)*

Atala, T.K; Tunji, A. and Omata P.A (2005). "The impact of training and visit system of Extension on adoption of Farm innovations and farm output" in Kaduna State, Nigeria. *The Nigeria journalof Agricultural Extension* 2. (3): 47-60

Clark, R.C and Akinbode, M. (1998). Factors associated with adoption of three farm practices in Western State. Nigeria Research Bulletin, No.1. Faculty of Agriculture, University of Ife Press: Pp2.

Essiet, A. and H. Uddoh (1996). Induced Innovation and Agricultural development, *Food policy*, 2 (3) Pp 138 – 142.

Ibrahim, F.D, Ibrahim, M, Ajayi, O. J. and Ibrahim, P.A. (2007). Effects of the Adoption of Improved Rice Varieties on the Production of Small – scale Farms in Badeggi, Niger State. *Nigeria Journal of Rural Economy and Society, Volume4, Pp 49- 55.*

International Institute of Tropical Agriculture (1990). Grain Legume Improvement Programme. Crop Improvement Division Activity Report and Work Plan, IITA, Ibadan, Nigeria.

Madukwe, M.C, D. Ayichi, and E.C. Okoli (2000). Issues in Yam minsett Technology Transfer to farmers in South – eastern Nigeria. African Technology Policy Working Paper No. 21. African Policy Studies (ATPS) Network, Nairobi.

Onemolease, E.A. and S.O. Alakpa (2009). Determinants of Adoption Decisions of Rural Youths in the Niger Delta Region of Nigeria. *Journal of Social Science* vol. 20 (1) Pp 61 – 66.

Okoli, D. and J.E. Akoroda (1995). Role of Rural Institute in Agricultural Development in Nigeria: An analytical Review of Nigerian Agriculture. Pp 49.

Showemimo, F.A and N.U.A. Idem (2004). Cereal crops of Nigeria. Principle of production and utilization, Ade commercial press, Kaduna. Pp20.

Welch, D.G (2005). Rapid multiplication of Yam minisett Technique, National Root Crop Research Institute (NRCRI) Umudike, Extension Bulettin, No. 2.