

Assessing Crop Production Technologies Adoption by Women Farmers: Some Empirical Evidence

Augustine J. Udoh¹

1. Professor, Department of Agricultural Economics & Extension, University of Uyo, Uyo 530002
Akwa Ibom State, Nigeria

Corresponding author e-mail: *augtine@yahoo.com*

Paper Received on November 22, 2015, Accepted on December 10, 2015 and Published Online on December 15, 2015

ABSTRACT

The study assessed the determinants of women's adoption of crop production technologies under Women in Agriculture (WIA) programme in the southeastern zone of Nigeria. A multi-stage sampling technique was adopted to select the sample for the study. Three out of six agricultural zones were randomly selected. Then five blocks were randomly selected from each of the 5 zones making 15 blocks and finally, 10 women farmers were randomly selected from each of the 15 blocks making a total of 150 respondents that took part in the study. Questionnaire was used to collect data from the respondents. Probit regression was used to analyse the data. The probit regression analysis showed that years of farming, years of formal education, household size, farm size and membership of social organizations and land acquisition were significant factors influencing women's adoption of crop production technologies. The most adopted technologies were dry season vegetable production, Gnetum africanum, improved cassava and maize varieties cultivation. The study recommends that the programmes of the WIA arm of the extension service should be integrated into a more decisive national action plan.

Key words: *Women's adoption; Crop production technologies; Women in Agriculture (WIA);*

Improved technologies serve no useful purpose except when they are disseminated to farmers and the farmers in turn use them to achieve higher productivity as observed by *Okwusi and Tolubanwo (2006)*. Women have been described by *Tokula (2006)* to constitute one third of the work force in Sub-Saharan Africa. Women especially those from small resource farm holdings perform over 60% of on-farm activities in Sub-Saharan Africa and *Rosegrant et. al. (2005)* assert that the adoption of appropriate technologies is required to help rural communities to maintain present production level and to allow farmers to respond to increasing demands. Similarly, in the Andean regions of Bolivia, Columbia and Peru, women develop and maintain seed-banks (*Heyzer, 2000*). In Nigeria, *Rahman and Usman (2004)* contend that women play a vital role in food production, processing and marketing. In the same vein, *Hughes (2005)* describes women as a major force driving the economic and social fabrics of rural South Africa with major responsibilities in

agricultural and non-agricultural business enterprise.

The Women in Agriculture (WIA) unit of Akwa Ibom State Agricultural Development Programme (AKADEP) through the unified extension delivery services has disseminated various technologies to women farmers in the State to boost crop production, increase level of income and improve standard of living. Although the WIA programme had been proven to be efficient in the Imo State Agricultural Development Programme (ISADEP), farmers feedback recorded that the extent of adoption was less than 40% (*Anuebunwa et. al, 2002*). Similarly, in Umuahia zone of Abia State Agricultural Development Programme (ASADEP), *Tokula and Nwachukwu (2004)* observed that non-availability of planting materials, lack of technical aid and incompatible cropping systems were reasons for low adoption of technologies. Therefore, what are the extent of adoption of crop production technologies in WIA programme Akwa Ibom State of Nigeria and what are the factors that may influence the adoption of these technologies?

METHODOLOGY

The study was conducted in Akwa Ibom State of Nigeria (Latitude 4°31' and 5°31'N and Longitude 7°35' and 8°25'E). Women in Agriculture (WIA) work under Akwa Ibom State Agricultural Development Programme (AKADEP). There are six agricultural zones in AKADEP. A multi-stage sampling technique was adopted in selecting the sample of the study. The first stage involved the simple random sampling of three out of six zones of AKADEP. The selected zones were Uyo, Eket and Ikot Ekpene. The second stage involved the random selection of 5 Extension Blocks per zone making a total of 15 Blocks and 10 respondents per block making a total of 150 women respondents that took part in the study. Questionnaire was used to collect data for the study. A test-retest reliability was used to ascertain the reliability of the instrument. Descriptive and inferential statistics were used for analysis of data.

RESULTS AND DISCUSSION

Level of women's adoption of crop production Technologies under WIA : A three point likert scale was used to determine the level of women's adoption of crop production under WIA programme in the study area. The result from Table 1 shows that dry season vegetable has the highest level of adoption with 1.73 mean score. This was followed by *Gnetum africanum* cultivation with 1.65 means score; cultivation of improved cassava varieties with 1.57 mean score and cultivation of improved maize varieties with 1.42 mean score. Other technologies with mean score more than 1 are cucumber, garden egg production and pineapple cultivation. Technologies like seed yam production

through yam minisett, nursery establishment and agronomic practices in swamp rice and mushroom production show low level of adoption among the respondents. The findings indicate that the highly adopted technologies could be because the crops are staple food in the study area. Also, the technologies may be compatible with their farming systems. The low level of adoption may be as a result of inadequate and insufficient exposure of the farmers to these technologies in the study area.

Factors that determine women's adoption of crop production under WIA programme : Table 2. shows the result of the probit model which was employed to estimate the factors that determine women's adoption of crop production technologies under the WIA programme. The model seeks to explain the probability of adoption as a result of any of the 10 independent variables identified. The signs and significance of the coefficient of the independent variables were used in determining to a great extent, the impact of each variable on probability of adoption of technologies by women farmers. The model has a good fit and it is significant at 1%. The log likelihood of adoption was - 71.104283. also, 5 out of the 10 parameters estimated in the model were statistically significant. The significant variable included years of farming experience, household size, years of formal education, membership to social organization and farm size. The years of farming experience of farmers has a positive coefficient and it is statistically at 1%. This indicates that years of experience in farming is directly related to adoption. This implies that long years of farming experience is an advantage for increase in farm productivity since it

Table 1. Respondents' level of adoption of crop production technologies under WIA programme in Akwa Ibom State

WIA technologies	No Adoption	Low Adoption	High Adoption	Total	MS	Decision
Cucumber production	9(6.0)	115(76.7)	26(17.3)	167	1.11	High
Seed yam production	17(11.3)	133(88.7)	-	133	0.89	Low
Rice production	57(38)	61(40.7)	32(21.3)	125	0.83	Low
Pineapple cultivation	12(8)	123(82)	12(10)	153	1.02	High
Mushroom production	53(35.3)	84(56)	13(8.7)	104	0.69	Low
Garden egg production	32(21.3)	75(50)	43(28.7)	161	1.07	High
Dry season vegetable	(0.7)	39(26)	110(73.3)	259	1.70	High
<i>Gnetum</i> cultivation	1(0.7)	50(33.3)	99(56)	248	1.65	High
Cultivation of improved Maize varieties	15(10)	57(38)	78(52)	213	1.42	High
Cultivation of improved Cassava	5(3.3)	55(36.7)	90(60)	235	1.57	High

* Percentage in parenthesis

Table 2. Estimation of factors that determine adoption of crop production technologies

Probit Estimates:	Number of OBS	= 150
	LRCH.2 (10)	= 26.31
	Prob > chi ²	= 0.004
	Pseudo R ²	= 0.2724
Log likelihood		= -71.104283

Explanatory variables	Co-efficient	Std Error	Z	P>(Z)
Age	-0.319279	0.715105	-.432	0.67
Marital status	-1.132281	0.700156	-1.617	0.12
Years of farming experience	1.297439	0.425189	3.047	0.000***
Household size	0.935773	0.551226	1.689	0.09**
Years of formal education	-0.908120	0.451271	-2.013	0.04**
Income level	0.270581	0.545322	.497	0.62
Membership to social organization	1.069756	0.383381	2.789	0.000***
Farm size	1.431244	0.420448	-1.001	0.000***
Land acquisition	-0.301247	0.382525	151	0.32
Extension visit	0.697363	0.634611	-1.099	0.27
Constant	-9.182395	2.017573	-6.995	0.43

** Significant at 5%; *** significant at 1%

encourages rapid adoption of farm innovation. The Household size of the farmers has a positive coefficient and is significant at 5%. It shows that the larger the household size, the higher the likelihood and intensity of adoption among women farmers in the study area. The coefficient of 0.94 indicates that a unit increase in the size of household of the farmers will lead to an increase in the probability of adoption by 0.94. This is likely due to the fact that the larger the household size, the more is the dependency on other members of the household whom are economically active.

Years of Formal Education is significant at 5% but has a negative coefficient. This implies that years of formal education of farmers is inversely related to adoption. In other words, education in this case does not influence adoption. This finding is in line with findings of *Ojo and Ajibefun (2000)* and *Ojo (2003)*. They observed in their findings that, elementary education has no effect on women farmers productivity. *Ojo and Ajibefun (2000)* posit that the more educated and experienced the farmers, the less time they have for farm supervision because their involvement in other social activities such as politics and other occupation as a way of diversification.

Membership of social organization has a positive co-efficient of 1.069756 it is significant at 1%. It shows that membership to social organization is directly related

to adoption. It therefore means that an increase in one unit of membership leads to an increase in the probability of adoption by 1.069756. This implies that if the farmers are exposed to social organizations, they will have access to information, access to credit and hence these will increase their productivity.

Farm size is statistically significant at 5% and has a positive coefficient. This indicates that there is a direct relationship between farm size and adoption. This shows that the larger the size of farm, the higher the likelihood and intensity of adoption among women farmers in the study area. This is due to the fact that farm size is an important explanatory variable in determining adoption as it enhances productivity.

CONCLUSION

This study investigated the determinants of women's adoption of crop production technologies under WIA programe in Akwa Ibom State. A multistage sampling technique was used to select 150 respondents. The data was collected through a structured questionnaire. The data were analysed using inferential statistics and profit regression model. Most technologies were dry season vegetable, *Gnetum africanum* cultivation, cultivation of improved cassava varieties, cultivation of improved maize varieties, cucumber/pepper production, garden egg production and pineapple

cultivation. These technologies recorded a mean score of more than 1 point. This high level of adoption according to Dung (2007) may be as a result of technologies consistency with the respondents previous knowledge. The result of the probit regression analysis revealed that, the model is statistically significant at $P < 0.01$. Also, from the 10 parameters estimated in the model, five were significant determinants for adopting crop production technologies under WIA programme in the study area. The significant variables that determines the probability to adopt these technologies were: years of farming experience, household size, membership in social organization, years of formal education and farm size.

In conclusion, adoption studies help in accessing the effectiveness of technology transfer. It is an important way of following up the actual number of farmers who make a change and to understand farmers' choices (CIMMYT, 1993). Based on the findings, the socio-economic variables that positively influenced

women's adoption of crop production technologies under WIA programme were years of farming experience, household size and membership to social organizations. The positive relationship implies that a unit increase in these variables will lead to an increase in the probability to adopt the technologies.

Based on the findings of the study, the following recommendations are made: Farming experience was found to have a positive relationship with adoption. Women in Agriculture (WIA) should target their packages with inputs at more experienced farmers since adopting of this technology is directly related with years of farming experience of the respondents. Membership to social organization was positively significant to adoption. It is therefore recommended that policies should be designed to encourage more membership in farmer's organization. Finally, the programmes of the WIA arm of the extension services should be integrated into a more decisive national action plan.

REFERENCES

- Anuebunwa, F. O., Ugwu, B. O., Iloka, A. W., Ikeorgu, J. E. G. and Udealor, A. (2002). Extent of adoption of improved yam minisett technology by farmers in the major yam growing areas of Nigeria. A Research Report Submitted by NRCRI to NARP, Abuja, August 29.
- Centro Internacional de Mejoramiento de Maize (CIMMYT) (1993). The Adoption of Agricultural Technology, A Guide to Survey Design, CIMMYT, Mexico.
- Hughes, B. A. (2005). U. S. Department of Agriculture (USDA), Bi-national commission project. Human Capacity Development Project. Republic of South Africa.
- Hyzer, N. (2000) Women farmers and rural change in Asia towards equal access and participation. Kuala Lumpur: Asia and Pacific Development Centre.
- Ojo, S. O. and Ajebefun, I. A. (2000). Effects of training on labour productivity and efficiency in oil palm production in Ondo State, Nigeria. *Jour. of Sustainable Agri. and Environ.* **2**: 275 – 279.
- Ojo, S. O. (2003). Production and technical efficiency of poultry egg production in Nigeria. *Int'l Jour. of Poultry Sc.* **2**(6): 459 – 464.
- Rahman, S. A. and Usman, J. I. (2004). Comparative analysis of women participation in agriculture production in Northern and Southern Kaduna State, Nigeria. In: Proceedings of the 38th Annual Conference of the Agricultural Society of Nigeria held at the College of Agriculture, Nasarawa State, October 17 – 21, pp. 103 – 113.
- Rosegrants, M. W., Sulse, T. B. and Valmote, Santos, R. A. (2005). Looking ahead long-term prospects Africa's Agricultural Development and Food Security. International Food Policy Research Institute (IFPRI), Washington, D. C.
- Tokula, M. H. (2006). Effects of greater stereotypes on improved agricultural technology adoption. The case of cocoyam production technologies. Proceedings of the 40th Conference of the Agricultural Society of Nigeria, Abia State, 2006, pp. 307 – 311.

