Nigerian Journal of Agriculture, Food and Environment. 11(3):19-24
Published September, 2015

EFFECTS OF EXTENSION SERVICES ON CASSAVA PRODUCTION IN AKOKO NORTH-EAST OF ONDO STATE, NIGERIA

Ajayi*, O. J., Muhammed, Y., Tsado, J. H., Jibrin, S. and Olorunshola, A. E.

ABSTRACT

Department of Agricultural Economic and Extension Technology, Federal University of Technology, PMB. 65, Minna, Niger State. Pastordee2002@yahoo.com; Phone: 2348030254302

This study examined the effect of extension services on cassava production in Akoko North-East Local Government Area of Ondo State, Nigeria with specific objectives to; determine the factors influencing the adoption of extension services provided and identify the constraints faced by cassava farmers in the study area. Simple random sampling technique was employed to select 108 respondents who were basically cassava farmers and primary data collected using structured questionnaire complemented with interview scheduled. Data collected were analyzed with both descriptive and inferential statistics. Majority (80.6%) of the respondents were above 40 years implying that they are in their most productive state, while 82.4% are married, 8.3% single and 9.3%. More so, about 74.1% of the respondents attained secondary education while 25.9% attained primary education in the study area. Results of the logistic regression showed that adoption level of technology on cassava is inversely influenced by household size (X_2) and labour cost (X_9) while educational level (X_5) and experience (X_6) had direct and significant relationship with adoption level. However, marital status (X_4) and cooperative membership (X_7) was found to affect extension service on cassava production positively and significantly at 10% and 1% respectively. Some of the constraints include inadequate capital (50.9%), pest and diseases (25.9%), transportation (11.1%), etc. It was recommended that provision of improve cassava cutting, pest and diseases resistance varieties, transportation and extension delivery services will go a long way in increasing cassava production in the study area.

INTRODUCTION

Cassava is one of the most widely cultivated crops in Nigeria. It is generally cultivated on small-holdings in association with crops such as maize, groundnut, cowpea, vegetables and cocoyam depending on the agro-ecological zone and relies on residual soil nutrients when intercropped with maize which has been fertilized or as following crop in rotation with legumes (Chukwuji, 2008). Cassava crop is grown in 24 states out of the 36 states in Nigeria including the Federal Capital Territory (FCT). It does not only serve as a food crop but more so as a major source of income for rural households. Nigeria has been known to be the largest producer of cassava in the world with an annual production of over 34 million metric tonnes of tuberous roots (FAO, 2009). According to Tonukari (2004), cassava ranks very high among crops that convert the greatest amount of solar energy into soluble carbohydrates per unit of area. Among the starchy staples, cassava gives a carbohydrate requirement which is about 40% higher than rice and 25% more than maize, and is the cheapest source of calories for both human nutrition and animal feeding. However, despite the numerous economic importance of cassava crop, for the past few years cassava production and processing have been facing a lot of problems. Akinnagbe (2010) reported that no supply chain structures exist for the commercialization and supplying of cassava products as primary source of raw materials for the agro-industries. In the same vein, Ugwu (2008) posited that farm level production costs for cassava in Nigeria is high relative to other countries, production is not oriented towards commercialization, instead farmers produced and processed cassava at a subsistence level. The major constraint associated with cassava production is the rapid post-harvest deterioration of its roots which usually hinders their storage in the fresh state for more than a few days (Tonukari, 2004). However, responding to these challenges, agricultural extension plays a pivotal role in ensuring the awareness and subsequent adoption of the contemporary methods of cassava production. According to Davies (2009), agricultural extension and advisory services play an important role in agricultural development and can contribute to improving the welfare of farmers and other people living in rural areas. Extension services can be organized and delivered in a variety of forms, but their ultimate aim is to increase farmers' productivity and income Bamgbose *et al.*, (1998) and Daokinal, (2005). Ayanwuyi *et al.* (2013) also reported that extension service is an important link between the research centers and the farm families which help to convince farmers through the use of educational methods to accept scientific findings and technological development that are relevant in improving their methods of agricultural practices and as such, various extension methods have been employed to make sure that the technologies get to the end users.It was as a result of aforementioned that this study was conceived to determine effects of extension services on cassava production in Akoko North-East of Ondo State, Nigeria and provide answers to the research questions raised, hence the following objectives which are to:

i. describe the socio-economic characteristics of the cassava farmers in the study area

ii. determine factors influencing the adoption of extension technology on cassava production
iii. determine the effect of extension services on cassava production in the study area, and
iv. identify the constraints faced by cassava farmers in the study area.

MATERIALS AND METHODS

This study was conducted in Akoko North-East Local Government Area of Ondo State. The study area is located between latitude 7° 10' North and 5° 05' East of the equator, it covers a total land area of 512 kilometer square with a population of about 213,792 (NPC 2006). The area has a tropical climate marked by dry and wet season. The predominant traditional occupation of the community includes farming and teaching while other include petty trading, artisans, civil servants and carpentry. The population for this study was basically cassava farmers and list of active cassava farmers was obtained from Ondo State ADP. Simple random sampling technique was used to select seven (7) towns out of the fifteen towns in the study area which are: Akunnu, Awara, Ikakumo, Iboropa, Ikare, Auga and Ugbe. Total number of registered cassava farmers were 182 in the towns selected above. Sample size of 108 respondents was randomly selected representing 60% of the sample frame. Data were collected with the aid of well-structured interview schedule designed in line with the objectives of the study. Descriptive statistics such as frequency distribution, percentage and mean was used to achieve objective i and iv while inferential statistics such as logistic regression model statistics was used to achieve ii and ordinary least square (OLS) was used to achieve objective iii. Different functional forms such as linear, double-log, exponential and semi-log were considered. The lead equation was chosen as the best fit and statistical significance of the estimated co-efficient determined.

Model specification

Logistic regression analysis

Logistic regression was used to determine factors influencing adoption of extension technology on cassava production. The general logistic regression model is mathematically expressed as shown below:

$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 \ldots\ldots \beta_9 X_9 + e$

Where:

Y = Extension technology adopted (dummy variable, adopted = 1, not adopted = 0)
X_1 = age in years
X_2 = gender (male = 1, female = 0)
X_3 = household size in number of people
X_4 = farming experience in years
X_5 = cooperative members (member = 1, otherwise = 0)
X_6 = educational level in years of formal schooling
X_7 = farm size in hectare
X_8 = extension contact in number of visit
X_9 = labour cost in naira

Ordinary least square (ols)

This model was used to determine the effects of extension services on cassava production. The four functional form of the OLS namely: linear, double log, semi-log and exponential were considered with the best fit chosen as the lead equation which is expressed below as:

$Y = F(X_1, X_2, X_3, X_4, X_5, X_6, X_7, U)$

The explicit form of the functional forms is specified as follows:

$Y = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + \ldots\ldots\ldots + b_7X_7 + e$ (Linear)
$InY = Inb_0 + b_1InX_1 + b_2InX_2 + b_3InX_3 + \ldots\ldots\ldots + b_7InX_7 + e$ (Double log)
$InY = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + \ldots\ldots\ldots + b_7X_7 + e$ (Exponential)
$Y = Inb_0 + b_1InX_1 + b_2InX_2 + b_3InX_3 + \ldots\ldots\ldots + b_7InX_7 + e$ (Semi log)

Where;

Y = output of cassava in kilogram
X_1 = age in years
X_2 = gender (male = 1, female = 0)
X_3 = household size in number of people
X_4 = farming experience in years
X_5 = cooperative members (member = 1, otherwise = 0)
X_6 = access to credit in naira
X_7 = extension contact in number of visit

RESULTS AND DISCUSSION

Socio-economic characteristics of the respondents

This study looked at the socio-economic variables such as age, marital status, gender, education, farming experience and household size of the respondents. As revealed in Table 1, the majority (80.6%) of the respondents were above 40 years of age implying that they are in their most productive age while 70.4% of the respondents were male, 29.6% were female. More so, majority (82.4%) of the respondents were married while 75.0% of the respondents have household size from 1 – 5 people.

Table 1: Socioeconomic characteristics of the respondents

Descriptions	Frequency	Percentages
Age (in years)		
26 – 30	4	3.7
31 – 35	12	11.1
36 – 40	5	4.6
> 40	87	80.6
Gender (dummy)		
Male	76	70.4
Female	32	29.6
Marital status		
Single	10	9.3
Married	89	82.4
Windowed	9	8.3
Household size (number)		
1 – 5	81	75.0
6 – 10	27	25.0
Education (in years)		
Primary	28	25.9
Secondary	80	74.1
Farming experience (in years)		
1 – 5	2	1.9
6 – 10	12	11.1
> 10	94	87.0
Cooperative (dummy)		
Not Member	97	89.8
Member	11	10.2
Extension visit (dummy)		
Not Visited	78	72.2
Visited	30	27.8
Total	108	100.0

Source: Field Survey, 2014.

In terms of educational level of the respondents, 25.9.7% and 74.1% attained primary and secondary education respectively implying that the respondents have moderate level of education. According to Obinne (1991), education is an important factor influencing farmers' innovation uptake. Majority (87.0%) of the respondents had farming experience above 10 years with only 1.9% having between 1 – 5 years farming experience in the study area. Involvement in cooperative and number of extension visit is very poor as reported by the respondents. Only 10.2% were members of cooperative societies and 27.8% visited by extension agents in the study area. According to Yahaya and Omokhaye (2001), the social involvement of cassava farmers through their participation in farmers' co-operatives will enhance the diffusion of information among the farmers.

Factors influencing adoption of extension technology on cassava production

Logistic Regression model was used to determine the factors influencing adoption of extension technology by the respondents in the study area. The empirical results of the logistic regression are presented in Table 2. The value of the pseudo R^2 was 0.33 implying that about 33.3% of the variation in the dependent variable is explained by the independent variables in the logistic regression model. The logistic regression result revealed that only education X_5 and farming experience X_6 were significant at 1% and 5% level of probability, and positively related to the adoption of extension technology implying that one unit increase in the independent variable will result in an increase in adoption level of extension technology by the respondents. This is in line with Obukosia, *et al.* 2004 who reported that farmers' education level has been found to positively influence the adoption of improved production technologies while Adeniji (2002) also posit that farming experience helps the farmers to be

accustomed to farming challenges, and way of increasing productivity and as well as level of acceptance of innovation towards overcoming their challenges..

Table 2: Logistic regression of factors influencing adoption of extension technology

Variables	Coefficients	Standard error	T-value
Constant	8.1355	7.4294	1.10
Age (X_1)	-0.0105	0.0942	-0.11
Household (X_2)	-0.3015	0.1557	-1.94*
Farm size (X_3)	-0.4563	0.6232	-0.73
Gender (X_4)	0.2012	0.7781	0.26
Education (X_5)	0.8783	0.1903	4.61***
Farming Experience (X_6)	0.1987	0.0981	2.03**
Cooperative (X_7)	-0.4440	1.4137	-0.31
Extension contact (X_8)	-1.2396	1.4877	-0.83
Labour cost (X_9)	0.0087	0.0048	-1.82
Pseudo $R^2 = 0.3334$			

*significant at 1%, **significant at 5% and ***significant at 10%.
Source: Field Survey, 2014

Effects of extension services on cassava production

The various estimated functions arising from the ordinary least square (OLS) regression analysis are presented in Table 3. Farmers' cooperative organization was found to positively affect cassava production. This implies that as the level of cooperative activities increases, cassava production will also increase. This result is in agreement with the findings of Yahaya and Omokhaye (2001) who reported that social involvement of cassava farmers through their participation in farmers' co-operatives will enhance diffusion of information among the farmers. Conversely the regression coefficient of educational level (X_5) is negative which implies that the educated members in the study area are not engaged in Agriculture.

Table 3: OLS regression coefficients on effect of extension services on cassava production

Variables	Linear	Cobb-douglas	Semi-log	Exponential
Constant	61385.22	6.2418	10.870	-330267.7
	(0.83)	(1.06)	(12.19)***	(-0.70)
Age (X_1)	-182.240	-0.1078	-0.0024	-7930.437
	(-0.35)	(-0.44)	(-0.41)	(-0.36)
Gender (X_2)	8333.922	0.6098	-0.0517	11390.1
	(0.70)	(0.33)	(0.37)	(0.66)
Education (X_3)	-5545.398	-0.4242	-0.0491	-47565.88
	(-2.65)***	(-2.23)***	(-2.17)***	(-2.71)***
Cooperative (X_4)	53578.65	0.8275	0.5718	77425.55
	(3.73)***	(4.02)***	(4.02)***	(3.70)***
Farming Exp (X_5)	-500.011	-0.089	0.0039	-8560.933
	(-0.66)	(-0.74)	(-0.48)	(0.79)
Extension contact (X_6)	770.601	0.0043	0.0085	518.317
	(0.06)	(0.02)	(0.06)	(0.03)
Credit (X_7)	69.572	0.910	0.001	79323.30
	(0.19)	(1.12)	(1.06)	(1.21)
R^2	0.1770	0.1589	0.1538	0.1799
F	3.37	3.36	3.30	3.44

*significant at 1%, **significant at 5% and ***significant at 10%. Values in parenthesis represent the t – value of the coefficients.
Source: Field Survey, 2014

Constraints faced by the cassava farmers in the study area

The result in table 4 revealed that 50.9% of the sampled farmers were constrained by inadequate capital, 25.9% by pest and diseases, 11.1% by transportation and 4.6% by extension service delivery. Adeniji, A. A., Ega, L., Adeniyi A. A., Ugwu, B. O. and Balogun A. D., 2006 reported that inefficiency in extension service delivery is caused by irregular payment of travelling claims, ill-motivated field staff, reduced training session for village extension workers and reduced technology review meetings.

Table 4.Constraints faced by cassava farmers

Constraints	Frequency	Percentage
Problem of land tenure Inadequate capital	7	6.5
Pest and diseases	55	50.9
Shortage of planting material	28	25.9
Transportation	1	0.9
Extension service delivery	12	11.1
Total	5	4.6
	108	100

Source: Field survey (2014)

CONCLUSION AND RECOMMENDATIONS

The study assessed the effect of extension services on cassava production in Akoko North East Local Government of Ondo State, Nigeria. Multistage sampling techniques were used to select 108 farmers while structured interview schedule was used to elicit information from the farmers. Data were analyzed using descriptive statistics, logit regression and ordinary least square regression. The result revealed that 70.4% of the cassava farmers were females, 82.4% were married and 87.0% had above 10 years of farming experience. In conclusion, adoption of extension technologies were influenced by education and experience of the respondents while cooperative membership was found to have effect on cassava production with few (10.2%) of the respondents involved in a cooperative society. More so, inadequate capital and problem of pest and diseases were among the major constraints mentioned by the respondents. Based on the result it was recommended that farmers should be encouraged to seek more of formal education as it will further help them understand and take up innovations. In addition, farmers should also be encouraged to form co-operative societies as this will avail them the opportunities to asses' financial support from financial organizations.

REFERENCES

Adeniji, A. A., Ega, L., Adeniyi A. A., Ugwu, B. O. and Balogun A. D., 2006 Effect of desertification on cassava production potentials in North Eastern Nigeria. *Journal of Research and policies, 2(1): 37-42*

Adeniji, O.B. 2002. Adoption of Improved Technologies for Cotton production by famers in Kaduna State, Nigeria. A Ph.D. thesis submitted to the Department of Agricultural Economics and Rural Sociology, Ahmadu Bello University, Zaria, Nigeria. Pp 224.

Ayanwuyi, E., Adeola, R. G. and Oyetoro, J. O. 2013. Analysis of Relevance of Extension Services on Crop Production in Irepodun Local Government Area of Kwara State, Nigeria. *Global Journal of Science Frontier Research, Agriculture and Veterinary*, 13(7) 32-38.

Akinnagbe, O. M. and Ajayi, A. R. 2010. Challenges of Farmer-Led Extension Approaches in Nigeria. *World Journal of Agricultural Sciences*, 6 (4) 353–359.

Bamgbose, A. M., Sani, R. M., Sanusi, M. and Rufum, U. S. 1998. Major Constraints of Poultry production in Bauchi Metropolis. Proceedings of 3rd Annual ASAN Conference, Ikeja, Lagos; Pp 259 – 261.

Chukwuji, O. C. 2008. Comparative Analysis of Enterprise Combination Cost and Return in Cassava based Food Crop Farming System in Delta State Nigeria. *Journal of Agricultural and biological science*, 2 (5): 27 - 31.

Daokinal, R. M. 2005. Analysis of Returns and Constraints in Poultry Production. *Pakistan Journal of Agricultural Economics*, 3 (2): 14 – 23.

Davies, K. 2009. *Agriculture and Climate Change: An Agenda for Negotiation in Copenhagen. The Important Role of Extension Systems*. IFPRI Focus 16, Brief 11. Washington, D.C.: International Food Policy Research Institute.

Food and Agriculture Organization (FAO) 2009. *Storage and Processing of Root and Tuber in the Tropics*. FAO of the United Nations, Rome, Italy, Pp 6 – 24.

National Population Commission 2006. The Population Census Official Gazette (Extraordinary). 94(24), May 15, Lagos.

Obinne, C. P. O. 1991. Adoption of improved cassava production technologies by small-scale farmers in Bendel State. *Journal of Agricultural Science and Technology*. 1(1): 12-15.

Obukosia, S. D., Nyangio, H. O., Waikhaka, K. and Nzuma, M. J. 2004. An Assessment of the Socio- Economic Factors Affecting the Adoption of Citrus Tissue CultureTechnology in Kenya. Food and Agricultural Organization Report.

Tonukari, N. J. 2004. Cassava and the future of starch. *Electronic Journal of Biotechnology*. 7(1): 33 – 51.

Ugwu, C. C. 2008. Gender Roles in Cassava Production and Processing in Enugu North Agricultural Zone of Enugu State, Nigeria. B. Agric Thesis, Department of Agricultural Extension, University of Nigeria, Nsukka.

Yahaya, M. K. and Omokhafe, S. B. 2001. Cocoa farmers' perceived influence of communication on utilization of improved cocoa seed technologies in Owan – East local government area of Edo State. *Moor Journal of Agricultural Research*, 2 (2): 199 – 207.