

RESEARCH ARTICLE

(Open Access)

Factors Influencing Farmers' Choice of Crops in the Floodplain Farms in Akwa Ibom State, Nigeria

NDUBUEZE-OGARAKU, MERCY EBERE^{1*}, EKINE, IRENE DATA²

¹Department of Agricultural Economics & Extension, Faculty of Agriculture, University of Port Harcourt. East-west Road, Choba, Port Harcourt. Rivers State, Nigeria.

²Department of Agricultural & Applied Economics /Extension. Faculty of Agriculture, Rivers State University, Port Harcourt, Rivers State, Nigeria.

Abstract

The study was carried out to evaluate factors influencing farmer's choice of crops in floodplain farms in Akwa Ibom State, Nigeria. Specifically, farmers' socioeconomic factors were determined. Simple random sampling technique was adopted in selection of 340 respondents. Descriptive statistics and logistic probability model were the analytical techniques used. Result showed that mean age of farmers was 40 years and they were mainly women. Farmers' age, gender, years of formal education and farming experience were significant determinants of choice of crops grown among farmers in the area. Null hypothesis H_{01} of no significant influence of socio-economic variables on farmers' choice of crops grown in the floodplain in Akwa Ibom State was rejected. The study recommends that training programmes should be organized for farmers to help them make right choice of crops grown in the floodplain farms.

Keywords: Factors, farmers' choice, crops, floodplain, Akwa Ibom State, Nigeria.

1. Introduction

A floodplain as defined by [1] is a flat or nearly flat land adjacent to a stream or river that experiences occasional or periodic flooding. Fadama or floodplain soils have the potential for agricultural production in a sustainable way because of its peculiar hydrological characteristics. Such potential is particularly relevant in view of the degradation of the uplands of Nigeria (BSADP, 1994). The total wetland area in Africa [2] amounts to about 5.6 million km² (i.e. about 16% of the total area of the continent.

Wetland covers about 4.9 million hectares in Nigeria, [3] suggested that agricultural sector in Nigeria is dominated by low resource or resource-poor farmers characterized by small fragile farm soils, rain-dependent, minimum inputs and poor yield [4]. However, [5] states that there are three sources of food supply to the households. These were purchases from market, production from uplands as well as wetlands. Cassava and fluted pumpkin are major crops produced by farmers in the flood prone areas or low land areas in Akwa Ibom States. They are important crops in south-

south states and Nigeria at large as most households are regular consumers of the products. Nigeria is currently [6] the largest producer of cassava in the world with an annual output of over 34 million tonnes. They stressed that cassava production has been increasing for the past 20 or more years in area cultivated and in yield per hectare. On average, the harvested land area was over 80 percent higher during 1990–1993 than during 1974–1977.

International Fund for Agricultural Development Food [7] showed that on a per capita basis, North Central Nigeria is the highest producing state at 0.72 tonnes/person in 2002, followed by South East (0.56), South-South (0.47), South-West (0.34), North-West (0.10) and Northeast (0.01). National per capita production of cassava is 0.32 tonne /per person. By zone, the North Central zone in Nigeria produced over 7 million tonnes of cassava a year (1999 to 2002). South-South. Nigeria produces over 6 million tonnes a year while the South West and South-East produce just less than 6 million tonnes a year. The highest quantity of cassava production was from the north central states. According to [8] Benue and Kogi State in the North Central Zone

*Corresponding author: Ndubueze-Ogaraku, Mercy Ebere; E-mail: mercy.onu@uniport.edu.ng

(Accepted for publication September 25, 2018)

ISSN: 2218-2020, © Agricultural University of Tirana

are the largest producers of cassava. Cross-River, Akwa Ibom, Rivers and Delta states dominate in cassava production in the South-South. [9] reported that cassava is an important source of dietary carbohydrate, and provides food for over 60 million people in Nigeria. The roots according to ([10]; [11]; [12]) are processed into garri, *fufu*, tapioca, chips and cassava flour for human consumption as well as paper, pellets, adhesive, and a carrier for pharmaceuticals etc. Fluted pumpkin (*Telferia occidentalis*) is one of the most important vegetable crops grown extensively in almost every State but mostly in the southern part of the country by most households and consumed by majority of Nigerians because of its dietary importance. It is one of the major income generating crops in many parts of Africa [13]. Vegetables are of great nutritional value and important sources of vitamins and minerals, and dominate the diets of most Nigerians. Vegetable production [14] constitutes about 46 percent of the total staple food production in Nigeria between 1970-2003. This implies that vegetables are important for a balanced human diet. A review of species of vegetables by [15] showed that indigenous and traditional vegetables could make a significant contribution to world's food production because they are well adapted to adverse environmental conditions and are generally resistant to diseases. These vegetables include fluted pumpkin (*Telferia occidentalis*) among others.

In Akwa Ibom State, vegetables such as pumpkins (*Telferia occidentalis*) receive high popularity due to their high consumption demands by people in the area. This vegetable crops [16] form major types of vegetables commonly cultivated by both rural farmers and those into urban or backyard food crop production in the area. The demand [17] for fluted pumpkin in the study area has increased tremendously due to the diverse ways in which the crop is use. Popularity of the crop in the study area according to [18] is due to low cost per unit of resource use in the production, short gestation period and quick returns on invested capital compared to other crop enterprises.

In considering factors that influence farmers considerations on types of crops to grow in farms, [19] found that more than 80 percent of the respondents identified rotational considerations as a factor in their decision of which crops to plant on their irrigated acres in any forth coming season. He stressed that economic considerations such as knowledge of futures prices and expected costs of production inputs were also important considerations. [20] reported that level of

education could influence the farmer's understanding of climatic and weather and factors affecting farming could help in taking various farm decisions.

Farming in Akwa Ibom State involves growing food crops in both upland and low lands (floodplains). Cropping in the floodplain area is restricted to certain periods of the year. It is surprising to note that in spite of yearly occurrence of floods, farmers still engage in growing crops in the floodplain farmland. The decision to cultivate a particular food crop in the floodplain area relies exclusively on the farmer but the effects of these factors on the farmers choice is a serious research concern. It is on this background that this study was initiated to evaluate the factors influencing farmers' choice of crops grown in the floodplain in Akwa Ibom State.

The broad objective of this study was to estimate determinants of choice of crops grown among floodplain farmers in Akwa Ibom State and specifically the study;

- i examined the socio-economic characteristics of floodplain farmers in Akwa Ibom State.
- ii evaluated factors that influence farmers' choice of crops grown in the study area.

Hypothesis:

Ho₁ = Crops grown in Akwa Ibom State floodplain farms is not influenced by farmers' socio-economic factors.

2. Methodology

Area of study

This research was carried out in Akwa Ibom State of Nigeria; the state is one of the 36 states of Nigeria and one of the oil rich states in Niger Delta region of Nigeria. It occupies a total land area of 7,246 square kilometers, with a population of 3,920, 208 people having 1,983,202 males and 1,918,849 females [21].

Sources and Methods of Data Collection

The study adopted a multi-stage sampling procedure with the use of purposive and simple sampling procedure for the selection of the respondents. The choice of the study area was purposive because of high activity of floodplain farming in the area. Selection of the floodplain farmers in the sample area was through simple random sampling of the farmers from the 360,000 farming families in Akwa Ibom State [22]. The first selection process was the selection of Local Government Areas (LGAs) from each of the agricultural zones of the state. Akwa Ibom State is made up of six (6) agricultural zones Viz: Oron, Abak,

Ikot Ekpene, Etinan, Eket, and Uyo, and has very high potential for agriculture. Three agricultural zones were randomly selected from the six agricultural zones in the state for the study. These were Abak, Uyo and Etinan agricultural zones. The next stage was the random

selection of three (3) communities from each Local Government Area giving a total of 18 communities and 340 floodplain farmers were randomly selected from the communities.

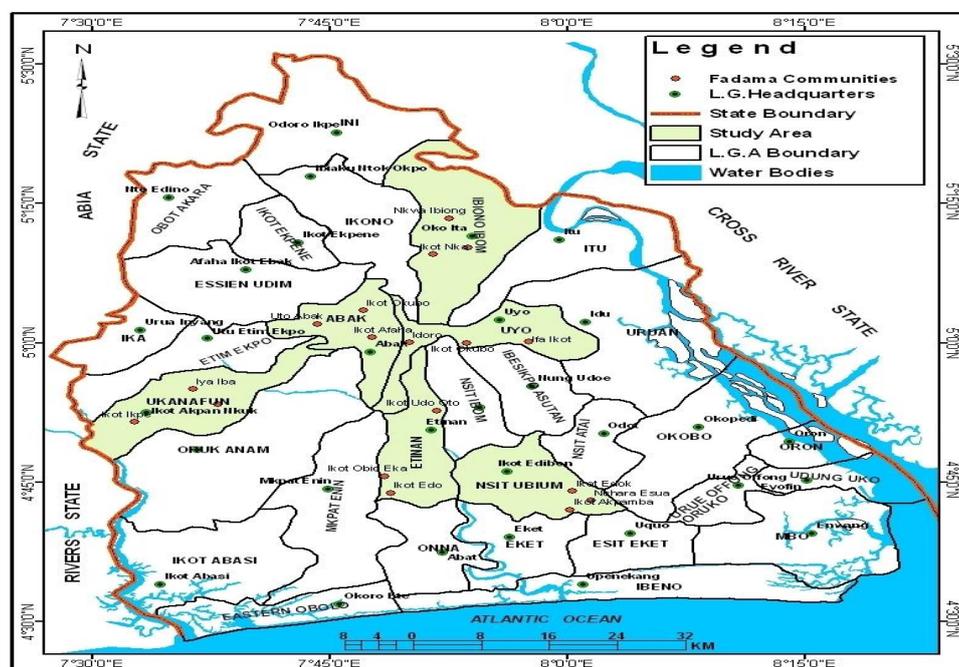


Figure 1. Map of study area in Akwa Ibom States showing LGAs and communities

Model Specifications

Logistic Regression Model

$$P(Y) = \frac{e^{-Y}}{1 + e^{-Y}} \quad \text{eq 1}$$

Logit model

In the logit model, the dependent variable takes the value of between 0 and 1 (or between 0 and 100) if it is in percentage form. Where P(Y) is the value of the dependent variable between 0 and 1

In other words the probability that the dependent variable takes the value P (Y) is expressed as = $P(Y) = \frac{1}{1+e^{-y}}$ eq 2

Logistic Regression Model

$$\log_e(P) / (1 - \log_e(P)) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + e$$

where:

P(Y) = Probability of access to healthcare (Y= 1 = grow fluted pumpkin; Y= 0 grow cassava)

β_0 = Constant

$\beta_1 - \beta_6$ = Coefficients

X_1 = age of farmers in years

X_2 = sex of farmers in dummy

X_3 = household size in number of persons

X_4

= education in number of years spent in education

X_5

= experience in number of years spent in farming

X_6 = farm size in hectares

e = error term

The probability assumes a binary dependent variable one (1) or zero ie choosing cassava or fluted while the independent variables are the socio-economic variables.

H_{01} = Choice of crops grown in the floodplain farms of Akwa Ibom State is not affected by the socio-economic characteristics of farmers.

Wald χ^2 statistics is used in the test of significant level which calculated as follows [23] [24].

$$\text{Wald } \chi^2 = \left(\frac{\text{Coefficient } t}{SE \text{ coefficient } t} \right)^2$$

Decision Rule: If the Wald Statistics value is high with p-value of less than or equal to 10%, then the coefficient is assumed to be significant. If the coefficient is above 10 %, it is assumed to be to have insignificant effect. Presence of significant coefficients

in a logistic variable implies that the variables had influence on the farmers' choice of enterprise.

3. Results and Discussion

Result on Table 1 showed that 35 percent of the farmers were between the age bracket of 31- 40 years, while 1.2 percent of them were in the age group of 15- 20 years. The mean age of farmers was 40 years. The result shows that able young and energetic youths are engaged in the floodplain cassava and fluted pumpkin production in the study area. It is implied that farmers are in their active and productive stage in life and could easily carry out farming activities in the study area.

The data also indicated that 56.5 percent of the farmers were women while male farmers constituted about 43.5 percent. Female dominating the farming population in this area will likely be connected to the fact their male counterpart may have moved to the city for better paid jobs or are engaged in contract jobs especially in the oil drilling companies operating in the area since the state is one of crude oil mineral producing states in Nigeria while women being left in the rural communities were engaged in farming business as a means of livelihood.

Mean number of persons showed in the data was 7 persons. Majority (50.3 percent) had 1- 5 persons per household while 14.1 percent of the respondents had a household size ranging from 11- 15 persons. Large family size found could be that most farmers relied on family members as one of the source of farm labour supply.

The study further indicated that majority 33.8 percent of the framers obtained primary school certificate while only 3.8 percent of them had higher degree. An average farmer spent 10 years in formal education, implying that a typical farmer in the area had at least Junior Secondary School Certificate. This implies that most farmers were literate and this could enable them to understand and know how to apply innovation packages that would enhance their productivity in the farming business.

The result further showed that 53.2 percent of the farmers spent between 6-10 years in cropping in the floodplains of Akwa Ibom State and spent 9 years as an average farming. Number of years spent in farming is

an indication that the farming system is not new in the area. Also, the experiences gained by older farmers will be of great benefits to younger farmers who may need advice on how to improve their productivity. The data found that 42.9% of farmers cultivated farm size of less than 0.4 hectare having an average plot size of 1 hectare.

Probability of choosing either of the two major crops in floodplain farming (either fluted pumpkin or cassava production in the floodplain area was suspected to be influenced by certain socio-economic variables. The result showed that farmers' age, gender, years of formal education and farming experience were significant factors which influenced farmers choice of crops in the Akwa Ibom State floodplain farms. Farmers gender and farming experience positively influenced farmers' decision while age and level of education negatively influenced the decision on the type of crop grown in the floodplain areas. The slope coefficients had Wald statistics, which were all significant at one (1) percent level.

With the Wald statistics recorded in the model, therefore, we have no choice than to reject the null hypothesis of the study H_{01} , which stated that farmers socio-economic variables had no significant influence on choice of crops grown in the floodplain farm land of Akwa Ibom State. Therefore, we can confidently conclude that decision to choose any of the two crops in the floodplain areas of Akwa Ibom State in the Niger Delta Region were not by chance but were highly influenced by the variables mentioned above. The outcome of this study is contrary to the finding of [26] Ani, which indicated that age, marital status and educational level of the respondents were not important factors significantly influencing farmers decision making behaviour. However, the study agrees with [27] which showed that literacy was among the factors that significantly influenced farmer's decision on the use of chemical fertilizer but the study is contrary to their findings that farm size had significant effect on the farmer's decision on the use of chemical fertilizer in the farm.

Table 1. Socioeconomic characteristics of farmers

Age in Years	Frequency	Percentage
15-20	4	1.2
21-30	71	20.9
31-40	119	35.0
41-50	98	28.8
51-60	43	12.6
61 & above	5	1.5
Mean	40 years	
Sex		
Male	148	43.5
Female	192	56.5
Household Size in Number of Persons	Frequency	Percentage
1-5	171	50.3
6-10	121	35.6
11-15	48	14.1
Mean	7 persons	
Educational Level	Frequency	Percentage
No Formal Education	33	9.7
Primary	115	33.8
Secondary	97	28.5
NCE/Diploma	42	12.4
First Degree	40	11.8
Higher Degree	13	3.8
Mean	10 years	
Years of Farming Experience in Number	Frequency	Percent
1-5	68	20.0
6-10	181	53.2
11-15	65	19.1
16-20	12	3.5
21-25	4	1.2
26-30	4	1.2
30 & above	6	1.8
Mean	9 years	100
Farm Size in Hectare	Frequency	Percent
Less than 0.4	146	42.9
0.4-0.9	67	19.7
1-1.4	45	13.2
1.5-1.9	13	3.8
2-2.4	43	12.6
2.5-2.9	3	.9
3 & above	23	6.8
Mean	1 hectare	
Total	340	100

Source: Field Survey, 2010

Table 2. Classification of Choice Model in Akwa Ibom State

Observed	Predicted choice of crops grown (Cassava=0, Pumpkin =1)	Percent Correct		
		Cassava	Pumpkin	
Crop choice (Cassava=0, Pumpkin =1)	Cassava	122	8	71.84
	Pumpkin	62	108	63.5
Overall Percentage				67.6
Cut value = .500				
Model Summary				
	-2 Log likelihoods	Cox & Snell R Square	Nagelkerke R Square	
	387.133 ^a	.219	.293	

Source: Field Data (2010) Analysis Output Using SPSS 17.0 Programme

The result on Table 2 employed [25] pseudo R² in the measurement of fitness of the model. The estimates, which are respectively 0.22 and 0.29, are low enough to justify the application of the model in the analysis.

Table 3. Logistic Result

Variables	B	S.E.	Wald	Df	Sig.	Exp(B)
Age	-.034*	.013	7.259	1	.007	.967
Sex	.741*	.249	8.877	1	.003	2.098
Household size	.024	.035	.491	1	.484	1.025
No of years spent schooling	-.102*	.032	10.151	1	.001	.903
Farming experience in year	.193*	.031	37.586	1	.000	1.213
Farm size	-.181	.390	.216	1	.642	.834
Constant	-.510	.783	.425	1	.515	.600

N/B *= significant at 1%

Source: Field Survey, (2010) Analysis Output Using SPSS 17.0 Programme

4. Conclusions

The study concludes that farmers' age, gender, years of formal education and farming experience were significant determinants of choice of grown by farmers in the study area. Therefore, decision to choose any of the two crops in the floodplain farms in Akwa Ibom State were not by chance but were highly influenced by the socio-economic variables of the farmers. It is recommended that training programmes on floodplain farming should be organized to improve farmers' ability of choice making regarding crops to grow on the floodplain area.

Also training programmes should be targeted at women since they dominated the farming population.

5. Acknowledgements

Authors wish to thank Rivers State Scholarship Board, 2010 for sponsoring this project and Rivers State University, Nigeria for providing necessary supports in hosting the research activities.

6. References

- [1] Judson S, Kauffman ME: **Meaning of Floodplain and Physical Geology**. 8th Edition. Englewood, Prentice Hall, 1990. 290-292.
- [2] Andriessse, J.P. **The Tropical lowland peat in South-East Asia**. *Royal Tropical Institutes*, Amsterdam. 1985. 63.
- [3] **Bauchi State Agricultural Development Project (BSADP) Annual report for the national fadama development project**. Bauchi PME Unit, Bauchi, Nigeria. 1994

- [4] Okuneye PA, Fabusors E, Adebayo K, Ayinde IA: **The Nigerian agriculture and poverty incidence: The Need for private sector employment.** *Journal of Farm Management Association of Nigeria.* 2004. 7(2), 54-65.
- [5] Umoh GS: **The promise of wetlands farming: evidence from Nigeria.** *Medwell Online Agricultural Journal.* 2008. 3(2), 107-112. Retrieved on 23 November 2012 www.krepublishers.com/.../JHE-24-2-085.08-1797-Umoh.G.S.Ab.pdf.
- [6] Adeniji A, Ega L, Ugwu B, Akoroda M, **Cassava development in Nigeria. A Country case study towards a global strategy for cassava development.** Proceedings of the Validation Forum on the Global Cassava Development Strategy, International Fund for Agricultural Development / Food and Agriculture Organization of the United Nations (IFAD and FAO). Rome. 2005. Retrieved on 26th April, 2013. [Http://Www.Fao.Org/Docrep/009/A0154e/A0154e00.Htm](http://Www.Fao.Org/Docrep/009/A0154e/A0154e00.Htm)
- [7] International Fund for Agricultural Development Food (IFAD): **The Global cassava development strategy: a cassava industrial revolution in Nigeria.** The potential for a new industrial crop. Philips, T.P:Taylor, D.S; Sani, L and Akoroda M. O. (eds). International Fund for Agricultural Development Food and agriculture Organization of the United Nations. Rome. 2004. 1-13
- [8] Philips TP, Taylor DS, Sani L, Akoroda MO: **The Global cassava development strategy: A cassava industrial revolution in Nigeria:** The potential for a new industrial crop In.(eds). International Fund for Agricultural Development Food and Agriculture Organization IFAD/FAO: Rome. 2004 .2-30. retrieved on 4 September 2012. <ftp://ftp.fao.org/docrep/fao/007/y5548e/y5548e00.pdf>
- [9] Abdulahi A: **Employment creation and opportunities in the agro-allied sub-sector; The Case of cassava production.** *The Bullion Publication of CBN.* 2003. 27 (4): 1-10
- [10] Nigeria National Report: Rural reform and development in Nigeria. A Report presented at International Conference on Agrarian Reform and Rural Development. Porto Alegre. (2006).
- [11] Nwokoro SO, Orheruda A M, Ordia PI: **Replacement of maize with cassava peel in cockerel starter diets, effects on performances and carcass characteristics.** *Tropical Animal Health and Production,* 2007. 37 (6), 495 -501
- [12] Azaino E: **Business opportunities in the cassava value chain in Nigeria.** A paper presented at Agricultural Product Workshop Organized by Uptonville Foundation by Rivers State Sustainable Development Agency. Port Harcourt. 2008.
- [13] Adebisi-Adelani O, Olajide-Taiwo I.B, Adeoye IB, Olajide-Taiwo LO: **Analysis of production constraints facing fadama vegetable farmers in Oyo State, Nigeria.** *World Journal of Agric. Sci,* 2011. 7(2), 189-192.
- [14] Central Bank of Nigeria (CBN): Annual report and statistical bulletin. 2004. (6),12.
- [15] Siesmonima JS, Pilnek K: **Plant Resources of South East Asia.** PROSEA, Bogor, Indonesia. 1994. 412
- [16] Mbanasor JA, Kalu KC: **Economic Efficiency of Commercial Vegetable Production System in Akwa Ibom State, Nigeria.** A Translog Stochastic Frontier Cost Function Approach. *Tropical and Subtropical Agro-Ecosystems.* 2008. 8, 313- 318.
- [17] Udoh EJ, Akpan SB **Measuring technical efficiency of Waterleaf (*Talinum triangulare*) production in Akwa Ibom State, Nigeria.** *American Eurasian Journal of Agriculture and Environment Science.* 2007. 2(50):518-523.
- [18] Edet BN, Jim AA, Uwemedimo EO, Edet NE: **Determinants of Fluted Pumpkin (*Telferia occidentalis*) Production and Profitability in Akwa Ibom State, Nigeria.** *American Journal of Experimental Agriculture* 2015. 5(2): 109-117.
- [19] Mullen JD, Escalante C, Hoogenboom G, Yu Y: **Determinants of irrigation farmers' crop choice and acreage allocation decisions: opportunities for extension service delivery.** *Journal of Extension.* 2005 .43(5),1-10 retrieved on 5 September 2012. www.joe.org , <http://www.joe.org/joe/2005october/rb3.php>.
- [20] Iheanacho AC: **Economics of millet production under different cropping systems in Borno State of Nigeria.** (Unpublished doctoral

dissertation), Ahmadu Bello University, Zaria, Nigeria. 2000.

[21] National Population Commission NPC: **Legal notice on publication of 2006 census final results.** *Federal Republic of Nigeria Official Gazette*, Abuja. 2006. 2 (96): 1 – 42.

[22] Akwa Ibom State Agricultural Development: **Second quarterly progress report. monitoring and evaluation Sub-Programme Akwa Ibom Development Programme**, Uyo, Akwa Ibom State, Nigeria. 2000.

[23] Gujarati DN: *Basic Econometrics*. New York, McGraw-Hill, Inc. 1988. 144 – 489.

[24] Bewick V, Cheek L, Ball J: Statistics review 14: Logistic regression. 2005. Retrieved on 24 May 2013;

<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1065119/>.

[25] Howitt D, Cramer D: **Introduction to Statistics in Psychology**. England. Fifth Edition, Pearson Education Ltd. 2011. 559-613. Retrieved on 29 August 2012. <http://teachingpsychology.files.wordpress.com>.

[26] Ani AO: **Taking farm decisions and socio-economic characteristics of rural women farmers in southern Ebonyi State, Nigeria.** *Int. J. Agri. Biol.* 2003. 5(4), 645-649. Retrieved on 3 July 2010. <http://www.ijab.org>.

[27] Bacha D, Aboma G, Gameda A, De Groote H: **The determinants of fertilizer use in maize production in Western Oromiya, Ethiopia.** Seventh Eastern and Southern Africa Regional Maize Conference. Nairobi, Kenya. 2002.