

CASSAVA ENTREPRENEURSHIP AND GENDER PARTICIPATION IN UDI LOCAL GOVERNMENT AREA OF ENUGU STATE, NIGERIA

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Abstract

This Study on cassava entrepreneurship and gender participation was carried out in Udi local Government Area of Enugu State, Nigeria. Quarterly data from a panel of thirty male-headed and thirty female-headed cassava-based farm households randomly selected followings a multistage sampling of ten out of 24 autonomous communities of the study area was subjected to descriptive and inferential statistical analyses. Both male and female entrepreneurs engaged more on three of cassava products namely Garri, Fufu and Tapioca on account of relatively better profits from them. Segregating male from female entrepreneurs, participation of males in cassava enterprise was negatively influenced by adult number of males, time spent on housework, and daily non-farm wage while participation of females in the enterprise was influenced by adult number of females in household, daily non-farm wage, time spent on housework and frequency of contact with extension agency with challenges of high operational costs, and poor packaging on the enterprise in the area. To bring male and female entrepreneurs at par in terms of resource needs, all social and cultural constraints on female access to arable land and credit should be addressed by law such that there will be prohibition against any discrimination on women. We recommended provision of financial credit and grants for SMEs development to enable entrepreneurs (especially women) purchase fertilizers and automated machines for processing, and packaging of the products to attract better prices.

Key words: Entrepreneurship, Farm household, Gender participation, Udi, Cassava Value-chain

INTRODUCTION

Cassava (*Manihot esculenta*) has remained one root crop widely cultivated, traded on and consumed in sub-Saharan Africa including Nigeria [1]. Production of this crop has remained in the hands of small-scale entrepreneurs who have taken advantage of fact that the crop is drought tolerant and can be grown on poor marginal soils, intercropped with other crops, can successfully store in the ground/soil for many months, and is highly marketed in tubers, granulated roasted (garri), in fermented pesta (fufu) and as cassava flours [2] to grow it and guarantee security in food with great wealth from the crop.

A cassava-based entrepreneur is that farmer or processor who had initiated, organized, and

manages risks associated with cassava crop and/or its associated products and activities. The entrepreneur here is interested in innovations (new products, new production methods, new markets, and new forms of organizations) that create demand and ultimately wealth in appreciable quantity and speed. In agriculture, men and women have performed many and different gender roles in different farm enterprises either as planners, or owners, hired processors, or traders. In Nigeria, there has been serious call to develop cassava as not only a cash crop with local benefits but as an export crop [3, 4, 5]. How participatory have performance of these roles been on matters of product development and how much of the entrepreneurial functions are performed by males relative to that performed

by women are questions that prompted this investigation.

Women headship of households, especially lone mothers have often been associated with vulnerability to poverty, and are accused of being symptomatic to easy 'family breakdown' [6]. However, gender inequity exists as a pernicious obstacle to participation in development of females in developing economies [7]. A good product development approach must embrace gender participation to ensure that men and women in competition are 'equally involved' in meeting challenges of growth and development of the farm commodity, its involvement in creation of more jobs, and removal of distortions, and discriminations in labour markets [8]. This aptly applies to a choice crop like cassava where harvest and post-harvest value chain elements require gender decisions to reduce inefficiencies and improve profit. Commercial profitability of cassava should therefore reject the unitary household model and recognize other models that emphasize households as sites of bargaining, 'cooperative-conflict' and intra-household inequalities along gender lines whenever we consider resource generation and distribution [9]. In pursuing this line of reasoning therefore, the specific objectives of this study are, to (i) describe socio-economic characteristics of cassava - based farm entrepreneurs; (ii) determine profitability of entrepreneurship and challenges to cassava value chain activities, and (iii) segregate factors that influenced participation of male and female heads of farm households in cassava entrepreneurship in Udi.

MATERIALS AND METHODS

Area of Study

This study was carried out in Udi Local Government Area (LGA) of Enugu State, Nigeria. Udi LGA is one the seventeen LGAs of the state and shares boundaries in the East with Enugu North LGA, in the west with Ezeagu LGA, in the South with Oji-River LGA and in the North with Igbo Etiti LGA of the State. Udi is located between Latitudes 6°

12° N and $10^{\circ} 42^{\circ}$ N of the Equator and between Longitudes $7^{\circ} 10^{\circ}$ E and $7^{\circ} 28^{\circ}$ E of the Greenwich Meridian. Udi LGA occupies an area of 973.80Km^2 and is situated within high populated Igbo eastern heartland with 234,002 inhabitants made up of 115,579 males and 118,423 females [10] [FRN, 2007]. Udi LGA has 24 autonomous communities namely Umuagu, Umuabi, Obinagu, Nachi, Amokwe, Agbudu, Abia, Udi, Obioma, Nsude, Ngwo, Eke, Ebe, Abor, Ukana, Awhum, Okpatu, Egede, Affa, Umulumgbe, Umuoka, Akpakwume, Nze and Oghu. The topography of these communities varies with some areas hilly and others rolling lands and mean annual rainfall of about 1700mm. The soil is fertile and supports agricultural production of tree crops like oil palm, raffia palms and Cashew. Food crops grown in the state are Cassava, sweet potatoes, Plantain, Banana, cowpeas, vegetables, melon, pineapples and maize. The commonest cropping system in Udi LGA is mixed cropping with most farmers operating in smallholder scales.

Sampling Technique and Data collection

Multi-stage random sampling technique was used to select households from which socioeconomic, cassava production, processing and marketing activities is carried out in the study area. In the first stage, ten autonomous communities were randomly selected from the twenty four autonomous communities that make up Udi LGA. In the second stage, one village was selected from each of the chosen communities. In the third stage, six entrepreneurs' taking decisions for cassava-based farm households were randomly chosen: three male-headed and three-female headed households were chosen from each of the villages. This gave a sample of sixty cassava-based entrepreneurs consisted of thirty male-heads and thirty female heads of farm households involved in this study. Socioeconomic data collected included, marital status of farm head, educational attainment of farm head, farm size, farm inputs, cassava harvests, unit selling price, health status, annual farm income, daily farm wage, daily non-farm wage, time spent on cassava activities, time spent on other

household works, and frequency of extension contact.

Data Analytical Technique

A combination of statistical tools including frequency distribution, percentages, and means was used in analyzing the data collected for this study. While frequency, percentages and means were used to describe the socio-economic characteristics of the farm households profitability of cassava enterprises was determined using farm partial budget analysis. The Net Farm Income (NFI) was computed by subtracting production cost from gross production value [11, 12]. When Gross income is computed, and fixed cost is estimated, the net profit level of an enterprise or a farm is easily determined. In this study, the fixed costs included depreciation of knives for peeling tubers, sifters processing shed, grating machines, sieving machine, toaster and packaging machines. Mathematically, the NFI for a cassava entrepreneur was stated as follows:

$$NFI = \sum_{i=1}^n PiYi - \sum XxiXj - \sum Zk \dots [Eq-1]$$

Where

NFI = Net annual income of a cassava entrepreneur (₦'000);

Yi = The handled jth tonne of cassava or cassava product, for i = 1,2, 3...n entrepreneur;

Pi = Unit Price of the handled jth tonne of cassava or cassava product (₦);

Xj = Inputs used in producing or processing jth tonne of cassava or cassava product, for i=1,2,3...n;

Pxj = Unit price of the jth variable inputs (₦);

Zk = Depreciation value of the kth fixed inputs (₦), fork=1,2,3,...k);

∑ = Summation sign.

The annual depreciation value of the fixed inputs was computed following a straight line method that assumed zero scrap value at expiration of the lifespan: 3 years for implements and 5 years for machines. Thus:

Annual depreciation = Current Value of Cassava Enterprise Fixed cost item

Expected lifespan of Cassava Enterprise fixed cost items ...

[Eq-2]

Limited response dependent variable multiple regression probit model was used in analyzing factors that determined gender participation in cassava entrepreneurship. The model of limited dependent variable used was as introduced by [13] and as applied by [14] and corrected for bias [15] in selection of respondents. This probit model was stated as follows:

$$Y_{ij} = \alpha_j + \beta_j \sum_{k=1}^s H_{ijs} + \epsilon_{ij} \dots [Eq-3]$$

Where the H_{ijs} are vectors of s explanatory variables of the jth farm household; Y_{ij} is a vector of binary variables such that Y_{ij} =1 if the jth household is investigated gender that participated in cassava enterprise, and 0 otherwise. Since Y_{ij} can only assume two different values for the condition, 1 or 0 .The expected probability was defined as follows:

$$E(Y_{ij}) = E \left[\alpha_j + \beta_j \sum_{k=1}^s H_{ijs} + \epsilon_{ij} \right] \\ = \alpha_j + \beta_j \sum_{k=1}^s H_{ij} E(H_{ij}) [Eq-4]$$

[Equation -3] defines the proportion of households with characteristics (H_{ij}) likely explain gender participation in cassava entrepreneurship. The empirical model was specified for farm household participation is thus:

$$EXP_{ij} = \beta_0 + \beta_1 \ln (FS_{ij}) + \beta_2 \ln (AN_{ij}) + \beta_3 \ln (TC_{ij}) + \beta_4 \ln (TW_{ij}) + \beta_5 \ln (DW_{ij}) \\ + \beta_6 \ln (MS_{ij}) + \beta_7 \ln (HT_{ij}) + \beta_8 \ln (EC_{ij}) + \beta_9 \ln (ED_{ij}) + \beta_{10} \ln (SF_{ij}) + \epsilon_{ij} \dots [Eq-5]$$

Where explanatory variables (continuous, discrete and binary) are as defined in Table [1]. The dependent variable for equation [-5] is anticipated gender participating as defined in equation [-3]. It was hypothesized that (i) male-headed farm households participation would positively be determined by: FS_{ij}; TC_{ij}; MS_{ij}; HT_{ij}; SF_{ij} and (ii) that female-headed farm households participation would positively be determined by: FS_{ij}; TC_{ij}; MS_{ij};

SFij and (iii) that male-headed farm households participation in cassava entrepreneurship would negatively be determined by: ANij; TWij; DWij; ECij; SFij and (iv) that female-headed farm households

participation in cassava entrepreneurship would negatively be determined by: ANij; DWij; TWij; ECij; EDij; SFij.

Table 1. Description of Variables analyzed by Probit Regression Model

Variable	Variable Type	Expected Sign Eqn.4	Description of Variable
EXPij	Binary		1 if the anticipated male or female head participated in Cassava entrepreneur ; 0 if otherwise Eqn. (4);
FSij	Binary	+	1 if size of farmland is at least 3.0 hectares; 0 if otherwise;
ANij	Discrete	-/+	Adult number of male or females in household;
TCij	Continuous	+	Time Spent on cassava activities in a week;
TWij	Continuous	-	Time Spent on other housework activities in a week;
DWij	Continuous	-	Daily non-farm wage (₦);
MSij	Binary	+/-	Marital status (1 if Married; 0 if otherwise)
HTij	Binary	+/-	Health status of household members;
ECij	Discrete	+	Frequency of monthly extension contact ie Number of times in contact with extension agency;
EDij	Continuous	-	Number of years of formal Education of head of household;
SFij	Binary	+/-	Status of engagement: Full time=1;Part-time=0

RESULTS AND DISCUSSIONS

Household Characteristics

Table 2 shows the general characteristics of male- and female- headed cassava-based entrepreneurs involved in this study. The Table showed that cassava entrepreneurship in the study area included growing of cassava for tubers and stems. All male-headed and female-headed households investigated (100.0%) grew cassava; and different proportions processed the tubers into different products. Quite reasonable proportions, 33.3% of male-headed households and 20.0% of female-headed households processed cassava tubers to garri. Equally some good proportions, 26.6% of male-headed households and 43.3% of female-headed households processed cassava tubers into fufu; and 30.0% of male-headed and 46.7% of female-headed households processed the tubers into garri and fufu. Relatively low proportions: 13.3% of male-headed households and 36.7% of female-headed households processed cassava tubers into garri, fufu, and Tapioca; and yet lower proportions, 6.7% of male-headed households and 16.7% of female-headed households processed cassava tubers to tapioca. These showed that apart from processing cassava tubers into garri alone, more women-headed

households processed cassava tubers to other products especially garri and fufu , fufu, garri, fufu, and tapioca. However, some potential products with industrial demands such as starch and cassava chips have not been ventured into by cassava entrepreneurs in the studied area, on account of partly unawareness and no demonstrated affordable technology.

In terms of marital status, 80.0% of male household heads and 90.0% of female household heads were married. The figures further revealed that only 13.3% of male household heads and 6.7% of the female household heads were single. In male headed households, 6.7% had lost their spouses while in female headed households 3.3% were widows. Majority of cassava entrepreneurs being married suggest that activities involved in the enterprise on one side requires support of household labour and on the other side, the enterprise generates attractive returns enough to help households cushion effects of food and financial insecurity associated with married life. In Nigeria, with the Presidential initiative on cassava has pushed up the value of the crop such that cassava has been tagged a food security crop attracting relatively higher income [5]. The proportion of heads of households that had formal education was high in both the male and female headship of households but

relatively higher amongst female headed households. The female household heads with no formal education was only 6.7% as against 33.3 for the male household heads with no formal education.

Table 3.Characteristics of Cassava Entrepreneurs in Udi LGA of Enugu State Nigeria, 2012

Variable	Male-Headed Households N=30		Female-Headed Households N=30	
	Number	Percentage	Number	Percentage
Cassava Entrepreneurship*				
Cassava growing (Tubers)	30	100.0	30	100.0
Processing Garri	10	33.3	6	20.0
Processing Fufu	8	26.6	13	43.3
Processing Tapioca	2	6.7	5	16.7
Processing Garri & Fufu	9	30.0	14	46.7
Processing Garri, Fufu & Tapioca	4	13.3	11	36.7
Marital Status of household head				
Married	24	80.0	27	90.0
Single	4	13.3	2	6.7
Widower	2	6.7	n.a.	n.a.
Widow	n.a.	n.a.	1	3.3
Highest Formal Education of house head				
No formal Education	10	33.3	2	6.7
Primary Education	5	16.7	4	13.3
Secondary Education	9	30.0	4	13.3
Tertiary Education	6	20.0	20	66.7
Farm Size (Ha)				
<1.0	8	26.6	16	53.3
1.0-3.0	14	46.8	11	36.7
>3.0	8	26.6	3	10.0
Adult number of male/female in Households				
1-4	21	70.0	16	53.3
5-8	7	23.3	10	33.3
Over 8	2	6.7	4	13.4
Household weekly use of Time (Hours)				
Time on Cassava activities	117	51.5	102	47.7
Time on other household activities	110	48.5	112	52.3
Daily Nonfarm Wage (₦'000)				
0.6-1.0	14	46.7	20	66.7
1.1-1.5	14	46.7	8	26.7
>1.5	2	6.6	2	6.6
Mean: M= 1.5 ; F= 0.8				

Source: Field survey: 2012; n.a.= Not applicable; *= Multiple response observed.

₦150.00 ≈ US \$1.00

Cumulatively therefore, 66.7% of the male household heads had formal education and was lower than cumulative 93.3% of the households headed by females. House heads who had enough formal education stood to be better informed in all business issues associated with cassava as a commodity for both local and foreign transactions. Farm sizes skewed in favour of male-headed cassava entrepreneurs. Cumulatively, 63.4% of male-headed households each cultivated cassava on at least

1.0 hectare of arable land, with the rest (26.6%) having their enterprise each on less than 1.0 Ha of arable land. The situation was comparatively lower with female-headed farm households. More women-headed households (53.3%) cultivated cassava each on less than 1.0Ha of arable land with another fairly large proportion (36.7%) that cultivated cassava each on between 1.0 and 3.0 Ha of arable land. [16] revealed that small sizes of farms amongst smallholders in southeastern Nigeria call for some form of land integration policy.

In terms of adult males and adult females in cassava-based households, 70.0% of the male-headed households had at most 4 adult male members with only 6.7% of them having at least 8 adult male members. Amongst the female-headed households, the table showed that relatively less proportion (53.4%) had at most 4 adult female members with 13.3% of the households having at least 8 adult female members. Adult members of a household will responsibly be engaged in production, processing and marketing of cassava and its products. Children aged between 7 and 17 years however, have been recognized to contribute their labour to household cassava farm activities after school hours and on weekends [17].

Male-headed cassava-based households spend relatively more of their weekly time (117 of 227 hours) or (51.5%) on cassava-based activities while female-headed cassava-based households spend relatively more of their weekly time (112 of 214 hours) or (52.3%) on other household work activities. Gender headships of these entrepreneurs were such that relatively more female heads (66.7%) than male heads (46.7%) earned each a daily nonfarm wage of at most ₦1, 000.00. Earning relatively lower wage off-farm might compel many of them to remain glued to their enterprise.

Estimation Of Profitability Of Cassava/Product(S) Sales

Table 3 is a summary of annual costs and returns from cassava enterprises to entrepreneurs in Udi LGA of Nigeria. The income-yielding parts/products of cassava consumed and traded by the entrepreneurs included the tubers, stem cuttings, and the following products: garri, fufu, and tapioca. Annual total of 270.0MT of tubers and 945.0 bundles of stem cuttings of cassava were produced by the sampled male-headed entrepreneurs using 6.0MT of fertilizers, hired and household labour. The female-headed cassava households sampled on their part produced an annual 220MT of tubers and 770 bundles of cassava cuttings using 4.5MT of fertilizer. Each cassava bundle contained 50 healthy stem cuttings meant for propagation of the crop. The average of minimum farm gate

sales prices of the products (fresh cassava tubers, toasted sieved cassava (Garri), fermented cassava paste (fufu), sliced and treated cassava tubers (tapioca) was ₦91, 000.00 per Metric Tonne. The annual variable costs incurred by the male-headed cassava entrepreneurs were ₦1, 584,400.00 (1,015.4 US\$) and that by female-headed farm households was ₦1, 490,500.00 (9,554.5 US\$).

Break down of some of these variable items of costs are for high value items in male-headed households: weeding labour ₦238, 200.0 (1,526.9 US\$) or 15.0% of variable costs; in female-headed households: weeding labour ₦238, 200.00 (1526.9 US\$) or 15.9% of the variable costs. The least value item for male-headed and female headed households was water, ₦5, 000.00 (32.1 US\$) accounting for 0.3% of variable costs to each gender group. Water was needed in the value-chain product processes for washing, soaking, and boiling. The annual fixed costs (value of depreciation of implements, machines and processing/marketing stalls) for the male-headed households were ₦764, 700.00 and that for the female-headed household was ₦787, 300.00. The highest depreciation of fixed cost items in male-headed households was processing/marketing stalls ₦120, 500.00 (772.4 US\$) and in the female households was toasting trough ₦120, 300.00 (771.2US\$); while the least depreciated fixed cost items was in male-headed households steering/toasting spoons (₦11,200.00) (71.8 US\$) or 1.5% of fixed costs. In the female headed households, two items depreciated very lowly: steering/toasting spoons, and Mats ₦15, 700.00 (100.6 US\$) or 1.9% of fixed costs items.

The returns to the entrepreneurs were high especially to the male-headed households and to both groups quite encouraging. The enterprises gave an annual cumulative gross margin of ₦109, 526,600.00 (702,093.6 US\$) to the male-headed households and ₦88, 221,700.00 (565523.7 US\$) to the female-headed farm households. The mean net profit was ₦3, 625,400.00 for male headed households and ₦2, 940,700.00 for female-headed households.

Table 3. Summary of Annual Produced and Marketed Cassava Quantities, Costs and Returns By Male and Female Entrepreneurs in Udi LGA of Enugu State, Nigeria.

S/N	Description	Male Headed Cassava Entrepreneurs (n=30) Total	Household	Female Headed Cassava Entrepreneurs (n=30) Total	Household
1.	Quantity of Tubers harvested/processed (Metric Tons)		270.0		220.0
	Quantity of Stem Cuttings harvested (Bundles)				
	Quantity of Fertilizers used (Metric Tons)		945.0		770.0
2.	Minimum Sales price per metric ton (₦'000)		6.0		4.5
	(i) Fresh Cassava tubers				
	(ii) Garri		80		80
	(iii) Fufu		110		110
	(iv) Tapioca		130		130
	(v) Stem Cuttings		75		75
			60		60
3.	Average Products Sales price per ton (₦'000)		91		91
4.	Variable Costs (VC) (₦'000)				
	Land preparation labour (hired + household)				
			234.1		234.1
	Planting labour (hired + household)		110.2		110.2
	Weeding labour (hired + household)		238.2		238.2
	Fertilizer		180.0		135.0
5.	Harvesting labour (hired+ household)		234.1		221.1
6.	Transportation		107.6		117.6
7.	Tuber Processing labour (hired)		156.3		128.3
8.	Firewood		50.4		50.4
9.	Palm oil		15.0		15.0
10.	Water		5.0		5.0
11.	Product Packaging materials		22.3		17.3
12.	Implement Maintenance/Repairs		12.7		12.7
13.	Interest on Operating Capital §		218.5		205.6
14.	Total Variable Costs (TVC)		1,584.4		1,490.5
15.	Fixed Costs (FC₁) (₦'000) Depreciated over three years				
16.	Wheel barrows		75.0		75.0
17.	Baskets		30.1		30.1
18.	Basins		60.2		60.2
19.	Jute/Polythene bags for storage		42.6		32.6
20.	Mats		25.4		15.4
21.	Fufu Boiler pots		42.4		82.4
22.	Steering/toasting Spoons		11.2		15.7
23.	Peel knives		20.0		20.0
24.	TFC₁		306.9		331.4
25.	Fixed Costs (Machines) (FC₂) (₦'000) Depreciated over five years				
26.	Grating Machines		111.5		111.5
27.	Toasting trough		120.3		120.3
28..	Processing/ Marketing Stalls		120.5		115.5
29.	Interest on Investment Capital §		105.5		108.6
30.	TFC₂		457.8		455.9
31.	Total Fixed Costs (TFC)= (TFC₁ + TFC₂)		764.7		787.3
32.	Total Costs : (TFC₁ + TFC₂) + (TVC)		2,349.1		2,277.8
33.	Revenue (₦'000) $\sum(1) \times (3)$		111,111.0		90,499.5
34.	Gross margin (33) – (14)		109,526.6		89,009
35.	Mean Gross margin (34)/n		3,650.9		2,967.0
36.	Net Return (Profit) (34) – (31)		108,761.9		88,221.7
37.	Mean Net Profit (36)/n		3,625.4		2,940.7
38.	Return Per Naira invested in Cassava enterprise (36)/(31)		142.2		112.1

§ Mean Interest rate for agriculture and petty trading loans =16.0%; 1.0 US\$ = 156.0 NGN Source: Field Survey, 2012

Each naira invested by the male-headed household yielded an annual value of ₦142, 200.00 (911.5 US\$) and same amount invested by women led household yielded ₦112, 100.00 (718.6US\$). These differences in performance between male and female household headship in cassava enterprises

may not be attributable to management but to issues associated with resource inaccessibility (land, labour, and capital) linked with gender social and cultural differences.

Gender Leadership and Participation in Household cassava Enterprises

Table 4. Determinants of Participation of Gender Leadership in Household cassava Enterprises in Udi, Nigeria

Variables	Male-Headed Cassava Household Coefficients	Cassava Household t-Ratio	Female-Headed Cassava Household Coefficients	Cassava Household t-Ratio
Constant	45.71***	11.30	-18.34***	-2.99
Farm size	1.29***	12.17	3.08	1.65
Farming Status	0.005	0.34	1.12	1.03
Marital Status	-2.53**	-2.03	-0.05***	-3.1
Adult number in household	-0.44***	-4.18	-0.06***	-4.01
Frequency of Extension contact	2.72***	3.31	2.74***	3.61
Health status of members	-0.15**	-2.44	0.02**	2.07
Daily nonfarm wage	0.00003	0.36	0.004	1.32
Time spent on cassava activities	-3.66**	2.97	-4.21**	2.89
Time spent on other housework activities	-2.87*	2.78	-3.42***	5.11
Level of Formal Education	-0.57	-0.31	-0.015	-0.12
Annual net enterprise profit	0.54***	3.99	0.62**	2.96
Likelihood ratio	-89.03		-76.31	
LR-Chi ²	0.572***		0.415***	
Correctly predicted	81.7%		72.3%	

Dependent variable (D) = Takes active part in activities of Cassava Enterprise

*significant at 10.0%; ** significant at 5.0%; *** Significant at 1.0%.

Source: Field Survey, 2012

Table 4 showed segregated factors that influenced male and female headship participation in own cassava enterprises in Udi, Nigeria. Farm size, adult number of males in households, frequency of contact with extension agency, and annual net enterprise profit influenced very highly (P< 0.001) the participation male household heads in own cassava enterprises. In addition, marital status, health status of household members, and time spent cassava activities had moderate (P<0.05) influence, and time spent on other house works influenced very mildly (P<0.10) the participation of male household heads in own cassava enterprises. While farm size, frequency of contact with extension agency, and annual net enterprise profit had positive influences, the other

significant factors had negative influences on participation of male household heads on cassava enterprise activities. Positive influence meant that as each of the factors increased, the participation increased while negative influence means that as each of the factors increased the participation declined. Amongst the female-headed households, marital status, adult number of females in the households, and frequency of extension contact had very highly (P< 0.001) influence on the participation female household heads in own cassava enterprises. In addition, status of health of household members, weekly time spent on cassava activities and annual net enterprise profit had moderate (P<0.05) influences on participation of female heads of cassava enterprise households. Comparing

male household headship with female household headship, differences in critical factors that require some policy attention are farm size, and time spent on other housework activities. Culturally, women in the study area have difficulties in accessing farmland, farm credit, and other inputs [18] and do many of the house works with little or no assistance.

Challenges with Growing, Processing and Sales of Cassava and Products

Commercial activities associated with cassava enterprises are not quite easy as they are

fraught with difficulties and setbacks. These challenges as observed by the respondents are shown in Table 5. The Table revealed that stakeholders in cassava enterprises observed decline in tuber yield, high marketing operating cost, difficulties in transportation and communication as obstacles to growing, processing and marketing of cassava and its products in Udi area.

Table 5. Entrepreneurs Perceived Challenges with Growing, Processing and Sales of Cassava and its products in Udi, Enugu State, Nigeria 2012

Challenge	Cassava Growing (n=60)	Number (%)	Cassava Processing (n=60)	Number (%)	Cassava tuber/product Sales (n=60)	Number (%)
Decline in tuber harvests	Decrease in fertility of the soil and high cost of procuring fertilizers	46 (76.7)	Limited availability of central processing units with machines for high quality products	33 (55.0)	Selling bulk of the harvests in tubers	37 (61.7)
High marketing operating cost.	Extensive use of manual labour in land preparation, planting, weeding and harvesting	52 (86.7)	Frequent failure of processing machines	40 (66.7)	High transport cost incurred in moving tubers to processing centers	34 (56.7)
Transportation/Communication difficulties.	Heavy as head loads except with wheel barrows and pickup vans	51 (85.0)	Non-standardized transport charges as entrepreneurs bargain for charges	27 (45.0)	Rural roads in deplorable states especially during the rain season	56 (93.3)

Source: Field Survey, 2012; Figures in parentheses are percentages

With respect to decline in tuber harvests it was observed that there was decrease in soil fertility (76.7%), few units for centrally processing of the tubers (55.0%) forcing many of the entrepreneurs to sell off their fresh tubers (61.7%). Entrepreneurs reported that marketing operating costs were high on account of drudgery associated with the growing of the crop (86.7%), and incessant break down of processing machines (66.7%), and high costs of transporting the products within and between the communities and

markets (56.7%). Majority of the entrepreneurs (93.3%) agreed that rural roads in the area are in deplorable state such that transporters charged arbitrary prices (45.0%) to convey cassava stems, tubers and products to desired destinations.

CONCLUSIONS

This study concluded that:

1. Male and female headed households involved in production, processing and

marketing of cassava and its products are rewarded with reasonably high returns in Udi area.

2. Relatively more male-headed cassava households processed their fresh tubers into garri. Toasted cassava (garri) stores relatively longer than fresh tubers and cassava paste (fufu).

3. Female-headed cassava-based households sell fresh cassava tubers and process the ones not sold into fufu, and tapioca.

4. Low awareness and unavailability of affordable processing machines are obstacles to processing cassava tubers into high quality flours, starch and chips that have industrial values.

5. Farm size, adult number of males in households, frequency of contact with extension agency, and annual net enterprise profit are factors that very highly influenced the participation of male household heads in own cassava enterprises.

6. Other important determinants of participation of male-headed households in cassava enterprises are marital status, health status of household members, time spent on cassava activities and time spent on other house works.

7. Female-headed cassava-based households are highly influenced to be involved in cassava enterprises by marital status, adult number of females in the households, and frequency of extension contact.

8. Other important factors that influenced participation of female-headed households in cassava enterprises are status of health of household members, weekly time spent on cassava activities and annual net enterprise profit.

9. Obstacles to cassava value chain activities amongst entrepreneurs in Udi area included decline in tuber yields, high marketing operating cost, difficulties in transportation/communication in the area.

Policy Implications

Cassava is a crop that offers security to household food needs and holds potential to alleviating poverty amongst entrepreneurs in Udi area and wider areas of sub-Saharan Africa. To bring male and female

entrepreneurs at par in terms of resource needs, all social and cultural constraints on female access to arable land and credit should be addressed by law such that any of such discrimination against women is prohibited.

Cheap and affordable high quality chips and flour producing machines should be demonstrated and extended to male and female farmers investing in cassava to facilitate adoption of such in the area. Rural roads and reliable vehicles should be maintained by local government councils and transporters under some public-private partnership agreements. We equally recommended provision of credit support to investors in cassava not only as agricultural loans but as part of Small and Medium Scale Enterprise (SMEs) development grant. This will enable investors (especially the women) have enough funds to purchase fertilizers, hire labour, and purchase automated machines for processing, and packaging of the products to attract better prices.

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