



## Gender Differentials in Profitability of Cassava Value Chain in Rivers State

A. Henri-Ukoha and D.O. Ikpe

Department of Agricultural Economics and Extension, University of Port Harcourt.  
E-mail: adanna.henri-ukoha@uniport.edu.ng

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### ABSTRACT

#### Key Words

Cassava value chain  
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The study analyzed the cassava value chain in Obio/Akpor Local Government Area of Rivers State, Nigeria with a view to : (i) identifying the existing cassava value chain by gender and (ii) estimating the profit by gender in cassava value chain in the area. Primary data were collected with a questionnaire from a sample of 78 farmers. Data collected were analyzed using descriptive statistics, Net Income and Gross Margin. The study found that both males and females were actors in cassava value chain, but females participated more in production and processing while male farmers participated more in marketing in cassava value chain. Male farmers had gross margin of ₦23000 in cassava production while females had a gross margin of ₦12900 in cassava production in the study area. However, male processors also made more profit along the value chain with gross margin of ₦178,500 more than the females whose gross margin was ₦53200 while female marketers made more profit along the chain with gross margin of ₦180,000 more than the males whose gross margin was ₦58,000. It was therefore recommended that credit institutions, both private and public, should gear up efforts to provide the female cassava-based farmers with more farm credit and inputs needed along the cassava value chain to boost their profitability. Improved land access through review of the Land Use Decree in Nigeria was also recommended to improve women's access to land.

## Introduction

Cassava is grown all year round and in all the ecological zones in Nigeria. Recently, Nigeria is the leading world largest producer of cassava (Philips, Tayler, Sanni & Akorodu, 2004), with an annual production of about 38.17 million metric tons (FAO, 2005). The proportion of income obtained from cassava farming in Nigeria is higher than that obtained from other major staple (Ugwu, 1996). It is a major source of energy (Achnewhu & Owuamanam, 2001). Cassava is taken as a food security crop and perceived as a "Famine fighter" (Henri-Ukoha *et al.*, 2011), however, Nigeria is yet to explore the full potentials of cassava as a crop next to petroleum (Awoyinka, 2009). Cassava is widely consumed in Nigeria (Nwosu & Ogbonnaya, 2014) and is consumed in various forms (Anuebuwa & Iloka, 1998). Therefore, for cassava production to be market driven, value must be added to it, through

conversion to other by-products such as fufu, garri, starch, tapioca, chips, flour and animal feed that are more preferred, stable and safer (Nwosu & Ogbonnaya, 2014).

"The value chain of a product describes the full range of activities which are acquired to bring a product or services from conception, through the different participants involved in the production, processing and delivery to the final consumer" (Adekunle *et al.*, 2012). Value chain approaches describes the connections of diversities of firms as well as the interrelationship between the actors involved in bringing products from its point of production to final consumption through known channels (Gwary., Yekini & Diyaware, 2014). A well-functioning value chain provides the means to effectively link production activities to market demand and supply (Henri-Ukoha *et al.*, 2015).

Cassava value chain involves all the processes of processing cassava to form a new product. Value addition of cassava increases its shelf life, enhances its taste, making it more suitable and available for consumption (Onyeka., Dixon&Ekpo., 2005). Ezeibe(2015) advocated for a gender based policy towards cassava production. Unamma (2003) explained that before the Nigeria civil war in 1967-1970, cassava was regarded as a women's crop. However, Ironkwe *et al* (2007) pointed out that men and women perform different functions and exhibit unequal varying pertaining to access to production resources in agricultural production.

Gender affects every aspect of human endeavour even the distribution of resources(Welch *et al*, 2000). In most societies, there are differences and inequalities between women and men responsibilities assigned, activities undertaken, access to and control over resources as well as decision making opportunities (International Labour Organization, 2000). Men and women engage in several production activities which boosts economic growth. For instance, women produce 80% of the food and provide 60-80% of agricultural labour in Nigeria (Mgbada, 2002) but rarely own the means of production (Rahman, 2004). Nwachukwu (2012) reiterated that women lack access to productive resources due to their socio-economic status. Government and other stakeholders in Nigeria also recognizes the importance of value chain addition and therefore encourages a transition from the present status of usage to the level of industrial raw material and livestock feed as a development goal that can enhance growth with increase in the employment (Adekunle, 2012). Therefore, if women are put in the mainstream of value chain, they could go a long way in enhancing economic development in Nigeria as Osujiet *al.*, (2017) reiterated that gender triple role of reproduction, production and community development issues is vital for sustainable development. According to Kehinde *et al.*, (2015), women are involved in all farming activities such as tilling, weeding, harvesting, transporting, storage, processing, marketing. Hence

it is reasonable to involve them in cassava value chain activities.

Several works have been done on value chain. For instance, Henri-Ukoha *et al.*,(2015) analysed the profitability of cassava value chain in Ideato North Local Government Area of Imo State. Osuji *et al* (2017) looked at gender differentials in cassava value chain but it was considered from the seemingly unrelated regression approach. Gwary *et al*, (2014) identified the profitability of fish value chain in Borno State, but there is limited information on the contribution to profitability by various gender along the cassava value chain. This led to a gap which this study intends to fill. The questions are: who are these actors along the value chain? What are the various contributions to profit made by the different gender along the cassava value chain. The resolution on how of close this gap led to the objectives of the study. This will help in the formulation of policies that will favour both gender in accessing the productive resources so as to harness their potentials in cassava production. The following objectives were achieved; to identify the major existing cassava value chain in the study area and to determine the profitability along the cassava value chain by gender in the study area.

### Research Methods

The study was conducted in Obio/Akpor Local Government Area of Rivers State. Obio/Akpor is one of the 23 Local Government Area in Rivers state with a population of 464,789 people (National Population Census, 2006).

Two-stage sampling technique was used to select the cassava-based farmers. In the first stage 3 communities were selected randomly from the communities in the local government area. In the second stage, 35 male cassava-based farmers and 43 female cassava-based farmers were selected using proportionate sampling technique from each community giving a total of 78 cassava-based value chain actors in the study area.

Data were obtained through primary sources by the administration of structured questionnaire and scheduled interviews with respondents while secondary data were sourced from journals, textbooks, internet and other relevant publications.

Data were analyzed using descriptive statistics such as frequency count, percentages and mean, Gross Margin as well as Net Income model.

The Gross Margin as expressed by Olukosi and Erhabor (2005) is given as:

$$GM = TR - TVC \quad \text{--- eqn 1}$$

but

$$TR_i = \sum_{i=1}^n P_i Q_i \quad \text{--- eqn 2}$$

$$TVC_i = \sum_{i=1}^n P_{x1} X_1 + P_{x2} X_2 + \dots + P_{xn} X_n \quad \text{--- eqn 3}$$

Where,  $GM_i$  = Gross Margin per hectare of the  $i$ th class of gender;  $TR$  = Total Revenue generated by the  $i$ th class of gender;  $TVC$  = Total variable cost of an  $i$ th gender;  $P_q$  = Unit price of cassava product (tuber or garri).

The net farm income as expressed by Olukosi and Erhabor (2005) is given as:

$$NFI = TR - TVC \quad \text{----- eqn 4}$$

Where  $TR$  and  $TVC$  have been previously defined.

$NFI$  = Net Farm Income of the  $i$ th class of gender in the area.

For the purpose of this study, only cassava tuber and garri, the processed form were considered.

Table 1 shows that 34.29% males were involved in production, 22.86% in processing and 42.86% in

t test is expressed thus

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}} \quad \text{....(5)}$$

Where,  $x_1$  = Mean of male actors,  $x_2$  = Mean of female actors,  $S_1^2$  = Standard deviation of male actors,  $S_2^2$  = Standard deviation of female actors,  $N_1$  = Sample size of male actors,  $N_2$  = Sample size of female actors.

## Results and Discussion

### Major Existing Cassava Value Chain

The distribution of the farmers according to major existing cassava value chain is presented in Table 1

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1. Table 1: The distribution of the farmers according to major existing cassava value chain in the study area.

Table 1. Frequencies of Male and female involvement in Entrepreneurship

Variable	Male		Female	
	Frequency	Percentage	Frequency	Percentage
Producers	12	34.29	18	41.86
Processors	8	22.86	12	27.91
Marketers	15	42.86	13	30.23
<b>Total</b>	<b>35</b>	<b>100</b>	<b>43</b>	<b>100</b>

Source: Field Survey, 2017

marketing while 41.86%, 27.91% and 30.23% of the females were involved in production, processing



marketing of cassava respectively in the study area. This shows that the major existing cassava value chain include producers, processors and marketers in the study area. This is agreement with the findings of Osuji *et al.*, (2017) and Henri-Ukoha *et al.*, (2005) who identified three major actors in the cassava value chain as Producers, processors and Marketers.

The finding also revealed that majority of both males and females are involved in cassava value chain but female are major actors in cassava production and processing than males whereas males are the major actors in cassava marketing than the females in the study area. This corroborates the findings of Unamma (2003) who observed that cassava production and processing is dominated by women hence it is perceived as women's crop. In line with this, Henri-Ukoha *et al.*, (2015) observed the gradual involvement of men in cassava value chain, though women still dominate.

Table 2 indicates the total revenue generated by cassava-based farmers in female production were ₦43500 while the total variable cost were ₦30600, the total fixed cost of about ₦2700 and gross margin of ₦12900 while in males, the total revenue generated were ₦80500 with total variable cost of ₦57500 and total fixed cost of ₦3950 with gross margin of ₦23000. This indicates that males made more profit in cassava production than females in the study area. Since women are more involved in cassava production, they are expected to make more profit than their male counterparts, but the reverse is the case. This could be attributed to the fact that men have access to larger farmlands, therefore enjoy economy of scale. Ironkwe *et al.*, (2007) observed that women's farm sizes are small and scattered which affects their production.

Table 3 shows that in cassava processing, the total revenue generated by male garri processors were ₦230000 while the total variable cost were ₦51500 and the fixed cost were ₦3550 whereas the gross

margin were ₦178500 in male processors, meanwhile, the total revenue generated in female garri processors were ₦86000 while the total variable cost were ₦32800 and the fixed cost of about ₦3000 with gross margin of ₦53200. This shows that males also make more profit in garri processing than females in the study area. However, females are more involved in cassava processing than the male farmers, the reason could be attributed to the scale of operation of the male farmers since they have better access to productive resources than their female counterparts (Henri-Ukoha, 2011). This result agrees with Ironkwe & Asumugha (2007) and Henri-Ukoha, *et al.*, (2013) that women do not own land due to culture and tradition in Africa. Moreover women do not have access to better production technologies (Nwachukwu, 2012).

Table 4 indicates that the revenue generated by male garri marketers were ₦260000 while the total variable cost were ₦202000 and total fixed cost were ₦1700. Meanwhile the gross margin were ₦58000 compared to female whose total revenue were ₦336000 whereas the total variable cost were ₦156000 and the fixed cost were ₦2500 with gross margin of ₦180000. This indicates that garri marketing is profitable and that females made more profit in garri marketing than males in the study area. Though males are more involved in garri marketing but women probably incur less marketing costs and also show more commitment in garri marketing business hence their ability to make higher profits than their male counterparts in the study area.

Table 5 shows that cassava production along the value chain is profitable with gross margins of ₦23,000; ₦178,500 and ₦58,000 for male producers, processors and marketers respectively. Whereas a gross margin of ₦12,900; ₦53,200 and ₦18,000 were realized for female producers, processors and marketers respectively.

**Table 2: Profitability of cassava production (actors) in the study area**

Variables	Male			Female		
	Quantity	Unit price	Value	Quantity	Unit price	Value
<b>Revenue</b>						
Cassava tubers	20	3400	68,000	11	3000	33000
Cassava bundles	25	500	12,500	21	500	10500
<b>Total Revenue</b>			<b>80,500</b>			<b>43500</b>
<b>Variable Cost</b>						
Cassava cuttings (Bundle)	13	500	6,500	5	500	2500
Fertilizer (bags)	3	3,700	11,100	1	2700	2700
Poultry droppings(bags)	10	300	3000	5	400	2000
<b>Labour (Manday)</b>						
Clearing	2	1500	3000	2	1200	2400
Ploughing	3	2100	6300	2	3500	7000
Planting	2	1200	2400	2	1500	3000
Weeding	3	2000	6000	4	1000	4000
Harvesting	6	1400	8400	2	1500	3000
Fertilizer Application	6	1300	7800	3	1000	3000
Transportation		1500	3000	1	1000	1000
<b>Total Variable Cost</b>			<b>57500</b>			<b>30,600</b>
<b>Fixed Cost</b>						
Rent (Hectare)			2,300			1500
Depreciation on Farm tools			1,650			1200
<b>Total fixed Cost</b>			<b>3950</b>			<b>2700</b>
<b>Net Income = (TR- TC)</b>			<b>19,050</b>			<b>10,200</b>
<b>Gross Margin = TR-TVC</b>			<b>23,000</b>			<b>12900</b>

Source: Field Survey, 2017

Male processors made more profit than the producers and the marketers while female marketers realized more profit than the producers and the marketers in the study area. Generally, male cassava

actors made more profit than the female actors in the chain. These could be due to the fact that males had more access to productive resources than the female farmers (Henri-Ukoha, 2011).

**Table 3: Profitability of cassava processing(actor) in the study area**

Variables	<i>Male</i>			<i>Female</i>		
	Quantity	Unit price	Value	Quantity	Unit price	Value
<b>Revenue</b>						
Garri (Bags) (Bags/kg) (50kg)	10 bags	23,000	230,000	4	21500	86000
Total Revenue			230,000			86000
<b>Variable Cost</b>						
Cassava tubers (bags)	10 bags	3,300	3,300	8	3000	2400
Firewood (Bundles)	10	350	3,500	5	500	2500
<b>Labour (Manday)</b>						
Peeling	5	500	2500	3	400	1200
Grating	1	500	500	1	300	300
Drying	5	200	1000	3	200	300
Sieving	5	200	1000	3	500	1500
Frying	4	1000	4000	2	1000	2000
Transport	1	1500	6000	1	1300	1300
Total Variable Cost			51500			32,800
<b>Fixed Cost</b>						
Frying pan			800			
Processing implements			1500			3000
Knives			1250			
Total fixed Cost			3550			3000
<b>Net Income (TR-TC)</b>						
Gross Margin =(TR-TVC)			178,500			53200

Source: Field Survey, 2017

**Table 4: Profitability of cassava marketing (actors) in the study area**

Variables	Quantity	Males		Variables	Females		Value
		Unit price	Value		Quantity	Unit price	
<b>Revenue</b>							
Garri (Bags/kg) (50kg)	10	26000	260,000		12	28000	336000
<b>Total Revenue</b>			<b>260,000</b>				<b>336,000</b>
<b>Variable Cost</b>							
Garri (Bags)	10	20,000	20,000	7	22000		154,000
Transport	1	2000	2000	2	1000		2000
<b>Total Variable Cost</b>			<b>202,000</b>				<b>156,000</b>
<b>Fixed Cost</b>							
Basin			1200				2000
Garri Bags			500				500
<b>Total fixed Cost</b>			<b>203,700</b>				<b>2500</b>
Net Income = (TR - TC)			<b>56,300</b>				<b>178,000</b>
Gross Margin = TR – TVC			<b>58,000</b>				<b>180,000</b>

Source: Field Survey, 2017.

**Summary of Profitability of cassava-based farmers along the value chain**

Table 5: Profitability along the value chain in the study area

Variables	MALE		FEMALE	
	Gross margin (₦)	Net Income (₦)	Gross margin (₦)	Net Income (₦)
Producers	23000	19050	12900	10200
Processors	178500	174950	53200	50200
Marketers	58000	56300	18000	178000
Total	259500	250300	246100	238400

Source: Field Survey, 2017

## Conclusion

The study showed that both males and females are actors in cassava value chain. The study also revealed that male farmers made more profits than the female farmers in the chain. Based on the findings, the following recommendations were made:

- i. Government and the private sector should provide credit facilities and other inputs required to female cassava-based farmers along the chain in order to increase their level of productivity in cassava farming.
- ii. The Land Use Decree should be revisited to enable women have access to land especially for farming and other agricultural activities.

## References

- Achinowhu, S.C. & Owuamanam, C.I. (2001) Gratification of five improved cassava cultivars in Nigeria and physico chemical and sensory properties of garri yield. *African Journal of Root Tuber Crop*, 4:2
- Adegbite, D.A., O.A. Oluruntoba, K.O Adubi, & S.B. Shobanke (2008) Impact of National Fadama Development Project 2 on small scale farmers' income in Ogun State. *Journal of Sustainable Development in Africa* 10(3).
- Adekunle, A.A. (2012) Analysis of maize value chain in Nigeria. *Agricultural Digest*: 3(1): 55-56.
- Aina, L.O. (2007) Globalisation and small-scale farming in Africa: What role for information Centres. World Libraries and information congress 73rd IFLA General conference and Council. Durban, South Africa,.
- Almed & Idisi (2014) Gender participation in cassava value chain in Nigeria. *Merit Research Journal of Agricultural Science and Soil Science*, 2(11): 147-153.
- Apata, T.G. (2012) An analysis of cassava value chain in Nigeria, from a pro-poor and gender perspective of farming household in South west, Nigeria..
- Balit, S., M. Calvelo Rios, & Masias, L (1996) Communication for development for Latin America. FAO, Rome, Italy.
- Ezedinma, C.I. (2007) Post Harvest Potentials for Root and Tuber crops. 13th Symposium of International Society for Tropical root Crop. Arusha, Tanzania, 10-14.
- Henri-Ukoha, A., F.C. Anaeto, C. Chikezie, O.B. Ibeagwa, L.I. Oshaji, I.O. Ukoha, & Anyiam, K.H. (2015) Analysis of cassava value chain in Ideato South Local Government Area, Imo State, South-East, Nigeria. *International Journal of Life Sciences*: 4(4): 209-215.
- Ibeagwa, O.B., G.C.O Nnamerenwa, & C.P. Anorue (2012) Analysis of returns on investment of cassava processing in Kwara State, Nigeria. Annual Conference of the Farm Management Association. Michael Opara University of Agriculture, Umudike. 46-50.
- Igben, M.S. (Ed.) (1988) The Nigerian farmer and agricultural institutions. Nigerian Institute of Social and Economic Research. Ilo, Geneva. ABC of Women Workers Right and Gender Equality. 2000.
- Iwenna, O.A. (2002) Essential agriculture science for senior secondary schools. Lagos: Tonad Publishers,.
- James, A.N., Patience, G., Evans, N.Y. (2011) Economic Analysis of Cassava Production in Obubra Local Government Area of Cross Rivers State. *Asian Journal of Agricultural Sciences*, 3(3): 205-209.
- James, D., & Faleye A (2015) Cassava mechanization prospects and future in Nigeria. *International Research Journal of Agricultural Science and Soil Science*, 2015: 10-21.
- Mgbada, J.U. (2002) Motivation and staff morale: implications for the children in agriculture programme (CIAP) in post-primary



- institutions in Enugu Educational zone of Nigeria. *African Journal of Farm Child and Youth Development*: 7(1): 45-53.
- Munyua, H. (2000) Application of information communication technologies in the agricultural sector in Africa: A gender Perspective. Rathgeber, E; Adera, E.O. (Eds.) *Gender and Information Revolution in Africa*. IDRC/ECA., 85-123.
- Nnenna, A.O. (2011) Rural farmers' problems accessing agricultural information: A case study of Nsukka Local Government Area of Enugu State, Nigeria.
- Nwakor, F.N., & Nwakor, E.W. (2012) Evaluation of cassava processing and utilization forms among farmers in Abia State, Nigeria. *International Journal of Applied Research Technology*.
- Nweke, F.I. (2004) New challenges in the cassava transformation in Nigeria and Ghana. Environment and Production Technology Division, International Food Policy Research Institute. Washington., 118.
- Okunade, E.O., O.A. Olaniyi, & Ogunleye, K.Y. (2005) Adoption of improved cassava technologies among farmers in Surulere Local Government Area of Oyo State. 39th Annual conference of Agricultural Society of Nigeria. University of Ibadan., 15-18.
- Onyeka, T.J., A.G.O. Dixon & Ekpo, E. (2007) Field evaluation of root rot disease and relationship between disease and relationship between disease severity and yield in cassava. *Exp. Agric.*, 2005: 357-363.
- Food and Agriculture Organization (2007) *Cassava. Nigeria Cassava Master Plan 2006*. FAO, Rome.
- Rahman, S.A, & Usman, I. I. (2004) Comparative analysis of women's participation in agricultural production in Northern and Southern Kaduna State, Nigeria.
- Van Crowder, L., & Fortier, F. (2000) A proposed component of the Uganda National Agricultural Advisory Service. National Agricultural and Rural Knowledge and information system (NARKIS). Uganda: FAO. 22.
- Welch, C.J., B. Alemu, T. Msaki, M. Sengendo, & Kigutha, H. W. A. (2000) Improving household food security: institutions, gender and integrated approaches. USA: Basis management agency.