

Gender Participation and Constraints in Cassava Production, Processing and Marketing in Makurdi, Benue State, Nigeria

*Mary O. Agada¹, Favour I. Onuche¹ & Evangeline N. Mbah¹

Abstract

The study assessed gender participation and constraints in cassava production, processing and marketing in Makurdi Local Government Area of Benue State, Nigeria. Primary data were collected from 60 males and 60 females randomly selected cassava farmers from 6 villages using a structured questionnaire. Data were analyzed using descriptive statistics. Results revealed that 75-93.3% males took part in cassava production operations whereas 66.7-75% females carried out the same activities. Results also showed that all females (100%) participated in peeling, washing, fermenting, grinding and packaging, and 95-98.3% took part in other processing activities compared to less than 79% males who participated in the same activities. Furthermore, respondents engaged in all marketing activities with females recording higher participation in sales of produce/products (96.7%), grading (93.3%), standardization of measurement (93.3%), among others while males participated more in assembling produce (85%). Both gender faced similar constraints and employed similar strategies for improving participation in cassava enterprises. The study concluded that more males than females participated in cassava production while a greater percentage of females took part in processing and marketing. It is recommended that research and extension should target both male and female cassava farmers with appropriate technologies and messages for improved participation in cassava value chain development, which should enhance their income and standard of living.

Keywords: gender, participation, constraints, cassava development activities, Makurdi, Nigeria

1. Introduction

Cassava is a tuber crop which originated in South America and is grown in tropical and subtropical areas throughout the world. Despite the fact that maize is by far the most important staple food accounting for over half (54%) of the caloric intake of households, cassava is also staple for a large extent of the population. Cassava is the most important crop in Africa by both production weight and value and it provides a similar source of calories as rice. Its drought-tolerance, resilience on marginal agricultural land and ability to be stored in the ground up to three years make it an important food security crop for smallholder farmers (FAO, 2000; Sayre *et al.*, 2011). It is a staple and also a famine reserve crop and can be an important food source when drought and conflict prevent production of other food crops. As noted by Moses, Asafu-Agyei, Adubpfor & Augustine (2007), cassava-based farming communities cope better in hunger stressed times and uncomfortable situations. The crop provides a reliable and inexpensive source of carbohydrates for people in sub-Saharan Africa, where consumption is the highest per capital in the world (Westby, 2008).

Africa produces over 54% of the world's cassava with Nigeria taking the global lead with a production of about 54.8 million metric tonnes in 2014 (FAO, 2014). Cassava is grown in all agro-ecological zones of Nigeria but thrives in the rainforest and derived savannah areas. Production is highest in the North-Central and South-South regions (Sahel Capital, 2014).

¹ Department of Agricultural Extension and Communication, Federal University of Agriculture, Makurdi, Nigeria
*Corresponding Author: maryagada59@gmail.com

In Nigeria, cassava is one of the most important crops for farmers; it is the most widely cultivated crop and provides food and income for over 30 million farmers and large number of processors and traders (Awoyinka, 2009). As a crop with by-products that have a wide array of uses, cassava is the most important food crop for Nigeria by production quantity next to yam which is the most important food crop by value. According to FAO (1997), cassava roots are very rich in starch and contain significant amounts of calcium (50mg/100g), phosphorus (40mg/100g) and vitamins (25mg/100g). However, the leaves are a good source of protein if supplemented with the amino acid methionine despite containing cyanide.

Gender is a term often associated with roles and responsibility of males and females in the society as a social classification of sex. It is the socio-cultural differences between males and females as against the biological differences (Sinkaiye & Jibowo, 2005). It is also described as a concept used in social science analysis to look at roles and activities of men and women (International Institute of Tropical Agriculture (IITA, 1996). Thus, the focus of gender analysis is not biological differences between men and women but rather on their experiences as members of society. Gender participation give insight into issues affecting women and it is focused mainly on the relationship of both men and women to the social and economic structure of a society

In most parts of rural Nigeria, division of labour within the households is gender specific and according to age. Men and women perform different roles, have unequal decision-making power as well as differences in access to and control over agricultural productive resources. As a result of these differences, their views, needs, priorities and constraints to improving their productive potentials differ. This could affect their various outputs even in cassava enterprise development. Hence, the understanding of gender participation and constraints in cassava production, processing and marketing among rural farmers in Makurdi Local Government Area of Benue State, Nigeria is important in view of the current threat to food security as a result of the economic recession facing the country and the need to increase and sustain the enterprise among farmers. This will ensure effective allocation of resources for increased and sustainable cassava development activities, thereby increasing cassava outputs for improved livelihoods for the people.

The specific objectives of the study were: (1) describe the socio-economic characteristics of cassava farmers in the study area; (2) determine the gender participation in cassava production, processing and marketing; (3) identify gender constraints to cassava production, processing and marketing; and suggest strategies for improving gender participation in the production, processing and marketing of cassava produce/products.

2. Methodology

This study was conducted in Makurdi Local Government Area of Benue State, Nigeria. Makurdi Local Government Area is located in Benue State capital. It lies between longitude 8° 20'E and 9° E and latitude 7° 20'N and 8° N. It has an estimated population of about 226,198 inhabitants (National Population Commission (NPC, 1996) and covers a land area of about 804 km². A very important feature of this local government is River Benue. The climate is characterised by uniformly high temperature and seasonal distribution of rainfall. The rainfall begins with a steady increase from March to July followed by a lighter and more persistent rain through August and intense rain in September, decreasing in October and November. The main source of livelihood of the people is agriculture. This is due to the fact that the area is endowed with rich fertile land that facilitates the production of crops.

The population for this study comprised all cassava producers in the study area. Multi-stage sampling procedure was adopted for the study. Simple random sampling technique was used to select respondents from three wards, two villages per ward and 10 male and 10 female cassava farmers per village, bringing the total sample size to 120. Data for the study were collected from primary sources using a structured questionnaire. Data were analyzed using descriptive statistics such as frequency, percentage and mean scores.

3. Results and Discussion

3.1 Socioeconomic Characteristics of Respondents

3.1.1 Age (years): The results in Table 1 show that about 15.0 % and 31.7% of the male and female respondents respectively were within the age bracket of 21-30 years. Similarly 20.0% and 33.3% of the male and female farmers fell within the age bracket of 31 - 40 years respectively while about 35.0 % and 30.0% of respondents were within the age bracket of 41-50 years.

Also, while 30.0% of the male respondents were above 50 years of age, only 5.0% of the female farmers fell into this category. The average age for the respondents was about 46 years and 37 years for males and females respectively. This implies that female cassava farmers were younger than their male counterparts. It also implies that the population was made up of middle age farmers whose strength and agility are vital in cassava production, processing and marketing (Okoedo-Okojie & Onemolease, 2009). The finding is corroborated by the study of Agada & Ejembi (2010) who reported that female soybean farmers in Benue State were younger than their male counterparts with the mean age of 44.9 and 39.5 years for males and females respectively.

3.1.2 Education: Majority of the male (63.6 %) and the female (68.3%) respondents had an appreciable level of post primary education whereas 23.3% of the males and 15% of the females had no formal education (Table 1). This implies a population that can easily learn and offers an easy communication platform for the transference of innovation with respect to better ways of producing, processing and marketing cassava. The finding reveals that a higher percentage of the respondents had formal education, thus adoption of innovation by the farmers in the study area could be more effective.

3.1.3 Household size: Research findings also revealed that 50% of the male and 60% of the female respondents had a household size ranging between 6 and 10 persons (Table 1) with an average household size of 8 persons and 6 persons for male and female farmers respectively. This shows that males had larger household sizes compared to females. The finding conforms to the general practice of communal life common in the study area. This can be an indication of availability of family labour for cassava production, processing and marketing for both male and female farmers considering the fact that labour is a major factor of crop production (Mbuk, Bassey, Udoh & Udoh, 2011).

3.1.4 Cassava farm size (ha): The results revealed that majority of the respondents (males= 60%; females= 56.7 %) had farm sizes ranging from 2-2.99 hectares each with mean farm size of 1.8 hectares for both male and female farmers (Table 1). This result implies that majority of the respondents were smallholder cassava farmers and this may have a negative effect on their productivity. It also revealed that there was no difference between male and female respondents in respect of the land area under cassava cultivation.

3.1.5 Cassava farming experience (years): The result in Table 1 shows that about 45% and 53.4% of the male and the female respondents had farming experience of less than or equal to 10 years with mean farming experience of 14 years and 12 years for the male and female farmers respectively. Given the mean age of the farmers as 46 years and 37 years for male and female respectively, it implies that the respondents started cultivating cassava early in life and hence could be considered experienced in cassava farming and this experience is crucial in ensuring sustainable cassava production and productivity. Moreover, long years of farming could enhance efficient utilization of farm resources by small scale cassava farmers.

3.1.6 Membership of social organizations: Results showed that 71.7% of the male and 56.7% of the female respondents belonged to one association or another while 28.3% of the males and 43.3% of the females were not members of any association. This implies that majority of male and female cassava farmers were members of social organizations where they come together for mutual benefits. Farmer organizations are essential institutions for empowerment, poverty alleviation and advancement of farmers and the rural poor. Although, both gender belonged to various social organizations, more males than females were members of such organizations. This is expected as males have more leisure time than females which could be invested in attending meetings.

3.1.7 Cassava farm income (naira): This study revealed that the mean cassava income for the males was ₦534,667 (\$1,114) while that of the females was ₦50,908 (\$1,060) (Table 1). The result implies that the income from cassava was higher for males than for females. It also showed that more people earned an annual cassava income of ₦50,000 and below. This implies that both male and female farmers in the study area were small scale cassava farmers. With such income, the continued participation of the respondents in cassava cultivation might be threatened in the future. The study agrees with the report of Akinbile & Ndaghu (2005) who observed that low income from cassava production might threaten continued participation of males and females in cassava cultivation.

Table 1: Socio-Economic Characteristics of Cassava Farmers by Gender

Characteristics	Male (n=60)			Female (n=60)		
	Frequency	Percentage	Mean	Frequency	Percentage	Mean
Age (years)						
21-30	09	15.0		19	31.7	
31-40	12	20.0		20	33.3	
41-50	21	35.0	45.7	18	30.0	36.9
>50	18	30.0		03	5.0	
Education						
Non-formal	14	23.3		09	15.0	
Primary	08	13.3		10	16.7	
Secondary	17	28.3		24	40.0	
Post-secondary	21	35.3		17	28.3	
Household size						
<5	21	35.0		22	36.7	
6-10	30	50.0	7.8	36	60.0	6.4
11-15	06	10.0		02	3.3	
16-20	01	1.7		-	-	
>20	02	3.3		-	-	
Cassava farm size (ha)						
1.99	24	40.0		25	41.7	
2-2.99	36	60.0	1.8	34	56.7	1.8
3-3.99	-			01	1.7	
Farming experience (years)						
≤10	27	45.0		22	53.4	
11-20	19	31.7		22	36.7	
21-30	14	23.4	14.0	03	5.0	12.2
>30	-	-		03	5.0	
Membership of farmer association						
Yes	43	71.7		34	56.7	
No	17	28.3		26	43.3	
Annual cassava farm income (naira)						
≤50,000	34	56.7	53,466.7	33	55.0	50,908.0
50,001- 100,000	23	38.4		26	43.3	
>100,000	03	5.0		01	1.7	

Source: Field survey, 2015

3.2 Gender Participation in Cassava Farming Operations

The participation of male and female farmers in cassava production operations are presented in Table 2. The findings showed that 93.3% of the male farmers were engaged in land preparation compared to 70% of the females who took part in the same activity. The results also revealed that while 91.7% each of the males participated in planting and harvesting, 66.7% and 88.3% of the females took part in the same activities. In addition, while about 88.3% of the male farmers took part in insect/pest and disease management, 73.3% of the females were participated in the same activity. Furthermore, the result of the study showed that 86.7% of the male farmers were engaged in weeding compared to 75% of the females who participated in the same activity.

Also, while about 85% of the male respondents took part in fertilizer application, about 66.7% of the females participated in the same activity. This implies that both male and female cassava farmers were engaged in all the cassava farming operations. However, the male respondents recorded higher participation in all the cassava farming operations compared to the females. Although, the male folks dominated the production of cassava roots, it is important to note that women's activities in root production have increased due to increased need for food and cash. The findings contrast the earlier report by the International Fund for Agricultural Development (IFAD), (1994) that females normally do weeding, planting and harvesting. This has implication for research and extension to reach out to both male and female cassava farmers in the study area with appropriate technologies and information.

Table 2: Gender Distribution of Respondents According to Participation in Cassava Farming Operations

Farming Operations	Male (n=60)		Female (n=60)	
	Frequency*	Percentage	Frequency*	Percentage
Land preparation	56	93.3	42	70.0
Planting	55	91.7	40	66.7
Fertilizer application	51	85.0	40	66.7
Weeding	52	86.7	43	71.7
Insect pest and disease management	53	88.3	44	73.3
Harvesting	55	91.7	44	73.3

*Multiple responses recorded

Source: Field survey, 2015

3.3 Gender Participation in Cassava Processing

The results on participation of male and female farmers in cassava processing in the study area indicated that all the females took part in peeling of cassava tubers (100%), washing of peeled tubers (100%), fermenting of tubers (100%), grinding (100%) and packaging (100%). In addition, over 90% of the females were engaged in sun-drying (98.3%), sieving (98.3%), milling (98.3%), toasting (96.7%), squeezing water out of the tubers (96.7%), transportation of tubers to the house (96.7%) and chipping (95%). In contrast, 78.3% of the male farmers took part in transportation of tubers to the house, milling (70%), peeling of tubers (65%), packaging (63.3%) and chipping (63.3%). Other processing activities which recorded less than 60% male respondents' participation included washing of peeled tubers (56.7%), sun-drying (53.3%), grinding (53.3%), sieving (51.7%), toasting (50%), squeezing water out of the tubers (50%) and fermenting of tubers (38.3%). The results imply that both male and female respondents were engaged in cassava processing in the study area. However, the participation of females in cassava processing activities was higher compared to their male counterparts. This was expected as crop processing is one of the main pre-occupations of rural female farmers in Nigeria. The results of this study concur with the finding of Rüsgerd (2008) who reported that small scale cassava processing is the domain of women. However, men are becoming more involved as cassava processing has become more lucrative. Other researchers have corroborated this finding and noted the trend of men operating processing plants and becoming managers of such enterprises as processing became increasingly commercialized and mechanized (Adebayo, Lamboll & Westby, 2008). The implication of this finding for extension workers is to disseminate information on improved cassava processing to both male and female farmers in the study area. Also, extension agents should encourage both gender to form groups for easy access to loan facilities that would enable them acquire processing equipments for processing quality products for the markets.

Table 3: Gender Distribution of Respondents According to Participation in Cassava Processing

Activities	Male (n=60)		Female (n=60)	
	Frequency*	Percentage	Frequency*	Percentage
Transportation of tubers to the house	47	78.3	58	96.7
Peeling of tubers	39	65.0	60	100
Washing of peeled tubers	34	56.7	60	100
Fermenting of tubers	23	38.3	60	100
Squeezing water out of the tubers	30	50.0	58	96.7
Sun-drying	32	53.3	59	98.3
Grinding	32	53.3	60	100
Sieving	31	51.7	59	98.3
Packaging	38	63.3	60	100
Toasting	30	50.0	58	96.7
Chipping	38	63.3	57	95.0
Milling	42	70.0	59	98.3

*Multiple responses recorded

Source: Field survey, 2015

3.4 Gender Participation in Cassava Marketing

The results on participation of male and female farmers in cassava marketing indicated that most respondents took part in assembling of products or produce (male=85%; female=81.7%); bulking of produce/products (males=71.7%; females=86.7%); storage of products and produce (males= 70.0%; female=85.0%); transportation of products and produce to the market (males=71.7%; 86.7%); loading/unloading (males=75%; females=83%); sorting (66.7%; 86.7%); grading (males=83.3%; females=93.3%); advertisement/promotion (males=81.7%; females=83.3%); standardization of measurement (males=83.3%; females=93.3%); and sales of produce/products (males=81.6%; females=96.7%). The findings imply that although, both male and female farmers participated in cassava produce and product marketing, females were more involved in the marketing activities compared to their male counterparts. The results of this study agree with the report of IFAD (1994) which noted that women play a dominant role in marketing of cassava and other crops. In many cases, women buy the agricultural produce from their husbands and other farmers and market this at a profit. At times, they buy cassava in the soil, harvest, process and market. Women farmers would, therefore, need access to nearby markets where they can easily dispose of their produce/products and prevent deterioration which will reduce their income and food security.

Table 4: Gender Distribution of Respondents According to Participation in Cassava Marketing

Activities	Male (n=60)		Female (n=60)	
	Frequency*	Percentage	Frequency*	Percentage
Assembling of products or produce	51	85.0	49	81.7
Bulking of products and produce	43	71.7	52	86.7
Storage of products or produce	42	70.0	51	85.0
Transportation of products and produce to the market	43	71.7	52	86.7
Loading/ unloading	45	75.0	50	83.3
Sorting	40	66.7	52	86.7
Grading	50	83.3	56	93.3
Advertisement/promotion	49	81.7	50	83.3
Standardization of measurement	50	83.3	56	93.3
Sales of produce/products	49	81.7	58	96.7

*Multiple responses recorded

Source: Field survey, 2015

3.5 Gender Constraints to Participation in Cassava Production, Processing and Marketing

Entries in Table 5 show the respondents' constraints to participation in cassava production, processing and marketing. The results revealed that both gender were faced with 11 serious production constraints out of the 13 listed while all the respondents faced the same processing constraints. Also, both male and female farmers were confronted with the marketing problems such as high cost of bulking and transportation (Male: M=2.3; Female: M=2.3), poor linkages between markets, producers and processors (Male: M=2.1; Female: M=2.3), lack of government or institutional support for market development (Male: M=2.3; Female: M=2.4), weak market information (Male: M=2.2; Female: M=2.4). In addition, male farmers reported poor quality of products (M=2.1). The results indicated that both male and female cassava farmers experienced similar constraints in cassava production, processing and marketing. The findings agree with the report of Asante-Pok (2013) who noted that the constraints in cassava production include a wide range of technical, institutional and socioeconomic factors. It is important to note that without disease resistant and high-yielding seed varieties, adequate post-harvest processing technologies and access to ready markets, farmers may not be willing to invest in cassava enterprise development.

Table 5: Mean Distribution of Respondents According to Constraints to Participation in Cassava Production, Processing and Marketing

	Male (n=60)		Female (n=60)	
	Mean	Standard Deviation	Mean	Standard Deviation
Production Constraints				
Non availability of planting materials	1.8	0.8	1.8	0.7
Lack of good quality planting materials	1.9	0.7	1.9	0.7
Inadequate input supply	2.1	0.8	2.2	0.7
High cost and unavailability of fertilizers, herbicides, pesticides, etc to farmers when and where needed	2.1	0.7	2.2	0.7
Poor access to credit	2.2	0.7	2.2	0.6
Inadequate provision of viable and relevant extension services	2.2	0.8	2.3	0.7
Unavailability and unaffordability of tractor rental services and other labour saving devices	2.2	0.8	2.4	0.7
Low soil fertility	2.4	0.7	2.3	0.7
Weed problem	2.4	0.7	2.3	0.7
High incidence of pest and disease infestation	2.3	0.7	2.4	0.6
Poor cultural practices	2.3	0.7	2.2	0.7
Shortage/high cost of labour	2.2	0.7	2.2	0.7
Low rate of adoption of improved technical packages by farmers	2.2	0.7	2.1	0.7
Disaggregated and fragmented producers	2.0	0.7	2.2	0.8
Processing Constraints				
High cost of processing equipment and associated infrastructure cost	2.1	0.7	2.4	0.7
Lack of grades and standards	2.2	0.7	2.2	0.7
Poor quality raw materials for processing	2.1	0.8	2.4	0.6
Limited range of processed products	2.3	0.8	2.4	0.7
Irregular supply of cassava tubers	2.3	0.8	2.2	0.7
Discolouration	2.2	0.7	2.2	0.7
Poor infrastructure (water, roads, electricity)	2.4	0.7	2.3	0.8
Marketing Constraints				
High cost of bulking and transportation	2.3	0.7	2.3	0.7
Poor linkages between markets, producers and processors	2.1	0.8	2.3	0.8
Lack of government or institutional support for market development	2.1	0.7	2.4	0.7
Market opportunities in the industrial sector not fully developed	1.5	0.7	1.6	0.7
Poor access to markets	1.8	0.7	1.8	0.7
High transaction cost	1.8	0.7	1.9	0.7
Poor quality of products	2.1	0.7	1.9	0.7
Poor pricing of cassava products	1.8	0.8	1.9	0.7
Weak market information	2.2	0.8	2.4	0.7

Mean \geq 2.0 (serious constraints)

Source: Field survey, 2015

3.6 Strategies for Improving Gender Participation in Cassava Production, Processing and Marketing

Results in Table 6 show the respondents' perceived strategies for improving participation of males and females in cassava production, processing and marketing in the study area.

The results indicated that both male and female farmers reported that all the strategies were effective for improving their participation in cassava production, processing and marketing. However, the most effective strategies noted by the male farmers were making improved planting materials available to farmers at the right time and in the right quantity (M=2.4), encouraging the formation of cooperative societies to enhance farmers access to finance (M=2.4), devising innovative low cost strategies for farmers to access funds (M=2.4), and enabling the provision of viable and relevant efficient and effective extension services to farmers, which could be offered by input suppliers as a package for selling their products (M=2.4). On the other hand, the most effective strategies proposed by the female respondents included making improved planting materials available to farmers at the right time and in the right quantity (M=2.4), use of resistant and high yielding varieties (M=2.4), proper and regular weeding of cassava farms (M=2.4), and devising innovative low-cost strategies for farmers to access funds (M=2.4). Therefore, extension organizations should implement these strategies in order to enhance gender participation in cassava production, processing and marketing in the study area.

Table 6: Mean Distribution of Respondents According to Strategies for Improving Participation in Cassava Production, Processing and Marketing

Strategies	Male (n=60)		Female (n=60)	
	Mean	Standard Deviation	Mean	Standard Deviation
Make improved planting materials available to farmers at the right time and at the right quantity	2.4	0.7	2.4	0.7
Use of resistant and high yielding varieties	2.3	0.8	2.4	0.7
Use of recommended spacing and planting	2.2	0.7	2.2	0.7
Proper and regular weeding of cassava farms	2.2	0.8	2.4	0.7
Regular visits by extension agents for dissemination of information	2.2	0.7	2.2	0.7
Provide machineries for cassava production	2.3	0.7	2.3	0.8
Facilitate access to affordable and available fertilizers, pesticides, etc. to farmers when and where needed	2.3	0.7	2.2	0.9
Plant sweet cassava varieties which have a relatively low cyanide content	2.3	0.7	2.2	0.8
Encourage the formation of cooperative societies to enhance farmers access to finance	2.4	0.7	2.2	0.8
Subsidize the prices of agricultural inputs	2.3	0.7	2.3	0.8
Rehabilitate rural feeder roads to reduce transportation costs	2.2	0.8	2.2	0.7
Devise innovative low cost strategies for farmers to access funds	2.4	0.7	2.4	0.7
Enable the provision of viable and relevant efficient and effective extension services to farmers, it could be offered by input suppliers as a package for selling their products	2.4	0.7	2.3	0.8
Improve linkages within cassava value chain	2.3	0.7	2.2	0.8

Mean \geq 2.0 (effective strategies)

Source: Field survey, 2015

4. Conclusion and Recommendations

The study concluded that all the respondents were in their productive age and income from cassava enterprise for both male and female farmers was low due to the smallness of area of land under cultivation. In addition, both male and female farmers actively participated in cassava production, processing and marketing activities. However, males recorded higher participation in cassava production operations compared to the females who dominated most processing and marketing activities. Also, both gender faced similar constraints and employed similar strategies for improving participation in cassava enterprise activities in the study area.

Based on the conclusion of the study, the following recommendations were made:

1. Government and private organizations should encourage these young men and women who are already into cassava production, processing and marketing through the provision of improved production and processing technologies to reduce drudgery and improve income and food security in the study area.
2. Makurdi Local Government should encourage cassava farmers to increase the land area under cultivation to enhance their productivity, boost their income and improve their standard of living through the provision of farm machinery, fertilizers and herbicides at subsidized rates.
3. In view of the fact that both male and female farmers took part in all aspects of cassava enterprise development activities, research should develop gender sensitive technologies for dissemination to both gender to enhance production, productivity and quality of processed products.
4. There is need for Makurdi Local Government to establish nearby markets where cassava produce/products can easily be sold and prevent glut and deterioration which may reduce farmers' income and food security leading to diminishing interest in cultivating the crop.

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