

**ANALYSIS OF RURAL WOMEN'S PARTICIPATION IN CASSAVA
PRODUCTION IN OHIMINI LOCAL GOVERNMENT AREA OF BENUE STATE,
NIGERIA**

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Abstract

The study examined rural women's participation in cassava production in Ohimini Local Government Area of Benue State, Nigeria. A Multistage sampling technique was used to select a sample of 103 respondents for the study. The statistical tools used for analysis were frequency, percentage and mean and inferential statistical tools such as Ordinary Least Square Regression analysis and gross margin analysis. The results of the analysis showed that most of the rural women farmers had a household size 6-10 members (47.5%), with a mean size of 7 persons, 21 – 30 years of experience (46.6%), with a mean of 10 years, farm size of 2 to 3 hectares (36.9%) with a mean size of 2.4 hectares, were 31 – 45 years (47.6%) with a mean age of 40 years, used family labour (44.7%), majority had an annual income of ₦401,000 and above (72.8%), with a mean annual income of ₦840,543.689, an annual off-farm income of ₦100,000- ₦500,000 (58.3%), with a general mean annual off – farm income of ₦380,048.544, engaged in farming (58.35) as their major occupation, were married (51.5%), members of an association (57.3%) and had 1 to 6 years of formal education (70.3%). The results of ordinary least squares multiple linear regression analysis of level of participation of rural women farmers in cassava production in the study area showed education, cost of fertilizer, membership of association and training were the significant factors that influenced rural women's involvement in cassava production in the area. The coefficient of educational level (1.8664) was positive and statistically significant at 1 percent level, cost of fertilizer (-0.0028) was negative and significant at 1percent level, number of trainings in cassava production by extension agents (4.4878) was positive and significant at 5 percent level and association membership (13.737) was positive and significant at 5 percent level. The results of Gross Margin analysis of cassava production by rural women farmers in the study area indicated that the average total variable cost (TVC) and total revenue (TR) of

rural women cassava farmers were estimated at ₦60515.535 and ₦764883.495 respectively, while the gross margin was estimated at ₦704367.960 during the production period. This result indicates that cassava production is a highly profitable venture in the study area. The results of response of rural women farmers (51.5%) to the level of women participation in cassava production activities revealed that there was a high level of women participation in cassava production activities in the study area. The results of constraints inhibiting the effective participation of rural women cassava farmers in cassava production showed that the most (16.7%) problem militating against the effective participation of rural women farmers in cassava production was low level of education, with a mean value of 3.05. Therefore, the study recommends that, women should be encouraged into cassava farming since the study shows that rural women participation is slightly high; women should also be encouraged to invest in cassava production for its profitability and economic value; inputs, especially fertilizer and improved varieties of cassava cuttings should be made available to women at affordable price; they should belong to cooperative associations and should be given greater access to land and control of production resources.

Keywords: Rural women, participation, cassava production, constraint, profitability, regression

Introduction

Cassava is a perennial staple and a famine - reserve crop which constitutes an important food source when drought and conflict prevent production of other food crops. 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 (Udemezue *et al.*, 2012). Global demand for cassava has been growing, as it is an attractive food security crop for growing populations in emerging markets, and there is increased demand for industrially processed cassava products (African Development Bank, AFDB, 2015). This has led to increased cassava production globally. According to FAO (2018), as of 2018, world cassava production stood at about 278 million tonnes; Africa total production was about 170 million tonnes (about 56% of world production) (FAOSTAT, 2019). At the same period, Nigeria produced about 60 million tonnes (FAOSTAT, 2019). From the year 2010, the world's cassava production has been on the increase from about 240 million metric tons. In the same period, Nigeria alone produced about 42.5 million metric tons which is estimated to be about 18% of total global production. Thus, Nigeria's share of world production had risen to 21.5% of world

production by 2018. FAO projects that by the year 2025, about 62% of global cassava production will be from sub-Saharan Africa (FAOSTAT, 2020).

In Nigeria, cassava is one of the most important crops for farmers; also the most widely cultivated crop that provides food and income for over 30 million farmers and large number of processors and traders. 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 (Udemezue *et al.*, 2021). Cassava is cultivated and consumed, primarily as gari (cassava flakes or ground cassava roots). It is also used to make fufu (cassava paste), tapioca, chips and cassava flour. Starch, ethanol and pellets are non-edible derivatives of cassava. The waste produced from cassava processing can be reprocessed into animal feed, glue and pharmaceutical materials. According to Montagnac *et al.* (2009), these cassava products (paste & flakes) are prepared using hot water to make it into solid food that can be eaten with soup source (e.g vegetables, draw soup etc). The leaves are also good soup ingredients and it is frequently consumed by people living in the south-west and south-eastern parts of Nigeria. Cassava has been found to contain calcium, vitamins B and C, and other essential minerals. Abila (2012) reported that Cassava is also considered the most promising crop with the potential for biofuel production in Nigeria. Rahman and Awerije (2016) reported that demand for cassava derivatives, such as starch, gari, tapioca, etc., have doubled over the last two decades and in recent years, the establishment of the Cassava Bread Development Fund (CBDF) and the Cassava Transformation Project by the Nigerian government have further raised hopes for improving the cassava sector.

Nigerian women carry out the majority of labour associated with cassava production and processing. They form an active and reserved labour force but they rarely own the means of production (Rahman, 2016). However, the position of women in meeting the challenges of agricultural development cannot be over-emphasized. Women make a significant contribution to food production; they provide 60-80% of agricultural labour and are responsible for 80% of food production (Rahman, 2004; Onyemauwa, 2012). Women play a central role in cassava production, processing and marketing, contributing about 58 percent of the total agriculture labour in the southwest, 67 percent in the southeast and 58 percent in the central zones. They are almost entirely responsible for virtually all activities like hoeing, weeding, harvesting, transporting, storing, processing, marketing and domestic chores

which provide them with additional income-earning opportunity and enhance their ability to contribute to household food security (Shamsodini *et al.*, 2011).

In recent years, Cassava has increased in importance in the middle Belt of Nigeria. Cassava and cassava-based products have been the most important food for the people. The crop is almost a daily menu in households and grown by smallholder farmers, many of them women, especially in the north-central and rural Nigeria. Despite the importance of this crop, its production in the country has been generally constrained by several factors: "These include limited adoption of improved seeds and use of herbicides, near-universal lack of good agronomic techniques and limited access to financing to purchase equipment and improved inputs. Smallholder farmers rarely use improved seeds or planting materials (clean, healthy seeds) and the sub-sector is dominated by disease-prone local varieties with long maturation periods and low-yield potential. Low use of herbicides and pesticides presents another obstacle. Fertilizers are also used either infrequently or in insufficient amounts because they are costly. Finally, most cassava plantations are rain-fed (77 percent in the state of Benue). Nigerian cassava farming is highly labour-intensive, and related costs can account for up to 90 percent of total production costs. For example, the cost of developing and preparing land is quite high. Primary field research in Oyo and Benue states show the average cassava production cost of USD 700 per hectare, 98 percent is labour (ridging, planting, weeding, etc.) and 2 percent is inputs such as fertilizers, seeds. A low level of mechanization characterizes small – scale cultivation. For example, in Nigeria, tractors are used in only 10 percent of cassava production and harvesting is usually done manually as well and is therefore time-consuming and expensive (AFDB, 2015).

Specifically, "of Nigeria's 6 million smallholder farmers of cassava, 1.5 million (25 percent) are women (including rural women)(AFDB, 2015). However, their participation in cassava production is constrained by several factors. In Benue State including Ohimini Local Government Area, the major factors that constrain women involvement in cassava production are non-ownership of farm land, lack of access to capital, their pre-occupation with household chores, inadequate farm size and high cost of processing cassava roots into chips. "Oftentimes, they are burdened with a disproportionate share of unremunerated care and domestic work. As a result, women usually have less time to spend on farming activities and are therefore less productive" (AFDB, 2015). This makes the increased participation of rural women in cassava production in Ohimini Local Government Area and Nigeria in

general, a non – negotiable necessity, but not without tackling the constraints, owing to the current threat to food security as a result of the COVID – 19 pandemic and economic recession facing the country and the need to increase and sustain the enterprise among farmers. According to Udemueze *et al.* (2021), this will ensure effective allocation of resources for increased and sustainable cassava development activities, thereby increasing cassava outputs for improved livelihoods for the people.

Although some research works have been undertaken on Women participation in Cassava production in some states in Nigeria, such as Otunba-Payne, 2020; Udemezue *et al.*, 2021; Mgbakor, 2013; Ogunyinka and Oguntuase, 2020; Abali *et al.*, 2014, none of the studies examined rural women participation in cassava production in Benue State, especially in Ohimini Local Government Area of the State. For instance, Otunba-payne (2020) carried out An Analysis of the Role of Women in the Cassava Value Chain in Nigeria; Udemezue *et al.* (2021) examined Gender Participation in Cassava Production, Processing and Marketing in Anambra State, Nigeria; Mgbakor and Nwamba investigated the Role of Women in Cassava Production in Awgu Local Government Area of Enugu State, Nigeria; Ogunyinka and Oguntuase (2020) carried out an Analysis of Cassava Production and processing by various groups in support of Cassava Value Chain in the South West of Nigeria; Abali *et al.* (2014) delved into an Analysis of Women Participation in Cassava Production in Rural Communities of Rivers State, Nigeria. It was in realization of this obvious fact that the study became imperative. Thus, with a view to filling this research vacuum, this study was aimed at carrying out an analysis of rural women participation in cassava production in Ohimini local Government Area of Benue State, Nigeria. The specific objectives of this study were to:

- i. describe the socio-economic characteristics of rural women who participate in cassava production in the study area;
- ii. examine the factors that affect rural women participation in cassava production in the study area;
- iii. estimate the costs and returns in rural women Cassava production in the study area;
- iv. identify the major constraints that affect the effective participation of rural women in cassava production in the study area.

Methodology

Study area

The study was conducted in Ohimini Local Government Area of Benue State, Nigeria. Its

headquarters is situated in the town of Idekpa-Okpiko of the area. The Local Government Area (LGA) was created in December 1996 by the military regime of General Sani Abacha from the old Otukpo LGA of Idoma land along with four other local government councils (LGCs) in the state. These LGCs are Agatu, Obi, Logo and Tarka. The Local Government derived its name "Ohimini" from River Ohimini, the largest river in the council, cutting across the entire LGA. Its geographic coordinates are Longitudes $7^{\circ} 47'$ and $10^{\circ} 0'$ East, and Latitudes $6^{\circ} 25'$ and $8^{\circ} 8'$ North. Major districts under the Ohimini LGA are Onyagede which shares boundary with Kogi state has the following villages: Amoke, Enumona, Ogodu, Awume, Ikpoke, Ogoli, Ogande, Ugofu, Ipolabakpa, Umonomi and Iyaya, Okpiko, Agadagba, Oglewu and Idekpa the capital. It has an area of 632 km² and a population of 71,482 (NPC, 2006). Ohimini is an agrarian society with the farmers taking full advantage of the fertile, well-drained arable land suitable for the cultivation of cassava, [yams](#), millet, sorghum, rice, citrus fruits, palm produce, vegetables and livestock thus contributing to making the status of [Benue State](#) the "Food Basket of The Nation". It is believed that the Onyagede market (one of the largest market in [Idoma](#) land), is a major source of export of [garri](#) to neighbouring states like Plateau, [Kano](#), Rivers and Kogi, amongst others. Hence choice of the LGA as a study area.

Population and sample size selection

The study population involved all rural women cassava farmers in the study area. Since the target population was not homogenous, stratified sampling was done to isolate the women involved in cassava farming in the area from the rest of the population. Purposive and simple random sampling techniques were used to select the respondents for the study. Four council wards were purposively selected. These council wards were Oglewu, Idekpa, Agadagba and Ochobo. The reason for the selection is based on the fact that there were more rural women farmers in the study area compared to other wards. Two village communities were purposively selected out of each of the council wards based on the records of the State Agricultural Development Project (ADP) which showed that the villages were leading cassava producers. A simple random sampling of women cassava farmers from each of the selected villages based on the ADP list from the Root and Tuber Production Unit was done. A total of 103 cassava farmers were randomly selected.

Data analysis

The data collected for the study were analyzed using both descriptive and inferential

statistics. Descriptive statistics such as frequencies, percentages and means were used to analyze objective (i), ordinary least square multiple linear regression was employed to realize objective (ii), gross margin analysis was used to analyze objective (iii), percentage analysis was used for objective (iv), while percentage and mean were used to achieve objective (v).

Model specification

Ordinary Least Square Multiple Linear Regression Analysis

The model was specified in its explicit form thus;

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} X_{10} + u_i, \dots \dots (1)$$

where:

Y = Quantity of cassava output in Kg which determines the level of women participation

X₁ = Age of the respondent (years)

X₂ = Experience in cassava production (years)

X₃ = Farm size (in hectares)

X₄ = Level of education (number of years spent in formal schooling)

X₅ = Cost of fertilizer (in Naira)

X₆ = Household size (number of members)

X₇ = Cost of Labour (in Naira)

X₈ = Cost of cassava cuttings (in Naira)

X₉ = Women farmers' membership of association (Dummy: 1 = yes; 0 = otherwise)

X₁₀ = Number of trainings via Extension contact (number of visits in a year)

β₀ = β₁₀ = Regression coefficients

U = well behaved error term

The dependent variable (Y) is not a dummy; it does not take the values, 0 and 1. Since the dependent variable is not binary, the ordinary least square (OLS) technique is appropriate to estimate the model. The OLS Multiple linear regression was therefore used.

The *a priori* expectation of a rural women farmer's level of participation in cassava production is stated as:

Level of participation: This is the tendency of a rural women farmer to be involved in

cassava production. It is determined by quantity of cassava output, which is the total amount of cassava production by rural women farmers from their own farm. It is expected that the increase in quantity of own production will increase rural women participation. The expected effect on rural women farmers' participation is positive.

Age of respondent: It is expected to have impact on cassava output resulting in rural women farmers' participation in cassava production. Young people are stronger and are expected to adopt innovations and cultivate large-size farms than old people. However, the expected impact of age on rural women participation could be positive or Negative.

Farm Experience: It refers to number of years of farming in year. It is expected to increase rural women farmers' participation in cassava production resulting from the increase in quantity of output. The expected effect is positive.

Farm size: The larger the farm size, the higher the expected participation level due to increased output. The expected effect on rural women participation in cassava production is positive.

Household size: It is expected that as the number of persons in a rural women household increases, output increases when most members are not dependants. The expected effect on rural women participation in cassava production is positive.

Educational status: Education impacts positively on household's ability to adopt innovations and to take good and well-informed production, nutritional and poverty-reducing decisions. It also enables individuals to have access to job opportunities in the labour market. The expected effect on output resulting in farmer participation is positive.

Labour cost (₦): This is the sum total of the expenses incurred on labour on the farm. Labour cost either increases or decreases output resulting in increase or decrease in rural women farmers' participation in cassava production. The expected effect on rural women farmers' participation in cassava production is positive or negative.

Cost of cassava cuttings: This refers to expenses incurred in purchasing cassava cuttings for planting. The higher the cost, the less the quantity of cuttings to be purchased, resulting in low output. The lower the output, the lower the level of participation of rural women in cassava production. It is expected that low cost of cassava cuttings will positively affect rural women participation in cassava production.

Women farmers' membership of an association: This is a vehicle for access to inputs and income. It is therefore expected that the rural women farmers' membership of an association

would bring about increased cassava output resulting in increased participation in cassava production. Therefore, the expected effect on rural women farmer participation in cassava production is positive.

Access to training by extension: Household's access to extension services ensures training on soil and crop management practices and adoption of improved crop varieties or new innovations by farmers, leading to increased cassava output resulting in increased rural women farmer participation in cassava production. The expected effect on food security is positive.

Gross margin analysis

Objective (III) was realized using gross margin analysis. The gross margin is stated thus;

$$GM = TR - TVC \dots\dots\dots(2)$$

where:

GM = Gross Margin

TR = Total Revenue (₦)

TVC = Total Variable Cost (₦)

This estimation served as a profit index of cassava producers in the study area. As it is conventional, the higher the GM, the more profitable the cassava farm is likely to be and the smaller the GM, the lesser the profitability.

Results and Discussion

Socio-economic characteristics of the women cassava farmers in the study area

The results of household socio-economic characteristics of cassava women farmers are presented in Table 2. The results Showed that most (47.6%) of the respondents examined were within the brackets of 31-45 years. The mean age was 40 years, which implies that majority of the rural women cassava farmers are within the active farming age. This result is consistent with the finding of Mgbakor and Nwamba (2013) who found out in their study of women cassava farmers that they were within the same mean age implying their activeness in providing labour and decision making in women cassava farming activities in the study area.

The results further showed that the majority (51.5%) of the respondents were married and

most (47.5%) of them had a household size of 6-10. This implies that they had a sizeable household size to substitute for the cost of hired labour. This result is in consonance with the finding of Mgbakor and Nwamba (2013) who found out in their study that a higher proportion of the respondents had household size of 6-10 members who constituted the farm labour. The result of educational qualification of the respondents showed that 70.3 percent had between 1 to 6 years of formal education. The women cassava farmers had a mean of 6 years of formal schooling. This means that the women farmers had a good education that would enhance adoption of new farming techniques which would facilitate high productivity. This result is in consonance with the finding of Onyemauwa (2012) but contradicts Abali *et al.* (2014) who found out in their study that majority of the women cassava farmers had no formal education, while the finding of Angba and Iton (2020) also revealed that majority of the respondents they studied had primary education only.

The result for the farm experience of rural women farmers further showed that most of them (46.6%) had farm experience of 21 to 30 years and the mean farming of the respondents is 10 years. This was slightly in agreement with the findings of Ibrahim *et al.* (2014) who found that most of the respondents had experience of 20 years or less but contradicts the findings of Udemueze *et al.* (2021) whose study discovered that most of the respondents had experience of less than or equal to 10 years with a mean age of 17 years. 36.9 percent of the respondents had farm size of 2 to 3 hectares, and the mean size of farms owned by the respondents is 2.4 hectares. This result means that the rural women cassava farmers were small scale farmers. The result also showed that majority (72.8%) of the respondents had an output of 51 – 100 100-kg bags of cassava output, and the mean output of 57 bags produced by the respondents per hectare.

The results also revealed that majority (72.8%) of the respondents had a farm income of ₦401000 and above annually. The mean annual income obtained by the respondents is ₦840543.689. In addition to this, majority (58.3%) of the respondents had an annual off-farm income of ₦100000- ₦500000, with a general mean annual off – farm income ₦380048.544. This clearly shows rural women farmers engaged in productive off – farm activities to augment and increase household welfare. The results for occupational status of rural women farmers showed that 58.3 percent of the women cassava farmers engaged in farming as their major occupation while 41.7 percent of them were both farmers and civil servants. Majority (57.3%) of the respondents were members of an association such as a

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Table 2: Distribution of Respondents by the Socio-economic Characteristics of Women Cassava Farmers (N = 103)

Variable	Frequency	Percentage (%)	Mean
Age (years)			
15-30	26	25.2	40
31-45	49	47.6	
46-60	17	16.5	
≥61	11	10.7	
Occupation			
Farming	60	58.3	NA
Both farming and civil service	43	41.7	
Marital Status			
Single	50	48.5	NA
Married	53	51.5	
Household Size (number)			
1-5	32	31.1	7
6-10	49	47.6	
11 and above	22	21.4	
Educational Qualification (years)			
1-6	73	70.9	6
7-12	17	16.5	
13 and above	13	12.6	
Farm Experience (years)			
1-10	11	10.7	10
11-20	28	27.2	
21-30	48	46.6	
31 and above	16	15.5	
Farm Size (Ha)			
0.5-1.4	15	14.6	2.4
1.5-2.4	38	36.9	
2.5-3.4	43	41.8	
3.5 and above	7	6.80	
Farm Output (per 100-kg bag) (roots, cuttings, chips)			
< 51	3	2.90	57
51 – 100	75	72.8	
101 – 150	25	24.3	
Annual farm Income (₦)			
100000-200000	1	0.97	840543.689
201000-300000	22	21.4	
301000-400000	5	4.85	
401000 and above	75	72.8	
Annual Off-farm Income (₦)			
100000-500000	60	58.3	380048.544
501000-1000000	27	26.2	
1010000-1500000	13	12.6	
1510000 and above	3	2.91	
Association Membership			
Yes	59	57.3	NA
No	44	42.7	
Source: Field Survey, 2021		NA = Not Applicable	

cooperative society. This result is in line with the finding of Udemueze *et al.* (2021) who found out that majority of male and female cassava farmers were members of social organizations where they came together for mutual benefits. Farmer organizations are essential institutions for empowerment, poverty alleviation and advancement of farmers and the rural poor. They revealed that, although, both gender belonged to various social organizations, more females than males were members of such organizations. This is expected as females have more leisure time than males which could be invested in attending meetings.

Multiple Linear Regression Analysis of Factors Influencing Rural Women Participation in Cassava Production in the Study Area

The result of the multiple linear regression analysis on factors affecting level of participation in cassava production proxied by output in the study area is presented in Table 3. The result showed education, cost of fertilizer, membership of association and training were the significant factors that influenced rural women participation in cassava production in the area. The estimated R^2 value shows that 53 percent of the variations in cassava output are explained by the explanatory variables included in the model. Adjusted R^2 equals 47 percent. The coefficient of multiple correlation (R) equals 0.7247. It means that there is a very strong direct relationship between the explanatory variables and the level of women participation resulting from the level of cassava output. The coefficient of educational level (1.8664) was positive and statistically significant at 1 percent level. This implies that an increase in the level of education of the rural women cassava farmers increases their tendency to be involved in cassava production which results from or in the increase of cassava output by 186.64 at the 0.01 level of significance. This suggests that the literate women farmers are more likely to source for agricultural related information for higher agricultural production than the illiterate farmers. This agrees with Onyemauwa (2012) that, as the women attain more education, they are better prepared to involve in cassava production.

Cost of fertilizer (-0.0028) was negative and significant at 1 percent level. This implies that an increase in the cost of fertilizer decreases the tendency of the rural women cassava farmers to be involved in cassava production which results from or in the decrease in cassava output by 0.28 at the 0.01 level of significance. This implies that women cassava farmers could not

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afford fertilizer due to its high cost resulting in low level of rural women participation in cassava production arising from low cassava output in the area. This result is in line with the finding of Angba and Iton (2020) who reported in their study that fertilizer has a positive effect on cassava output.

Also, number of trainings in cassava production by extension agents (4.4878) was positive and significant at 5 percent level. This entails that an increase in the number of trainings in cassava production by extension agents increases the tendency of the rural women cassava farmers to be involved in cassava production resulting from or in cassava output by 448.78 at the 0.05 level of significance. This result agrees with the finding of Onyemauwa (2012) that, as women get more contact with extension agents they are likely to learn modern techniques of cassava production and thus their involvement in it. Association membership was positive and significant at 5 percent level. This entails that association membership (13.737) increases the tendency of the rural women farmers to be involved in cassava production, resulting from or in cassava output by 1373.7 at the 0.05 level of significance. This result corroborates the finding of Onyemauwa (2012) that, association membership increases the tendency of farmers to be involved in cassava production.

Table 3: Multiple Linear Regression Analysis of Factors Influencing Rural Women Participation in Cassava Production in the Study Area (N = 103)

Variables	Estimated Coefficients (β)	Standard Error	t Statistics	P-value
Constant	52.248	18.130	2.8819	0.0049*
Age	0.2597	0.1613	1.6101	0.1108
Farm experience	0.1276	0.2968	0.4298	0.6684
Farm size	1.9974	4.1597	0.4802	0.6322
Educational qualification	1.8664	0.6281	2.9718	0.0038*
Fertilizer cost	-0.0028	0.0009	-3.1974	0.0019*
Household size	0.4394	0.4722	0.9305	0.3545
Labour cost	6.34E-05	0.0002	0.2690	0.7885
Cuttings cost	0.0006	0.0004	1.4332	0.1552
Association				
Membershiship	13.737	5.5589	2.4712	0.0153**
Number of Trainings	4.4878	1.8673	2.4034	0.0183**

Source: Field Survey, 2021

Multiple R = 0.7247 R² = 0.5253 Adjusted R² = 0.4737 F = 10.1788

Significant at 1% and 5% (**P < 0.05, *P < 0.01)

Costs and Returns of Women Cassava Production

The results of Gross Margin analysis of cassava production by women farmers in the study area are presented in Table 4. The result indicated that the average total variable cost (TVC) of rural women cassava farmers was estimated at ₦60515.535, which represents expenses on cassava cuttings (8.80%), transportation (19.1%), rent on land (13.9%), cost of labour (17.5%), fertilizers (14.5%) pesticides (11.3%), herbicides (14.9%). Total revenue and gross margin were estimated at ₦764883.495 and ₦704367.960 respectively during the

Table 4. Distribution of Respondents by Gross Margin Analysis of Women Cassava Production/Hectare in the Study Area (N = 103)

Item	Mean amount (₦)	Percentage of TVC
Variable costs		
Rent on Land	8394.175	13.9
Labour Cost (land preparation, manual weed control, planting, Pesticide/herbicide app & harvesting activities)	10602.913	17.5
Fertilizer Cost	8760.194	14.5
Cost of Cassava cuttings	5326.214	8.80
Cost of Pesticides	6837.864	11.3
Cost of Herbicides	9018.447	14.9
Transport Cost	11575.728	19.1
Total Variable Costs (TVC)	60515.535	100
Revenue		
Total Revenue (TR) (from the sale of Cassava roots, stems and home-dried chips in 100-kg bags)	764883.495	
Gross Margin (GM) = TR-TVC	704367.960	

Source: Field Survey, 2021

Factors inhibiting the effective participation of rural women farmers in cassava production

The results of constraints inhibiting the effective participation of rural women cassava farmers in cassava production are presented in Table 5. The results showed that the most (16.7%) problem militating against the effective participation of rural women farmers in cassava production is low level of education, with a mean value of 3.05. This implies that majority of the rural women cassava farmers had primary education or basic literacy. Their poor level of education may have also affected their non-formation into groups and poor access to agricultural credit. This corroborates the findings of Abali *et al.* (2014) who reported that illiteracy and lack of adequate education have been identified as part of the major factors militating against institutional support towards agriculture.

Table 5 Distribution of Respondents by Problems Inhibiting their Effective Participation in Cassava Production in the Study Area

Variable	Mean	Percentage	Ranking
Bad roads	1.19	6.50	9th
Lack of improved Cassava varieties	1.20	6.55	8th
Inadequate finance	1.22	6.66	7th
Poor extension communication system	1.33	7.26	6th
Low level of education	3.05	16.7	1st
Inadequate labour supply	3.00	16.4	2nd
Inadequate fertilizer	2.87	15.7	3rd
Shortage of land	2.79	15.2	4th
Inadequate herbicides and pesticides	1.66	9.06	5th

Source: Field Survey, 2021

Conclusion and Recommendations

The study concluded that all the rural women cassava farmers were in their productive and active age which was expected to possibly allow them cultivate large farm sizes, hence majority of them had a high output of cassava from own production. The respondents had a good farm experience and large household sizes which constituted a reasonable farm labour. Majority of the rural women cassava farmers were literate having at least primary education. This literacy level among the households has impacts on their level of participation in cassava production resulting in high output, since household head's education was found to be one of the significant determinants of the rural women farmers' tendency to be involved cassava production in the area. Other factors significantly affecting the rural women farmers' level of participation in cassava production in the study area were number of trainings by extension agents, association membership and cost of fertilizer. The household's on and off – farm income was very high in the study area. The results of Gross Margin analysis of cassava production by rural women farmers in the study area indicated that cassava production is a highly profitable venture in the study area. Several factors militated against rural women farmers' effective participation in cassava production in the study area. The major one among them was low level of education. Based on these study findings, the following recommendations were made:

- Women should be encouraged into cassava farming since study shows that rural women participation is slightly high.
- Women should be encouraged to invest in cassava production for its profitability and economic value.
- Inputs should be made available to women and at affordable price especially fertilizer and improved varieties of cassava cuttings.
- It is highly recommended that the women should belong to cooperative associations
- Women should be given greater access to land and control of production resources

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