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Gender Dynamics and Cassava Production: Empirical Evidence among Farmers in Oyo State, Nigeria

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Abstract
This study was conducted to analysed gender dynamics in cassava production and to estimate profitability and profit efficiency among farmers in Oyo State, Nigeria. Primary data were collected using structured questionnaire administered randomly to select 245 cassava farmers made up of 68 adult male (AM), 58 adult female (AF), 61 youth male (YM) and 58 youth female (YF) cassava farmers. Data were analyzed using descriptive statistics, net farm income (NFI) and profit efficiency regression models. The NFI showed that cassava production is profitable across the various gender. However, it was more profitable among adult male cassava farmers (₦317,250.00) compared to adult female (₦159,580.00), youth male (₦157,970.00 or youth female (₦111,370.00). The result revealed that the coefficients of costs of farm size (0.004), stem cutting (1.010) and labour (-0.008) were statistically significant variables influencing profit efficiency of AM farmers. Stem cutting and labour statistically influences efficiency of AF, YM and YF farmers with different coefficients and magnitude and at different level of probability. The results of inefficiency variables showed that the coefficients for household size (-2.812), extension contact (0.139) and credit utilized (1.552) were statistically significant inefficiency variables affecting profit in AM cassava production. Extension contact (0.002) and credit utilized (-2.14) in AF cassava farmers. Similarly, extension contact (-0.695) and credit utilized (1.294) in YM cassava farmers. Only extension contact (0.034) influences YF cassava farmers. Productivity improvements can be achieved by implementing policies such as improved access to extension services, credit and technical assistance to ensure farmers use existing inputs and technology more efficiently.
Keywords: *Cassava, extension, gender, labour, profit efficiency*

Introduction

Cassava (*Manihot esculenta crantz*) is one of the most important staple food crops in Oyo State and its average consumption exceeds 300 kg per person annually in some areas of the State (Raufu *et al.*, 2018). It is about the cheapest source of calories (Andersson *et al.,* 2016; Raufu *et al.,* 2018). The roots are rich in energy, starch and soluble carbohydrates, but poor in protein. It is vital, not only as a food crop but also as a source of income for rural households. Cassava can endure poor soil, adverse weather, pests and diseases, hence its ability to grow and be available all year round, which gives it advantage over other major staples food crops like yam and cocoyam in the State (Osondu *et al.,* 2014; James and Faleye, 2015). It is dry season resistance, resilience on marginal agricultural land and capacity to be stored in the ground make it an important food crop for poverty alleviation among small-holder farmers (Agada *et al.,* 2018; Oyewo *et al.,* 2018).

Gender issues center on relationships between adult male, adult female and youths, their access to, authority over resources, division of labour and needs. Gender is not determined biologically, as a result of sexual characteristics of either men or women, but socially constructed. It is a central organizing principle of societies, and regularly governs the processes of production and reproduction, distribution, and consumption (FAO, 1997). Gender influences the distribution of

resource, production decision making as well as the entitlement within the household (Osondu and Obike, 2015). Gender roles are shaped by ideological, economic, and cultural factors and these are key determinant of the distribution of responsibilities and resources between men and women (FAO, 2011).

The result of studies by International agencies such as World Bank (WB), United Nations (UN), Food and Agriculture Organization (FAO), IFAD, and International food Policy Research Institute (IFPRI), observed that although adult female and youth farmers are essential partners in the world's food production, they are additionally frequently underestimated in most development strategies. This has prompt inequality in agricultural strategies and policies developed for execution in Nigeria. Furthermore, gender inequalities and the absence of adequate attention regarding gender in agricultural development has added to lower productivity, loss of income, and higher levels of poverty in the developing countries including Nigeria. Therefore, the failure to perceive the gender roles, differences and disparities between adult male, adult female and youths represent a genuine risk to the effectiveness of the agricultural development agenda (WB, FAO and IFAD, 2009).

In Nigeria, adult female and youths represent practically half of the agricultural labor force, yet loans, extension services, farm credit, and other financial services are more targeted towards adult male than adult female and youths. For example, study shows that adult female and youths experience low access to credit and other financial markets while the adult male farmers have access to credit (USAID, 2017). Adult female and youth farmers are handicapped, and do not have much control over their resources, have low levels of harvest yields, low rates of modern input and technology adoption, and are hindered as far as human and physical capital are concerned. These gender-based differences likewise concern economic capacities and incentives which in turn undermine their capacity to add to and partake of economic growth, influence intra-household resource allocation, land productivity, and welfare levels.

In Oyo state, there is scanty information about gender contribution in cassava production (Olaosebikan *et al*., 2019). Thus, it becomes important for empirical documentation of gender dynamics in cassava production, so that development intervention agencies, non-governmental organisation (NGOs) and government could target the beneficiaries across board in the study area.

This research estimate the profitability of cassava production and factors influencing the profitability of cassava production based on gender.

Materials and Methods

The study was conducted in Oyo state, one of the six states in Southwest, Nigeria. The state is among the major cassava producing state in the country and the region in particular. It is geographically located within Latitudes 5^{o} 15' N and 9^{o} 10' N, and Longitudes 2^{o} 50' E. The annual temperature varies from 25^{o}C – 35^{o}C. The vegetation has a rainfall pattern of about 1,300 mm to 1,500 mm per annum, and ranges from rain forest to derived savannah. The climate is equatorial with notable dry and wet seasons with high relative humidity. The state has a projected population of 8,617, 931 persons in 2020 with an estimated growth rate of 3.2 percent (NBS, 2017). The state covers an area of approximately 28,454 sq. km. The state comprises 33 LGAs and 4 agricultural zones namely, Ibadan / Ibarapa, Oyo, Ogbomosho, and Saki.

This study targeted Oyo state in South-West, Nigeria. A multi-stage sampling procedure was used to obtain the sample size (Table 1). The first stage involves the random selection of two LGAs from each of the four agricultural zones in the state, followed by a random selection of

two villages from each of the LGAs selected to make a total of 16 villages. The last stage involves using Yamane formula developed by Yamane (1967) to calculate the minimum sample size based on the assumption of 5% expected margin of error, 95% confidence interval and applying the finite population correction factor. The formula is expressed as follows:

$$n = \frac{N}{1+N(e)^2} \quad (1)$$

Where: N = the population under study, n = the desire sample, e = the level of tolerable error assumed to be 0.05; while 1 is a constant value

$$n = \frac{634}{1+634(0.05)^2}; \; n = \frac{634}{2.59} \; n = 245; \qquad \frac{245}{634} x \; 100 = 38\%$$

The sample size of 245 cassava farmers was sorted by gender for the purpose of this study. Therefore, the sample size was made up of 68 adult male, 58 adult female, 61 youth male and 58 youth female cassava farmers.

Primary data were used for this study. Data collection was accomplished with the aid of structured questionnaire that was administered to cassava farmers by trained enumerators via personal interview method. The analytical tools that were used in this study include descriptive statistics, net farm income and profit efficiency model. Net farm income was used to estimate the profitability of cassava production by gender.

Table 1: Sampling procedure and sample size of cassava farmers in the study area

Zones	LGAs	Villages	Sample frame	Sample size (39%)
Ibadan/Ibarapa	Ido	Apete	36	14
		Idi-oro	28	11
	Ibarapa Central	Abule Oba	27	11
		Lanlate	35	14
Oyo	Iseyin	Iseyin	48	19
		Akinwumi	42	16
	Afijio	Fiditi	67	25
		Ilora	42	16
Saki	Atisbo	Tede	45	17
		Irawo	30	11
	Iwajowa	Okeho	48	19
		Temidire	38	15
Ogbomosho	Surulere	Iresaadu	55	20
		Oko	36	14
	Ori-ire	Oolo	35	14
		Ikoyile	22	9
Total	**8**	**16**	**634**	**245**

Source: OYSADEP, 2019.

The model for estimating the net farm income (NFI) is represented by the following:

$$NFI = TR - TC \quad (2)$$

$$NFI = TR - (TVC + TFC) \quad (3)$$

Where: NFI = net farm income; TR = total revenue; TC = total cost and TVC = total variable cost. TR is the total output multiply by the price per unit of produce, TFC = depreciated value of total fixed cost including cost of all fixed inputs used. The fixed inputs will be depreciated using

straight line method. Total variable cost (cost of variable inputs used in cassava production including stem cuttings, labour, fertilizer and organic manure). The TVC was estimated using the following equation:

$$TVC = Y_1X_1 + Y_2X_2 + Y_3X_3 + Y_4X_4 \quad (4)$$

Where: Y_1X_1 = unit cost of stem cuttings (₦), Y_2X_2 = unit cost of fertilizer used in production (₦/kg), Y_3X_3 = unit cost of labor utilized in cassava production (₦ / man-day) and Y_4X_4 = unit cost of herbicide used in production (₦ / L).

The stochastic profit frontier production function analysis was used to estimate the factors influencing the profitability of cassava production based on gender. The frontier production function model is specified as;

$$ln\ Yi = ln\beta o + \beta_1\ ln\ X_1 + \beta_2\ ln\ X_2 + \beta_3\ ln\ X_3 + \beta_4\ ln\ X_4 + \beta_5\ ln\ X_5 + V_i - Ui \quad (5)$$

Where: *Ln* = natural logarithm; Yi = normalized profit (₦); X_1 = cost of farm land (₦); X_2 = cost of labour input used (₦); X_3= cost of seed used (₦); X_4 = cost of fertilizer (₦) X_5 = cost of agrochemical (₦); Vi = error term which are random variables; Ui = error term which are non-random variables or technical inefficiency effect, βo = intercept and $\beta_1 - \beta_5$ = regression coefficients

The profit inefficiency model is defined by:

$$Ui = \delta o + \delta_1 Z_1 + \delta_2 Z_2 + \delta_3 Z_3 + \delta_4 Z_4 + \delta_5 Z_5 + \delta_6 Z_6 + \delta_7 Z_7 + ei \quad (6)$$

Where: Ui = profit inefficiency effect of the ith farm; Z_1 = age (years); Z_2 = household size (number of persons); Z_3 = education (years of schooling); Z_4= farming experience (years); Z_5 = extension contact (number of visit per year); Z_6 = membership of association (years of participation); Z_7= access to credit (amount borrowed in ₦); δ_1-δ_7 = parameters to be estimated ei= error term

Results and Discussion

Gender Profitability Analysis of Cassava Production

Table 2 depicts the results of the profitability of cassava production based on gender. The TVC accounted for about 87% of the total cost for adult male and adult female, and 91% (youth male), 93% (youth female). The total variable cost difference between adult male and female was ₦65, 900 and ₦16, 190.00 between youth male and female. The share of labour expenses in the TVC was 47% for adult male, adult female (49%), youth male (58%) and youth female (60%). This implies that labour took the highest percentage of total variable cost especially among youth cassava farmers. This is tandem to the findings of Ojiako *et al*. (2018) who reported that labour was the highest contributor to TVC among smallholders in southern Nigeria. The total cost difference between adult male and female was ₦75,520.00, between youth male and female was ₦18,590.00 This implies that adult male farmers spend more on cassava production compared to other genders. This could be because they (adult male farmers) have larger farm size than adult female and youth cassava farmers.

Analysis of Returns in Cassava Production Based on Gender

The difference in the yield was 13, 940 and 3,720 tons between adult male and female and, youth male and female respectively. This implies that adult male farmers had more yield, while youth female had the lowest yield. This could be as a result of adult male having larger farm size and had more access to farm inputs compared to other gender group. The gross revenue reported by this study for adult female and youth male is very close to the revenue of ₦277, 400 reported by Ojiako *et al*. (2018). The net farm income difference between adult male and female was

₦157,670 and ₦46,600 between youth male and female. The net farm income analysis has shown that cassava farming operations is profitable in the study area. However, cassava production is more profitable among adult male cassava farmers. This was in line with Daud *et al*. (2015) who reported a gross margin of ₦162,487.07 in cassava production in study carried out in Saki west local government of Oyo state, Nigeria.

Table 2: Profitability of cassava farmers based on gender

Variable	A. Costs (000'₦)	AM	AF	YM	YF	Pooled
Variable Cost	Labour	58.12	28.51	37.12	29.14	39.02
	Cassava stem (cutting)	22.34	12.05	10.23	7.39	13.35
	Fertilizer	36.51	14.18	14.56	9.77	19.43
	Herbicide	7.29	3.62	2.57	1.99	3.99
	Total variable cost	124.26	58.36	64.48	48.29	75.79
	Total fixed cost	18.54	8.92	6.18	3.78	9.69
	Total cost	142.8	67.28	70.66	52.07	85.48
Return	Average yield (Kg /ha)	26.76	12.82	12.98	9.26	15.88
	Total revenue (₦)	460.05	226.86	228.63	163.44	277.01
	Net farm income	317.25	159.58	157.97	111.37	191.53

Source: Field survey, 2019; AM= Adult male, AF= Adult female, YM= Youth male and YF= Youth female

Profit margin

Table 3 showed high profit margin in cassava production across the various genders, though, adult female had a higher profit margin. A high profit margin is an indication that the farmers are selling their produce at high profit level. Hence, the farmers are expected to have sufficient funds to pay for operating expenses while having high turnover in the study area. This finding is in consonance with the findings of Bwala and John, (2018) where they reported a gross profit margin of 45%. The gross ratio was 0.31 for adult male and youth male respectively, compared to 0.30 for adult female and 0.32 for youth female. This implies that every 30k spent would yield a benefit of ₦1.00 for adult male and youth male respectively and vice-versa across the gender. This implies that cassava farming is a viable enterprise in the study area and across the various gender. This agrees with the finding of Oke, (2014) and Oyedepo and Adekanmbi, (2018) who found a gross ratio of 0.27 and 0.95 respectively in their various study area.

The return on investment was positive across gender which implies that cassava production was profitable across the various gender groups. This agrees with the finding of Oke (2014) who found an ESR of 0.07 among backyard farmers in Osun state Nigeria. The operating ratio was estimated to be 0.27 for adult male, 0.13 for adult female, 0.14 and 0.10 for youth male and female respectively. The operating ratio relates to the farm variable input usage. The lower the ratio operating ratio, the higher the profitability of the farm business. Therefore, the average farm can be said to be profitable across the various gender. This is tandem with the findings of Oyedepo and Adekanmbi (2018) who found an operating ratio of 0.80 among ofada rice producers in Ogun state, Nigeria.

Table 3: Profitability ratio of cassava farmers based on gender

Profitability Index	AM	AF	YM	YF	Pooled data
Profit margin (%)	68.95	70.34	67.25	68.14	69.14
Gross ratio	0.31	0.30	0.31	0.32	0.31
Return on investment	3.22	3.37	3.24	3.14	3.24
Expense structure ratio	0.15	0.15	0.10	0.08	0.13
Operating cost	0.27	0.13	0.14	0.10	0.16
Total cost/ton	5.34	5.25	5.45	5.63	5.38
Net farm income/ton	11.85	12.45	12.17	12.03	12.06
Net farm income to cost ratio	2.22	2.37	2.24	2.14	2.24

Source: Field survey, 2019

Estimation of stochastic frontier production model

The stochastic profit frontier production model was estimated using the maximum likelihood estimate (MLE) of Cobb-Douglas stochastic frontier and the result is presented in Table 4. The log-likelihood ratio values which represents the value that maximizes the joint densities in the estimated model show values of AM (39.573), AF (63.585), YM (14.916), YF (1.624) and pooled data (340.684) exceeding the critical chi-square values at 1% level of significance with number of restriction (degree of freedom) of 4. Therefore, the Cobb-Douglas functional form adequately represents the data. The correctness of the specified assumption of the distribution of the component error terms is tested by the significant levels of the sigma-square (σ^2). The 1% levels of statistical significance for all the groups show the appropriateness of the assumption for the distribution of the component error term. The result of the MLE of the production function showed diverse relationship among the 4 groups of cassava production in the study area.

The result revealed that the coefficients of costs of farm size (0.004), stem cutting (1.010) and labour (-0.008) were statistically significant variables influencing profit efficiency of AM farmers. Furthermore, stem cutting (1.051) and labour (-0.054) influences AF farmers and similarly, stem cutting (1.04) and labour (-0.021) influences YM farmers and also stem cutting (0.011) and labour (-0.017) for YF farmers. The positive sign on all statistically significant variables in the four groups implies that a unit increase in these variables will lead to corresponding decrease in profit efficiency by their equivalent units. In the same vein, all the coefficients with negative signs demonstrated that a unit increase in these variables will lead to an increase in profit efficiency by their corresponding units.

Cost of farm size was statistically significant at 10% in only AM farmers. This means that increase in the cost of farm size will lead to decrease in profit efficiency. Result also indicated that cost of labour was negative and statistically significant at 1% probability level in all the 4 groups except among AM farmers ($p<0.05$). It revealed that the use of labour will result to higher output of cassava in the area and invariably higher profit. This is in agreement with believe that labour if effectively utilized contribute significantly to output.

Cost of stem cutting showed a positive and statistically significant relationship for the 4 groups of cassava farmers. This relationship implies that the higher the cost of stem cutting used for the cultivation of cassava production, and the lower the profit realized from cassava output.

Table 4: MLE results of stochastic frontier profit function for cassava farmers based on gender

Variable	AM (β)	AF (β)	YM (β)	YF(β)	Pool data
Constant	2.830***	4.646***	2.599***	11.664***	11.811***
	(5.167)	(4.656)	(2.639)	(48.402)	(74.098)
Cost of farm size	0.004*	0.049	0.001	-0.005	-0.005
	(1.976)	(0.413)	(0.123)	(-1.042)	(-1.207)
Cost of stem cutting	1.010***	1.051**	1.040***	0.011 ***	0.069***
	(18.017)	(2.352)	(9.260)	(2.847)	(4.398)
Cost of fertilizer	-0.002	0.031	0.001	-0.003	0.022***
	(-0.353)	(0.758)	(0.120)	(-0.569)	(3.413)
Cost of labour	-0.008**	-0.054***	-0.021***	-0.017***	-0.008
	(-2.183)	(-2.521)	(-2.505)	(-2.514)	(-1.299)
Cost of herbicides	-0.006	-0.146	0.003	0.006	0.005
	(-0.653)	(-0.224)	(0.452)	(0.851)	(0.661)
Diagnostic statistics					
Sigma square	0.334**	16.643***	0.083***	0.079***	19.051***
	(2.228)	(16.647)	(3.804)	(5.009)	(7.216)
Gamma	0.967***	1.000***	0.201	0.001	0.990***
	(56.645)	(35484.685)	(0.788)	(0.253)	(444.272)
LLF	19.004	-107.383	-5.083	-9.393	-265.976
LRT	39.573	63.585	14.916	1.624	340.648

Field survey, 2019; Note: Figure in parenthesis are value of t-test; β denote coefficient, LLF log likelihood function, LRT likelihood ratio test

Estimation of profit inefficiency model

Profit inefficiency of cassava production was analyzed as shown in Table 5. The results showed that the coefficients for household size (-2.812), extension contact (0.139) and credit utilized (1.552) were statistically significant inefficiency variables affecting profit in AM cassava production. Extension contact (0.002) and credit utilized (-2.14) were significant variables affecting profit inefficiency in AF cassava farmers. Similarly, extension contact (-0.695) and credit utilized (1.294) were significant variables affecting profit inefficiency in YM cassava farmers. Only extension contact (0.034) was statistically significant among YF cassava farmers.

The positive coefficients on some socio-economic characteristics in all the four groups imply that a unit increase in any of these variables will lead to a corresponding increase in inefficiency in cassava production. However, negative coefficients of some variables suggest that a unit increase in these variables will increase efficiency of cassava production.

The negative coefficient of household size ($p<0.10$) among AM farmers imply that a unit increase in this variable will lead to 2.812 units increase in efficiency of AM cassava farmers. This implies that farmers who had large household sizes with less dependents were more profit efficiency compared with farmers with small household size. This result further reiterates the importance of household size, especially for family labour use in agriculture in Nigeria. Household size is important in the supply of family labour because increase in household size may lead to decrease in technical inefficiency, *ceteris paribus*.

The coefficient of access to extension contact was positive and statistically significant in AM (0.139), AF (0.002) and YF (0.034) cassava production farmers. This implies that cassava farmers with less extension contacts tend to be less technically efficient than those with more extension contacts. This is in line with the understanding concerning extension services which serves as the medium for educating farmers on new innovations before adoption of the

technology. The coefficients of access to credit was positive in AM (1.552) and YM (1.294), and negative in AF (-2.14) with different level of probability. This implies that cassava farmers that have negative coefficient of access to credit facilities reduce profit inefficiency in AF farmers. If production credit accessed is invested on cassava production, it is expected to lead to higher levels of output and invariably higher profit. In contrast, coefficients of access to credit among AM and YM cassava farmers that are positive, imply higher inefficiency.

Table 5: Profit inefficiency function based on gender

Variable	AM (β)	AF (β)	YM (β)	YF (β)	Pool data (β)
Constant	-0.515	-0.017	-6.714	0.055	3.461***
	(-0.391)	(-0.017)	(-1.291)	(0.062)	(2.782)
Age	0.870	-0.066	2.347	-0.015	-9.784***
	(1.300)	(-0.094)	(1.375)	(-0.051)	(-8.348)
Educational level	0.669	-0.032	-0.142	-0.051	-1.216*
	(1.511)	(-0.034)	(-1.208)	(-1.012)	(-1.722)
Household size	-2.812*	-0.029	0.313	-0.044	-0.374
	(-1.921)	(-0.030)	(1.333)	(-0.352)	(-0.357)
Farming experience	-0.353	-0.046	-0.695*	0.090	1.682**
	(-0.893)	(-0.054)	(-1.907)	(1.073)	(2.146)
Access to extension	0.139**	0.002**	-0.441	0.034*	2.351**
	(2.029)	(2.002)	(-1.258)	(1.937)	(2.407)
Access to credit	1.552*	-2.14*	1.294*	0.130	2.607***
	(1.681)	(1.940)	(1.895)	(0.971)	(2.616)

Field survey, 2019; Note: Figure in parenthesis is t-value

The results of the technical efficiency score of the cassava farmers are presented in Table 6. The results revealed that youth female and male farmers had a mean profit efficiency of 0.92 and 0.90 compared to adult male and adult female with 0.85 and 0.41 respectively. A large percentage of AM cassava farmers (75.21%) falls within profit efficiency range of 0.80-1.00; 85.25% of YM cassava farmers had a profit range of 0.80-1.00; and large majority of YF farmers (96.55%) had a profit range of 0.080-1.00. However, only 8.62% if AF cassava farmers falls within 0.80-1.00.

Table 6: Distribution of profit efficiencies indices among cassava farmers based on gender

Decile classes	AM F (%)	AF F (%)	YM F (%)	YF F (%)	Pool data F (%)
0.01 – 0.19	0 (0.00)	12 (20. 69)	0 (0.00)	0	1 (0.41)
0.20 – 0.39	2 (2.94)	20 (34.48)	0 (0.00)	0	16 (6.53)
0.40 – 0.59	3 (4.41)	13 (22.41)	2 (3.28)	0	75 (30.61)
0.60 -0.79	5 (7.35)	8 (13.79)	7 (11.48)	2 (3.45)	111 (45.31)
0.80 – 0.89	21 (30.88)	2 (3.45)	8 (13.11)	14 (24.14)	42 (17.14)
0.90 – 1.00	37 (54.41)	3 (5.17)	44 (72.13)	42 (72.41)	0 (0.00)
Total	68 (100)	58 (100)	61 (100)	58 (100)	245 (100)
Mean	0.85	0.41	0.90	0.92	0.63
Minimum	0.32	0.01	0.50	0.78	0.01
Maximum	0.97	1.00	0.99	1.00	0.88

Field survey, 2019; F denote frequency

Return to scale in cassava production based gender

The return to scale (RTS) analysis, which serves as a measure of total resource productivity, is given in Table 7. The elasticity of the mean value of cassava production based gender farm output was estimated to be an increasing function. The positive coefficients for these variables show that an increase in any or in all of these variables would reduce profit by corresponding coefficients., while the negative coefficients shows the increase in profit level.

The total maximum likelihood estimates (MLE) of the Cobb-Douglas based stochastic production function parameter of 0.998, 0.931, 1.024, -0.008 and 0.083 for AM, AF, YM and YF cassava farmers respectively were obtained from the summation of the coefficients of the estimated inputs (elasticities). It indicated that, cassava production in AM, AF and pooled data were in the stage II of the production surface. Stage II is the stage of decreasing positive return-to scale, where resources and production were believed to be efficient, called the rational stage. This is an indication that these categories of cassava farmers in both system of production and pooled data could benefit from economies of scale linked to increasing returns in order to enhance production. At the stage II (rational stage), production could be increased by using more of the factors with positive elasticities especially farm size and stem cutting. Adjustments in the use of inputs can be made at this stage so that farmers could produce at the point of economic optimum which guarantees profit maximization.

Table 7: Return to scale of gender based cassava production

Variables	AM (β)	AF (β)	YM (β)	YF (β)	Pooled (β)
Farm size	0.004	0.049	0.001	-0.005	-0.005
Stem cutting	1.010	1.051	1.040	0.011	0.069
Fertilizer	-0.002	0.031	0.001	-0.003	0.022
Labour	-0.008	-0.054	-0.021	-0.017	-0.008
Herbicide	-0.006	-0.146	0.003	0.006	0.005
Return to scale	0.998	0.931	1.024	-0.008	0.083

Field survey, 2019; β denote the coefficient

Conclusion and Recommendations

Based on the findings of this study, it could be concluded that cassava production in the study area was profitable and economically viable for all categories of cassava farmers with adult male farmers having the highest profit. The result of the MLE of the production function established that production inputs and socio-economic variables were factors determining profit efficiency in cassava production among the four cassava production actors in the study area.

From findings of this study, the following recommendations were made:

(i) Formulation of policies, planning and preparation of projects / programmes by relevant agencies that would encourage gender sensitivity on cassava production is advocated.

(ii) In view of the relatively high profitability level in cassava production, government and non-governmental organizations should encourage unemployed youth to partake in cassava production enterprises in order to reduce unemployment and poverty level.

(iii) Policies that would encourage relatively younger and educated persons and provide them easy access to improved seeds, credit, fertilizers and mechanization will go a long way in addressing unemployment problem and poverty reduction in the study areas.

(iv) Productivity improvements can be achieved by implementing policies such as improved farmers' access to extension services and technical assistance to ensure farmers use existing and improved inputs and technology more efficiently.

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