Effect of Cassava Transformation Initiative on the Profitability of Micro-Scale Cassava Processing Enterprises in Southwest Nigeria

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ABSTRACT: This study evaluated the effect of cassava transformation initiative on the profitability of Micro-Scale Cassava Processing Enterprises (MSCPEs) in Southwest Nigeria. The study assessed the profitability of the MSCPEs before and after the initiative, using survey design and multi-stage sampling technique (purposive sampling, and proportionate stratified sampling technique) to select respondents. The sample size for the study was 292 respondents. Structured questionnaires were administered to the respondents with only 86% (251) retrieved. The data collected were analyzed with descriptive statistic (percentages, addition, subtraction, multiplication, division) and Gross Margin Analysis (GMA). Hypothesis was tested with Analysis of Variance (ANOVA). The study revealed that, the Cassava Transformation Initiative (CTI) had a significant effect on the profitability (with p-values of gross margin and profit being .005 and .000 respectively) of the Micro-scale cassava processing enterprises in the study area. The study therefore recommended that, the government and all stakeholders in the cassava industry in Nigeria should assist in providing enabling environment for the industry to strive and extend the processing of cassava as substitute for imported cassava products, use cassava as a source of poverty alleviation as well as earn foreign exchange from its processing.

INTRODUCTION

Cassava is one of the most widely cultivated tubers by farmers in Nigeria. It is planted in every part of the country because of its ability to strive in every type of soil. Cassava is an essential source of food for sub-Saharan region in Africa (International Institute of Tropical Agriculture IITA, 2005a). It can be produced at farm level by farmers, processed into chips, flour and pellets by processors, and used by agro industries to produce other products like ethanol, dextrin/adhesive, native and modified starch for other industries (for example, textile, paper, and wood) (IITA, 2005b; Knipscheer, *et al.* 2007). Cassava is cultivated in virtually all the states, and flourishes in every agro-ecological zones in Nigeria (Foundation for Partnership Initiatives in the Niger Delta PIND,

2011). Cassava has become the main crop for sustaining the nation's economy, such that, Nigeria has attained the status of the highest producer of the crop in the globe with an average of 54 million tonnes (Ettah and Nweze, 2016).

In the year 2003, the Nigerian Government decided to develop the Nigerian cassava industry, with the purpose of increasing primary processing and utilization of cassava; using Nigerian cassava products as substitutes for imported cassava products (Nigeriafirst.org, 2005; Adebayo, 2009), and earning ₦5 billion annually from the export of cassava products (Awoyinka, 2009; Ohimain, 2015). The objective of this study is to examine the effect of the CTI on the profitability of the micro-scale

cassava processing enterprises in Southwest Nigeria. There are few studies on the effect of the CTI on the profitability of the micro-scale cassava processing enterprises in Nigeria. This study proposes to contribute to the existing literature on the effect of cassava transformation initiative on the profitability of micro-scale cassava processing enterprises.

The Cassava Transformation Initiative that was established by the Nigerian government in 2003, was intended to develop the Nigerian cassava production and processing industry. While some authors agreed that the initiative aided the development of the cassava production and processing industry (Foundation for Partnership Initiatives in the Niger Delta (PIND), 2011; Sanni, Onadipe, Ilona, Mussagy, Abass, and Dixon, 2009), some other authors concluded that the initiative had a little or no effect on the enhancement of the cassava production and processing industry (Olokunle, 2016). The intention of this study therefore, is to assess the effect of the initiative on the profitability of the micro-scale cassava processing enterprises in Southwest Nigeria.

LITERATURE REVIEW

Empirical studies on profitability of small-scale cassava farmers and processors in Nigeria

Adeyemo, Oke and Akinola (2010) carried out a study on economic efficiency of small-scale farmers in Ogun State, Nigeria. Data gathered were analysed with descriptive statistics, budgetary technique and the stochastic frontier analysis. The result revealed that, the gross margin and profit of the farmers was ₦105, 775 and N95.738.10 respectively. Cost ratio (1.8) and percentage profit (80%). The authors further established that, the total variable cost and labour costs were 91.6% and 68.2% of the total cost respectively, while the return to scale was 1.024. They concluded by saying that, cassava farming in the study area is profitable. Similarly, Ijigbade, Fatuase and Omisope (2014)'s study on conduct and profitability of *garri* production for increased food security in Ondo State, Nigeria, used descriptive statistics, profitability analysis and multiple regression model to analyze data collected. The result revealed that *garri* production was a profitable enterprise given a gross margin and profit of N24,582.18 and N16,582.18 per *garri* processing cycle (a week) respectively, benefit cost ratio of 1.33 and profitability ratio of 0.33. Moreover, Fefa, Obute and Ucherwuhe (2012)'s study, on cassava processing technology adoption and poverty reduction among operators in Benue State, Nigeria, used descriptive statistic (frequency counts, tables, charts, percentages and means) and budgetary analysis of profitability to analyze collected data. The study disclosed that, the processors' Total revenue was ₦398,063.97, total cost was ₦145,948.40 and total variable cost was ₦114,234.32. Profit (Total Revenue – Total Cost) was ₦252,115.57, Gross Margin (Total Revenue – Total Variable Cost was ₦283,829.65. Also, their Cost-Benefit Ratio (Total Revenue/Total Cost, was 2.73, (meaning for every ₦1 invested by the processors, the processors earn ₦2.73 as revenue, and gain ₦1.73 each and their rate of return **was** 2.48. This again means that, a unit cost of production of cassava output, would result to more than two times gain. TVC ((₦114,234.32) (78%)) formed the bulk of total cost.

Furthermore**,** Odediran and Ojebiyi (2017)'s study on cassava processors' willingness to utilize cassava peel for mushroom production in Southwest, Nigeria, affirmed that, a lot of cassava processors in Southwest, Nigeria, gained 65 kobo for every one naira invested in cassava processing. Okpeke and Onyeagocha (2015)'s revealed that, for every one naira invested in the processing of cassava, into *garri* in Isoko North Local Government Area of Delta State, analysed their data with descriptive statistic (mean, frequency distribution, percentages) and inferential statistics (gross margin and regression analysis). The result revealed that, the projected annual total revenue of the processors was N610,000, total variable costs was N370,000 and the gross margin was N240,000 per annum. The study further revealed that, for every one naira invested in the processing of cassava, in the study area, the

farmer gained 65 kobo. Erhabor, Emokaro and Abiola (2004), in their study carried out in Egor and Oredo Local Government Area of Edo State concluded that, the gross margin of the respondents in the area was N12,900 and the return per naira invested was ₦1.08 for *garri* and starch production, while Egor obtained higher values of N17,250 and N1.56 respectively. While Emokaro, Iluobe, and Alufohai (2008)'s study disclosed that, a gross margin of N211,275 in one Month in the peak season of cassava processing, can be obtained if regular supply of raw cassava tubers are readily available for production in the market.

In addition, Ettah and Angba (2016)'s study on analysis of cost and returns among cassava farmers in Cross River State, Nigeria, analyzed data gathered for the study with descriptive statistic (frequency, mean, percentage) and inferential statistic (gross margin analysis). The result revealed that the Total variable cost for the cassava farmers was ₦113,554.99, while Total revenue and gross margin were estimated at ₦251,424.80 and ₦137,869.81 respectively during the period of production. Also, return on naira invested was ₦1.41 which means that for every ₦1 invested the farmers will realize a profit of ₦ 0.41. Furthermore, Olokunle (2016)'s study on socio-economic determinants and profitability of cassava production in Nigeria, disclosed that, the rates of returns on cassava production in Nigeria was 55 per cent. This means that for every one naira (100 kobo) invested in cassava production is a net profit of 55 kobo. Also, Muhammad-Lawal, Omotesho and Oyedemi (2013) on an assessment of the economics of cassava processing in Kwara State, Nigeria, confirmed that, the return on investment of *garri* processing in Kwara State was 30.88%, while Oluwasola (2010) disclosed that, the internal rate of return to cassava enterprise in Oyo State was 1.84.

Gross Margin (GM)
Gross Margin (GM) was defined by Olukosi and Erhabor (2005) as the difference between the Gross Farm Income (GFI) and the Total Variable Cost (TVC). It is the disparity between revenue and cost of goods sold, divided by revenue, represented in percentage. However, it is usually, calculated as the selling price of an item, minus the cost of goods sold (Farris and Bendle, 2012). Gross Margin is used to measure profitability, with the supposition that Fixed Cost (FC) is insignificant, like the situation with the processing of cassava, which is typically carried out in small-scale (Olukosi and Erhabor, 2005; Arene, 2006).

Furthermore, there is a presumption that, analysis is carried out within a short period of time (Olukosi & Erhabor, 2005). Olukosi and Ogungbile (2005) and Olukosi and Isitor (1990) defined Variable Costs (VC) as the costs that change along with production output. Spurlock and Gills (1997) referred to variable costs as the costs managers can control in the short run, and those costs and that increase along with total planned production. While Fixed costs (FC) are the costs that do not change along with production output (like land, rent among others).

Total Cost (TC) is the addition of Total Fixed Cost (TFC) and Total Variable Cost (TVC), while profit is Total Revenue (TR) minus TC. Kotler and Armstrong (2010) defined marketing as "the process by which companies create value for customers and build strong customer relationships in order to capture value from customers in return". It is important that cassava processors understand the needs and wants of their national and international customers and potential customers, develop the products that can satisfy these needs and wants, and supply these products to the customers in exchange for local and foreign currency. The reliability of the research instrument was carried out with Cronbach's Alpha, and the Cronbach's Alpha coefficient was 0.798. This indicates that the result is high and the instrument is suitable for social science

METHODOLOGY

Study Area

The study was carried out in Southwest, one of the six geopolitical zones in Nigeria. The zone is the home of the Yoruba people (Ogundele, 2007), whose occupation is farming (National Population Census NPC, 2006). The zone comprises six states. These states are: Lagos, Oyo, Ekiti, Ondo, Ogun and Osun. Its total land area is 77,818 km2, and its population is 27,581,992 (National Population Census (NPC), 2006). Also, the zone is bordered by Kogi and Kwara states in the North, Gulf of Guinea in the South, Republic of Benin in the West, and Edo and Delta states in the East. The zone is in-between longitude 2°311 and 6°001 East and Latitude 6°211 and 8° 371 North (Agboola, 1979). The area is made up of two seasons (wet and dry seasons), and its vegetation consist of fresh water swamp and mangrove forest at the belt. The zone has a good climate for cultivating cassava, maize, yam, and among other, (National Population Census NPC, 2006).
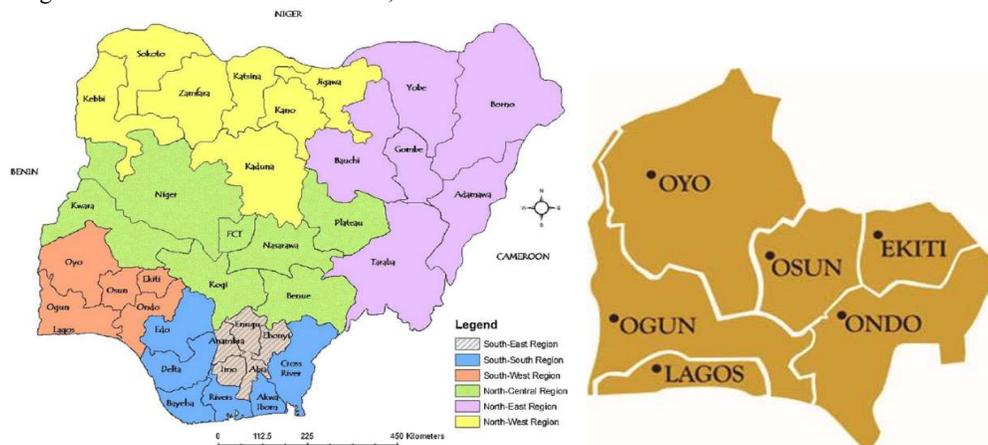

Figure 1: Map of Nigeria, showing six States in Southwestern Nigeria

Method

The sampling technique used for this study is multistage sampling. Southwest zone in Nigeria was selected via purposive sampling, since the zone was acknowledged by Food and Agriculture Organization FAO (2005), as one of the cassava growing zones in Nigeria. Ekiti, Ogun, Lagos, Ondo, Osun and Oyo states make up the zone. Purposive sampling technique was also used to select the micro-scale cassava processing enterprises that benefited from the Presidential Cassava Transformation Initiative, and registered with Agricultural Development Projects (ADPs), an agricultural extension services of each of the states. This institution was one of the Nigerian Government's Agricultural Institution that implemented the initiative in every state in Nigeria. The population for the study was 1,083 micro scale cassava enterprises (Ekiti, 104, Lagos, 93, Ogun, 119, Ondo, 226, Osun, 226 and Oyo, 315). Since the number of beneficiaries from each state varied, proportionate stratified sampling technique was used to select 27% of beneficiaries from each state. A number of 292 cassava micro-scale enterprises in the study area formed the sample size (Ekiti, 28, Lagos, 25, Ogun, 32, Ondo, 61, Osun, 61 and Oyo, 85). Structured copies of questionnaire were used to gather data from the respondents, with the support from trained research assistants/extension agents, and youth leaders (members of the communities). However, 251 (86% response rate) of the questionnaires were retrieved. Descriptive statistic (percentages and mean score) and Gross Margin Analysis (GMA) were used to analyze the data retrieved, while hypothesis of the study was tested with Analysis of Variance (ANOVA). Reliability test was also carried out with Cronbach test. The statistical analysis was done with use of the

Statistical Package for Social Sciences (SPSS), version 21.

Model Specification

Gross Margin Analysis (GMA)

Gross Margin Analysis formula was adapted from Owombo, *et al.* (2012) to determine the effect of the Federal Government of Nigeria's cassava transformation initiative on the level of performance (profit and profit margin) of the Micro-Scale cassava processing enterprises in South-west Nigeria, by comparing the profitability of the enterprises before with the profitability of the enterprises, after the initiative. Gross Margin Analysis was represented by

$$G.M = G.I – TVC \ \ \ldots\ldots\ldots\ldots (1)$$

Where:

G.M = Gross margin

G.I = Gross sales or income (Gross sales was used in this study)

TVC = Total Variable Cost.

$$\text{Profit } (\pi) = \text{Total Revenue (TR)} - \text{Total Cost (TC)} \ \ldots\ldots\ldots\ldots..(2)$$

$$\text{Benefit Cost Ratio} = TR – TC \ \ldots\ldots.(3)$$

$$\text{Profitability Ratio} = \text{Profit}/TC \ \ldots\ldots.(4)$$

$$\text{Rate of Return} = GM/TVC \ \ldots\ldots\ldots..(5)$$

RESULTS AND DISCUSSION

Socio-economic Characteristics of the beneficiaries of the Cassava Transformation Initiative

Table 1 revealed that, 22(8.8%) of the beneficiaries were from Ekiti State, 24(9.6%) from Lagos State, 26(10.4%) from Ogun State, 60(23.9%) from Ondo State, 49(19.5%) from Osun State, and 70(27.9%) from Oyo State. This implies that the selected beneficiaries spread across the six states. Also, the male respondents made up 25.9% (65) of the beneficiaries, while the female made up 74.1% (186). This implies that the female respondents were more than the male respondents. Nevertheless, this did not have any significant effect on the results because the respondents were randomly selected. However, it shows that the female gender, partake in cassava processing more than their male counterparts. This result is in line with that of Okpeke and Onyeagocha (2015)'s study on analysis of processing cassava tubers into *garri* in Isoko North Local Government Area of Delta State, Nigeria, in which it was concluded that, 95% of the respondents were females. Also, Muhammad-Lawal, Omotesho, and Oyedemi (2013)'s study, on assessment of the economics of cassava processing in Kwara State, Nigeria in which it was established that, 88.1% of the respondents were female. Furthermore, Oluwasola (2010)'s study on stimulating rural employment and income for cassava *(Manihot sp.)* processing farming households in Oyo State, Nigeria, disclosed that, women comprised 90% of processors in the study area. Also, 241(96%) of the beneficiaries were Nigerians, 4% (10) were non-Nigerians.

Furthermore, the beneficiaries within the age group 20-29 years were 1.6 % (4), those within age group 30-39 years, 8.0% (20), 40-49 years 42.6% (107), 50-59 years 29.1% (73), and 60 years and above were 18.7% (47). This result shows that, a lot of the beneficiaries of the initiative were between 40-49 years of age, and they were energetic and could participate actively in cassava processing. This result is similar to those of Odediran and Ojebiyi (2017) on cassava processors' willingness to utilize cassava peel for mushroom production in Southwest, Nigeria, which revealed that, majority of cassava processors in Southwest Nigeria were within the ages of 41 to 60 years. Also, Muhammad-Lawal *et al*. (2013), disclosed that a lot of cassava processors in Kwara State, Nigeria, were between 40-59 years. However, this study is not in agreement with that of Muhammad-Lawal, Omotesho, and Oyedemi (2013), which concluded that, the cassava processors in Kwara state, had an average age of 32 years. Also, Oluwasola (2010) disclosed that, the mean age of cassava processing households in Oyo State was 36 years.

In addition, 31.9% (80) of the beneficiaries had Primary School Certificate, 17.9% (45) had Secondary/O' Level, 8% (20) had Vocational/Technical education, 7.2% (18) had Polytechnic/University education, while 35%

(88) were not educated. This implies that, a lot of the beneficiaries had either Primary School Certificate or were not educated. This result is similar to that of Oluwasola (2010)'s study on stimulating rural employment and income for cassava *(Manihot sp.)* processing farming households in Oyo State, Nigeria, which revealed that, over 80% of cassava processors in the study area, did not study beyond primary school level.

Table 1: Distribution of Socio-economic Characteristics of Beneficiaries

Personal Characteristics	Freq.	%
Beneficiaries Location		
Ekiti	22	8.8
Lagos	24	9.6
Ogun	26	10.4
Ondo	60	23.9
Osun	49	19.5
Oyo	70	27.9
Gender		
Male	65	25.9
Female	186	74.1
Nationality		
Nigerian	241	96.0
Others	10	4.0
AGE		
20-29	4	1.6
30-39	20	8.0
40-49	107	42.6
50-59	73	29.1
Above 60	47	18.7
Education		
Primary School Cert	80	31.9
Secondary/O' Level	45	17.9
Vocational/Technical	20	8
Polytechnic/University	18	7.2
Not Educated	88	35
Years of Experience		
1-10	53	21.1
11-20	148	59.0
21-30	38	34
31-40	8	3.2
Above 40	4	1.6

Source: Field Work 2018

Once more, 21.1% (53) of the beneficiaries had 1-10 years of experience, 59.0% (148) had 11-20 years of experience, 34% (38), 21-30 years, 3.2% (8) had 31-40 years and 1.6% (4) had above 40 years of experience. These years of experience assisted the beneficiaries to give useful information on the trade. This finding is not far from that of Ijigbade *et al.* (2014)'s study on conduct and profitability of *Garri* production for increased food security in Ondo State, Nigeria, where it was disclosed that, 64% of cassava processors in Kwara State, had between 11 and 20 years of experience.

Average Sales per Week in Naira (₦), Total Variable Cost, Total Fixed Cost, Total Cost and Profit of the Micro-Scale cassava processing enterprises in the study area, before and after the FGCTI

Table 2 revealed that average sales per week in Naira (₦), Total Variable Cost, Total Fixed Cost, and Total Cost of the Micro-Scale cassava processing enterprises in the study area, before and after the CTI. The figures on Table 3, were used to compute the profitability of the beneficiaries before and after the initiative, on Table 2. The fixed cost is made up of cost of equipment and implement (fryers, drums, cutlasses, knives, washing basins, rent and grating machine (was not applicable to all respondents), pressing machines and skillets). The variable cost was made up of (cost of raw materials, cost of transportation, labour cost, cost of peeling and washing cassava tubers, cost of grinding or cutting, cost of frying, charcoal, firewood, and diesel). Drying was mainly carried out on platforms or cemented ground without cost.

Table 2: Distribution of Average Sales per Week in Naira (₦), Total Variable Cost, Total Fixed Cost, Total Cost and Profit of the Micro-Scale cassava processing enterprises in the study area, before and after the Cassava Transformation Initiative

Before	Oyo	Ogun	Osun	Ondo	Lagos	Ekiti
Sales (Gross Income) (G.I or TR)	29,292.52	40,745.49	46,228.57	26,512.26	34,799.32	25,108.39
Total Variable Cost (TVC)	18,517.54	25,480.06	30,375.49	17,428.55	22,146.60	16,049.13
Fixed Cost (FC)	2,126.32	3,841.07	4,379.08	2,467.05	2,583.64	2,355.84
Total Cost (TC)	20,643.86	29,321.13	34,754.57	19,895.60	24,730.24	18,404.97

After	Oyo	Ogun	Osun	Ondo	Lagos	Ekiti
Sales (Gross Income) (G.I or TR)	68,013.52	75,591.46	94,195.04	92,610.50	59,421.10	70,227.04
Total Variable Cost (TVC)	38,078.48	43,289.58	54,683.38	52,576.36	34,321.42	42,654.91
Fixed Cost (FC)	9,165.29	9,511.21	12,343.82	13,391.47	7,469.00	6,649.84
Total Cost (TC)	47,243.77	52,800.79	67,027.20	65,967.83	41,790.42	49,304.73

Source: Field Work, 2018

Effect of Federal Government Cassava Transformation Initiative on Gross Margin of the Micro-Scale cassava processing enterprises in the study area.

The average gross margin, profit, benefit cost ratio, profitability ratio, and the rate of return of the beneficiaries in the six states in Southwest Nigeria are presented in Table 3. The table revealed that, the average gross margin per month for the Micro-scale cassava processing enterprises in Oyo state before benefitting from the initiative, was ₦10,774,98 per week, and after the initiative, it became, ₦29,935.04. That is an increment of ₦19,160.06 (178%). That of Ogun state was ₦15,265,43 before the initiative, and 32,301.88 after the initiative. This implies that, there was an increment in the average gross profit, with ₦17,036.45 (112%). Osun state, 15,853.08 before the initiative and 41,511.66 after the initiative. That is an increment of ₦25658.58 (162%). Also, Ondo state had a gross margin of 9,083.71 before the initiative and 40,034.14 after the initiative. This means, the beneficiaries had an increment in the average gross profit, with ₦30,950.43 (341%). That of Lagos state was ₦12,652.72 before the initiative and ₦25,099.68 after the initiative. This means, the beneficiaries had an increment in the average gross profit with ₦12446.96 (98%). Ekiti state had average gross profit of

₦9,059.26 before the initiative and ₦27,572.13 after the initiative. This implies that, beneficiaries had an increment in their average gross margin with ₦26662.87 (293%). This result is similar to those of Ijigbade, *et al.* (2014), whose study on "Conduct and Profitability of *Garri* Production for Increased Food Security in Ondo State, revealed that the gross margin per month attained by the *garri* processors to be ₦24,582.18, Fefa, *et al.* (2012)'s study which revealed that the gross profit per month of cassava processors in Benue State, Nigeria was ₦23,652.47 and Okpeke and Onyeagocha (2015)'s study on "Analysis of Processing Cassava Tubers into *Garri* in Isoko North Local Government Area of Delta State, Nigeria" which revealed a gross margin of ₦20,000 per month. However, Erhabor *et al.* (2004)'s study on "Feasibility Study on the Marketability of Root and Tuber Crops and their Processed Products (A Case Study of Cassava). Edo State Agricultural Development Programme" revealed a gross margin value of ₦12,900 per month, Emokaro *et al.* (2008)'s study on "Profitability and Constraints in *Garri* and Edible Starch Processing by Women in Egor and Oredo Local Government Areas of Edo State" revealed a gross margin of ₦17,606.25 per month, while Muhammad-Lawal *et al.* (2013)'s study on "an assessment

of the economics of cassava processing in Kwara State, Nigeria" disclosed an average gross margin of ₦9,070. These findings are lower than that which was attained in this study.

Furthermore, Oyo state beneficiaries had on the average, gross profit per month of 8,648.66 before benefitting from the initiative, and 20,769.75 (140%), after the initiative, Ogun state was ₦11,424.36 before the initiative, and 22,790.67 (99%) after the initiative, Osun state, 11,473.43 before the initiative and 27,167.84 (137%) after the initiative. Also, Ondo state had a gross profit of 6,616.66 per month before the initiative and 26,642.67 (301%) after the initiative, Lagos state had 10,069.08 before the initiative and 17,630.68 (75%) after the initiative, and Ekiti state had 6,703.42 before the initiative and 20922.31 (212%) after the initiative. This result is similar to those of Ijigbade *et al.* (2014), whose study on "Conduct and Profitability of *Garri* Production for Increased Food Security in Ondo State, revealed ₦16,582.18 as an average profit per month attained by *garri* processors and Fefa *et al.* (2012)'s study which revealed that the average profit per month of cassava processors in Benue State, Nigeria was ₦21,009.63.

In addition, Oyo state had on the average a Benefit Cost Ratio of 1.42 (meaning for every ₦1 invested, ₦1.42kobo will be earned, that is a profit of 42 kobo will be made) before benefitting from the initiative, and 1.44, after the initiative, Ogun state was 1.39 before the initiative, and 1.43 after the initiative, Osun state, 1,33 before the initiative and 1.41 after the initiative. Also, Ondo state had a gross profit of 1.33 before the initiative and 0.41 after the initiative, Lagos state had 1.41 before the initiative and 1.42 after the initiative, and Ekiti state had 1.36 before the initiative and 1.42 after the initiative. These findings are not far from those of Ijigbade *et al*. (2014)'s study on conduct and profitability of *garri* production for increased food security in Ondo State, Nigeria. This study revealed that, the benefit cost ratio of *garri* producers in Ondo State, Nigeria was 1.33. Fefa *et al*. (2012), who found out in their study, cassava processing technology adoption and poverty reduction among operators in Benue State, Nigeria, that, the cassava processors in their study area, had a Benefit Cost Ratio of 2.73 (meaning for every ₦1 invested by the processors, they would get ₦2.73 as revenue, and gain ₦1.73 each. Adeyemo *et al*. (2010) who revealed that, the benefit cost ratio of the small scale farmers in Ogun State, Nigeria, was 1.33. Also, Ettah and Angba (2016), disclosed that, the return on naira invested was ₦1.41 which shows that farmers in the study area realized profit in cassava production as ₦1 invested will realize a profit of ₦ 0.41. While Oluwasola (2010) revealed that, the benefit-cost ratio of cassava enterprise in Oyo state was 1.17. These results show that, the cassava production and processing business is profitable in Nigeria. Adeyemo *et al*. (2010)'s study on economic efficiency of small scale farmers in Ogun State, Nigeria also confirmed that the benefit cost ratio of small scale farmers in Ogun State was 1.8. Odediran and Ojebiyi (2017)'s study again observed that, majority of cassava processors in Southwest, Nigeria, gained 65 kobo for every one naira invested in cassava processing. Okpeke and Onyeagocha (2015)'s revealed that, for every one naira invested in the processing of cassava, into *garri* in Isoko North Local Government Area of Delta State, 65 kobo was gained. Erhabor *et al*. (2004), in the study they carried out in Egor and Oredo Local Government Area of Edo State concluded that, a return per naira invested of processing *garri* in the study area was ₦1.08 for *garri* and ₦1.56 for starch.

These results further revealed that the profitability ratio for Oyo state, on the average was 0.42 before benefitting from the initiative, and 0.44, after the initiative, Ogun state was 0.39 before the initiative, and 0.43 after the initiative, Osun state, 0.33 before the initiative and 1.41 after the initiative. Also, Ondo state had a gross profit of 0.33 before the initiative and 0.40 after the initiative, Lagos state had 0.41 before the initiative and 0.42 after the initiative, and Ekiti state had 0.36 before the initiative and 0.42 after the initiative. Adeyemo *et al* (2010) who revealed that, the profitability ratio of the small-scale farmers in Ogun State, Nigeria, was 0.33. Ijigbade *et al*. (2014)'s again,

revealed that, the profitability ratio of *garri* producers in Ondo State was 0.33. While, Ademiluyi and Ayodele (2014) and Ettah and Nweze (2016) disclosed that the profitability index for each naira invested by the adopters of improved cassava production business was 0.50 kobo. Adeyemo *et al.* (2010)'s study also affirmed that the percentage profit of small scale farmers in Ogun State was 80%.

While Oyo state's rate of return was 0.58 (which means, a unit cost of production would generate over 50% gain) before benefitting from the initiative, and 0.79, after the initiative, Ogun state was 0.60 before the initiative, and 0.75 after the initiative, Osun state, 0.52 before the initiative and 0.72 after the initiative. Also, Ondo state had a rate of return 0.52 before the initiative and 0.76 after the initiative, Lagos state had 0.57 before the initiative and 0.73 after the initiative, and Ekiti state had 0.56 before the

initiative and 0.65 after the initiative. These results are also close to that of Olokunle (2016)'s study on socio-economic determinants and profitability of cassava production in Nigeria, which disclosed that, the rates of returns on cassava production in Nigeria was 55 per cent. This means that for every one naira (100 kobo) invested in cassava production is a net profit of 55kobo. Muhammad-Lawal, *et al.* (2013) observed that, the return on investment on *garri* processing was 30.88%. In addition, Oluwasola (2010) revealed that, the internal rate of return to cassava enterprise in Oyo state, was 1.84, while Fefa *et al.* (2012), found out that, the cassava processors in their study area, had a rate of return of 2.48. This again means that, a unit cost of production of cassava output, would result to more than two times gain.

Table 3: Distribution of Gross Margin, Profit, Benefit Cost Ratio, Profitability Ratio and Rate of Return of the Micro-Scale cassava processing enterprises in the study area, before and after the CTI, using Gross Margin Analysis

Before	Oyo	Ogun	Osun	Ondo	Lagos	Ekiti
Gross Margin (G.M) = Gross Income (G.I) – TVC	10,774,98	15,265,43	15,853.08	9,083.71	12,652.72	9,059.26
Profit (π) = Total Revenue (TR) – Total Cost (TC)	8,648.66	11,424.36	11,473.43	6,616.66	10,069.08	6,703.42
Benefit Cost Ratio = TR / TC	1.42	1.39	1,33	1.33	1.41	1.36
Profitability Ratio = Profit/TC	0.42	0.39	0.33	0.33	0.41	0.36
Rate of Return = GM/TVC	0.58	0.60	0.52	0.52	0.57	0.56
After	**Oyo**	**Ogun**	**Osun**	**Ondo**	**Lagos**	**Ekiti**
Gross Margin (G.M) = Gross Income (G.I) – TVC	29,935.04	32,301.88	41,511.66	40,034.14	25,099.68	27,572.13
Profit (π) = Total Revenue (TR) – Total Cost (TC)	20,769.75	22,790.67	27,167.84	26,642.67	17,630.68	20922.31
Benefit Cost Ratio = TR / TC	1.44	1.43	1.41	1.40	1.42	1.42
Profitability Ratio = Profit/TC	0.44	0.43	0.41	0.40	0.42	0.42
Rate of Return = GM/TVC	0.79	0.75	0.72	0.76	0.73	0.65

Source: Field Work, 2018

ANOVA Result on Profitability of the Micro-Scale Cassava Processing Enterprises in the Study Area, Before and After the Federal Government Cassava Transformation Initiative

Table 4 shows the ANOVA result on the differences in average sales per week in Naira (₦), total variable cost, total fixed cost, total cost, gross margin and profit of the micro-scale

cassava processing enterprises in the study area, before and after the Federal Government Cassava Transformation Initiative. The p-value for gross margin is .005, while that of profit is .000. These values are less than the table value of 0.05. Based on this result, the null hypothesis H_0, which states that there is no significant difference in the profitability of the micro-scale cassava processing enterprises in Southwest

Nigeria, before and after the FGCTI is rejected, and the alternate hypothesis which states that there is a significant difference in the profitability of the micro-scale cassava processing enterprises in Southwest Nigeria, before and after the FGCTI is accepted. This implies that the initiative had a significant effect

on the MSCPEs in the study area. This result is not in agreement with Olokunle, (2016) who asserted that, the presidential initiative and transformation agenda has been implemented with little or no impact on the cassava industry.

Table 4: ANOVA result on the differences in the profitability of the micro-scale cassava processing enterprises in the study area, before and after the CTI

Total Cost (TC) Before* Total Cost (TC) After	Between Groups	101225775.2652	1	101225775.2652		
	Within Groups	293282923.67596	10	29328292.36759	3.451	.009
	Total	394508698.94116	11			
Gross Margin (G.M) =	Between Groups	501939217771.49	1	501939217771.5		
Gross Income (G.I) – TVC Before *	Within Groups	2321108711085.9	10		4.662	.005
Gross Margin (G.M) = Gross Income (G.I) – TVC After	Total	2823047928857.5	11	232110871108.6		
Profit (π) = Total Revenue (TR) – Total Cost (TC)	Between Groups	546592196.38800	1	546592196.3880		
	Within Groups	92156254.866483	10		59.31	.000
Before* Profit (π) = Total Revenue (TR) – Total Cost (TC) After	Total	638748451.25449	11	9215625.486648		
Total Cost (TC) Before* Total Cost (TC) After	Between Groups	101225775.2652	1	101225775.2652		
	Within Groups	293282923.67596	10	29328292.36759	3.451	.009
	Total	394508698.94116	11			
Gross Margin (G.M) =	Between Groups	501939217771.49	1	501939217771.5		
Gross Income (G.I) – TVC Before *	Within Groups	2321108711085.92	10		4.662	.005
Gross Margin (G.M) = Gross Income (G.I) – TVC After	Total	823047928857.5	11	232110871108.6		
Profit (π) = Total Revenue (TR) – Total Cost (TC)	Between Groups	546592196.38800	1	546592196.3880		
	Within Groups	92156254.866483	10		59.31	.000
Before* Profit (π) = Total Revenue (TR) – Total Cost (TC) After	Total	638748451.25449	11	9215625.486648		

Source: Field Work, 2018

CONCLUSION

This study revealed that majority (over 70%) of cassava processors in the study area are women and the average gross margin of the Micro-scale cassava processing enterprises in all the Southwestern States increased above 100% after participating in the Cassava Transformation Initiative. The Benefit Cost Ratio of all the States also increased above 75%. Furthermore, the Profitability ratio and the rate of returns increased for all the States.

In summary, the result above disclosed that, the CTI had a significant effect on the profitability of the Micro-scale cassava processing enterprises in all the Southwestern States in

Nigeria. The p-value for gross margin was .005, while that of profit was .000. Thus, considering the high rate of improvement in the profitability of the Micro-scale cassava processing enterprises after participating in the initiative, it would be worthwhile for the government and all stakeholders in the cassava industry in Nigeria to help provide enabling environment for the industry to strive and extend the production of cassava as substitute for imported cassava products, use cassava as a source of poverty alleviation as well as earn foreign exchange from its processing.

REFERENCES

Adebayo, K. (2009). Dynamics of technology adoption in rural-based cassava processing enterprises in South-West Nigeria. *International Journal of Agricultural. Economics and Rural Development* (IJAERD), 2(1), 15 –25.

Ademiliyu, I.O. & Ayodele, J. (2014) Profitability of improved cassava production in Ohaozara Local Government Area of Ebonyi State, Nigeria. Proceedings of the conference of Nigeria association of agricultural economics held at the Federal University of Technology Akure, Nigeria, 170-180.

Adeyemo, R., Oke, J. T. O. & Akinola, A.A. (2010). Economic efficiency of small scale farmers in Ogun State, Nigeria. *Tropicultura*, 28 (2), 84-88.

Agboola, S.A. (1979). *An agricultural atlas of Nigeria. Nigeria*: Oxford University Press, 248.

Arene, C.J. (2006). Measurement of resource productivity and the efficiency of labour use among small holder rice farmers in Nigeria. *Modelling, Measurement and Control,* 12(2), 13–15.

Awoyinka Y.A. (2009). Effect of presidential initiatives on cassava production efficiency in Oyo State, Nigeria. *Ozean Journal of Applied Sciences,* 2(2), 185-193.

Emokaro, C.O., Iluobe, R.O. & Alufohai, G.O. (2008). Profitability and constraints in garri and edible starch processing by women in Egor and Oredo Local Government Areas of Edo State. Proceedings of the 22nd annual national conference of farm management association of Nigeria, held at University Auditorium, North Core, University of Agriculture, Makurdi; 8th-11th September, 2008.

Erhabor, P.O., Emokaro, C.O. & Abiola, M.O. (2004). Feasibility study on the marketability of root and tuber crops and their processed products (A case study of cassava). Edo State Agricultural Development Programme' Technical Report, 31.

Ettah, O. & Angba, A.O. (2016). Analysis of cost and returns among cassava farmers in Cross River State, Nigeria. *International Journal of Science and Research (IJSR)*, 5, (11) 111-114. Retrieved from: www.ijsr.net.

Ettah, O.I. & Nweze, N.J. (2016). Analysis and determinants of technical efficiency among cassava farmers in Cross River State, Nigeria. *International Journal of Innovative Research and Development, 5(10), 109-113.*

Farris, P.S. & Bendle, G.O. (2012). Marketing matrix. The definitive guide in measuring marketing performance. Upper Saddle River, New Jersey: Pearson Education Press.

Fefa, J., Obute, C.O., & Ucherwuhe, S. I. (2012). Cassava processing technology adoption and poverty reduction among operators in Benue State, Nigeria. *International Journal of Science and Research (IJSR)*, 309-317.

Food and Agriculture Organization (FAO) (2005). A cassava revolution in Nigeria. FAO documentary repository file, 1-5.

Foundation for Partnership Initiatives in the Niger Delta (PIND) (2011). A report on cassava value chain analysis in the Niger Delta, 1-80.

IITA (2005a). Additional Funding Program Description. Cassava Enterprise Development Project (CEDP), submitted to the United States Agency for International Development (USAID) – Nigeria Mission *and the* Shell Petroleum Development Company (SPDC) – Nigeria *by the* International Institute of Tropical Agriculture Ibadan, Nigeria. March 21, 2005. *p. ii-iv.*

IITA (2005b). Cassava Market Opportunity and Subsectors Analysis In: A Cassava Industrial Revolution in Nigeria: On FAO Documentary Repository Ill on the Internet pp. 1, 2.

Ijigbade, J. O., Fatuase, A.I. & Omisope, E.T. (2014). Conduct and profitability of garri production for increased food security in Ondo State, Nigeria. *IOSR Journal of*

Humanities and Social Science (IOSR-JHSS), 19, 89-95. Available at: www.iosrjournals.org.

Kotler, P. & Armstrong, G. (2010). Principles of marketing. London: Pearson Education Inc., Upper Saddle River, New Jersey, USA: Pearson Prentice Hall, 29.

Knipscheer, H., Ezedinma, C., Kormawa, P., Asumugha, G., Makinde, K., Okechukwu, R. & Dixon A. (2007). *Opportunities in the industrial cassava market in Nigeria.* Ibadan: International Institute of Tropical

Muhammad-Lawal, A., Omotesho, O. A. & Oyedemi, F. A. (2013). An assessment of the economics of cassava processing in Kwara State, Nigeria. Invited paper presented at the 4th international conference of the African Association of Agricultural Economists, September 22-25, 2013. Hammamet, Tunisia.

National Population Census (NPC) (2006). National bureau of statistics official gazette (FGP71/52007/2,500(OL24) Abuja. Retrieved; http://www.nigerianstat.gov.ng

NigeriaFirst.org (2005). Cassava initiatives in Nigeria. Retrieved from: http://www.nigeriafirst.org/article_4301.s html>.

Odediran, O. F and Ojebiyi, W. G. (2017). Cassava processors' willingness to utilise cassava peel for mushroom production in Southwest, Nigeria. *International Journal of Agricultural Policy and Research*, 5 (4), 86-9. Available at: https://www.journalissues.org/IJAPR/.

Ogundele, S. O. (2007). Aspects of indigenous medicine in South Western Nigeria. *Ethno-Med,* 1(2), 127-133.

Ohimain, E. I. (2015). A decade (2002 – 2012) of presidential intervention on cassava in Nigeria; the successes and challenges. *Asian Journal of Agricultural Extension, Economics & Sociology,* 6(4), 185-193. Retrieved from: www.sciencedomain.org.

Okpeke, M. Y. & Onyeagocha, S. U. O. (2015). Analysis of processing cassava tubers into garri in Isoko North Local Government Area of Delta State, Nigeria. *European Journal of Agriculture and*

Forestry Research, 3 (5), 15-25. Retrieved from: www.eajournals.org.

Olokunle, O. T. (2016). Socio-economic determinants and profitability of cassava production in Nigeria. *International Journal of Agricultural Economics and Extension,* 4(4), 228-249. Available at: WWW.internationalscholarsjournals.org.

Olukosi, J.O. & Erhabor, B.I. (2005). *Introduction to farm management economics*: *Principles and applications*. Zaria, Nigeria: Agitab publications Ltd.

Olukosi, J.O. & Isitor, S.U. (1990). *Introduction to agricultural marketing and price*; *Principles and applications*. Living Book Series. Abuja, Nigeria: G. U publications, 1-116.

Olukosi, J.O. & Ogungbile, A.O. (2005). *Introduction to agricultural production economics*; Principles and implications. Zaria, Nigeria: Agitab Press.

Oluwasola, O. (2010). Stimulating rural employment and income for cassava *(Manihot sp.)* processing farming households in Oyo State, Nigeria, through policy initiatives. *Journal of Development and Agricultural Economics,* 2(2), 018 and 021. Available at: http://www.academicjournals.org/jdae.

Owombo, P.T., Adiyeloja, D.K., Koledoye, G.F., Ijigbade, J.O., & Adeagbo, M.A. (2012). Gross margin analysis of amaranth vegetable production in Ondo State, Nigeria: A gender perspective. *Journal of Agriculture and Biodiversity Research,* 1(6), 91-96. Available at: http://www.onlineresearchjournals.org/JABR.

Sanni, L.O., Onadipe, O.O. Ilona, P., Mussagy, M.D., Abass, A. & Dixon, A.G.O. (2009). Successes and challenges of cassava enterprises in West Africa: A case study of Nigeria, Bénin, and Sierra Leone. International Institute of Tropical Agriculture (IITA) Report. Supported by Common Fund for Commodities (CFC), 1-19. www.iita.org.

Spurlock, S. R. & Gills, W. G. (1997). Cost and returns for corn, cotton, forestry experience. *Station Bulletin 1082*, 1-9.