



Assessment of the Effect of Cassava Transformation Initiative on Cassava Tubers Availability to Small-Scale Cassava Processing Enterprises in Southwest Nigeria

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Authors' contributions

This work was carried out in collaboration between the five authors. Author OTO performed the statistical analysis, wrote the study, wrote the prolix, and wrote the first draft of the manuscript. Authors SVP and ZOO designed the study. Author OOA managed the analysis of the study and Authors OOA and OJO did the literature searches. All authors read and approved the final Manuscript.

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ABSTRACT

This study assessed the effect of the Cassava Transformation Initiative (CTI) on cassava tubers' availability in Small-scale Cassava Processing Enterprises (SSCPEs) in Southwest Nigeria. The study took place from April to December 2016. The paper examined the availability of cassava tubers

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to the SSCPEs before and after the initiative. The paper used survey design, multi-stage sampling technique - purposive sampling and proportionate stratified sampling techniques to select respondents. Data were collected from 251 respondents (beneficiaries of the initiative). The respondents comprised 86% of 292 SSCPEs that questionnaires were retrieved from. The questionnaires were structured. Data were analyzed, using descriptive statistic - percentage, mean score, charts, and Analysis of Variance (ANOVA) was used to test hypothesis. The study revealed that, 74.1% of the respondents were female, while 25.9% were male, 71.7% fell into the age group, 40 to 59 years, 35% were not educated, and 31.9% had Primary School Certificate. The study also disclosed that, the CTI assisted in improving the availability of cassava tubers to the SSCPEs in the study area. The paper therefore recommend that policy makers, enhance cassava tubers' availability, but also reduce the distance traveled by the SSCPEs to purchase cassava tubers, which will increase the SSCPEs' productivity.

Keywords: Cassava transformation initiative; cassava tubers; cassava tubers' availability; small-scale; cassava processing enterprises.

1. INTRODUCTION

Nigeria produces cassava more than any other country in the world [1,2]. Its production increased from 34 million metric tonnes a year in 2002, to 54 million metric tonnes [3,4,5]. Nigeria only accounts for 0.001% of the world cassava export market [6]. The promotion of cassava for export in Nigeria is important to increase foreign exchange earnings.

Prior to the Federal Government of Nigeria's Cassava Transformation Initiative, several cassava multiplication projects had been carried out by the Federal Government such as: the Root and Tuber Improvement Programme on Maize and Cassava Production, anchored by IITA in 1971, Cassava Multiplication Project (CMP) anchored by IFAD between 1987 and 1997, Root and Tubers Expansion Programme (RTEP) anchored by IFAD in 2001, among others. These past programmes raised Nigeria's cassava tubers' productivity [7,8,9,10], but failed in transforming the cassava processing industry, and raising Nigeria' share of export in the cassava global market, due to lack of modern processing and storage technology, instability in government and government policies, absence of rolling plan, erratic power supply, and inadequate funding. Weak marketing and market linkages for the products, products' lack of competitiveness in the global market due to high production cost and poor product quality, also contributed to the failure of the programmes [11,12,13,14,15, 16,17,18,19].

In the year 2003, the Nigerian Government established the Federal Government Cassava Transformation Initiative, with the objective to expand primary processing and utilization,

develop new market opportunities for import substitution and export, guarantee the availability of clean (disease free) plant materials targeted at the emerging industries and make the crop a source of foreign exchange earner [20]. Few studies [21,9,22] have been carried out on the effect of the 2003 Federal Government Cassava Transformation Initiative on the cassava industry. Their focus was on the effect of the programme on cassava tubers' productivity and technical efficiency, market linkages, access to credit and labour cost. These studies revealed that, the CTI programme improved cassava productivity and technical efficiency of cassava farmers. It helped to enhance processing for export, cassava farmers access to credit, access to processing equipment, marketing, and established market linkages. It also provided training packages for cassava equipment producers and cassava processors, and led to huge investment in the cassava sub sector, by private and public organizations. In addition, it helped to generate employment in the Nigerian cassava subsector. However, some problems were occasioned by the programme. These problems include: cassava glut in some areas of the country, and scarcity in other areas. Meanwhile, [23] opined that, the presidential initiative and transformation agenda has been implemented with little or no impact on industrial utilization, competitiveness and export of cassava. He further stated that, the export share of Nigeria in the cassava global market has remained very low even after the implementation of the initiative.

There is no study on the 2003 Federal Government of Nigeria's Cassava Transformation Initiative has adequately assessed the effect of the programme on the availability of cassava tubers to the small-Scale

Cassava Processing Enterprises (SSCPEs) in Nigeria. This study addresses the shortcomings in past literature, by assessing the effect of the programme on the availability of cassava tubers to the SSCPEs, by measuring the quantity purchased and distance covered to make purchases, before and after the SSCPEs' participation in the programme.

2. METHODS

Multi-stage sampling technique was used to draw sample for the study. Firstly, purposive sampling method was used to select Southwest zone in Nigeria. This zone is one of the three major agricultural zones, and cassava growing belt (others are, Southeast and central zones) in Nigeria, according to FAO (2005). The Southwest zone comprise: Lagos, Ogun, Oyo, Osun, Ondo and Ekiti states. Secondly, purposive sampling technique was used to gather the number of Small-Scale cassava processors that participated in the Initiative, on the list of the Agricultural Development Projects (ADPs) (Nigerian Government Agricultural Institution that was part of the implementing institution, in the six states. The population of the study was 1,083 (Oyo = 315, Osun = 226, Lagos = 93, Ekiti = 104, Ondo = 226, and Ogun = 119). Out of the 1,083 Small-Scale cassava processing enterprises, 292 were selected, using [24]'s formula ($n = N/1+N(e^2)$). Where: n = Sample Size, N = Population of the Study, and e = error margin @ 5% (0.05). Thirdly, since the beneficiaries in each state were not equal, 27% of the beneficiaries were selected from each state using proportionate stratified sampling technique. Oyo (27% of 315 = 85), Ogun (27% of 119 = 32), Osun (27% of 226 = 61), Ekiti (27% of 104 = 28), Ondo (27% of 226 = 61) and Lagos (27% of 93 = 25). Structured questionnaires were used to collect data from the respondents. The questionnaire comprised two sections. Section A contained questions about the personal bio-data of the respondents, while section B contained questions to assess the level of cassava tubers availability to Small-Scale cassava processing enterprises in the study area, before and after participating in the programme. Copies of questionnaire were administered to the 292 respondents, with the aid of trained research assistants/extension agents and youth leaders who live within the selected communities. The questionnaires were retrieved after they were filled. Only 251 questionnaires (86%) were retrieved from the Small-Scale enterprises. The collected data were subjected to statistical analysis which involved the use of descriptive

statistic (percentage, charts, mean score and standard deviation). Analysis of Variance (ANOVA), was used to test the hypothesis of the study. The Statistical Package for Social Sciences (SPSS) was used to analyze the data collected.

2.1 Study Area

The study area of this research is South-Western Nigeria, as shown in Fig. 1.

The Southwest zone in Nigeria is made up of six States (Ondo, Oyo, Lagos, Osun, Ekiti and Ogun). The region lies between longitude 2°31'1" and 6°00'1" East and Latitude 6°21'1" and 8° 37'1" North [25]. It has a total land area of 77,818 km² and the total population was 27,581,992 as at 2006 (National Population Census (NPC,2006). This part of Nigeria is the abode of the Yoruba people" [26]. Their main means of livelihood is farming (NPC), 2006). A lot of research institutions are situated in this region. Examples of these research institutions include: The International Institute of Tropical Agriculture (IITA), Ibadan, *Federal Institute of Industrial Research, Oshodi (FIIRO)*, Lagos, Cocoa Research Institute of Nigeria (CRIN), Ibadan, National Horticultural Research Institute (NHR), Ibadan, Nigerian Institute for Oceanography and Marine Research, Lagos, Nigerian Institute of Social and Economic Research (NISER), Ibadan, other research centers situated within the universities in this zone, among others.

[27], stated that, the climate in the Southwest zone favours the cultivation of crops like maize, yam, cassava, millet, rice, plantain, cocoa, kola nut, coffee, palm produce, cashew among others. Also, cassava is produced mainly (99%) by small farmers with 1-5 hectares of land intercropped with yams, maize, or legumes in the rainforest and savannah agro-ecologies of Southern, Central, and lately Northern Nigeria. Since cassava is extremely tolerant to environmental stress [28], including drought, and poor soils, and can grow on soil where a lot of other crops cannot grow well, almost all farmers in the main cassava belts of the southeastern, southwestern and central zones grow cassava. Cassava is typically intercropped as a main or minor crop. It means that, since 70% of the population (27,581,992) in South west Nigeria, lives in the rural areas, and their main occupation is farming, one can conclude that, majority of the population, plant cassava. While the South West Coordinator of Nigeria Cassava Growers Association (NCGA), Dr David

Ogunsade, disclosed that, there are over 300,000 members of the association in the South West Zone [29], no figure has been released from any source, for the number of cassava processors, on the list of the Cassava Processors' Association, in Southwest Nigeria. Again, majority of the cassava farmers and processors in Nigeria, are non-members of their associations. Only the big farmers and processors usually register with the associations. Cassava can be produced at the 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 (e.g. textile, paper, and wood) [30,2]. Cassava can also be used to produce gari, fufu, cassava chips, farina, tapioca, macaroni, cassava bread and pudding.

The Nigerian cassava system, including that in the South west zone, is characterized by small-scale farmers/holdings cultivating less than 2 hectares of cassava (average of 0.5 ha).

Cassava farming and processing is subsistent in nature [31]. Cassava processing in the study area is carried out under the sheds, at the back or in front of houses in the rural areas, or in clusters, using rudimentary implements, which are ineffective and inefficient. Such as: cutlasses and knives for peeling. The processors have to process under harsh environmental circumstances [31], including travelling through bad roads to purchase the cassava roots and market their products, buying diesel to power their machines, inadequate capital, among others. All these add to their cost of production. Women play a central role in cassava production, processing and marketing, contributing about 58 percent of the total agricultural labour in the southwest, 67 percent in the southeast and 58 percent in the central zones. They are almost entirely responsible for processing cassava which provides them with additional income-earning opportunity and enhances their ability to contribute to household food security [32].

Map of Nigeria, showing Southwestern Nigeria

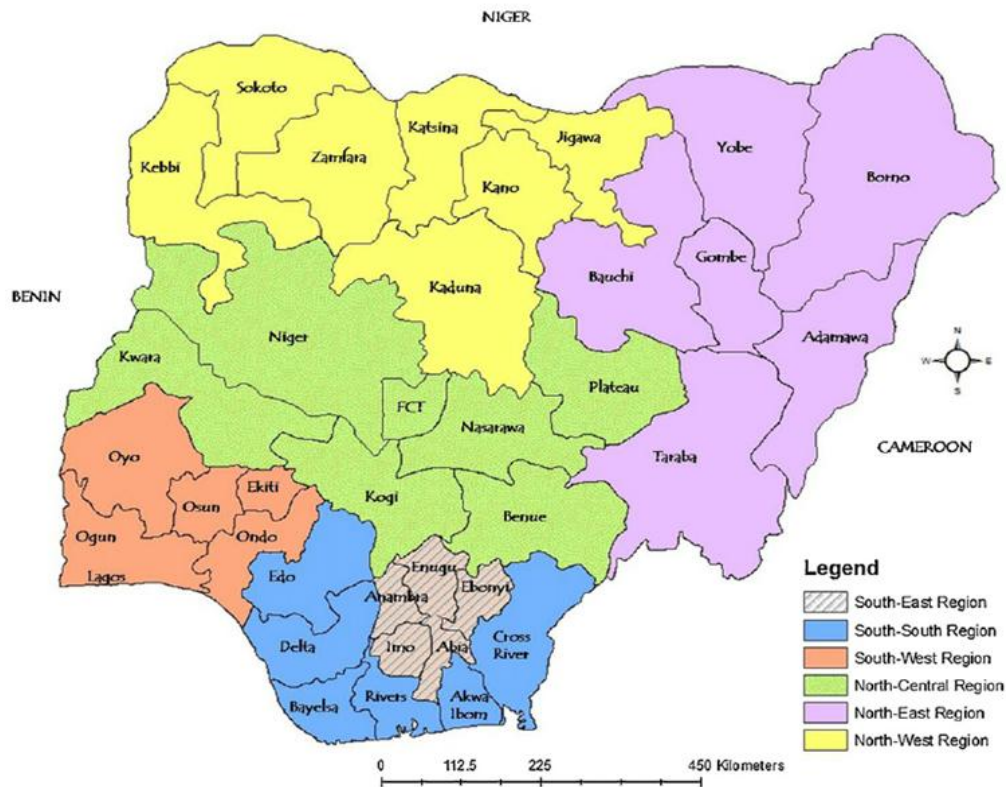


Fig. 1. The study area of the research



Fig. 2. (a) Cassava Roots (b) Peeling and washing method (c) Old garri frying Method (d) More advanced method of frying garri

Source: Sanni et al., 2009

Fig. 2a contains cassava tubers. Cassava tuber is one of the most widely cultivated tuber in Sub-Saharan Africa, and one of the most essential crops for Nigerian farmers and the second most essential staple food in terms of per capita food energy consumed [33]. The tubers can be processed into chips, flour and pellets, and used by agro industries to produce other products like ethanol, dextrin/adhesive, native and modified starch for other industries, like, textile, paper, and wood [30,2]. Fig. 2b shows how cassava tubers are peeled with knives, and washed in basin of water, in Africa. While Fig. 2c shows how garri is fried with local frying pans, which can fry little quantity of garri at a time, and Fig. 2d shows the improved frying pan, which can fry more quantity of garri (five times more than the local type) at a time.

3. RESULTS AND DISCUSSION

3.1 Personal Characteristics of Respondents

Table 1 revealed that the proportion of female was a lot higher than the male. This shows that the female gender, dominate in this trade. 65 (25.9%) of the beneficiaries were male and the remaining 186 (74.1%) were female. This finding is in agreement with that of [34] who confirmed that crop processing in Kwara state is mostly dominated by female in Nigeria and a lot of African societies. Also in agreement with this findings are those of [35], whose findings revealed that Bulk ((76.50%) of the cassava processors in Southwest Nigeria were women; [36] whose findings revealed that 95% of garri processors in Isoko North Local Government Area of Delta State were females, and [37] whose study found out that Women carry out more than 60 percent of the food and fiber production in Nigeria. [38] also confirmed that

women and children are mainly involved in the processing and marketing of cassava into various products in Nigeria. Furthermore, 4 (1.6%) of the beneficiaries, were within age group 20-29 years, 20 (8.0%) were within, 30-39 years, 107 (42.6%) within 40-49 years, 73 (29.1%) within 50-59 years, while the remaining 47 (18.7%) were 60 years and above. It is evident from the results presented that majority of the beneficiaries were within age group 40-49 years. In other words, a large number of the beneficiaries are adults. This result is similar to that of [35], whose study revealed that over 70 percent of cassava processors in Southwest Nigeria were between the ages of 41 to 60 years. This means that, the cassava processors are in their active age and can partake productively in the initiative. In addition, 241 (96%) of the beneficiaries were Nigerians, while the remaining 10 (4%) were none Nigerians. Furthermore, 22 (8.8%) 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, while the remaining 70 (27.9%) were from Oyo State. This shows that the beneficiaries from the six states were well represented.

Also, 80 (31.9%) of the beneficiaries had Primary School Certificate, 45 (17.9%) had Secondary/O' Level, 20 (8%) had Vocational/Technical education, 18 (7.2%) had Polytechnic/University education, while the remaining 88 (35%) were not educated. This result shows that, a sizeable number of the beneficiaries were either not educated or had Primary School Certificate. These findings is similar to that of [39] whose findings revealed that, 60.20% of cassava processors in Kwara state have some forms of education. The remaining 39.80% have no formal education. However, it is different from that of [39] who found out that 33% of garri processors

in Isoko North Local Government Area of Delta State had secondary school leaving certificates. Again, 53 (21.1%) had 1-10 years of experience, 148 (59.0%) had 11-20 years of experience, 38 (34%) 21-30 years, 8 (3.2%) had 31-40 years and 4 (1.6%) had above 40 years of experience. This shows that the beneficiaries had enough knowledge, skills and experience on the trade, to give useful responses to the questions that were asked. The years of experience of the cassava processors in this study is similar to that of [35], who found out that more than one-third (35.5%) of the cassava processors Southwest Nigeria had between 21 and 30 years of experience.

3.2 Availability of Cassava Tubers to the Beneficiaries before and after the Cassava Transformation Initiative

Fig. 3 gives a pictorial view of the availability of cassava tubers before and after the CTI as rated by the beneficiaries. The bar chart shows that, majority of the beneficiaries agreed that, cassava tubers were moderately or poorly available before the initiative, while cassava tubers were very highly, and highly available after the initiative.

Table 1. Distribution of personal characteristics of beneficiaries

Personal characteristics	Frequency	Percentage (%)
Gender		
Male	65	25.9
Female	186	74.1
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
Nationality		
Nigeria	241	96
Others	10	4
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
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
Year 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 2016

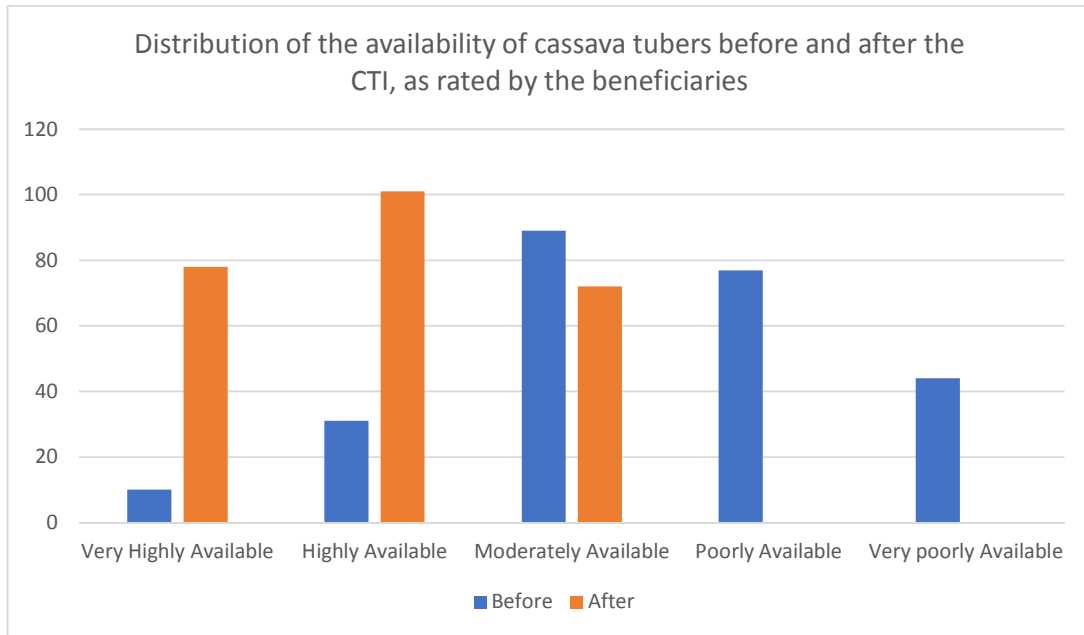


Fig. 3. Bar chart showing the distribution of the availability of cassava tubers to the beneficiaries of the CTI before and after the initiative

Source: Field Work 2016

In agreement with the result on Fig. 3, Appendix I shows the Distribution of the availability of cassava tubers before and after the CTI, as rated by the beneficiaries, using Likert scale. The result revealed that, before the CTI, 89 (35.4%) of the beneficiaries agreed that, cassava tubers were moderately available to them, while 77 (30.7%) of the beneficiaries agreed that cassava tubers were poorly available to them. This means that, cassava tubers were not adequately available to the beneficiaries before the CTI. However, after the initiative, 101 (40.2%) of the beneficiaries, agreed that cassava tubers were highly available to them, while 78 (30.1%) agreed that cassava tubers were very highly available to them. This shows that there was a high improvement of the availability of cassava tubers to the beneficiaries, after the CTI.

These results are in accord with [40], who observed that, there was no cassava industry in Nigeria, that was producing to full capacity in the year, 2005, because, they had insufficient supply of fresh tubers. Also [20,41,42,40,43,1], and agreed that, between 2003 to 2007, the major problem that the Nigerian cassava processors faced was, insufficient back-up supply of cassava tubers. Nevertheless, the cassava transformation initiative, improved the availability of cassava tubes to the MSCPEs in Southwest Nigeria. [28,44,45,46,22,9,21,4] among others, agreed

that, to a certain extent, the Presidential Cassava Transformation Initiative, led to the improvement in cassava tubers' productivity, and as such, availability in Nigeria. Also. Dada (2014) revealed that, in his study, majority (79.05%) of respondents agreed that they had sufficient supply of cassava tubers for processing.

Also, Appendix II shows the ANOVA result on the differences in the availability of cassava tubers before and after the CTI. The result shows that there was a significant difference in cassava tubers' availability to the Small-scale cassava processing enterprises before and after the CTI, with F-Value = 5.199, p-value = .002, which is less than the table value of .05. This means that the CTI significantly improved the cassava tubers' availability to the Small-scale cassava processing enterprises in Southwest Nigeria.

3.3 Average Distance Traveled in Kilometers, by the Beneficiaries to Purchase Cassava Tubers, before and after the Cassava Transformation Initiative

Table 2 presents the average distance that beneficiaries had to travel before and after the CTI. In this study, 2006 was used as the starting point for after the programme because, almost all

the beneficiaries used for this study, ticked 2006 as the year they started benefiting from the programme, while the rest of the beneficiaries, ticked years after 2006. The result revealed that, the average distance traveled by the beneficiaries, before the CTI were: Oyo State (5.43 KM), Ondo State (5.71 KM), Osun State (8.49 KM), Ekiti State (6.01 KM), Ogun State (6.78 KM), Lagos State (8.12 KM), and Southwest (combination of the six States) (6.76 KM). The result also disclosed that, the average distance traveled by the beneficiaries, after the CTI were: Oyo State (3.05 KM), Ondo State (3.33 KM), Osun State (3.65 KM), Ekiti State (3.3 KM), Ogun State (3.05 KM), Lagos State (2.96 KM), and Southwest (combination of the six States) (3.22 KM).

This implies that, there was a decrease in average distance traveled by the beneficiaries of the CTI, to purchase cassava tubers, after the programmes by: Oyo State (2.38 KM (43.8%)), Ondo State (2.38 KM (41.7%)), Osun State (4.84 KM (57%)), Ekiti State (2.71 KM (45.1%)), Ogun State (3.73 KM (55%)), Lagos State (5.16 KM (63.5%)), and Southwest (combination of the six States) (3.54 KM (52.1%)). This shows that, the CTI reduced the distance traveled by the beneficiaries of the initiative, in Southwest Nigeria, by an average of 52%.

These findings have been depicted in Appendix III. A close observation of Appendix III reveals that, the average distance travelled to purchase cassava by the Small-Scale cassava processing enterprises between year 2000 to 2004, was 6 KMs. However, it suddenly went up to 12 KMs in 2005 to part of 2006, before climbing down to an average of 2 KM. towards the end of 2006 to 2015. The sudden drop in distance traveled by the beneficiaries in the last part of 2006 may have been as a result of the findings by [47,37] who disclosed that, between 2005 and 2006, there was a 73 percent increase in cassava production, partially due to the initiative [47]. The increase may have been occasioned by the findings of [40,20,4,43,1,42]. These authors agreed that the major constraints that cassava processors encountered between 2003 and 2006, was inadequate back-up supply of cassava tubers. This finding is as a result of the cassava glut being experienced by the cassava farmers before the CTI. This glut discouraged cassava farmers to continuously produce cassava due to the losses from the glut. This led to scarcity, and an increase in the distance travelled by the MSCPEs to purchase cassava tubers. However, the CTI did

not concentrate on cassava farmers' productivity only, but on cassava processing, that helped mop up cassava glut. This encouraged more farmers to go back into planting cassava, and the initiative ensured that different groups of processors formed cooperatives and were located within the same vicinity where the cassava farms were located. This sharply reduced the distance travelled by the processors to purchase cassava tubers, after the processors and farmers joined in the CTI, mainly in 2006, in the study area.

Also, Appendix IV shows the ANOVA result on the differences in average distance traveled (in Kilometers (KM)) by the beneficiaries to purchase cassava tubers, before and after the CTI. The table revealed that, the p-values for all the states (Oyo (.001), Ondo (.000), Osun (.000), Ekiti (.000), Ogun (.000), Lagos (.000)) are less than the table value of 0.05. This result shows that, there is a significant difference in the average distance travelled by the beneficiaries of the CTI in Southwest Nigeria, before and after the initiative.

3.4 Average Quantity in Kilogrammes (per Month) Purchased by the Beneficiaries, before and after the Cassava Transformation Initiative

Table 3 presents the average quantity in Kilogrammes (per Month) purchased by the beneficiaries, before and after the CTI. The result shows that, the average quantity in Kilogrammes (per Month) purchased by the beneficiaries, before the CTI were: Oyo State (1,724 KG), Ondo State (1,616 KG), Osun State (2,721 KG), Ekiti State (1,913 KG), Ogun State (2,354 KG), Lagos State (3,134 KG), and Southwest (combination of the six States) (2 KG). The result also revealed that, the average quantity in Kilogrammes (per Month) purchased by the beneficiaries, after the CTI were: Oyo State (4,398 KG), Ondo State (4,809 KG), Osun State (4,846 KG), Ekiti State (5,389 KG), Ogun State (4,403 KG), Lagos State (4,978 KG), and Southwest (combination of the six States) (4,804 KG). This means that, there was an increase in average quantity in Kilogrammes (per Month), purchased by the beneficiaries, after the CTI by: Oyo State (2,674 KG (155.1%)), Ondo State (3,193 KG (197.5%)), Osun State (2124 KG (78.1%)), Ekiti State (3,476 KG (181.7%)), Ogun State (2,050 KG (87.1%)), Lagos State (1,843 KG (58.8%)), and Southwest (combination of the six States) (2,560 KG (114.1%)).

These findings have been illustrated in Appendix V. A close observation of Appendix V reveals that, the average average quantity in Kilogrammes (per Month) purchased by the beneficiaries, suddenly increased in 2006, became a little stagnant in 2007 after the change in government in 2007, and increased a little in 2013. This shows that, the CTI increased the average quantity in Kilogrammes (per Month), purchased by the beneficiaries, in Southwest Nigeria, by an average of 114.1%. This result is in accord with that of [45], who confirmed that the CTI led to a huge investment and employment in the cassava industry, decline in Nigeria's imports and raised the yield in cassava production from 10.8 t/ha to 20 t/ha. This made Nigeria the largest cassava producer over the globe. The Raw Materials Research and Development Council (RMRDC), 2004). Also, there was an upsurge in sales of cassava products during the initiative, market information was made available, and information was circulated at trainings. [48] affirmed that the implementation of the CTI raised cassava production to 6.4%, national food production to 8.7% and food adequacy to 1.9%. In addition, [9,22] stated that, the initiative encouraged processing for export. This had effect on processed quantity. In order to support the programme, the government made policies that will enhance the development of cassava the cassava industry. Such policies included the addition of 10% cassava flour to cassava bread, 10% bioethanol in gasoline and replacement of

paraffin with ethanol gel fuel as the cooking fuel [45]. All these raised the purchase and sales of cassava tubers and cassava products in the market, during and after the programme.

Again, Appendix VI shows the ANOVA result on the differences in average quantity purchased (in kilogrammes (KG) per Month) by the beneficiaries to purchase cassava tubers, before and after the CTI. The table revealed that, the p-values for all the states (Oyo (.000), Ondo (.000), Osun (.000), Ekiti (.000), Ogun (.000), Lagos (.000) are less than the table value of 0.05. This result shows that, there is a significant difference in the average quantity of cassava tubers purchased (in kilogrammes (KG) per Month) by the beneficiaries, before and after the initiative.

In addition, the validity of the research instrument used in this study, was carried out by a senior lecturer in Agricultural Resource Economics department in the Federal University of Technology, Akure, while Cronbach Alpha was used to carry out the reliability test. The Cronbach Alpha coefficient of the reliability test carried out on the questions used to assess the effect of CTI on the level of cassava tubers availability to the Small-Scale cassava processing enterprises in Southwest Nigeria, as shown in Appendix VII, was 0.797. That is, the reliability of the research instrument, is higher than 0.7. This means that the result is high and it is appropriate for social science.

Table 2. Distribution of average distance in Kilometers traveled by the beneficiaries to purchase cassava tubers, before and after CTI

Year	Oyo	Ondo	Osun	Ekiti	Ogun	Lagos
1999	3.21	1.93	5.54	3.01	3.1	7.3
2000	4.94	5.05	7.47	5.09	6.76	7.97
2001	4.91	5.05	7.47	5.09	6.76	7.97
2002	4.91	5.05	7.47	5.09	6.76	7.97
2003	4.94	5.05	7.47	5.09	6.76	7.97
2004	4.96	5.05	7.47	5.09	6.76	7.97
2005	10.1	12.8	16.6	13.6	10.5	9.68
Avg. Before	5.43	5.71	8.49	6.01	6.78	8.12
2006	10.1	12.8	16.6	13.6	10.5	9.68
2007	2.15	2.49	2.01	1.82	2.18	2.4
2008	2.41	2.05	2.2	2.38	2.29	2.17
2009	2.26	2.49	2.03	1.82	2.18	2.4
2010	2.32	2.21	2.32	2.35	2.29	2.35
2011	2.36	2.14	2.13	2.38	2.05	1.89
2012	2.23	2.37	2.13	1.96	2.29	2.35
2013	2.29	2.04	2.38	2.19	2.29	2.35
2014	2.08	2.33	2.46	1.96	2.4	2.07
2015	2.23	2.33	2.3	2.57	2.05	1.91
Avg. After	3.05	3.33	3.65	3.3	3.05	2.96

Source: Field Work 2016

Table 3. Distribution of average quantity of cassava purchased in Kilogrammes (per Month), by the beneficiaries, before and after the CTI

Year	Oyo	Ondo	Osun	Ekiti	Ogun	Lagos
1999	1337	969	2130	1109	1853	2832
2000	1548	1128	2392	1591	2060	3051
2001	1581	1261	2583	1809	2162	3043
2002	1690	1486	2629	1957	2354	2971
2003	1824	1712	2928	3110	2477	3363
2004	1928	1847	3000	3194	2796	3278
2005	2160	2913	3386	620	2774	3402
Avg Before	1724	1616	2721	1913	2354	3134
2006	2461	3068	3460	3416	3113	3660
2007	3912	4589	4684	4781	3409	4729
2008	4491	4796	4778	5274	4292	5057
2009	4642	4880	4810	5504	4458	4819
2010	4715	4914	4968	5557	4646	5157
2011	4731	5022	5024	5657	4732	5175
2012	4741	5064	5064	5796	4580	5168
2013	4601	5030	5086	5830	4562	5157
2014	4833	5368	5260	6026	5047	5374
2015	4849	5363	5322	6048	5194	5479
Avg After	4398	4809	4846	5389	4403	4978

Source: Field Work 2016

4. SUMMARY OF FINDINGS

This study evaluated the impact of Cassava Transformation Initiative on the availability of cassava tubers' to Small-Scale cassava processing enterprises (SSCPEs) in Southwest Nigeria. In the study, analysis was carried out to find out the differences in cassava tubers' availability to the SSCPEs before and after the Initiative. The past studies carried out under Cassava Transformation Initiative in Nigeria, were majorly on the effect of the initiative on cassava farmers' productivity, access to credit, market linkages, and technical efficiency. These past studies, were carried out by Onakuse, Bogue and De Los Rios, 2016; Awoyinka, 2009; Ogunleye and Oladeji, 2012; Onwudiwe, Akarakiri, Agbarajo, Onothoja, Agidi and Oyibo, 2015; Donkor, Ohimain, 2015; Ogunleye, 2016, among others. In these studies, mean average, standard deviation, stochastic frontier function model, regression were used to analyze data. The studies revealed that, the CTI programme enhanced cassava productivity and technical efficiency of cassava farmers. It aided cassava farmers' access to credit, processing for export, access to processing equipment, marketing, and established market linkages. On the other hand, Olokunle (2016)'s study revealed that, CTI was implemented with little or no impact on industrial utilization, competitiveness and export of cassava.

5. CONCLUSION

In this study, the effect of CTI on SSCPEs in Southwest Nigeria, was assessed. To attain this goal, the availability of cassava tubers to the SSCPEs, distance traveled by the SSCPEs, and quantity of cassava tubers purchased, before and after the CTI, were analyzed. The methodology used in the selection of the study area and respondents, was multi-stage sampling technique. It involved the use of purposive sampling method, to select one of the major cassava growing zones of Nigeria (Southwest zone), purposive sampling technique to collect the number of Small-Scale cassava processors that participated in the Initiative, on the list of the Agricultural Development Projects (ADPs), in the six South west States. The population of the study was 1,083 Small-Scale cassava processing enterprises. 292 were selected, using Yaro Yamane (1967)'s formula. The beneficiaries in each state were selected, using proportionate stratified sampling technique, since the beneficiaries from each State were not equal. Structured questionnaires were used to collect data from the respondents. Out of the 292 questionnaires that were given out, only 251 questionnaires (86%) were retrieved from the respondents.

This study, went further to assess the effect of the initiative on distance traveled and quantity

purchased by the SSCPEs, before and after the initiative. The result revealed that, before the initiative, cassava tubers were moderately available to SSCPEs, while after the initiative, cassava tubers were highly available to them. This shows that there was a high improvement on the availability of cassava tubers to the beneficiaries, after the CTI. The result also disclosed that, the average quantity in Kilogrammes (per Month) purchased by the beneficiaries, after the initiative, was higher than before the initiative. Meaning that, the initiative, increased the average quantity in Kilogrammes (per Month), purchased by the beneficiaries. Again, the average distance traveled in Kilometers, by the beneficiaries, to purchase cassava tubers, reduced after the initiative.

The method of analysis used in this study, has an added advantage because, it did not just base its analysis on the qualitative rating of the availability of cassava tubers, by the beneficiaries, but went further to use the quantitative data provided by the beneficiaries to compute the average distance traveled and quantity purchased before and after the programme, to augment the assessment.

The collected data were subjected to statistical analysis which involved the use of descriptive statistic (percentage and mean score). The study concluded that the CTI assisted in enhancing the availability of cassava tubers to the SSCPEs in Southwest Nigeria.

The outcome of this study, suggests that, the policy makers in the cassava processing sector, should not only concentrate on making policies that will enhance cassava tubers' availability, but, also on policies that will reduce the distance traveled by the SSCPEs to purchase cassava tubers. This will lead to more purchases of cassava tubers by the SSCPEs, and increase their productivity. Also, it was discovered during this study, that policies on the transformation of the cassava industry, changed with the entrance of new government in Nigeria. This truncated the progress of the already existing programme, and led to the failure of the cassava transformation. It is therefore necessary for successive governments in Nigeria, to come up with rolling plans that will keep cassava transformation programmes alive with transition in government.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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APPENDIX I

Distribution of the availability of cassava tubers before and after the CTI, as rated by the beneficiaries

Before

Availability	Frequency	Percentage
Very Highly Available	10	4
Highly Available	31	12.4
Moderately Available	89	35.4
Poorly Available	77	30.7
Very poorly Available	44	17.5
Total	251	100

After

Availability	Frequency	Percentage
Very Highly Available	78	30.1
Highly Available	101	40.2
Moderately Available	72	28.7
Poorly Available	0	0
Very poorly Available	0	0
Total	251	100

Source: Field Work 2016

APPENDIX II

ANOVA result on the differences in the availability of cassava tubers before and after the CTI, based on the rating of the beneficiaries

ANOVA Table

		Sum of Squares	df	Mean Square	F	Sig.
Availability of cassava before CTI *	Between Groups (Combined)	5.356	3	1.785	5.199	.002
	Within Groups	84.819	248	.343		
Availability of cassava after CTI	Total	90.175	251			

Source: Field Work 2016

APPENDIX III

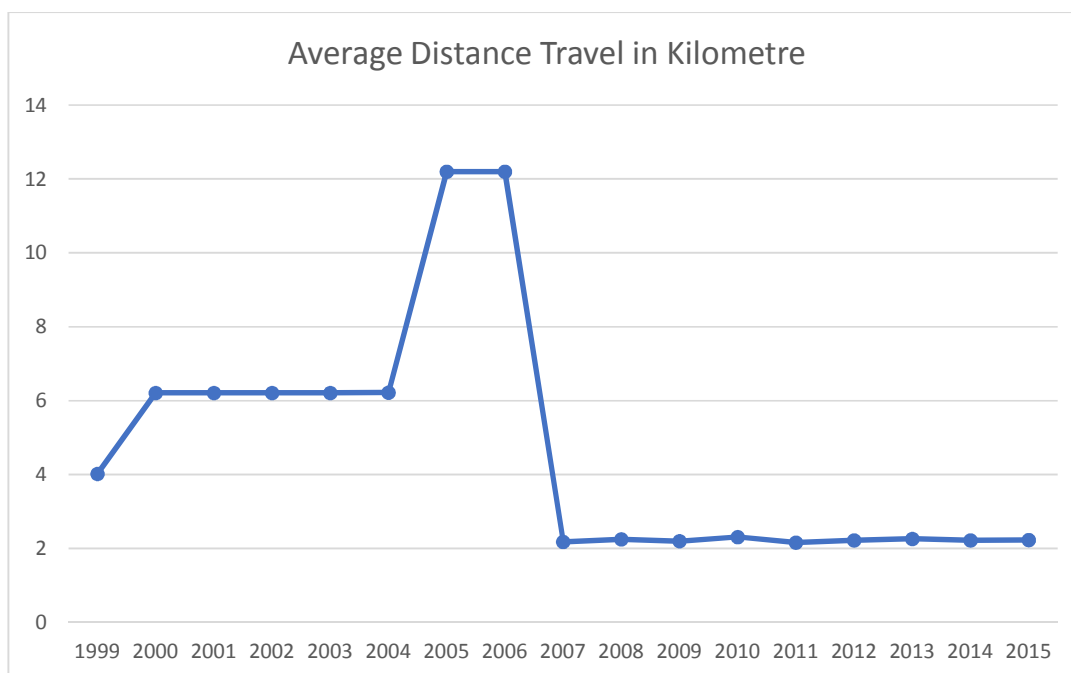


Chart of Average Distance Traveled before and after the Cassava Transformation Initiative

Source: Field Work 2016

APPENDIX IV

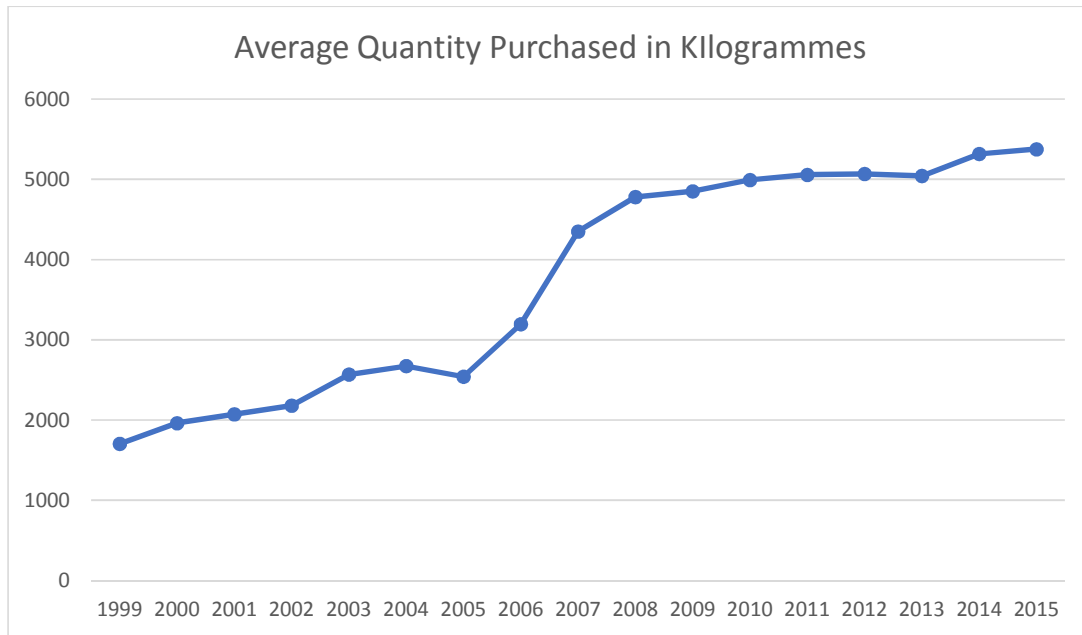
ANOVA result on the Differences in Average Distance Traveled (in Kilometers (KM)) by the Beneficiaries to Purchase Cassava Tubers, before and after the CTI

ANOVA Table

			Sum of Squares	df	Mean Square	F	Sig.
Oyo after *	Between Groups	(Combined)	52.323	2	13.081	1017.962	.001
Oyo Before	Within Groups		.026	4	.013		
	Total		52.349	6			
Ondo After *	Between Groups	(Combined)	94.657	2	47.329	1143.758	.000
Ondo before	Within Groups		.166	4	.041		
	Total		94.823	6			
Osun after *	Between Groups	(Combined)	179.304	2	89.652	5510.266	.000
Osun before	Within Groups		.065	4	.016		
	Total		179.369	6			
Ekiti after *	Between Groups	(Combined)	113.026	2	56.513	621.706	.000
Ekiti before	Within Groups		.364	4	.091		
	Total		113.390	6			
Ogun after *	Between Groups	(Combined)	58.866	2	29.433	2982.070	.000
Ogun before	Within Groups		.039	4	.010		
	Total		58.906	6			
Lagos after *	Between Groups	(Combined)	47.201	2	23.600	495.080	.000
Lagos before	Within Groups		.191	4	.048		
	Total		47.392	6			

Source: Field Work 2016

APPENDIX V



Average Quantity of Cassava Purchased before and after the Cassava Transformation Initiative
 Source: Field Work 2016

APPENDIX VI

ANOVA result on the Differences in Quantity Purchased per Month (in Kilogrammes (KG)) by the Beneficiaries, to Purchase Cassava Tubers, before and after the CTI

ANOVA Table

		Sum of Squares	df	Mean Square	F	Sig.
Oyo after *	Between Groups	22188893.037	2	22188893.037	105.064	.000
Oyo before	Within Groups	1267164.897	4	211194.150		
	Total	23456057.934	6	3350865.419		
Ondo after *	Between Groups	31556653.450	2	31556653.450	167.661	.000
Ondo before	Within Groups	1129302.684	4	188217.114		
	Total	32685956.134	6	4669422.305		
Osun after *	Between Groups	13483533.117	2	13483533.117	230.864	.000
Osun before	Within Groups	350427.912	4	58404.652		
	Total	13833961.029	6	1976280.147		
Ekiti after *	Between Groups	36465069.883	2	36465069.883	72.950	.000
Ekiti before	Within Groups	2999174.667	4	499862.444		
	Total	39464244.550	6	5637749.221		
Ogun after *	Between Groups	11618693.581	2	11618693.581	164.383	.000
Ogun before	Within Groups	424082.910	4	70680.485		
	Total	12042776.491	6	1720396.642		
Lagos after *	Between Groups	9988543.725	2	9988543.725	128.663	.000
Lagos before	Within Groups	465802.049	4	77633.675		
	Total	10454345.773	6	1493477.968		

Source: Field Work 2016

APPENDIX VII

Reliability Test on Questions used to Assess the Effect of Federal Government's cassava transformation initiative on the level of cassava tubers availability to the Small-scale cassava processing enterprises in Southwest Nigeria

Reliability Statistics

Cronbach's Alpha	.797
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Source: Field Work 2016

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