

Production and Marketing Performance of Farmers Participating in Cassava Initiative across Agricultural Zones in Nigeria

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Abstract

This study investigated the production and marketing performance of farmers participating in cassava initiative. Data were obtained from individuals who had at least 10 years membership of Cassava Growers Association (CGA) which constituted the target group in the implementation of the initiative. A total of 290 respondents were selected from the three cassava-growing zones (central, southwest and southeast) in Nigeria using multistage sampling procedure. Interview schedule was used to elicit information on cassava farmers' enterprise characteristics, change in cassava production and marketing activities before and during initiative (performance). Descriptive statistics, production and marketing indices and ANOVA were used to analyse the data at $p = 0.05$. Mean farm size before the initiative was 1.2 ± 1.1 ha and 2.3 ± 2.4 ha after the initiative while mean yield was 14.1 ± 7.1 and 20.3 ± 8.4 tonnes/ha, respectively. Production performance was high for 14.5% ($\bar{x} \geq 12.58$), moderate for 68.6% ($1.8 < \bar{x} < 12.58$) and low for 16.9% ($\bar{x} \leq 1.8$). Also, 17.2% ($\bar{x} \geq 14.98$), 28.3% ($0.56 < \bar{x} < 14.98$) and 54.5% ($\bar{x} \leq 0.56$) had high, moderate and low marketing performance, respectively. There were significant differences in marketing performance ($F=26.47$) but no difference in production performance ($F=0.795$) across the cassava growing zones. The cassava initiative improved the production and marketing performance of the cassava farmers.

Keywords: Cassava, production, marketing, performance.

1.0 Introduction

Agricultural production in Africa, especially Nigeria, is not very productive as per unit of land and labour (Oyewole and Philip, 2006). This is because of lack of access to land, poor technology and harsh environment in terms of low soil fertility, erratic rainfall and fragile ecosystems (Ugwu, 1996). In addition, it suffers from marketing constraints, poor infrastructures such as roads and means of transportation, poor financial services, lack of affordable inputs at farmers' level and high transaction costs of agricultural produce (Onomolease, 2002). Majority of African farmers cultivate less than two hectares of farmlands, use rudimentary tools, and lack access to processing and storage facilities and use traditional cultural practices (Philip *et al.*, 2004). Many of these farmers lack producers' organisations and product quality evaluation and therefore find it difficult to enter the international food chains (Nweke, 1994). Agricultural produce largely remains on farm or goes to nearby local markets where it deteriorates within 40 to 48 hours or is sold at market dictated unprofitable price respectively (Ashaye *et al.*, 2005).

In Nigeria, the large expanse of land, spanning the coast to the Sahel allows for wide range of crops and livestock to be produced. The northern part, which is drier, is suitable for the production of cereals and grain legumes like sorghum, millet, maize, cowpea, groundnut, cotton and sesame. The southern part, which is wetter, supports the production of root and tuber crops such as yam, cassava and cocoyam (Adegeye *et al.*, 1999). Nigeria has considerable level of experience in the development, multiplication and processing of cassava into various foods, feed and raw material forms and the continued dominance in cassava production. Nigeria has five agricultural zones namely; southwest zone, southeast zone, central zone, northwest zone and northeast zone (FMANR, 1997). According to FAO and IFAD (2005), the cassava-growing belt falls within three agricultural zones of the southeast, southwest and the central zones.

Cassava is a crop that has the potential to increase farm incomes, reduce rural and urban poverty and help close the food gap (Nweke *et al.*, 2002) and Nigeria is the world largest producer of cassava with about 44 million metric tonnes per annum ahead of other producers like Brazil and Thailand (Eke-Okoro and Njoku, 2012). Despite this, Nigeria only accounts for about 0.001% of the world export market compared with 50% by Thailand that produces less than Nigeria (Philip *et al.*, 2004; Oyewole and Philip, 2006). This is because about 70% of the Nigerian production is being consumed as food in the country thereby resulting in small quantity or none left for commercial purposes. Even, average yield of cassava in Nigeria has remained stagnant at about 10 tonnes /ha and this has largely been due to lack of adoption of improved varieties, inability to access credit, extension information, lack of fertilizer, and other inputs (Ezedinma *et al.* 2007). The unavailability of standard

processing facilities, low quality cassava and unorganised marketing structure also contributes to low industrial and international demand for cassava from the country.

In addressing this gap, the Nigerian Government in July 2002 launched an initiative called “Presidential Initiative on Cassava” (PIC) with strategic measures to address the problem associated with cassava production and marketing. This is to diversify the economy to one that is able to generate employment and sustain incomes for its citizens as well as increase utilisation of industrial capacity through processing and diversified export earnings from efficient marketing structure (Akinwumi and Yusuf, 2003; Nigeria First, 2005; Hartmann, 2007). This anticipated industrial revolution from cassava was expected to be driven by the private sector while the government creates the enabling environment. The existence of farmers’ organizations such as producers’ co-operatives or associations and agricultural lobby groups are beneficial to commercialisation of agriculture and agribusiness development (Dannson, 2004). Their collective endeavour make necessary arrangements for proper inputs supply, extension support, credit facilities, collection of produce, processing and marketing in an integrated manner so as to maximise returns on the investment (Srivastava, 2007). These encouraging attributes of the farmers’ organisation make them one of the main target groups in the implementation of the PIC. Preliminary study on the status of cassava production showed that the critical private group identified at the grassroots level was cassava growers association (Ezedinma *et al.*, 2007 and Adebayo, 2009) that has been in existence before the PIC programme but experienced increased patronage at the introduction of the programme (RMRDC, 2004). This group is found in all the cassava growing regions of the country and has since been benefiting from the PIC programme of the government.

The need to examine the changes brought about by the introduction of PIC programme on the production and marketing activities of cassava farmers across the cassava growing agricultural zones forms the thrust of this study.

2.0 Methodology

The study was carried out in Nigeria. Nigeria lies between latitudes 4⁰16’ and 13⁰53’ north and between longitudes 2⁰40’ and 14⁰41’ east. It is located in West Africa and bordered in the west by the Republic of Benin, on the north by the Republic of Niger and on the east by the Republic of Cameroon. It is bordered to the south by the Atlantic Ocean. Nigeria occupies a land area of 923,738 kilometres (91 million hectares) and the vegetation ranges from mangrove forest on the coast to desert in the far north. Nigeria has five agricultural zones namely; south-west, south-east, central, north-west and north-east (FMANR, 1997). According to FAO and IFAD, (2005), the cassava-growing belt falls within three agricultural zones of the south-east, south-west and central zones. The population of the study was all cassava farmers that had been members of the cassava growers’ association (CGA) for over ten (10) years. CGA is a producer association concerned with only one crop that is cassava (Ezedinma *et al.*2007)

Multi-stage sampling technique was used to draw sample for the study as shown on Table 1. The first stage involved purposive sampling of three (3) agricultural zones (southeast, southwest and the central zone) because they are the major cassava-growing zone in Nigeria. The second stage involved random sampling of twenty percent (20%) of states from each selected zone while the third stage was the sampling of twenty percent (20%) of the units (nomenclature of CGA for groups) in each of the state sampled through random sampling. The last stage was the compilation of list of cassava growers’ association members that had been part of the association for ten years with the assistance of unit leaders. Through random sampling, twenty percent (20%) of members of sampled units were selected to give a sample size of 290.

Table 1: Summary of states used for the study

Major Cassava Agricultural Zones	Number of States	Number of States sampled from each zone (20%)	Sampled States	Number of units in the sampled states	Number of units sampled (20%)	Number of members at least 10 years of membership in units sampled	Number of respondents sampled (20%)
Southwest	9	2	Ogun	35	7	292	58
			Osun	28	6	284	56
Southeast	8	2	Enugu	20	4	230	46
			Abia	12	3	175	35
Central	8	2	Niger	18	4	268	54
			Kwara	20	4	205	41
Total	25	6	6	133	28	1454	290

The data for this study were obtained from primary sources. Data were collected using interview schedule containing structured and unstructured questions that was pretested with reliability score of 0.72 using split-half method. The interview schedule contained sections which addressed the enterprise characteristics, production and marketing activities.

The Independent variables of this study were the enterprise characteristics of the respondents. These characteristic of respondents before initiative and after initiative were measured and these include average cassava farm size, average annual cassava yield, type of cassava variety planted, cassava processing employed and patronage of processing centre. The dependent variables were the changes in production and marketing activities of the cassava farmers. In order to capture these, production and marketing indices were developed. A number of operations listed as the elements of the initiative (IITA, 2007) were arranged under the production and marketing activities to solicit responses from respondents on a 3-point rating scale of: all the time (2), some of time (1), never (0). These also considered their situation before and after the initiative. The production index was a composite score of 13 items that varied from 0 to 26 while the marketing index was a composite score of 23 items that varied from 0 to 46. Performance score of each respondent in the activities was computed using the method of Akinbile and Omotara (2000) and Akinola (2008). This was computed by subtracting the mean score obtained in all items in the activity to generate indices for before from that of after the initiative. This performance scores for all respondents were therefore subjected to test statistics, then level of performance of respondents was categorised thus:

High performance = Between maximum points and (Mean + 1S.D) points

Moderate performance (intermediate) = Between upper and lower categories

Low performance = Between (Mean – 1S.D) points and minimum point.

The descriptive statistics employed for data summarisation includes percentages, mean and standard deviation, while test of hypotheses stated in null form is as stated below.

H₀₁: There is no significant difference in the level of production activities of cassava farmers after the initiative programme across the agricultural zones. **ANOVA was used**

H₀₂: There is no significant difference in the changes of marketing activities of cassava farmers across the agricultural zones. **ANOVA was used**

3.0 Results and Discussion

3.1 Enterprise characteristics of cassava farmers

One innovative initiative being undertaken to achieve greater cassava production by the CGA is acquiring large parcels of land in each Local Government Authority (LGA). Each parcel was intended to provide 1000 ha of land, suitable for commercial cassava cultivation. Table 2 shows that, in Nigeria before the initiative, the mean farm size was 1.2ha and 98.7% of the farmers operated land holding between 0.1 ha and 4.99ha. However, with the introduction of the initiative, the mean farm size was 2.2ha and 94.2% had land holding between 0.1 ha and 4.99ha. This also shows that the initiative did not address the problem of inaccessibility to land as CGA members still operate on small-scale land holdings. This corroborates the findings of RMRDC (2004) and Uchechi and Nwachukwu (2010) who observed that majority of cassava farmers in Nigeria have small land holdings. This is also in agreement with Awoniyi *et al.* (2009) that participants of PIC in Osun State had small farm size. The land tenure system may be responsible for this as pointed out by RMRDC (2004). Situation across the agricultural zone shows that respondents still operated farm size between 0.1 and 4.99 ha both before and after the initiative. However, south-west had an average of 2.9ha after the initiative.

The mean cassava yield of 14.1 tonnes/ha before the initiative is similar to that of Nweke (2002) who found that in Nigeria, the average yield was 14.7 tonnes/ha while after the initiative, the mean yield was 20.3 tonnes. This increased output might be due to the use of improved varieties which produce more cassava per plant when cultivated (FMARD, 2004 and Phillip, 2004). Mean yield improved across the agricultural zones after the initiative. Before the initiative in the south-east, mean yield of cassava was 16.6 tonnes/ha but increased to 23.3 tonnes/ha after the initiative. In the southwest, the farmers' mean yield increased from 13.9 tonnes/ha before the initiative to 21.0 tonnes/ha after the initiative while in the central zone farmers' mean yield increased from 12.3 tonnes/ha before the initiative to 16.8 tonnes/ha after the initiative.

Cassava is a perishable crop that deteriorates within 48 hours if not processed. From the study, 69.0% of the farmers processed cassava before the initiative while 75.9% processed cassava after the initiative. This means that more people resolved to adding value to cassava after the initiative. This confirms the finding of Adebayo and Salawu (2007) that the Presidential Initiative on cassava has helped to improve cassava processing and that cassava processing is profitable (Olorunsanya *et al.*, 2007). Value addition of cassava was predominant across the zone in Nigeria before and after the initiative. There was an increase cassava processing after the initiative as 82.7%, 71.1% and 75.8% respondents processed their cassava in the southeast, southwest and central zones respectively.

Majority (64.8%) used private processing site, 2.8% used association owned site and 1.4% used government owned site. However, after the initiative, patronage of private processing site reduced to 60.3%, while association owned sites recorded appreciable increase in patronage with 12.1% while 3.4% used government owned processing site. This implies that the initiative might have empowered local associations to organize value addition by processing and may equally have organized and strategically positioned these

associations to own processing centres which consequently increased patronage by group members. This finding reinforces Ezeburio *et al* (2010) who opined that groups are strong platforms for arrangement for processing machines for adding value to cassava.

More than half (54.5%) planted local variety, 31.0% planted a combination of improved and local varieties together, while very few (14.5%) planted improved variety before the initiative. However, after the initiative, 41.4% planted improved variety, more than half (52.8%) planted both improved and local variety, while very few (5.9%) planted local variety. This shows that there was an improvement in the use of improved variety, which resulted in higher output and disease free cassava tubers. The drastic increase in the use of improved variety might be because of the involvement of agricultural based research institute that were saddled with the responsibility of distributing improved cassava varieties to farmers after the initiative. There was a sharp difference in the variety of cassava cultivated by farmers across the agricultural zone of Nigeria. Furthermore, in the southeast, southwest and central zone 97.6%, 93.9% and 91.6%, respectively cultivated improved and combinations of the varieties.

3.2 Performance of Production and Marketing Activities

3.2.1: Changes in production activities of respondents across agricultural zones

The change in the level of production activities of respondents in Table 3 revealed that in the southeast zone, there was improvement in activities such as sole cropping practice, extension contact, application of herbicides for weeding, the use of sprayer for spraying operations, use of pesticides, group purchase of agrochemicals for cost reduction and application of fertilizer. Also, in the southwest zone, cost of land preparation reduced. Respondents performed better in planting of improved cassava varieties, group purchase of stem cuttings, extension contact, application of herbicide for weeding, use of sprayer, group purchase of agrochemicals and application of fertilizer on cassava fields while in the central zone, performance of farmers improved in terms of mechanised land preparation, planting of improved cassava varieties, group purchase of stem cuttings, sole cropping of cassava, extension contact, application of herbicides for weeding, use of sprayer, group purchase of agrochemicals for cost reduction and application of fertilizer.

Table 2. Distribution of respondents' enterprise characteristics

Variables	All respondents (N= 290)		Southeast (n= 81)		Southwest (n= 114)		Central (n=95)	
	Before %	After %	Before %	After %	Before %	After %	Before %	After %
Variables								
Farm size								
0.1 ha - 4.99ha	98.7	94.2	100.0	100.0	97.4	87.7	100.0	96.8
5.0 ha – 9.99ha	1.0	4.8	0.0	0.0	2.6	9.6	0.0	3.2
10.0 ha -26.0ha	0.3	1.0	0.0	0.0	0.0	2.6	0.0	0.0
Mean	1.2	2.2	0.9	1.5	1.3	2.9	1.1	1.2
Yield (Tonnes/Ha)								
0.1-10	32.4	7.6	21.0	1.2	40.4	12.3	32.6	7.4
10.1-20.0	53.8	53.1	53.1	45.7	44.7	43.0	65.3	71.6
20.1-30.0	11.7	25.9	23.5	35.8	11.4	27.2	2.1	15.8
30.1-40.0	2.1	12.4	2.5	13.6	3.5	17.5	0.0	5.3
40.1-50.0	0.0	1.0	0.0	3.7	0.0	0.0	0.0	0.0
Mean	14.1	20.3	16.6	23.3	13.9	21.0	12.3	16.8
Processed cassava								
Yes	69.0	75.9	85.2	82.7	57.0	71.1	69.5	75.8
No	31.0	24.1	14.8	17.3	43.0	28.9	30.5	24.2
Patronage of processing centre								
Privately owned	64.8	60.3	80.2	74.1	55.2	51.8	63.2	58.9
Association	2.8	12.1	2.5	7.4	0.0	12.3	6.3	15.8
Government	1.4	3.5	2.5	1.2	1.8	7.0	0.0	1.1
Variety planted								
Local	54.5	5.9	23.4	2.4	55.3	6.1	80.0	8.4
Improved	14.5	41.3	13.6	38.3	21.9	42.1	6.3	43.2
Both	31.0	52.8	63.0	59.3	22.8	51.8	13.7	48.4

In summary, participating farmers in cassava initiative across Nigeria improved in mechanised land preparation in the central zone while land preparation cost was reduced in the southwest. Planting of improved cassava varieties improved across the three agricultural zones (southwest, southeast and central zones). Also, group purchase of stem cuttings improved in the southwest and central zone while sole cropping of cassava improved in southeast and central zones. Extension contact, application of herbicides for weeding, use of sprayer

for spraying operations, group purchase of agrochemicals for cost reduction and application of fertilizer improved across the agricultural zone while the use of pesticides only improved in the southeast agricultural zone.

Table 3: Distribution of respondents' performance in their production activities

Production activities	Items	All the Zones (N=290)	Change in Southeast Zone (n=81)	Change in Southwest Zone (n=114)	Change in Central Zone (n=95)
Pre-planting operation	Participation in cluster land cassava farming	0.252	-0.01	0.46	0.24
	Mechanised land preparation	0.451	0.12	0.54	0.63
	Reduced cost of land preparation	0.293	0.21	0.63	0.32
Planting operation	Planting of improved varieties	0.862	0.94	0.89	0.76
	Group Purchase of stem cutting	0.737	0.36	0.7	0.76
	Sole cropping practice (12,300 stand per hectare)	0.566	0.58	0.53	0.6
	Mixed cropping practice (10,000 stand per hectare)	0.083	0.13	0.01	0.1
	Extension Contact	0.689	0.84	0.66	0.6
Post-planting operation	Application of herbicides for weeding	0.790	0.82	0.81	0.74
	Use of sprayer	0.696	0.56	0.86	0.61
	Use of Pesticides	0.466	0.51	0.43	0.47
	Group purchase of agrochemicals for cost reduction	0.655	0.58	0.79	0.57
	Application of fertilizer	0.659	0.69	0.67	0.63
	Mean	0.554	0.487	0.614	0.541

3.2.2 Level of respondents' performance in production activities

The level of change in performance with respect to production across the cassava growing zones of Nigeria is presented in Table 4. Majority (68.6%) of the respondents had moderate performance in production. Very few (14.5%) had high performance while 16.9% had low performance. Furthermore, the distribution revealed that majority (84.0%) of respondents in the Southeast and 66.7% in the Southwest performed moderately in their production activities. Also, more than half (57.9%) of the respondents in the central zone performed moderately as well in their production activities. This means that the change induced by the initiative regarding production activities in the central zone and southwest zones was just a little above average. This moderate performance experienced by the farmers in their production activities might have been because farmers adopted good agronomic practices (Ezedinma, 2007), have access to improved variety, increased access to extension training on cassava and access to local market for sales of cassava and products. In the southwest and the central zones, 19.3% and 17.9% respectively had high performance in their production activities whereas very few (3.7%) had high performance in the southeast. This corroborates Manyong *et al* (2005) that the central zone and southwest zone are development domains for cassava in Nigeria.

This result implies that the production of cassava in Nigeria still needs to be given attention so that farmers can achieve high level of performance in their production activities. This suggests that the initiative has not done badly in enhancing the production of cassava in Nigeria.

3.2.3 Changes in marketing activities of respondents across agricultural zones

Marketing performance of marketing activities of the respondents across the agricultural zones in Nigeria is as presented in Table 5. The focus here is to know how each zone performed in their marketing activities. The overall score was 0.338 therefore activities with mean score above or equal to this was regarded as being

performed well. From the table, it is deduced that the cassava growing zones in Nigeria performed well in the processing of cassava to semi-industrial products as a result of the initiative however, respondents performed well in the sales of the products only in the central zone

Table 4 :Distribution of respondents' performance levels of production activities in Nigeria

Level of performance in production activities	All respondents (N= 290)		Southeast (n= 81)		Southwest (n= 114)		Central (n=95)	
	Frequency	%	Frequency	%	Frequency	%	Frequency	%
High Performance	42	14.5	3	3.7	22	19.3	17	17.9
Moderate Performance	199	68.6	68	84.0	76	66.7	55	57.9
Low Performance	49	16.9	10	12.3	16	14.0	23	24.2

Mean = 7.2

Table 5: Distribution of respondents' performance in their marketing activities across the cassava growing zone in Nigeria

Marketing Activities	Items of Marketing Activities	All the Zones (N=290)	Change in Southeast Zone (n=81)	Change in Southwest Zone (n=114)	Change in Central Zone (n=95)
Processing	Processed cassava to semi industrial products (i.e. pellet, chips, starch)	0.428	0.37	0.34	0.59
	Process cassava to traditional products (i.e paste <i>Fufu/akpu</i>), Toasted granules (<i>gari</i>), Fermented Chips/flour (<i>Lafun</i>),Animal feeds, Tapioca etc.)	0.172	0.12	0.15	0.24
Commodities Marketed	Cassava Tubers	0.076	-0.1	0.17	0.11
	Semi industrial products (pellet ,chippings, starch)	0.321	0.01	0.3	0.61
	Traditional products (i.e paste (<i>Fufu/akpu</i>), Toasted granules (<i>gari</i>), Fermented Chips/flour (<i>Lafun</i>), Tapioca)	-0.031	-0.05	0.04	-0.09
Financing	Availability of credit	0.434	0.07	0.46	0.72
	Promptness of credit provision	0.428	0.07	0.47	0.67
	Adequate credit provision	0.366	0.06	0.38	0.61
Sources of Market Information	Other farmers (farmer's friend)	0.290	0.53	0.23	0.15
	Cassava Farmers Association	0.610	0.62	0.97	0.28
	Buying agents	0.514	-0.06	0.73	0.63
	Traders	0.207	0.05	0.3	0.23
	Government Agencies.	0.345	0.11	0.35	0.54
Marketing Information	Television	0.279	-0.03	0.46	0.33
	Radio	0.224	-0.02	0.46	0.16
	Timely information on market price for cassava tubers	0.431	0.16	0.51	0.56
	Timely information on market price for cassava products	0.497	0.45	0.52	0.5
Transportation	Timely information on available market for cassava tuber	0.459	0.17	0.64	0.49
	Timely information on available market for cassava products	0.407	0.37	0.39	0.47
	Availability of transport from harvest point within 2 days of harvest.	0.210	0.12	0.14	0.38
	Easy access to transportation	0.379	0.19	0.4	0.52
Storage	Easy storage of cassava products before sales	0.352	0.06	0.29	0.67
	Availability of warehouse services for bulk storage of cassava products.	0.376	0.01	0.33	0.73
	Mean	0.338	0.143	0.393	0.439

3.2.4: Level of respondents' performance in marketing activities

Table 6 shows the level of marketing performance of the respondents as a result of cassava initiative. More than half (54.5%) of the respondents had low performance in their marketing activities, 28.3% had moderate performance while very few (17.2%) had high performance in their marketing activities. This probably justifies Awoyinka (2009) who opined that most important problem that needs urgent attention is guaranteed market so that there can be sustainable cassava production for domestic and industrial use and export market.

Considering the performance of the farmers across the cassava growing zones in Nigeria as a result of the initiative, the result shows that none of the respondents in the southeast had a high performance in their marketing activities while very few (9.9%) had moderate performance in their marketing activities. However, majority (90.1%) of the respondents had low performance in their marketing activities. In the southwest zone, 16.7% had high level of performance in their marketing activities, 42.1% had moderate performance and 41.2% had low performance. Farmers in the central zone had a better performance regarding marketing activities as 32.6% of the respondents had high performance in their marketing activities. About 27.4% had moderate performance in their marketing and 40.0% had low performance.

This implies that the initiative improved marketing activities of the farmers in central and southwest zones whereas this was not the case in the southeast. These results indicate that each zone had its peculiarity as a result of the influence of the initiative.

Table 6: Distribution of respondents' performance level of marketing activities in Nigeria

Level of performance in marketing activities	All respondents (N= 290)		Southeast (n= 81)		Southwest (n= 114)		Central (n=95)	
	Frequency	%	Frequency	%	Frequency	%	Frequency	%
High Performance	50	17.2	0	0	19	16.7	31	32.6
Moderate Performance	82	28.3	8	9.9	48	42.1	26	27.4
Low Performance	158	54.5	73	90.1	47	41.2	38	40.0

Mean = 7.8

3.3 Test of difference in the level of production activities of cassava farmers after the initiative programme across the agricultural zones

The mean score of changes experienced in respondents' production activities across the agricultural zone was computed using analysis of variance. Change in production activities of cassava farmers across the agricultural zones on Table 7 showed that there was no significant difference ($F=0.795$; $p>0.05$) across the zones. This implies that changes experienced by farmers as a result of the initiative regarding the production activities of the farmers did not differ across the agricultural zone. This might be because of the involvement of collaborating agencies like IITA and RTEP as collaborators in the fulfilment of the initiatives' set objectives (Agumagu and Adesope, 2007)

Table 7: ANOVA of respondents' change in production activities after the initiative across the agricultural zones

	Sum of Squares	Df	Mean Square	F- value	P-value	Decision
Between Groups	46.221	2	23.11	0.795	0.452	Not Significant
Within Groups	8340.347	287	29.06			
Total	8386.569	289				

3.4 Test of difference in respondents' change in marketing activities after the initiative across the agricultural zones

The result on Table 8 showed that significant difference ($F=26.47$; $p<0.05$) exists in the change in marketing activities across the agricultural zones. This implies that the marketing activities differ across the zone. These differences might be because there are no institution saddled specifically to co-ordinate the marketing activities of cassava farmers in Nigeria.

Post hoc analysis of respondents' change in marketing activities after the initiative across the agricultural zones.

Table 9 showed a significant difference in marketing activities between central agricultural zone and southeast zone with mean difference of 5.75. Likewise, there was significant difference between southwest and southeast zones while there was no significant difference in the change in marketing activities between central and southwest agricultural zones as their Least Square Difference (LSD) equals 1.10 ($p>0.05$). This indicates that the central agricultural zone and southwest experienced similar significant change in marketing activities of cassava. This might be due to the influence of processing factories located within the reach of farmers in the area (i.e Ekha-Agro Farms, Lagos-Ibadan Expressway, Thai farms along Ijebu-Ode, Benin Expressway in Ogun State and TJ farms located at Ijabe in Osun State).

Table 8: ANOVA of respondents' change in marketing activities after the initiative across the agricultural zones

	Sum of Squares	Df	Mean Square	F- value	P-value	Decision
Between Groups	2339.26	2	1169.632	26.47	0.000	Significant
Within Groups	12683.72	287	44.194			
Total	15022.98	289				

Table 9: Post Hoc analysis of respondents' change in marketing activities after the initiative across the agricultural zones

(I) Zones	(J) Zones	Mean Difference (I-J)	Std. Error	P-value	Decision
Southwest	Southeast	5.74594	0.96606	0.000	Significant
Central	Southeast	6.84418	1.00539	0.000	Significant
	Southwest	1.09825	0.92351	0.235	Not Significant

The mean difference is significant at the 0.05 level.

Conclusion

The study revealed that the PIC has improved the enterprise characteristics of the cassava farmers across the agricultural zones in Nigeria. There was no significant difference in production activities across the agricultural zones in the country. Farmers in southeast zone had the least change in marketing activities while marketing activities between farmers in central zones and southwest agricultural zones were similar. This programme should be reviewed in a way that the initiative elements will be relevant to the specific need of each zone. It is obvious from the study that the needs of cassava farmers across the agricultural zones are not the same. Extension agents need to be trained in aspect relating to market so that they can disseminate useful, regular and detailed market information that would be of great help to the farmers. Private investors should be encouraged to invest in cassava sub-sector by strategically citing cassava processing industries in every state of the federation.

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