

SMALL SCALE PROCESSORS' ENGAGEMENT IN CASSAVA POSTHARVEST AND HOUSEHOLDS' FOOD PROVISION IN IMO STATE, NIGERIA

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Abstract

This paper examined smallholder cassava processors' involvement in post-harvest activities for ensuring households' food provision in Imo State, Nigeria. A multi-stage random sampling technique was used in selecting one hundred and eighty (180) respondents across the three agricultural zones of the State. Data collected were analyzed with both descriptive and inferential statistics. Result showed that Majority (82.2%) of the processors were married females. Also, a large population of the respondents (28.5% and 30.6%) belonged to the age bracket of 41 – 50 and 51 – 60 respectively. Most of the processors (52.8%) had secondary education and majority (65.0%) of them had contact with extension services every fortnight. More than one-third (35.6%) of the processors earned less than ₦2,000 monthly from cassava processing. Out of the 5 cassava post-harvest livelihood activities listed, *only process and market garri* (3.16), *process and market odourless fufu* (2.52) recorded moderate level of involvement of the respondents. From results of the study the respondents also showed that their involvement in cassava post-harvest livelihood activities enabled them to make moderate/modest (3.31) provision of food for their households. Also, a chi-square goodness of fit = 386.55 at $P < 0.05$ showed a significant association between household food provision status and livelihood activities such as; *owning/operating processing center* (t-ratio=-1.986), *processing/marketing fufu* (t-ratio=2.967), *processing/marketing flour* (t-ratio=2.413), *processing/marketing starch* (t-ratio=-2.458). This is an indication that the respondents combine lots of livelihood strategies in addressing the challenges of hunger and household food insecurity. The paper therefore recommended the re-structuring of the extension service system to provide the needed services to the processors in terms of technical advice which will help them maximize the benefits of post-harvest technologies. Also, policies that will encourage the rural processors in diversification is recommended.

Keywords: Cassava, Small scale, Processors, Livelihood activities and Household foods

Introduction

Currently, Nigeria's cassava output is being threatened by post-harvest losses. Sixty percent of the cassava tubers produced in Nigeria is for fresh consumption. Furthermore, cassava is a major source of income and food for rural communities with an estimated 54 million tons produced annually by small holder farmers in Nigeria. Despite the crop's importance, massive amounts of cassava are spoiled each year in Nigeria. It is estimated that 40 percent of total cassava produced is lost due to spoilage. Put in another way, almost half of the country's output is completely wasted, leading to large foregone opportunities in farmer income and rural socioeconomic development (Ogundipe, 2016). This is mainly because most small holder farming communities are yet to embrace cassava post-harvest technologies.

A wide range of existing cassava post-harvest technologies developed by some research organizations has not been fully embraced by small holder farmers and the non-adoption of available processing cassava technologies limit the crop from reaching its full potential as a source of food and livelihood for the many rural households. Thus, opportunities provided by the development of the cassava

processing technologies to improve households' livelihood in Imo State as well as the entire rural economy are not optimally utilized.

The cassava processing technologies developed through research and introduced to the farmers by the extension service include;- cassava grater, screw press, improved method of processing gari, frying machine, steel frying pot, processing cassava flour, processing cassava to starch, curumbus grinder, and mechanical peeler (Adebayo, 2009). The level of adoption of these cassava processing technologies by small holder processors is influenced by the nature of their socio-economic characteristics. A study conducted by Ekwe *et.al*, (2016) identified certain socio-economic variables (such as sex, farming and processing experiences, marital status, extension contact and membership of cooperative organizations) as determinants of the adoption of cassava processing technologies in Imo State.

Livelihood opportunities are likely to influence household income levels and in particular the number of options that become available to different income classes (Ellis, 2000). Several studies (Marter, 2002, Matshe and Young, 2004; Serra *et al* , 2007; Jan *et al*, 2009) reported that livelihood opportunities help in minimizing household income variability, providing an additional source of income and employment which have implications for rural poverty reduction and contribute substantially towards improving households' welfare. Furthermore, Ahumihe (2015) reported that smallholder processors in Imo State engage in diverse postharvest activities as livelihoods strategies for coping with hunger and poverty pressures in the households. Nevertheless, there is dearth of information on involvement of small scale processors in cassava postharvest activities for households' food provision in Imo State, Nigeria.

In view of the foregoing, this study, therefore sought to examine small scale processors' involvement in cassava post-harvest activities for households' food provision in Imo State, Nigeria. The specific objectives include to: describe the socioeconomic characteristics of the processors; ascertain processors' level of involvement in Cassava postharvest livelihood activities; ascertain households' food provision status of respondents gained from cassava postharvest activities as well as determine the relationship between processors' livelihood activities and their household food provision status.

Methodology

This study was conducted in Imo State of Nigeria. The State is located in the South Eastern geopolitical zone of Nigeria. Multistage random sampling procedure was used in selecting the respondents. In the first stage, all the 3 agricultural zones (Owerri, Orlu and Okigwe) were selected. In the second stage, one Local Government Area (LGA) was selected, from each of the three Agricultural zones by simple random sampling technique. They were Ikeduru LGA from Owerri zone, Isiala Mbano LGA from Okigwe zone and Ohaji/Egbema LGA from Orlu zone. In the third stage, six communities were randomly selected making a total of 18 communities. The last stage involved the selection of ten (10) respondents from each of the communities which gave a sample size of 180 persons. Using structured questionnaire, data relevant to the study were collected from the respondents and analyzed using both descriptive (such as frequency, percentage, mean) and inferential statistics (Probit regression model). Specifically, the socio-economic characteristics of small holder cassava processors were realized using descriptive statistics. A five-point Likert type measuring scale was employed to obtain respondents' level of involvement in cassava post harvest activities in the study area. The scale was weighted as follows; Very low = 1, Low = 2, Moderate = 3, High = 4, Very High = 5 and mean score rated as follows 0.00-2.33= low; 2.34-3.66=moderate; 3.67-5.00=high. Also, to obtain status of households' food provision among processors involved in cassava post-harvest activities, a 5 point Likert type measuring scale weighted as Very low = 1, Low = 2, Moderate = 3, High = 4, Very High

= 5 was employed. Afterwards, the calculated mean score was further categorized as follows 0.00-2.33= low; 2.34-3.66=moderate; 3.67-5.00=high. Finally, the Probit regression estimate was used to determine the relationship between livelihood activities/strategies and the status of household food provision among the small scale processors.

The Probit regression approach used is implicitly given as:

$$P_i = F(Z_i) = \frac{1}{1+e^{-(\lambda_0+\sum\lambda_n\beta_n)}} \dots \dots \dots 1$$

$$Z_i = f(x_1, x_2, x_3, x_4 \text{ and } x_5) \dots \dots \dots 2$$

The same model is explicitly given as:

$$Z_i = \lambda_0 + \lambda_1 x_1 + \lambda_2 x_2 + \lambda_3 x_3 + \lambda_4 x_4 \text{ and } \lambda_5 x_5 \dots 3$$

Where:

Z_i = Livelihood outcome (Dummy variable whereby 1 = if yes 0 = if no)

X_1 = Owns/operates processing centre

X_2 = processing/marketing garri

X_3 = Processing/marketing fufu

X_4 = processing/marketing flour

X_5 = processing/marketing starch

$\lambda_1 - \lambda_5$ = beta coefficient of explanatory variables

e = Error term.

Given *a priori* expectation, the beta coefficients are expected to be signed as follows:

$\lambda_1 < 0$; $\lambda_2 < 0$; $\lambda_3 > 0$; $\lambda_4 > 0$; $\lambda_5 > 0$

Results and Discussion

Socio-Economic Characteristics of the Processors in the study area

The result in the Table 1 below is the distribution of the socio-economic characteristics of the processors in the study area. The Table 1 above represents the socio-economic characteristic distribution of the respondents which includes: sex, age, marital status, education status, extension contact, and monthly income from processing cassava. The result shows that 56.1% of the respondents were female while the remaining 43.9% were male implying that cassava postharvest activities are dominated by women in contrast with Otitoju and Arene (2010) that Nigerian Agriculture is dominated by men. On the marital status of the respondents, the Table 1 indicated that majority (82.2%) of the farmers were married, while only 17.8% were single. Table 1 also shows the age distribution of the respondents. The result indicated the large population of the respondents (28.5% and 30.6%) belonged to the age bracket of 41 – 50 years and 51 – 60years respectively. Also 15.6% were aged 31 – 40 years and ≥ 60 years. Only 10.0% of the respondents were below 30 years of age. The result implies that there is a relatively high proportion of old farmers in the area and this differed from Ekwe (2004) who observed that most farmers in Nigeria are at the active stage of life and not relatively old.

The distribution of farmers according to educational status is also presented in Table 1 above. The Table shows that most of the farmers (52.8%) had secondary education, while (15.6%) and 29% had primary school education and tertiary education respectively. Only 2.8% of the total number of respondents had no formal education. The result shows that most of the farmers were literate and this would likely make them more responsive to extension programme and policies. According to Apu and Nwachukwu (2008) increase in educational attainment of farmers positively influenced their adoption of improved technologies. On the extension contact by the respondents, the result as presented in Table 1 above shows that most (65.0%) of the farmers had contact with extension agents every 2 weeks while 16.8% and 13.3% had no contact at all with extension agents and once every month respectively.

Table 1: Distribution of processors according to their socio-economic characteristics

Variable	Frequency	Percentage	Variable	Frequency	Percentage
Sex			Marital Status		
Male	79	43.9	Married	148	82.2
Female		56.1	Single	32	17.8
Age (Years)			Educational Status		
≤ 30	18	10.0	No formal schooling	5	2.8
31-40	28	15.6	Primary education	28	15.6
41-50	51	28.5	Secondary education	95	52.8
51-60	55	30.6	Tertiary education	52	29.0
≥ 60	28	15.6			
Average			Monthly income from cassava processing		
Extension contact			≤ 2000	64	35.6
No contact at all	30	16.8	2100-5000	59	32.8
Once per week	9	5.00	5100-10,000	39	21.9
Every two weeks	117	65.0	≥ 10,000	18	9.9
Every month	24	13.3			
Every Quarter	0	0.00	Membership of organization		
Household size			Yes	114	63.3
0-5	99	55.0	No	66	36.7
6-10	76	42.2			
Above 10	5	2.8	Involvement in cassava processing		
Average	4.9		Active	108	60
Farm size (Ha)			Passive	72	40
0-2	154	85.6			
2.1-5.0	24	13.3			
Above 5	2	1.10			
Average	1.2				

Source: Field survey 2015

Only 5.0% had once per week contact with extension agents while a 0.0% was recorded for contact with extension agents every quarter. The result shows a moderate level of conduct with extension agents by the processors, given the dwindling situation of extension services in Nigeria. Table 1 also presented the monthly income distribution of the processors in the study area. The table revealed that most (35.6%) of the processors earned less than ₦2, 000 monthly from cassava processing. Also 32.8% and 21.7% earned ₦2, 100 – ₦5, 000 and ₦5100 – ₦10, 000 monthly. Only 9.9% of the processors earned above ₦10, 000 monthly from the venture. This result corroborates Akinbola and Saibu (2004) which placed Nigeria as one of the poorest nation in the world. The result implies a high poverty rate among the farmers which is characteristic of the farming system practiced in the rural areas where returns from investment is low as a result of low level investment by subsistent farmers.

Processors' Involvement in Cassava Post Harvest Livelihood Activities

The distribution of the respondents according to their level of involvement in cassava post-harvest livelihood activities for food provision in the household in the study area is presented in Table 2. The results as presented in Table 2 indicate that out of the 5 cassava post-harvest livelihood activities listed, only process and market garri (3.16), process and market odourless fufu (2.52) recorded moderate level of involvement of the respondents for households' food provision. Meanwhile, operating cassava processing centre (2.21), process and marketing cassava flour (2.30), process and market cassava starch

(2.07) recorded low level of involvement of the respondents for purpose of food provision in the households. The result implies that respondents in the study area have not maximized cassava post-harvest livelihood opportunities which would positively impact on their food provision capacity and general welfare. Although cassava post-harvest activities have increased, the situation of the respondents in the study area with respect to their involvement in cassava post-harvest livelihood activities contradicts the view of Olawoye (2002), who cited that rural dwellers across Nigeria and Ghana engage in multiple food-providing activities to give hunger a resolute fight. According to Babatunde and Qaim (2009) the pattern of income diversification among rural households in Nigeria shows that majority of the households have fairly diversified income generating sources.

Table 2: Distribution of respondents according to their level of involvement in cassava post-harvest activities for food provision in the study area

Variable	Very low 1	Low 2	Moderate 3	High 4	Very high 5	Mean score	Remarks
Operating cassava processing Centre	75 (41.6)	26 (14.4)	46 (25.6)	27 (15.0)	6 (3.3)	2.21	Low
Process and market garri	40 (22.2)	10 (5.6)	35 (19.4)	70 (38.9)	25 (13.9)	3.16	Moderate
Process and market odorless fufu	52 (28.9)	32 (17.8)	51 (28.3)	39 (21.7)	2 (1.1)	2.52	Moderate
Process and marketing cassava flour	70 (38.9)	20 (11.1)	58 (32.2)	30 (16.7)	0 (0.0)	2.30	Low
Process and market cassava starch	81 (45)	17.2)	42 (23.3)	46 (14.4)		2.07	Low

Source: Field survey data, 2015. Key: Low = 0.00-2.33; Moderate = 2.34-3.66 and High= 3.67-5.00

Livelihood Outcome Levels among the Processors in Imo State

The result presented in Table 3 below is a distribution of the respondents according to their level of households food provision gained from engagement in cassava post-harvest activities in the study area.

Table 3: Distribution of respondents according to their level of household food provision gained from cassava post-harvest activities in the study area

status	Frequency (n)	Percent (%)	Likert Scale weight (w)	Aggregate score (nxw)
Very high	14	7.8	5	70
high	74	41.1	4	296
moderate	52	28.9	3	156
low	34	18.9	2	68
Very low	6	3.3	1	6
Total	180	100		596
Mean/ remark				3.31 (moderate)

Calculated from field data 2015, 0.00-2.33= Low; 2.34-3.66=Moderate; 3.67-5.00=High

As presented in Table 3, the result of the distribution of the respondents according to the household food provision status gained from cassava post-harvest technologies rated on a 5 point Likert-type scale

show that respondents recorded moderate level (3.31) of Household food provision from their involvement in the cassava post-harvest activities earlier discussed in Table 2. Again, the result implies that respondents are yet to maximize benefits of the different cassava post-harvest activities available and this may have been the reason for the level of abject hunger still recorded in the area. Asa (2008) reported that people pursue a range of livelihood outcomes by drawing on a range of assets to pursue a variety of activities and definite options among the range is determined by certain structures (including the roles of government or private sector) and process such as institutional policy and culture. In consonance, Khan (2009), identified the cause of poverty to include culture, climate, gender, market and public policy

Relationship between Livelihood Activities and Households' Food Provision

To show the relationship between respondents' cassava postharvest livelihood activities and household food provision status, results of probit analysis is presented in Table 4. On the relationship between livelihood strategies and household food provision, the result shows a chi-square goodness of fit = 386.55 at $P < 0.05$ authenticating the fitness of the model. At $P < 0.05$, the results showed a significant positive relationship between household food provision status and such cassava post harvest activities as processing/marketing fufu (2.967), as well as processing/marketing flour (2.413). This implies that respondent's households' food provision status improved as they got more involved in the activities of processing and marketing of cassava fufu and flour. On the other hand, processing/marketing starch (-2.458) as well as owning/operating cassava processing centre (-1.986) showed a negative significant relationship with household food provision status among small sale processors in the study area thus indicating that households food provision status dwindled as they got more involved in processing starch and ownership of cassava processing centre. Nevertheless, the results showed that respondents in the study area combined a lot of livelihood strategies in addressing household food security as this is consonance with Olawoye (2002) who argued that the term occupation is not appropriate in developing nations, like Nigeria especially in the rural areas where many activities are carried out simultaneously to secure the foods for the households.

Table 4: Estimates of the relationship between cassava postharvest activities and household food provision status of small scale processors in Imo State.

Cassava postharvest Activities	Coefficient	Std Error	z-value
Intercept	-1.502	.111	-13.479***
Owns/operates processing centre	-.042	.021	-1.986**
Processing/marketing garri	-.029	.025	-1.188
Processing/marketing fufu	.093	.031	2.967***
Processing/marketing flour	.091	.038	2.413***
Processing/marketing starch	-.108	.044	-2.458***
F value	3.492***		
Pseudo R ²	0.156		
Chi square livelihood	386.55***		

Source: Field Survey Data, 2015; *= P< 0.01; **= P< 0.05; *= P< 0.1**

Conclusion

The study has shown that farmers' involvement in cassava post-harvest livelihood activities is crucial in realizing the full potentials of cassava. From the socio-economic characteristics of the respondents, result shows that there are relatively high proportions of old farmers in the area while most of the farmers were literate. Also, extension agents contact with the processors was at a moderate level. Income was also low implying a high poverty rate among the processors. Respondents in the study area have not maximized the benefits of cassava post-harvest activities available which would positively impact on household sustenance and general welfare. Although the study revealed that respondents combine lots of livelihood strategies in addressing the challenges of hunger and household food insecurity. The study therefore recommended the restructuring of the extension service system to provide the needed services to the processors in terms of technical advice which will help them maximize the benefits of post-harvest activities. Also, policies that will encourage the rural processors in diversification is recommended. There is the need for processors to be encouraged to belong to cooperative societies and organizations to enable them access to current information will enhance their rural livelihoods in general and household food provision in particular.

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