ANALYSIS OF LIVELIHOOD OUTCOMES OF SMALL SCALE CASSAVA PROCESSING ACTIVITIES AMONG FARMERS IN IMO STATE, NIGERIA.

Ekwe, K. C.,Ukpai K.andAhumihe E.
Department of Rural Sociology and Extension,
Michael Okpara University of Agriculture, Umudike, Abia State, Nigeria

Abstract:
The paper analyzed the livelihood outcomes of small-scale cassava processing activities among farmers in Imo State, Nigeria. A multi-staged 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 shows that Majority (56.1%) were female and 82.2% of the farmers were married. Also, a good proportion of the respondents (28.5% and 30.6%) belonged to the age brackets of 41 – 50 and 51 – 60 respectively. Most of the farmers (52.8%) had secondary education and majority (65.0%) of the farmers had contact with extension every 2 weeks. Furthermore, 35.6% of the farmers earned less than ₦2, 000 monthly from cassava processing even when 60% of them were actively involved in cassava processing. An average household size of 4.9 persons/household was recorded among the respondents having 1.2ha of farmland on the average. Mean scores of 3.13, 3.31 and 2.71 show moderate level in gains from income generation, household food security and household employment as livelihood outcomes respectively. For the socioeconomic factors affecting small holder farmers'livelihood outcomes in cassava processing activities, income generation with F-value (5.193) and food security with F-value (6.036) were significant at P<0.05 respectively with such factors as age (t-ratio=2.590) and farm size (2.783) for income generation as a livelihood outcome and on the other hand, processing experience (t-ratio = -2.196), faming experience (1.945), farm size (2.767), extension contact (2.267), educational statues (-2.744), household size (3.177) and membership of cooperatives (1.959) affecting household food security as a livelihood outcome. In order to address the challenges revealed, the paper therefore recommends that extension and advisory services should be provided for farmers to enable them access to such information that will arouse their interest in maximizing livelihood opportunities in cassava processing. More so, adequate training and retraining programme should be organized for farmers regularly to keep them abreast of current issues in cassava processing.
Keywords: Livelihood Outcomes, Cassava, Post-harvest, Small holder, Socioeconomic

Introduction:
Livelihood opportunities abound in cassava post-harvest activities which if properly harnessed are likely to influence household income levels as well as other livelihood outcomes. Asa (2008) reports that people pursue a range of livelihood outcome 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.Ekwe*et al* (2016) asserted that opportunities provided by the development of the cassava processing technologies to improve households' livelihood as well as the entire rural economy are not optimally utilized even though it is reported that good proportion of farm households in Southeast Nigeria have actively embraced the use of improved technologies for processing cassava into gari in order to optimize the gains of vast opportunities in the product to earn meaningful livelihoods (Ekwe and Nwachukwu 2011). The place of Agricultural extension and advisory services cannot be overemphasized in helping the local people adopt improved practices, explore varying livelihood outcomes and by so doing increase their productivity and social welfare. The foregoing therefore gives the extension agents the position of an important link between agricultural research and technology end users (farmers) (Tokula, *et al.*, 2008).

Several studies (Marter, 2002, Matshe and Young, 2004; 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. In spite of these reported benefits, there is dearth of studies on the livelihood outcomesgained in cassava processing enterprise among rural households in Imo State.This study therefore was designed to analyze of livelihood outcomes of small-scale cassava processing activities of farmers in Imo State, Nigeria.

The Specific objectives are to;
1.   describe the socioeconomic characteristics of the respondents.
2.   examine the status of livelihood outcomes gained from processing activities by the respondents in the study area.
3.   determine the factors affecting respondents' status of cassava livelihood outcomes.

Methodology:
This study was conducted in Imo State of Nigeria. The State is located in the South Eastern part 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 LGA was selected, from each of the three Agricultural zones by simple random sampling technique. They were Ikeduru LGA from Owerri zone, IsialaMbano 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 such as weighted least square regression statistics.To ascertain respondents' status of livelihood outcome gained from cassava post-harvest technologies, the various livelihood outcomes in cassava processing enterprise were listed out and the number of livelihood outcomes indicated by the cassava processor showed his/her status, using a 5 point Likert scale of 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, for factors affecting respondents' status of Cassava Livelihood Outcomes, the weighted least square regression model was used and is presented thus;

$$Y= f(B_0+B_1X_1+B_2X_2+B_3X_3+B_1X_1+B_4X_4+B_5X_5+B_6X_6+B_7X_7+B_8X_8+B_9X_9+B_{10}X_{10} + Ei)$$

Where

Y = Farmers' level of livelihood outcomes gained from cassava processing activities (measured on a 5 point Likert-type scale).

X_1 = Sex (Dummy variable wheremale=1 otherwise =0)

X_2 = Age of the farmer (years)

X_3 = Marital Status (Dummy variable wheremarried = 1 if, otherwise =0)

X_4 = Processing experience (years)

X_5 = Cassava monthly Income (N)

X_6 = Extension contact (number of visits by extension agent in one year)

X_7 = Level of education (number of years spent in School)

X_8 = Farm size (In hectares)

X_9 = Household size (number of household members)

X_{10}= Social organization membership/cooperative (Dummy variable where member of a cooperative=1 otherwise=0).

B_0= Constant

Ei= Error terms

Results and Discussion
1. Description of the Socio-Economic Characteristics of the Respondents

The results in Table 1 below is the description of the socio-economic characteristics of the respondent in the study area.

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

Variable	Frequency	Percentage (%)	Variable	Frequency	Percentage (%)
Sex;			**Marital status;**		
Male	79	43.9	Married	148	82.2
Female	101	56.1	Single	32	17.8
Total	180	100	Total	180	100
Age;			**Educational status;**		
0- 30	18	10.0	No formal school	5	2.8
31-40	28	15.6	Primary school	28	15.6
41-50	51	28.5	Secondary school	95	52.8
51-60	55	30.6	Tertiary school	52	29
61 and above	28	15.6	Total	180	100
Total	180	100			
Extension contact;	30	16.8	**Monthly income for cassava processing;**		
No contact at all	9	5.0	0- 2000	64	35.6
Once per week	117	65.0	2100-5000	59	32.8
Every two weeks	24	13.3	5100-10,000	39	21.7
Every month	0	0	10,000-20,000	18	9.9
Every quarter	180	100	**Total**	180	100.0
Total					

Household size;			Membership of			
0-5	99	55.0	organization;	114	63.3	
6-10	76	42.2	Yes	66	36.7	
11-15	5	2.8	No	180	100	
Total	180	100	Total			
Average	4.9					
Farm size (ha);			**Involvement in cassava**			
0-2	154	85.6	**processing;**			
2.1-5	24	13.3	Active	108	60	
5-7	2	1.1	Passive	72	40	
Total	180	100	**Total**	180	100	
Average	1.2ha					

Source: Field survey Data 2015.

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, household size, membership of social organization, farm size and respondents' involvement in cassava processing.The results show that 56.1% out of 180% respondents were female while the remaining 43.9% were male implying that cassava post-harvest activities are dominated by women althoughAkintayo(2011) and Otitoju and Arene (2010) opined that Nigerian agriculture is dominated by men.

On the marital status of the respondents, the result 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 resultsindicates the large population of the respondent (28.5% and 30.6%) belonged to the age bracket of 41 – 50 and 51 – 60 respectively. Also 15.6% were aged 31 – 40 and ≥ 60. 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 corroborates with Akinolu(2003) but differed from Agwu, *et al*(2008) 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 the extension programme. According to Apu and Nwachukwu (2008) increase in education of farmers positively influences their adoption of improved technologies.

On the extension contact by the respondents, the results as presented in Table 1 show that most (65.0%) of the farmers had contact with extension every 2 weeks while 16.8% and 13.3% had no contact at all with extension and once every month respectively. Only 5.0% had once per week contact with extension while a 0.0% was recorded for contact with extension every quarter. The result shows a moderate level of contact with extension by the farmers, given the dwindling situation of extension services delivery in Nigeria.

Table 1 also represents the monthly income distribution of the farmers in the area. The Table revealed that 35.6% of the respondents 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 respondents earned above ₦10, 000 monthly from the venture. This result corroborates the opinion of International Bank for Economic Reconstruction and Development (IBRD) as reported by Oladoju*et al* (2008) which placed Nigeria as one of the poorest nation in the world. The result implies a poor level of returns among the farmers which is characteristic of the farming system practiced in the rural area where returns from investment is low as a result of low level of investment by subsistent farmers (Conroy, 2005).

On the household size distribution of the respondents, the result in Table 1 shows that (42.2%) of the processors 6-10 members in their household, 55.0% of the respondents had 0 – 5 persons in their households. Average household size of 5 persons/household was recorded among the respondents implying a moderate household size which could support farm labour. A large household size may also be advantageous in the diffusion of technological innovation since every member of the household is a potential source of information.

Furthermore, the distribution of the farmers according to membership of cooperative organization revealed that majority (63.8%) belonged to one social organization or the other while the remaining (38.7%) were not members of any social organization. This reported high level of participation in association membership among the farmers, may positively result in high innovativeness among the farmers as a result of group dynamics effects. As opined by Adisa and Jibowo (2005) social association create an avenue for sharing of experience and information among members.On the

farm size of the respondents, the result as presented in table 1 shows that most (85.6%) of the farmers cultivated 0 – 2 hectares of farmland while 13.3% and 1.1% cultivated 2.1 – 5 hectares and above 5 hectares respectively.

The average farm size of the farmers was 1.2 hectares. This result is an indicator that the study area consists of small scale farmers, this finding corroborates Chikezie, *et al* (2010) that majority of Nigerian farmers are smallholders cultivating small areas of farmland. Earlier studies (Agwu*et al*, 2008, Anaeto(2010) reveals that relatively small farm holding could constitute a major constraint to technology adoption in agriculture.

The distribution of the respondents according to their involvement in cassava processing is also presented in Table 1 above. The Table revealed that majority (60%) of the processors were actively involved in cassava processing while the remaining (40%) are passively involved in cassava processing. A farmer's level of involvement may likely affect the level of his or her responsiveness to technological innovation.

2.   Status of Livelihood Outcomes

The result presented in Table 2 below is a distribution of the respondents according to their level of livelihood outcomes gained from cassava post-harvest technologies in the study area.

Table 2: Distribution of respondents according to their level of livelihood outcomes gained from cassava processing activities in the study area

Variable	Very low 1	Low 2	Moderate 3	High 4	Very igh 5	Mean Max=5	Remarks
Income generation	10 (5.6)	28 (15.6)	79 (43.9)	54 (30)	9 (5.0)	3.13	Moderate
Household food security	6 (3.3)	34 (18.9)	52 (28.9)	74 (41.1)	14 (7.8)	3.31	Moderate
Household employment	38 (21.1)	34 (18.9)	59 (32.8)	39 (21.7)	10 (5.6)	2.71	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 2 above, results of distribution of the respondents according to the livelihood outcome gained from cassava processing activities rated on a 5point Likert-type scale show thatthe respondents recorded moderate levels of livelihood outcomes gainedfrom cassava processing activities. The outcomes included income generation, household food security and household employment. The results imply that respondents are yet to maximize economic benefits of the different cassava processingpackages available and this may have been the reason for the level of poverty still predominant in the area. Asa (2008) reports that people pursue a range of livelihood outcome 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

3. Estimate of Relationship Between Farmers Socio-Economic Characteristics and Livelihood Outcomefrom Cassava processing activities

This was tested using a weighted least square regression estimate as presented in Table 3 below was used to determine the socioeconomic factors affecting Cassava Livelihood Outcomes among the Processors.

Table 3: Weighted least square regression estimate of relationship between farmers' socio-economic characteristics and livelihood outcomes from cassava processing activities

Variables	Income Generation	Food Security	Household Employment
Constant	2.548	1.233	0.921
	(3.608)***	(1.702)*	(4.559)***
Sex	-0.237	-0.151	-0.005
	(-1.475)	(-0.937)	(-0.097)
Age	0.031	0.003	0.001
	(2.590)***	(0.252)	(0.239)
Marital status	-0.434	0.172	0.000
	(-1.676)	(0.682)	(-0.011)
Processing Experience	0.002	-0.030	0.039
	(0.179)	(-2.196)***	(4.926)***
Cassava monthly income	-1.943	-1.569	-1.267
	(-0.133)	(-1.075)	(-1.925)**
Extension contact	0.051	0.146	0.006
	(0.783)	(2.267)***	(-0.348)
Educational status	-0.660	-0.531	-0.027
	(-3.395)***	(-2.744)***	(-0.689)

Farm size	0.237	0.245	0.006
	(2.847)***	(2.767)***	(0.379)
Household size	0.029	0.126	-0.004
	(0.727)	(3.177)***	(-0.291)
Membership to cooperative	0.383	0.276	-0.029
	(2.783)***	(1.959)**	(-0.706)
F-value	5.193***	6.036***	4124
R^2 value	0.290	0.322	0.245
Adjusted R^2 value	0.234	0.269	0.186
Log likelihood	-236.56	-237.66	-234.11

Figures in bracket ( ) represent t-values.

As presented in Table 3 above, the livelihood outcomes tested includes, income generation, food security and household employment, only the models for income generation with f-value (5.193) and food security with f-value (6.036) were significant at P<0.05 respectively.

As presented, the result shows a significant (P<0.05) association, existing between income generation as a livelihood outcome and socio-economic variable as age (t-ratio=2.590), farm size (2.783). Aphunu, *et. al* (2011) also observed the same socio-economic variables as affecting agricultural technologies adoption.

For food security as a livelihood outcome, an f-value (6.036) at P<0.05 also shows the significance of the model explaining the relationship between livelihood outcome and socio-economic characteristics of respondent. The required (0.322) shows that about 32% of the likelihood of the respondent livelihood outcome from cassava post-harvest technologies is explored by the socio-economic characteristics of the respondent included in the model as independent variables. It showed an association between livelihood outcome (food security) and processing experience (t-ratio = -2.196), faming experience (1.945), farm size(2.767),extension contact (2.267), educational statues (-2.744), household size (3.177) and membership of cooperatives (1.959). According to Lemchi*et al* (2003), age and faming experience influences farmers adoption of technologies and this agrees with Agbamu (1993) who in addition observed the report of farm size, extension contact in influencing farmer adoption of technologies as those with large farm size may have capacity to produce more, which he/she would be interested in preserving from loss and farmers interaction with extension may influence them towards implementing recommended innovations. From the fore going, we therefore reject the null hypothesis and accept the alternate that there is a significant relationship between farmers cassava livelihood outcome and there socio-economic characteristics.

Conclusion and Recommendations
The study shows that most of the farmers are in their active production ages with a relatively high level of literacy. It also concludes that majority of cassava farmers are women with relative high household sizes. A moderate level of livelihood outcomes of income generation, household food security and household employment gained from cassava post-harvest technologies was recorded implying that the respondents are yet to maximize benefits of the different cassava post-harvest technologies available. Also, there is a significant relationship between farmers' cassava livelihood outcome and certain socio-economic characteristics (age, processing experience, educational status, household size, extension contact, membership of social organization, monthly income from cassava and farm size). The study is of the opinion that farmers are yet to maximize livelihood opportunities in Cassava post-harvest technologies which has negatively affected livelihood outcomes gained from such activities in the study area which has serious implication on the poverty situation in the area.

It is therefore recommended that extension and advisory services should be provided for farmers to enable them access to such information that will arouse their interest in maximizing livelihood opportunities in cassava processing. Moreso, adequate training and retraining programmesshould be organized for farmers regularly to keep them abreast of current issues in cassava processing.

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