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PROMOTING IMPLEMENTATION OF SUSTAINABLE DEVELOPMENT GOALS IN RURAL NIGERIA: II FOOD SECURITY ISSUES AND THEIR DETERMINANTS AMONG CASSAVA-BASED FARMING HOUSEHOLDS IN AKPABUYO LOCAL GOVERNMENT AREA, CROSS RIVER STATE, NIGERIA

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ABSTRACT

This study analyzed the food security situation among cassava-based farming households in Akpabuyo local government area of Cross River state, Nigeria. The objectives were to describe their socio – economic characteristics, determine their food security status and its determinants and make recommendation based on the findings of the study. A multi-stage sampling procedure was used in the selection of wards, communities and cassava-based farming households. Data for the study were collected through the use of structured questionnaires administered to one hundred and three (103) households from 53 communities in the Local Government area. Descriptive statistics, food security indices and logistic regression models were used in data analysis and interpretation. The results showed that the percentages of male to female farmers differed considerably, with most households (59%) consisting of married men and women, thirty three percent (33%) of which were aged 46 years and above. Ninety eight percent (98%) of the households were comprised mostly of Christians, thirty-eight percent (38%) of whom had no formal education. Forty eight percent (48%) of the total number of the cassava farming households had less than 4 member-family sizes. The results showed also that 63.11% of the farming households were food secure, while 36.89% were food insecure. The food security gap and food surplus index showed that the food-secure households exceeded the food security line by 33%, while 59% of food-insecure household fell below the food security line. Also, the mean per capita expenditure for all households was N12, 684.21 while the mean per capita expenditure for food secure and food insecure households were N9000 and N3684.20 respectively. The estimated regression model gave a pseudo R^2 of 0.7304. Food security and Poverty status of the households were negatively correlated. The odd ratio in favour of household food security decreased by 0.03% for every unit increase in poverty (P>0.05%). It is recommended that more of the young and energetic youth population, and more women and the vulnerable be encouraged to engage themselves more in cassava and other crops' enterprises; that household sizes be controlled to manageable numbers, and sizes of their farm lands optimally expanded. Finally, sources of farmers' income should be diversified and cassava farmers should be encouraged to form and/or join cooperative societies so as to build and benefit from ensuing "social capital", as well as be in positions to benefit from possible incentives of government(s).

KEYWORDS: Sustainable Development Goals, Food Security, Cassava-based Households, Cross River State.

INTRODUCTION

The challenge of feeding 9.7 to 10.3 billion people by 2050 is enormous and daunting and the extent and depth of food insecurity in the developing world at the turn of the century and millennium remains unconscionable (Pinstrup-Andersen, 2009). Indeed, hundreds of millions of people currently do not enjoy an acceptable level of food security, that condition which exists "when all people, at all times, have physical and economic access to sufficient , safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life." About 1.3 billion people – one-sixth of the developing world's population - do not have access to sufficient food to lead healthy and productive lives. Around 201 million and 100 million of these people live in Sub-Saharan Africa and Nigeria respectively. To confront this challenge, agricultural production needs to increase, at the least, by 75% worldwide, and by almost 100% in developing countries, in order to meet growing food demand. A number of options have been proposed to help address the food security challenge, including closing the yield gap, increasing the production potential of crops, reducing wastes, changing diets and expanding aquaculture, which all need to be coordinated in a multifaceted and linked global strategy to ensure sustainable and equitable food security (Godfray *et al*., 2010).

Achieving global food security would mean that, to quote the Sustainable Development Goal No. 2, "Ending hunger, achieving food security and improving nutrition and promoting sustainable agriculture"(Anon, 2015), wherever they exist. Although hunger and deprivation are intrinsically experienced by persons,

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many indicators of food security and vulnerability are reported at the household level. While cost and complexity considerations may lead policymakers to use household-level indicators of hunger and food insecurity such as the Household Hunger Scale (Deitchler *et al*., 2011), the exclusive reliance on household-level indicators prevents a closer look at how differences among individuals within the household- whether due to sex, age, or status within the household – affect individual food security and vulnerability. More importantly, if we are to achieve the Sustainable Development Goal No. 2, more and better information on household food security (Gellen, 1994; Carletto et al., 2013; Kumar and Quisumbing, 2011, Quisumbing 2013) – especially a family's ability to grow or buy enough food for a healthy life, while addressing inequalities that hamper access to food and other resources within the family- is crucial for improved analysis and decision-making. The work reported in this paper was aimed at examining the food security issues and their determinants among Cassava-Based Farming Households in Akpabuyo Local Government Area, Cross River State, Nigeria.

Research Methodology

This study was conducted in ten selected communities of Akpabuyo Local Government Area of Cross River State, Nigeria (Agbachom and Amalu, 2016). Akpabuyo LGA, which is popularly referred to as the "Food Basket" of Cross River State, lies between latitude 4^0 55" and 5^0 40' and longitude 8^0 25' and 8^0 32' East. It lies within the Tropical Rain forest vegetation belt of Southern Nigeria and shares the Atlantic Coastline water fronts with Bakassi to the east and the Republic of Cameroons to the west (GIS-UNICAL, 2015).

The communities are Idundu/ Anyananse , Atimbo East, Atimbo West, Ikot Edem Odo, Eneyo, Ikot Nakanda, Ikot Eyo, Ikang North, Ikang South, and Ikang Central (Agbachom and Amalu, 2016), which are found in Akpabuyo LGA in the Eastern Coastline area of Cross River state. Akpabuyo LGA was created on Tuesday 27^{th} August 1991, out of the former Odukpani LGA of Southern Senatorial zone of Cross River state. It became the 14^{th} and 589^{th} LGA in Cross River state and Nigeria respectively. According to the Millennium Year Book of Local Government Councils in Cross River State (Anon, 2010), Akpabuyo LGA had a total population of 360,000 persons. The total area of the districts is about 28.5 square kilometers of which 60% is arable (AfDB, 2013). The study areas represent some of the major cassava-and maize-growing areas of the State. The agricultural production system is mixed crop-livestock (traditional) agricultural system whereby a smallholder farmer practices food-crops and livestock production under the same management. The major crops grown in Akpabuyo include Cassava, cocoyam, plantain/bananas, Kola nut, coconut, and Oil palm produce as well as sea foods. These crops are produced both for cash income and for household consumption while Goats, sheep, and poultry are also important livestock kept by the smallholder farmers. Thus, crops and livestock contribute their share to the farmers' farm income. Again, while cassava, cocoyam, plantain/bananas are major crops in terms of quantity and cultivated land area in the study areas, cassava is the crop of focus in this study.

Sampling techniques and data collection.

A multi-stage sampling procedure (Ebo, 2009) was used to select wards, communities and farming households. In the first stage, the ten wards were purposively selected from the major cassava producing areas based on the intensity of Garri production, agro-ecology and accessibility. Varying numbers of households from each of the communities were randomly selected (Table 1). Out of a total of 176 farm households randomly selected. (103 farm households were cassava-based farming households from 53 wards respectively). For the sake of homogeneity among farm households, the 103 households who engaged in cassava productions were considered for the study. Data were collected by 19 enumerators from cassava-based households using structured interview questionnaire schedule. The survey collected valuable information on several factors including household composition and characteristics, land and non-land farm assets, household membership in different rural institutions, cassava-farm acreage, costs of production, yield data, and indicators of access to infrastructure and household market participation.

Table 1: Selected community, Numbers of Farming households, numbers of cassava-based households and field work Enumerators

Communities	Number of Households	Number of Cassava-Based Households	Enumerator(s)
Idundu/ Anyananse	**13**	**08**	**2**
Atimbo East,	**12**	**09**	**2**
Atimbo West,	**17**	**11**	**3**
Ikot Edem Odo,	**20**	**10**	**2**
Eneyo,	**21**	**12**	**2**
Ikot Nakanda,	**17**	**10**	**2**
Ikot Eyo,	**21**	**07**	**2**
Ikang North,	**18**	**10**	**2**
Ikang South,	**19**	**12**	**2**
Ikang Central	**18**	**14**	**3**
TOTALS	**176**	**103**	**22**

Source: Field survey data, 2015

Sources of Data and Analysis

The primary data used in this study were obtained through solicited responses by cassava-based household farmers (units of analysis) in personal interview sessions and distributed questionnaires. One hundred and three (103) questionnaires were administered to the identified cassava-based farming households and on completion; the well-filled completed questionnaires were retrieved for collation, coding/encoding, analyzed and interpreted. Section A of the questionnaire consists of questions on Household demographic and socio-economic characteristics, Section B consists of questions on food security status of the farming households. Descriptive statistics (using mean frequency and percentages) were used to analyze socioeconomic characteristics. Food security index and Logistic regression model were used to analyze food security status and its determinants.

Measurement of Food (In) security

In accessing food security at household level, a food security index was constructed. This involved two steps: identification and aggregation process. This method has been applied in several studies whose main focus was to determine the food security status of households (Omotesho *et al*, 2006; Asogwa and Umeh, 2012; and Amaza *et al*, 2009). The identification process defines the minimum level of nutrition (calories) necessary to maintain healthy living; this is the food security line. The FAO recommended minimum daily energy requirement per adult equivalent is 2250K cal; therefore this value defines the food security line for the study. Household which are below the food security line are classified as food insecure households while those households that are above are classified as food secured households. Aggregation on the other hand involves estimating the daily per capita calories consumption of each household. To do this, the estimated daily calories supply of households was divided by the household size adjusted for adult equivalents using the consumption factor for age-sex categories. Household calories supply was estimated using food nutrient composition for cassava since it is the common food consumed by the respondents in the study area.

$$\text{Food security index } (Z) = \frac{\text{Household daily per capita calories supply}}{\text{Recommended daily calories requirement}} \quad \text{---------- Equation 1}$$

Estimation of Logistic Regression

Based on the Farming household food security status (z), the logic model was estimated to identify the determinants of food security among farming households. The implicit form of the model

$$Zi = ßXi + Ui \quad \text{---------- Equation 2}$$

Where
Zi = the food security status of the farming household
Xi = vector of explanatory variables
Ui = the error term

ß = vector of the parameter estimates

The dependent variable and the explanatory variables that were included in the model are
Z_1 = Age
Z_2 = Education
Z_3 = Household size
Z_4 = Farm Size
Z_5 = Farming Experience
Z_6 = Food crop output
Z_7 = Poverty status

Food security

To identify the factors influencing the food security status of rural farming households, Two stages of analyses were used; first was construction a food security index (Z_i) and second the determination of the food security status of each household as used by Ibok et. al. (2014). The logit model was used to estimate the food security status of households as a function of a set of independent determinants. The food security index (Z_i) used to classify households food security status is given by:

$$Z_i = \frac{per\ capita\ food\ expenditure\ for\ the\ ith\ household}{\frac{2}{3}\ mean\ per\ capita\ food\ expenditure\ of\ all\ households} \quad \textbf{Equation 3}$$

Where Z_i = food security index (when $Z_i \geq 1$ = food secure ith household, $Z_i \leq 1$ = food insecure ith household)

A food secure household is, therefore, that household whose per capita monthly food expenditure falls above or is equal to two-third of the mean per capita food expenditure. On the other hand, food insecure household is that whose per capita food expenditure falls below two-third of the mean monthly per capita food expenditure. Additionally, food insecurity gap index, food surplus gap index and headcount ratio of food security were calculated for the sample households based on the food security index (Z). The food insecurity gap (P), measures the extent to which food insecure households on average fall below the food security line and the food surplus gap (S), the extent by which food secure households exceeded the food security line. The headcount ratio (H) measures the percentage of the population of household that are food insecure/secure.

- Food insecurity gap index (P) = $\frac{1}{M}\sum_{i=1}^{m} Gi$ where $G_i = \frac{R-Y_i}{(R)}$ ---------- **Equation 4**
- Food surplus gap index (S) = $\frac{1}{L}\sum_{i=1}^{L} Gi$ where $G_i = \frac{y_i - R}{(R)}$ ---------- **Equation 5**
- Headcount index (H_{fi}) = $\frac{M}{N}$ ------- **Equation 6**
- Headcount index (H_{fs}) = $\frac{L}{N}$ ---------- **Equation 7**

Where M = number of food insecure households; N = total number of households in the sample; L = number of food secure households; G_i = deficiency or surplus faced by ith households; H_{fs} = headcount index for food secured households; H_{fi} = headcount index for food insecure households; Y_i = monthly per capital expenditure on food item of ith households; R = food security line (N1,132.27)

Based on the household food security index (Z_i), the logit model was estimated to identify the determinants of food security among Cassava-based farming households. The implicit form of the model is expressed as in Equation 2.

$Z_i = ßX_i + U$ ---------- **Equation 8**

Z_i = Household food security status (food secure households = 1, food insecure households = 0)
X_i = vector of explanatory variables
U = Error term
ß = Vector of the parameter estimates

but the Xs in Equation 8 are explanatory variables and are defined as follows: AOF = Age of Farmer; Edu = level of education; HSZ = Household size; FSZ = Farm size; FAMEX = Farming experience (years); COUTPT = cassava output; PST = Poverty status

RESULTS AND DISCUSSION

The heads of respondent-cassava-based households were dominated by male cassava-based farmers who pooled 59% of the total, with women occupying the remaining 41% of the population (Table 2) This result is rather surprising as in Africa and particularly in Nigeria, cassava is socio-culturally presumed to be a woman's crop, while yam – the King of all crops is in turn presumed to be a man's crop; but the reasons are not far-fetched. The reasons are simply ecological (as noted earlier in Table 2) and economic. Whereas cassava can grow well in virtually under any agro-ecological conditions in the hot, humid tropical areas of Africa, yams are choosy and intolerant of excessive water or moisture conditions, persistent cloudy weather and high insolation conditions in this agro-ecology. Culturally, no premium is attached to yam consumption in Akpabuyo, whereas cassava-based meals are highly cherished. As a result of the premium attached to cassava-based meals, the favourable soil and climatic conditions and the relative ease of management of cassava cultivation in the field, cassava-based enterprises are preferred to yam-based enterprises in this local government area. This explains the predominance of male-headed respondent households in cassava cultivation in Akpabuyo Local Government Area

The age range of respondents involved in active cassava farming in Akpabuyo is 21 to over 45 years, as the this age bracket pooled an overwhelming Ninety four percent (94%) of the respondents' population actively involved in cassava cultivation(Table 2). This is in line with works of Earfan-Ali and Samad (2013) which reported an overwhelming majority of farmers within 31 and 50 years. The age range of 26-45 years had sixty seven percent (67%) of the total population, while those above 46 years were only Thirty three percent (33%). The predominance of the younger famers in cassava production is an indication of the ease of entry into cassava enterprise. The cassava enterprise is usually not capital intensive at subsistence level and very minimal cultural practices are required for profitable production, thus both the young and old enter cassava production with little capital and own labour for profit.

Studies have shown however that cassava responds well to fertilization.

In Akpabuyo Local Government Area cassava cultivation is basically in the hands of married men and women, as this group pooled up fifty nine percent 59% of the total population of respondents. This group is remotely followed by widows/widowers (15%) and single parents (13%), while the divorcees/Separated men and women and single youngsters were the least involved as they pooled approximately ten percent (10%) and four percent (4%) respectively of the total population of respondents. The reasons for the low level of involvement of divorces/separated men and women and single person were not readily discerned in this work, but may not be unconnected with the culture of the people of this area which denies divorced women access to family lands. Single persons find alternative means of livelihood, other than cassava farming.

The educational assessment of the cassava farmers in Akpabuyo (Table 2) shows that a very high 38% of the population had no formal education; only 36% had primary school certificate, while those that had secondary school education were only 20%, and an abysmally low 6% of the total population proceeded to any post-secondary school education. The statistics here imply that over 90% of the cassava farmers in Akpabuyo have little (primary level) or no education at all. Although level of education has no direct link with food security, it does affect their farming activities and farmers' responses to new ideas and/or innovative technologies. Agricultural extension experts have reported that farmers with higher educational qualifications always want to adopt new agricultural technologies more than those without or with lower educational qualifications. Many studies (Earfan-Ali and Samad 2013; Elias and Hossain, 1983) found positive relationship between education and productivity, as well as that farmers with four or more years of schooling caused an increase in productivity. In this context, no education at all or little education does hamper degrees of adoption and adaptation of food production technologies by the farmers and ultimately food security.

It is surprising to observe that, whereas an overwhelming 101 respondents, out of the total number of 103 were Christians (98%), an infinitesimal 2% were pagans and/or atheists. Religious beliefs tend to influence number of hours that families spend in religious houses – This is particularly so with the recent expansionist trends in Pentecostalism, (where at the least 30% of the 24hour day is spent in the church) as against the so-called conservationists in the orthodox churches (where a little over 10% of the day is spent in the churches).

Table 2: Demographic and Socio-economic Characteristics of Cassava-based farmers in Akpabuyo local Government area.

Characteristics	Number of Respondents	Percentage of Totals (%)
Gender of Respondents		
Male	61	59.2
Female	42	41.8
Totals	**103**	**100**
Age of Respondents		
21 – 25 years	6	5.8
26 - 30 years	13	12.5
21 - 35 years	12	11.5
36 - 40 years	17	16.3
41 - 45 years	22	21.2
>46 years	33	32.7
Totals	**103**	**100**
Marital Status of Respondents		
Married	61	59.22
Single	13	12.62
Divorced/Separated	10	9.71
Widow/Widower	15	14.57
Never Married	4	3.88
Totals	**103**	**100**
Educational attainment of Respondents		
Post-Secondary School Certificate	6	05.82
Secondary School Certificate	21	20.38
Primary School Certificate	37	35.92
No Formal Education	39	37.88
Totals	**103**	**100**
Religion affiliation of Respondents		
Christianity	101	98.06
Traditional	2	1.94
Totals	**103**	**100**

Source: Field Survey Data, 2015

In this study, household size was described as the total number of persons living together under the administration of a single head of the family (Earfan-Ali and Samad, 2013). National household size in Nigeria is stipulated at six (6) persons per household. Forty eight percent (48%) of the cassava farmers had less than 4 persons per household; followed very closely by 42% of the total number of cassava farmers who have household sizes approximately at the National average of 6. Only very little 7% of the farmers had more than 10 persons per household (Table 3). Both paganism and the Islamic religion, for example, permit and promote large household sizes with the encouragement of early marriages and polygamous family systems. On the other hand, Christianity promotes monogamy, even as it prohibits even the most effective and safest forms of contraception, thus limiting population increases. Whereas reasonable household sizes ensure optimal food production and food security, overpopulated household sizes do the opposite, further depleting scarce resources and exacerbating food insecurity and poverty status.

In terms of primary daily occupation of the cassava based respondents, the community is

dominated by mainstream cassava farmers, as nearly half (49%) of the respondents are engaged on daily basis exclusively farming activities (Table 3), while the remaining 51% of the cassava based farmers are either in self-employment in off-farm activities such as tailoring, hair-dressing, photography etc, (26%) or gainfully employed in the public/civil services of the local government council (11%). Within this group are found house-keepers of various categories (such as housewives, disabled persons, people incapacitated etc) who pooled a little 5% of the total population and youngsters/youths (10%) who are engaged in sundry income generating ventures such as transport businesses (Taxi and Okada etc), auto-mobile repairs, generating sets repairs or hired in sand-dredging, masonry jobs, etc as hired labour.

The results showed also that the age at which children born and living in Akpabuyo experienced any form of farming activities was from 6 years (Table 3). No respondent agreed to having been exposed to any form of farming activity when he or she was below six years of age. Majority of the adult population who had no experience in farming were mostly stranger-elements residing in the local government area. Children of all ages do benefit enormously from visiting their parents' crop fields, grazing grounds and assisting in the processing of harvested food-crops at home or in distant farm lands. An overwhelming 91% of the cassava-based farming population experienced farming activities from their middle teenage (>15) years. Only approximately 9% of the cassava-based farmers agreed to have had the privilege of non-formal learning of farming activities. Non–formal learning of farming activities takes place naturally and spontaneously, as part of other activities in the family.

The monthly income categorizations of cassava-based respondents are presented in Table 3. The monthly income composition table revealed that 61.17% of the respondents earned between 1000 and 30,000 Naira monthly and this was the highest income range amongst the cassava-based farming households. Other respondents who earned between 30, 0001 and 50,000 Naira were 28.16%, while those that earned well over 50, 000 Naira were about 10.67%. These results show that the farmers that earned well over N50, 000 were the cassava-based farmers who were engaged also in one form of off-farm activity or the other. Most of the farmers in this category owned small-sized farm lands, and small-scale to medium scale off-farm businesses. Majority of the farmers who earned between 1000 and 30,000 Naira belonged to the group that depended wholly on Cassava farming, as shown in Table 3. Those cassava farmers who engaged themselves also in only one or two off-farm activities earned between 30,001 and 50,000 Naira. The monthly income earned by the farming households appear to have depended on sizes of the farms, which were not determined in this study and on the number of off-farm activities engaged on by the cassava farmers; altogether determining the poverty status and levels of food insecurity of the farming population in Akpabuyo.

Table 3: Economic Characteristics of Cassava-based farmers in Akpabuyo local Government area.

Characteristics	Number of Respondents	Percentage of Totals(%)
Size of Respondents' Households		
< 4	49	47.58
5 – 6	43	41.75
7 – 9	4	3.88
>10	7	6.79
Totals	**103**	**100**
Major occupation of Respondents		
House-keeping (Housewife, etc)	5	4.85
Off-farm activities (Self-employed)	27	26.21
Off-farm activities (Civil service)	11	10.68
Farming activities	50	48.54
Others(Hired Labour etc)	10	9.71
Totals	**103**	**100**
Age at which respondents experienced farming activities		
< 6 years	0	0.0
6 – 15 years	9	8.74
>15years	94	91.26
Totals	**103**	**100**
Monthly Income group (N)		
1000 – 30,000	63	61.17
30,001 – 50,000	29	28.16
50,0001>	11	10.67
Totals	**103**	**100**

Source: Field Survey Data, 2015

Food security status and Indices of Respondent-farmers in Akpabuyo Local Government area.

The coefficient of food security status has a negative logit effect of 6.92 and significant at the 1% level. The implication is that the probability of escaping from poverty trap and being non-poor increases as food security increases; and as food insecurity increases, the likelihood of being poor increases. The odds ratio of 11 implies a higher level of food insecurity for poor households. Based on the above results, the larger question of who is food secure and or food insecure comes to fore. The food security indices for cassava based farming households in Akpabuyo Local Government area are shown in Table 4. The households were categorized into food-secure and food-insecure groups based on their per capita food expenditure (Egbuna 2009; Ibok et al, 2014). The estimated food security line was N1, 132.27. Based on the above, sixty three percent (63%) of the cassava-based farming households were food-secure, while 36.89% were food-insecure. The food security gap and food surplus index which measure the extent of deviation from the food security line shows that the food-secure households exceeded the food security line by 33%, while 59% of food-insecure household fell below the food security line. Also, the mean per capita expenditure for all households was N12,684.21 while the mean per capita expenditure for food secure and food insecure households were N9,000 and N3,684.20 respectively.

Table 4: Food security Indices for cassava based farming households in the study area.

Food security Indices	Food secure	Food Insecure	All
Percentage of household	63.11	36.89	100
Number of households	65	38	103
Head count ratio (H)	0.63	0.39	
Food Security gap/surplus gap index	1.33	0.59	
Mean per capita expenditure	N9,000	N3,684.20	12,684.21

Food Security line = N1, 132.27

Source: Field survey data, 2015

Determinants of Food Security Status of Cassava Based Farming Household in Akpabuyo LGA

The determinants of Food Security Status of cassava based farming households in Akpabuyo Local Government area are shown in Table 5. From the Table, the estimated model predicted the food security status of cassava based farming household with 96.80% accuracy. The estimated regression model gave a pseudo R^2 of 0.7304, which implies that all the variables included in the model were able to explain about 73% of the determinants of food security status among cassava-based farming households. The log likelihood ratio (LR) statistics of -18.28 is significant, indicating that the variables included in the model jointly explained the probability associated with the variables.

The log odd coefficient of Age of household head (AGE) was statistically significant at 5%and had a positive effect on the food security status of cassava-based farming households. The odd estimates interpretations imply that as the age of household heads increased, the odds in favour of households to be food-secure increases by 1.2632 times or about 26.3%. This implies that the older the head of a farming household, the more likely for that their household to be food-secure. This is attributable to the fact that age not only provides experiences, but avails the heads with unlimited opportunities that may not be available to younger heads of households. Farmers with more experience tend to be more efficient (Olagunju et al, 2012)

Table 5: Logit model estimates of determinants of food security status of cassava based farming household in Akpabuyo LGA

Variables	Coefficients	Standard Error	Z-value	Odds Estimates	Marginal effects
Constant	-0.5554	2.5926	-0.21	-	-
AGE	0.2337	0.0842	-2.49**	1.2632	0.0072
EDU	-2.5271	1.0141	-2.49**	0.1174	0.0782
HSZ	-0.9094	0.3868	-2.35**	0.4028	-0.0281
FSZ	-0.9009	0.6885	-1.35	0.4062	-0.0278
FAMEX	0.6606	0.5310	3.63*	1.9359	0.0204
COUTPT	0.0007994	0.0022	3.63**	1.0008	0.0000247
Poverty	-5.9811	2.1042	-2.84**	0.002526	-0.4563

Source: Field Survey Data, 2015

Log – likelihood = -18.2809

LR chi square (7) = 99.07

Psedo R^2 = 0.7304

Percentage cases predicted correctly = 96.80%

Note EDU= Education, HSZ=Household size, FSZ= Farm-size, FAMEX=Farmers Experience, COUTPT= Cassava output

For farmer's years of experience (FAMEX), the log odd coefficient was statistically significant at 5% and had a positive effect on the food security status of cassava based crop farming households. The odd interpretation implies that every unit increase in farmers' years of engaging in farming activities, the odd in favour of households to be food secure increases by 0.4062 times or 40.62%. This result implies that the more years the households are involved in farming activities the more likely the chances of their being food-secure and agrees with the findings of Asogwa and Umeh (2012) that on-the-job skills acquisition enhances efficiency and productivity in agricultural practices.

The log – odd coefficient of cassava output (COUTPT) was statistically significant at 5% and had a positive effect on food security of the farming households in the study area. The implication here is that for every unit increase in cassava output the odd ratio in favour of households food security increase by 1.0008times or 0.08%. Therefore the higher the amount of food obtained from own household production, the greater the chances and likelihood of that household becoming food-secure.

However, number of years in school (EDU), Household size (HSZ), farm size (FSZ) and Poverty status (POV) are negatively related to the food security status of the households. These variables were statistically significant at 5% except farm size. The implication here is that for every unit increase in these variables, the odd ratio in favour of household food security decrease by 0.117, 0.402, 0.402, and 0.0025 or 11.7%, 40.6% and 0.03% for the number of years in school, household size, farm size and poverty status respectively. The negative relationship between number of years in school and food security is particularly remarkable and contrary to age-long held view that level of education enhances efficiency and productivity. The effect of household size is very important because it increases the number of consumers putting pressure of the household resources, particularly food; and household with high dependency ratio are naturally prone to food insecurity.

CONCLUSION AND RECOMMENDATIONS

Based on the results above, it is evident that the food security status of cassava-based farming households in Akpabuyo local government area of Cross River state were and still are heavily dependent upon the socio-economic characteristics (ages of household heads, gender of heads of households, household sizes, educational Level of household members, sizes of own farm lands and income-earning capacities of household members) of the cassava-based farming households. In considering the food security line estimated at N1, 132.27, only thirty seven percent (37%) of the cassava-based farming households were food insecure; implying that an overwhelming sixty-three percent (63%) of the total number of household were food secure. Yet, ages of household heads, gender of heads of households, household sizes, educational level of household members, sizes of own farm lands and income-earning capacities of household members largely determined the food security situations in Akpabuyo local government area of Cross River State. With the foregoing conclusions, it is hereby recommended that any intervention strategies aimed at alleviating and mitigating the excruciating pains and pangs of food insecurity in Akpabuyo local government area of Cross River State should necessarily be targeted at (a) encouraging the young and energetic youth population to engage themselves more in cassava and other crops' enterprises, (b) encouraging more women to engage in cassava farming and empowering more of the women and the vulnerable into investing more in cassava farming, and discouraging large household sizes, possibly with campaigns on family planning (c) providing more incentives for more household heads, regardless of their gender and their children to acquire as much education (formal or informal) as possible even while cultivating cassava as main or minor crop, (d) encouraging cassava-based farming households to optimally expand the sizes of their farm lands or intensify use of available pieces of land with low external inputs, (e) encouraging the cassava-based farming household members to diversify their sources of income by engaging in more off-farming activities and finally, (f) encouraging cassava-based farmers in Akpabuyo local government area to form and/or join cooperative societies so as to build and benefit from ensuing "social capital", as well as be in positions to benefit from possible incentives of government(s) on cassava production, example "Cassava Bread Fund", which are readily available and "collateral free" in the states' agricultural sector ministries and agencies nationwide.

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