Effect of RTIMP's Commercialisation of Cassava on Household Food Security in the Cape Coast Metropolis in the Central Region of Ghana

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Abstract

Root and Tuber Improvement and Marketing Programme was instituted to enhance income and food security, and to build a market-based system to ensure profitability at all levels of the root and tuber value chain. The RTIMP provided incentives to farmers to commercialise production (transform from subsistence to commercial production) thereby improving their incomes and food security. However, scientific feedback on the impact of this commercialisation programme on farmer households' food security is inadequate. The study was conducted to examine the factors that influence farmers' degree of commercialisation and determine the relationship that exists between degree of commercialisation and food security status among the agricultural households in the Cape Coast Metropolis. Random and snowballing sampling methods were used to select 50 beneficiary and 50 non-beneficiary households respectively, and data were collected using questionnaire. Data obtained were analysed using descriptive statistics, Household Food Insecurity Access Scale (HFIAS), multiple regression and probit models. Results of the study showed that majority of the beneficiary households (76%) were food secure compared to the non-beneficiary households (42%); beneficiaries were more commercialized than non-beneficiaries, and there was a positive association between degree of commercialisation and food security status. It was concluded therefore that RTIMP's commercialisation of cassava was playing a significant role towards improving household food security in the Cape Coast Metropolis. It was recommended that the programme should be extended to cover more farming households in order to minimize food insecurity situation in the Metropolis.

Keywords – Household, food security, Commercialisation, RTIMP and Cassava

Effet de la Commercialisation du Manioc Par RTIMP Sur la Sécurité Alimentaire des Ménages Dans la Métropole de Cape Coast, Dans la Région Centrale du Ghana

Résumé

Un programme d'amélioration et de commercialisation des racines et tubercules a été mis en place pour améliorer le revenu et la sécurité alimentaire, ainsi que pour créer un système fondé sur le marché garantissant la rentabilité à tous les niveaux de la chaîne de valeur des racines et

tubercules. Le RTIMP incitait les agriculteurs à commercialiser leur production (passant d'une production de subsistance à une production commerciale), améliorant ainsi leurs revenus et la sécurité alimentaire. Cependant, les informations scientifiques sur l'impact de ce programme de commercialisation sur la sécurité alimentaire des ménages d'agriculteurs sont insuffisantes. L'étude avait pour objectif d'examiner les facteurs qui influent sur le degré de commercialisation des agriculteurs et de déterminer le lien qui existe entre le degré de commercialisation et le niveau de sécurité alimentaire des ménages agricoles de la métropole de Cape Coast. Des méthodes d'échantillonnage aléatoire et boule de neige ont été utilisées pour sélectionner respectivement 50 ménages bénéficiaires et 50 ménages non bénéficiaires, et les données ont été collectées à l'aide d'un questionnaire. Les données obtenues ont été analysées à l'aide de statistiques descriptives, le barème d'évaluation de la sécurité alimentaire des ménages de modèles de régression multiple et de modèles probit. Les résultats de l'étude ont montré que la majorité des ménages bénéficiaires (76%) étaient en sécurité alimentaire par rapport aux ménages non bénéficiaires (42%), les bénéficiaires étaient plus commercialisés que les non-bénéficiaires et il existait une association positive entre le degré de commercialisation et la sécurité alimentaire. Il a donc été conclu que la commercialisation du manioc par RTIMP jouait un rôle important dans l'amélioration de la sécurité alimentaire des ménages dans la métropole de Cape Coast. Il a été recommandé d'étendre le programme à un plus grand nombre de ménages agricoles afin de minimiser la situation d'insécurité alimentaire dans la métropole.

Mots-clés - Ménage, sécurité alimentaire, commercialisation, RTIMP et manioc

Introduction

In Sub-Saharan Africa, roots and tubers are amongst the most important food security crops and represent a vital source of calories for more than 400 million Africans and contribute more than 600 calories per capita per day in the following countries: Angola, Democratic Republic of Congo, Congo-Brazzaville, Central African Republic, Mozambique, Ghana, Cote d'Ivoire, Rwanda, Togo, and Benin (FAO, 2000). The production and development of roots and tubers have become necessary in most developing countries with their production projected to increase by 58% (i.e. from 232 million tonnes to 635 million tonnes) from 2003 to 2020 (Scott *et al*., 2000).

Since 1995, Ghana's national food security strategy is to produce cassava, yam, cocoyam and sweet potato, in more than sufficient quantities at all times to satisfy human and industrial requirements with emphasis on food security and poverty alleviation (Kenyon *et al.,* 2006). Consequently, a range of programmes such as Root and Tuber Improvement Programme (RTIP), Root and Tuber Improvement and Marketing Programme (RTIMP), West Africa Agricultural Productivity Programme (WAAPP) among others are set out to ensure development in the roots and tuber sub-sector of the agricultural economy for the attainment of the above mentioned desired objectives especially in the rural areas.

The Root and Tuber Improvement Programme (RTIP) was implemented from 1999 to 2005 with the aim of developing the roots and tuber sub-sector with its focus essentially on developing crop production through research and extension. Under the RTIP, new varieties of cassava and sweetpotato were successfully developed through investment in research, and an effective multiplication and distribution

system was also created so as to increasing the availability of planting materials and yields for its 720,000 targeted smallholder farmers thereby raising their incomes. However, increased cassava yields did not lead to higher incomes. Farmers instead were facing higher production costs and lower output prices (IFAD, 2004).

In view of this, the Root and Tuber Improvement and Marketing Programme (RTIMP) was initiated by the International Fund for Agricultural Development (IFAD) and the Government of Ghana (GoG) for a period of 8 years (2007-2014) with the aim of enhancing income and food security to improve livelihoods of the rural-poor and to build a market-based system to ensure profitability at all levels of the value chain. To achieve its objective, the RTIMP provided incentives to farmers in order to produce beyond subsistence consumption, and to process surpluses for the market economy with the aim of improving their incomes and food security. However, there is inadequate scientific feedback on the impact of this commercialisation programme on farmer households' food security especially in the Cape Coast Metropolis.

Food security has been defined as a state in which all people at all times have both physical and economic access to sufficient food to meet their dietary needs for a productive and healthy life (USAID, 1992 cited in Coates *et al.*, 2007). The Ministry of Food and Agriculture (MoFA, 2002) of Ghana has specified quantity, quality, safety, timely availability, location and affordability aspect of food in the context of food security. Food security has three components namely food availability (sufficient availability of food to households through production, storage or imports); food accessibility (one's ability to purchase), and food utilization (ingestion and digestion of enough and quality food for maintenance of good health) (Gary *et al.*, 2000). Von Braun *et al.* (1992 cited in Oluwatayo (2009) contend that a number of other factors, such as the health, sanitation and household or public capacity to care for vulnerable members of the society also come into play in ensuring household food security. Shama (1992) has also indicated non-food factors such as health conditions, social and cultural practices as important factors to individual (household) food nutrition and security.

The relationship between agricultural commercialisation (transformation from subsistence to commercial production) and food security has been the subject matter of many studies with diverse findings (Dewey, 1980, 1981; Flueret and Flueret, 1980; Eicher and Baker, 1982; Kennedy and Cogill, 1987; Bouis and Haddad, 1990; Randolph, 1992; Immink and Alarcon, 1993; von Braun and Kennedy, 1994, Von Braun, 1995). Dewey (1980); Eicher and Baker (1982); Flueret and Flueret (1980) posit that agricultural commercialisation negatively affect food consumption and nutrition status of various individuals by increasing market vulnerability and food insecurity.

In his study in rural Mexico, Dewey (1981) found that dietary diversity, dietary quality, and nutritional status of preschool children was negatively associated with lower crop diversity and increased dependence on purchased foods. Bouis and Haddad (1990) in their study found that several former corn tenant households in Philippines had lost access to lands and employment when landlords who had decided to grow sugarcane chose to hire labour for the new crop rather than rent out land on share-of-harvest basis with corn as a result of sugarcane commercialisation. Randolph (1992) also found that agricultural commercialisation in Malawi had a negative influence on child

nutrition, especially during the seasons of nutritional stress. Immink and Alarcon (1993) cited in Jaleta, *et al.* (2009) contended that in smallholder commercialisation, it is assumed that resources are being diverted from food crops to cash crop production which results in lower food availability from own production and more dependence on local food markets.

Kennedy and Cogill (1987) argued that by exploiting the comparative advantages and generating faster growth for overall economy, commercial agricultural production raises income to improve nutrition and food security. Von Braun and Kennedy (1994) asserted that commercialisation in agriculture helps to alleviate poverty and improve food security by simulating agricultural growth, improving employment opportunities and expanding food supplies and income leading to improvement in food consumption and nutritional welfare of households. Evidence from International Institute of Tropical Agriculture - IITA (2010) showed that commercialisation of cassava offered women farmers another income stream, and improved livelihoods and food security in some African countries such as Nigeria, Democratic Republic of Congo, Ghana, Malawi, Mozambique, and Tanzania.

It is apparent that some researchers have found commercialisation of subsistence agriculture vital to household food security while to others, it has been a nuisance. Thus, impact of commercialisation of agriculture stand to be setting specific.

It is therefore important that programmes designed by Government Institutions, NGOs or International Organisations to motivate and propel farmers to commercial production through incentives, widening market access, or deepening market transactions as means of improving livelihoods and food security be assessed in order to know their ramification. This coupled with the limited scientific feedback of the RTIMP's influence on food security of some 720 farming households in Ghana provided the motivation for this study.

The study assessed the effect of RTIMP's cassava commercialisation on food security among farming households within the Cape Coast Metropolis in the Central Region of Ghana. Specifically, it examines the factors that influence the households' degree of commercialisation, and the relationship that exist between degree of commercialisation and food security status among these households. This study is thus important in the sense that it provides useful insights that could help the Government to appreciate the impact of the RTIMP on household food security status and therefore make necessary amendments where necessary. Results of the study provides understanding on some of the factors that influence cassava commercialization, and the implications of commercialisation of cassava on household food security which could be useful in making policy direct pertaining to commercialisation of agriculture.

Overview of the RTIMP

The Root and Tuber Improvement and Marketing Programme (RTIMP) is a follow-up to the Root and Tuber Improvement Programme (RTIP) which was implemented over 1999 to 2005. RTIMP is being sponsored by the International Fund for Agricultural Development (IFAD) and the Government of Ghana (GoG) for a period of 8 years (2007-2014). The programme is expected to be implemented across 60 districts. The goal of RTIMP is to enhance income and food security to improve livelihoods of the rural-poor and to build a market-based system to ensure profitability at all levels of the value chain.

The purposes of RTIMP are:

1. Enhance market relations within the

Root and Tuber commodity chain to ensure a "pull" factor for increased production; and to facilitate a better balancing of supply and demand.
2. Sustainable enhancement of farm level productivity of root and tuber crops (Cassava, Cocoyam, Yam, Sweetpotato, Persa Frafra potato).
3. Improve root and tuber processing and marketing.
4. Increase access of the economically active poor to working capital and investment capital by promoting new target-group specific lending instruments.
5. Organizational development including the creation of an Apex Body for root and tuber commodity chain.
6. Information dissemination, education and communication campaigns.

The programme is made up of four components namely:

1. Component A: Support to increased commodity chain linkages.
2. Component B: Support to Root and Tuber Production.
3. Component C: Upgrading of Small-Scale Root and Tuber Processing, Business and Marketing Skills.
4. Component D: Programme Coordination, Monitoring and Evaluation.

Research Methodology

Sampling and data collection

The study was conducted in the Cape Coast Metropolis in the Central Region of Ghana. The metropolis is one of the few RTIMP covered areas for cassava (and some sweet potato) in the Central region. Survey design was adopted for the study. The population for the study consisted of all cassava producing households in the Cape Coast Metropolis. One hundred households comprising of 50 beneficiary of RTIMP and 50 non-beneficiary households were selected as sample from seven purposively selected communities namely Ankaful, Efutu, Mpeasem, Nyinasin, Koforidua, Brabedze and Dahia. The reason for selecting these communities is that crop farming is the main occupation of the majority of the inhabitants, and cassava is the major food crop grown by the farmers in there.

The beneficiary households were selected from the RTIMP beneficiaries' register obtained from the Ministry of Food and Agriculture using a simple random method while the non-beneficiary households were selected using snowballing method because they were hard to find, and so required assistance of a key informant to identify them. Primary data were collected from respondents using questionnaire. Data were collected in February, 2011.

Data analysis

Analytical tools such as descriptive statistics, t-test, household food insecurity access scale (HFIAS), multiple regression model and probit model were used to analyse the data obtained. Data analysis was done using SPSS (v.16) and STATA (v.10) computer applications.

Analytical techniques

The study adopted the Household Food Insecurity Access Scale (HFIAS), multiple regression and probit models in determining food security status of respondents; household's degree of cassava commercialisation and the relationship between degree of commercialisation and food security status of households respectively.

The HFIAS is an 18-questions module (see Appendix) which psychologically enable researcher to detect the prevalence of food insecurity of household and changes in household food insecurity situations over time. It has scale score from 0 to 27 which reflect increasing order of food insecurity.

Households with scale score of 0 or 1 were considered food secure and those with scale score of 2 to 27 foods insecure. HFIAS is considered an important measure because it escapes the challenges (technical difficulty, data-intensiveness, and high cost of data collection) associated with other methods like income and caloric adequacy (Coates *et al.*, 2007).

The factors that influence farm household's commercialisation were assessed using the multiple regression model with household commercialisation index as the dependent variable. The model was estimated using maximum likelihood estimation (MLE) and specified as:

$$HCI = \alpha_0 + \alpha_1X_1 + \alpha_2X_2 + \alpha_3X_3 + \alpha_4X_4 + \alpha_5X_5 + \alpha_6X_6 + e$$

Where:

HCI = Household's Commercialisation Index (expressed as the ratio of the gross value of cassava sales to the gross value of total cassava production per year). This index gives the degree at which households are commercialising cassava production.

X_1 = Age (Age of household head in years)
X_2 = Education (Years of formal education of household head)
X_3 = Beneficiary status (1 if household head is a beneficiary of RTIMP or 0 if otherwise)
X_4 = Household size
X_5 = Size of cassava farm (in hectares, ha)
X_6 = Other farm income (income from farm sources other than cassava in GH¢/annum)
α_0- α_6 = Parameters to be estimated, and
e= Residual term.

The probit model was also used in determining the relationship that existed between households' degree of commercialisation and their food security status (Gujarati, 1995; Oluwatayo, 2009). The probit model is specified as:

$$Y = \beta_0 + \beta_1Z_1 + B_2Z_2 + B_3Z_3 + B_4Z_4 + B_5Z_5 + B_6Z_6 + B_7Z_7 + B_8Z_8 + \mu$$

Where:

Y=Food security status (1 if household is food secure and 0 if otherwise)
Z_1=Age (Age of household head in years)
Z_2 = Education (Years of formal education of household head)
Z_3 = Marital status (1 if household head is married or 0 if otherwise)
Z_4 = household size
Z_5 = Output (output of cassava in kg/ha)
Z_6 = HCI (household's degree of commercialisation)
Z_7 = Other farm income (income from farm sources other than cassava in GH¢/annum)
Z_8 = Off-farm income (in GH¢/month)
$B_0 - \beta_8$ = Parameters to be estimated, and
μ=Error term.

Results and Discussions

Descriptive statistics and comparison of households

Table 1 shows that the modal age range of both respondent categories is 41-50 and 31-40 respectively, indicating that cassava production is carried out by an active age group within the metropolis; the modal sex of respondent household heads is male, and most of the respondents of both household categories were married. That is, 74% for beneficiary households head and 72% for non-beneficiary households. Majority of beneficiary (64%) and non-beneficiary households (68) are between 3 and 6 in membership indicating that modal household size for the two groups of households ranges from 3-6. The percentages of beneficiaries who attained tertiary, secondary, and basic education are 8, 10 and 54, respectively. Those who did not attain any formal education were 24 %. On the other hand, the percentages

of non-beneficiaries who attained secondary, basic education and no-formal-education were 6 %, 60 % and 34%, respectively. None of non-beneficiaries attained tertiary education.

Additionally, less than half (46 %) of beneficiary households are engaged in off-farm job(s) while majority (56 %) of the non-beneficiary household respondents engaged in off-farm job(s). Seventy four percent of the beneficiary households and 54 % of the non-beneficiary households own farming land. This shows that majority of the two household categories belong to ownership type of land tenure. In addition, the cropping system adopted by most of the farming households for cassava production is mono-cropping.

Table 2 provides the t-test results for the households' comparison on demographics and farm characteristics. The results show that the average household size and the average number of years of formal education of beneficiaries and that of non-beneficiaries do not differ significantly.

The average farm size of the beneficiary households was 3 ha of which 1 ha was allocated for cassava production and that of the non- beneficiary households was 2.5 ha of which 0.7 ha was devoted to cassava showing that the households in the study area were smallholder cassava farmers. The difference between total farm sizes of both house-holds was not statistically significant, but between cassava plots sizes was statistically significant. This signifies that the beneficiary households allocated larger plots for cassava production than the non-beneficiary households, and was attributable to involvement of beneficiaries in the RTIMP through market assurance from the commodity chain linkage.

Concerning productivity, there was a statistically significant difference between the average output of cassava per hectare of beneficiaries (6163.2 kg/ha) and that of non-beneficiaries (5616.4 kg/ha). This was attributable to the improved cassava variety provided by the RTIMP to its beneficiaries. In addition, a statistically significant difference was between the commercialisation index of beneficiaries (0.812) and that of non-beneficiaries (0.646). This suggests that the beneficiary households sold larger proportion (81.2%) of their cassava output than their non-beneficiary counterparts sold (64.6%). This significant difference was considered to be the result of the linkage between beneficiary farmers, processors and marketers created by the RTIMP which encourages and enables some beneficiaries to sell more or all of their output whilst non-beneficiaries look for market for their produce.

Also, the mean incomes per annum from other crops obtained by beneficiaries (GH¢ 99.60) and non-beneficiaries (GH¢ 78.24) were significantly different. Thus, beneficiary households obtained significantly higher incomes from other crops than non-beneficiary households. This was attributed to training received from sub-programmes such as Farmer Field Fora (FFF) which are directed to the production of other crops. However, income per month obtained from off-farm activities by beneficiaries (GH¢44.40) did not differ significantly from that of non-beneficiaries (GH¢ 46.48).

Food security status of sample households

Figure 1 shows that majority (76%) of the beneficiary households were food secured whilst the majority (58%) of the non-beneficiary households were not. This was attributable to the greater cassava output higher income from other crops and the higher commercialisation index (more cash sales) which enabled the beneficiary households to purchase other food products to meet food

Table 1. Characteristics of sample households

Variable	Beneficiaries		Non-beneficiaries	
	Frequency	Percent	Frequency	Percent
Age				
<20	2	4	0	0
20-30	7	14	7	14
31-40	9	18	15	30
41-50	18	36	11	22
51-60	7	14	10	20
>60	7	14	7	14
Gender				
Male	36	72	28	56
Female	14	28	22	44
Marital status				
Married	37	74	36	72
Single	7	14	5	10
Divorced	4	8	3	8
Widowed	2	4	6	12
Household size				
1-3	11	22	7	14
4-6	21	42	19	38
7-9	11	22	15	30
10-12	7	14	8	16
>12	0	0	1	2
Education				
Tertiary	4	8	0	0
Secondary/technical/vocational	5	10	3	6
Basic	29	54	30	60
No formal education	12	24	17	34
Participation in off-farm job(s)				
Yes	23	46	28	36
No	27	54	22	44
Cropping system				
Mono-cropping	30	60	33	66
Mixed cropping	20	40	17	34
Land tenure				
Ownership	37	74	27	54
Rent	9	18	14	28
Sharecropping	4	8	9	18
Total	N=50	100	N=50	100

Source: Field survey data, 2011

Table 2: Comparison of beneficiaries and non-beneficiaries on some variables

Variable	Non-beneficiaries		Beneficiaries		t-value	Sig. (2 tailed)
	Mean	SD	Mean	SD		
Age of respondent	45.760	12.255	43.640	12.984	0.776	0.441
Education (years)	6.120	4.493	7.700	4.799	-1.699	0.954
Household size (No.)	6.560	2.734	5.680	2.766	1.541	0.130
Farm size, ha	2.438	2.163	2.958	2.022	-1.209	0.233
Size of cassava farm, ha	0.704	0.444	0.944	0.706	-1.876*	0.067
Cassava output, Kg/ha	5616.400	1208.904	6163.2	1565.221	-2.166**	0.035
HCI	0.646	0.289	0.812	0.268	-2.963***	0.005
Other farm income, GH¢/annum	78.240	52.056	99.600	52.056	-1.802*	0.078
Off-farm income, GH¢/month	46.480	68.413	44.400	68.413	0.130	0.897

Source: Field survey data, 2011.
SD = Standard deviation;***= Significant at 1%; ** = Significant at 5%; * = Significant at 10%.

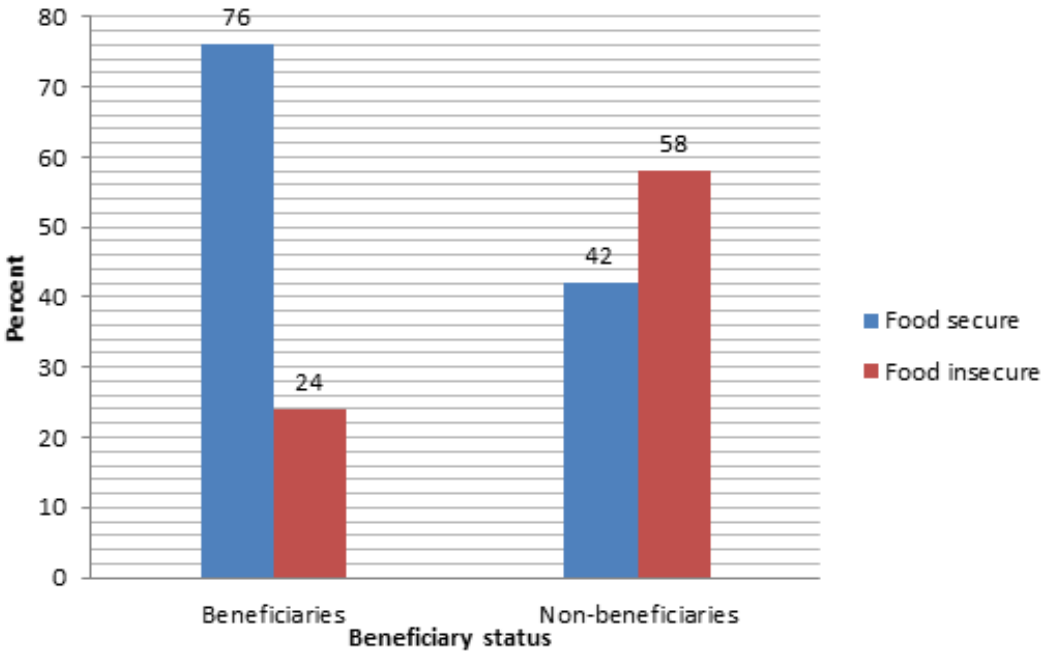

Figure 1. Distribution of sample households by food security status
Source: Field survey data, 2011

demand. Another food security indicator is the ability of the household to meet nutritional requirements (Stamoulis and Zezza, 2003 cited in Owusu and Abdulai, 2009).

Factors that determine household degree of commercialisation

Table 3 shows the multiple regression results of the determinants of household degree of commercialisation. The F-value [F (6, 93) = 4.43] is significant (Prob > F = 0.0005) indicating the model is fit for the data. Among the six independent variables used in the model, three were found to be significant - age, beneficiary status and size of cassava farm.

The coefficient of age is negative which implies that age has a negative effect on commercialisation. This finding is in agreement with Mathijs and Neov (2002), and was attributable to the fact that as one grows his demand for leisure increases hence his or her degree of involvement in market activities decreases. Beneficiary status of households has a positive coefficient indicating that beneficiary households are more commercialized than their counterparts. This finding could be attributed to the linkage that beneficiaries are more likely to have with processors and marketers in the programme.

Also, there is a positive relationship between degree of commercialisation and size of cassava farm. Thus, a unit increase in farm size will increase household's likelihood to commercialize by 0.163.

Relationship between commercialisation and food security.

Table 4 shows the probit model results for the relationship between household food security status and degree of commercialisation together with other variables. The Chi^2 value [Chi^2 (8) = 36.36] is significant (Prob> chi^2 = 0.0000) which indicates that the model is fit for the data. From the table, five of the eight independent variables are found statistically significant namely household size, output, HCI, other farm income and off-farm income.

Household size is found to be inversely related to food security. This result agrees with Oluyole *et al.* (2009) who found that as household sizes are increasing, the percentage of food secure households keeps on decreasing, in the sense that income per head of the household decreases thereby increasing the probability of the household to be food insecure. The coefficient of output is positive

Table 3. Result of multiple regression model

Variable	Coefficient	Std. error	T	p>/t/
Age	-0.0056543**	0.0023373	-2.42	0.018
Education	0.0039453	0.0059966	0.66	0.512
Beneficiary status	0.1271758**	0.0562399	2.26	0.026
Household size	0.00432	0.0101541	0.04	0.966
Size of cassava farm	0.1631813***	0.0470223	3.47	0.001
Other farm income	-0.0001036	0.0002412	-0.43	0.668
(Constant)	0.760826	0.1218754	6.24	0.000

Source: Field survey data, 2011. *** and **=significant at 1% and 5% respectively.
Number of observation=100; F (6, 93) = 4.43; Prob>F = 0.0005; R^2= 0.2224; Adj. R^2= 0.1723

Table 4. Probit result on the determinants of household food security status

Variable	Coefficient	Std. error	Z	P>/Z /
Age^2	-0.0031394	0.00202335	-1.55	0.121
Education	0.0196021	0.0344287	0.57	0.569
Marital status	0.1065237	0.168641	0.63	0.528
Household size	-0.208797***	0.0623741	-3.35	0.001
Output	0.0001834*	0.0001053	1.74	0.082
HCI	1.141711*	0.5894731	1.94	0.053
Other farm income	0.0035708**	0.0014943	2.39	0.017
Off-farm income	0.0003984***	0.0001499	2.66	0.008
(Constant)	-2.622451	0.9868727	-2.66	0.008

Source: Field survey data, 2011. ***; ** and * = significant at 1%; 5% and 10% respectively. Number of observation=100; LR $Chi^2(8)$ =36.36; Log likelihood= -50.956538; Prob> chi^2=0.0000; Pseudo R^2= 0.2629

which indicates that output of cassava is positively correlated with food security status. Thus, interventions that increases cassava output of a household will improve the food security status of that household.

In addition, food security status and HCI are positively related. This suggests that as a household's sales per unit of production (degree of commercialisation) increases, the tendency of the household to be food secured becomes higher. This outcome could be expected because increase in sales increases cash income of the household and enables the household to buy other food products to meet its food demand.

Other farm income and off-farm income are positively correlated with food security. That is, as household's income from other farms as well as from off-farm activities increase, their food insecurity condition minimizes. Increase in incomes means increasing economic access to food and food products - a higher tendency to be food secure. According to Bouis and Haddad (1990), increase in household's incomes increases calorie intake of households.

Conclusion

The findings have showed that most of the beneficiary households (76%) were food secure compared to non-beneficiary households (42%). In addition, beneficiaries allocated significantly larger plots for cassava, had significantly greater cassava output, had significantly much income from other farms, and were more commercialized than the non-beneficiaries. However, beneficiaries and non-beneficiaries did not significantly differ with respect to household sizes and off-farm incomes.

The findings further depict that household food security status is significantly related positively with household degree of commercialisation, cassava output, other farm income and off-farm income but negatively with household size.

Since there are no significant differences in household size and off-farm incomes between the beneficiaries and non-beneficiaries, the difference in food security status between them cannot be attributed to these two variables (household sizes and off-farm income levels) but their cassava output,

degree of commercialisation and other farm income with which the beneficiaries are superior to the non beneficiaries.

It is generally concluded that the RTIMP's commercialisation of cassava via commodity chain linkage is playing a significant role toward ensuring household food security within the Cape Coast Metropolis. We therefore recommend that the Government through MoFA extend the programme to cover more farming households within the Cape Coast Metropolis. We find it worthwhile if policy makers, national organisations and international organisations come out with programmes or projects that will motivate or enable small holder farmers to commercialise as this could help minimize food insecurity among them.

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