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The Distributional Effects of Horticultural Export Value Chains among Smallholders In Southern Ghana

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Abstract

Increasing foreign exchange problems and deteriorating prices of traditional export commodities have led policy makers and donor agencies to seek diversification in export crop production. In Ghana, crops such as pineapples and mangoes appear promising because of their high labour intensity and the expanding demand for fruits in Europe. Notwithstanding, there is a possible trade-off between export and food crop production because of the possibility of resource re-allocation. So far the major concern of government has been the macro-economic growth in terms export earnings while the distributional effects and impacts on household food security remain under-investigated. The study focused on a household survey undertaken in the forest and coastal-savannah transition zones, where the farming system has undergone a transition from established food-crop farming for urban markets to an intensive production of horticultural products for export. Logistic regression and a semi-log function were used to estimate the determinants of household food availability and income respectively. Results show that households engaged in export horticulture are better-off than those which do not. Yet, the sole adoption of staple or export crop is not a sufficient condition for improving household food security. Household land endowment and income are fairly to strongly unequally distributed, with higher inequality observed among households engaged in the combined scenario. The paper concludes that linkages which allow simultaneous and reliably access to a range of resources and services – purchased farm inputs, symmetric market information and technological know-how are critical if smallholders are to survive in increasingly competitive global food markets.

Introduction

Export horticulture has since the past two decades been identified as one of the fastest growing sectors to enhance economic growth in Sub-Saharan Africa. In Ghana, crops such as pineapples, papaya and mangoes appear promising as options to diversify the traditional export base comprising of Cocoa, Timber and Gold, because of their high labour intensity and the expanding demand for fruits in industrialized nations. Notwithstanding, a number of studies have raised concerns about the microeconomic performance of non-traditional export crops (NTEs) in developing economies. Most of such concerns are related to the trade-offs between food and export cash cropping systems due to the possibility of competition for resources between export crops and food crops resulting from a potential re-allocation of resources from one to the other and their effect on household food availability. Indeed potential synergy effects have been identified between cash-crop investment and food productivity, whereby positive spill over benefits of increased input are made possible for food crops through cash crop delivery channels (Dione, 1989; Goetz, 1993; Goverah and Jayne, 2003; Von Braun, 1995). Consequently, there are critics of such policies that advocate cash crop production (Von Braun and Kennedy 1986; Weber et al., 1988). They argue that the benefits have never materialized with the premise that, in areas where cash crop production has increased, food consumption and the nutritional status of the poorest households have deteriorated.

Within the Ghanaian context, the main effects of the introduction of export cropping has been the significant deterioration in access to land as smallholder food crop farms are being consolidated into larger scale export crop farms. Given the pattern of recent changes in the global political and economic environment, as well as ongoing processes of globalization and integration of agricultural and food markets, the livelihood of smallholders within the global food chain seem threatened. Horticultural exports must meet strict quality standards set by the overseas importers and supermarkets. These standards are dynamic and increasingly demanding, and sometimes require fundamental changes in production methods and structures with significant capital

investments. They often involve process monitoring of credence attributes plus traceability requirements. Conversely, there is an information asymmetry between the smallholders and the exporters regarding produce specifications such as shape, colour, weight, of fruits. So far the major concern of policy makers has been macroeconomic growth in terms of physical output and export earnings of these new crops. At the microeconomic level, the short and long-term impacts of the dynamic export horticultural market vis-à-vis its contribution to pro-poor growth still remains under-investigated. In an attempt to fill this gap, this paper attempts to access how various categories of households respond to horticultural export markets in target producing communities, whereby the farming system has undergone a remarkable transition from an established system of food crop farming for sale to urban consumers to an intensive production of fruits and vegetables for export to the Europe.

Materials and Methods

The study is based on a data set collected from a survey of 200 farm households in southern Ghana during the 2003/2004 cropping season. In accordance with the importance of the various horticultural crops to total export earnings, 7 villages with 20 households each within the pineapple cultivated based communities of the Akwapim south district and 3 villages with 20 households each from the mango cultivated based communities of the Dangme west district were selected for the survey using stratified random sampling approach.

Descriptive statistic tools were initially used to categorize the sampled farm households into three main groups based on the type of crops grown and other socio-economic characteristics. On the basis of this typology, the respondents comprised of 44 Non-Horticultural households, 118 Horticultural and Staple households, and 38 Horticultural households. The major differences and similarities among the three household categories have been outlined based on the extent of participation in export horticulture (McCulloch and Ota, 2002; Afari-Sefa, 2006). Logistic regression was used to estimate the determinants of food availability in export horticulture, whereas a modified Log-linear mincerian wage equation was used to estimate the income of the various household categories. Food availability in this study refers to whether the household has enough available calories either from own produced or market purchased staples to meet caloric requirements of household members year round. Some strategies improve the food security status of households but cause average incomes to fall substantially and hence may be avoided by households if they have better alternatives. Finally, an assessment of the impact of export horticulture on land and income distribution is explored using the Gini coefficient decomposition approach.

Results and Discussion

Inter-household landholdings and capital resource distribution

Households decide whether or not to participate in the cultivation of horticultural export crops based on perceived benefits, opportunities and constraints considering the risks and probabilities of occurrence. Generally, Horticultural households had the highest land resource in terms of endowment, total cultivated farm size, farm size per capita and fallow land area. This was followed by Horticultural and Staple households and finally Non-horticultural households in chronological order. Per capita income was also highest for Horticultural households, followed by Horticultural and Staple households with Non-horticultural households having the lowest income (Afari-Sefa, 2006).

It was observed that 78% of the sampled households were cultivators of horticultural export crops. This is an obvious reflection of the magnificent role these crops play in the daily lives of most households in the study area. The pooled results of the analysis indicate that pineapple cultivation is the most widely adopted crop by indigenous small scale farmers, whereas the cultivation of crops such as mangoes required a longer investment period and hence mostly adopted by immigrant large-scale commercial farmers.

Determinants of household food availability

The results of the model of income determination support the earlier findings from the analysis of the descriptive statistics and model of participation (Afari-Sefa, 2006). Clearly, households cultivating horticultural export crops do appear to be better off than Non-horticultural based households. Regarding food availability, the proportion of "food secure" households is higher among Horticultural households (78.9%) than among Horticultural and Staple households (69.5%) and Non-horticultural households (52.3%). Among the thirteen factors considered in the model, seven are found to have a significant impact in determining household food security (Table 1). These

are the total farm size, district dummy, age of head, residential status of head, household size, credit access and labour hire out. A positive and significant relationship is found between farm size and the probability of food security, implying that the probability of food security increases with farm size. Geographical location is significantly related to household food security. Thus the regional location of the household is equally important, and this probably affects food availability through its influence on food consumption patterns. Household size has a negative and significant relationship with the probability of food security, implying that the probability of food security decreases with family size. The age of the head has a negative significant relationship with food security. This could be explained based on the fact that most staple producing households, according to the NTE participation model were of the older and resource poor group. This could have accounted for the lack of sufficient produced food or insufficient availability of purchasing power to meet food needs. The residential status of the household has a negative significant relationship with food security at the 10% probability level. Undoubtedly, immigrant households have the tendency to improve their livelihood status by engaging in export horticulture. Access to credit and or capital inputs has a positive effect on the probability of a household being "food secure" at the 10% probability level. This means that households with better access to capital inputs or credit access to purchase the requisite inputs for production of various crops are more likely to be "food secure" than those who have relatively poor access to capital inputs and credit.

The ability of a household to hire out labour to other households is negatively and significantly related to household food security. As stated earlier, this might be a reflection of the poor resource base of the household for using family labour for own productive resources since the comparative returns to hiring out labour in the study area is relatively low.

The amount of TLU owned is not statistically significant with the food security status of a household. Surprisingly, it is negatively related to the probability of being "food secure", implying that the household food security decreases with increasing number of livestock. The negative insignificance of TLU is probably attributed to the fact that households may prefer to reduce current consumption so as save for future consumption.

Access to off-farm work does not have a significant impact on the probability of household food availability. However, it is positively related to the probability of food security as anticipated, implying that the probability of food availability increases with access to off-farm work. Cultivation of food crops is positively related to food security but not significant. This can be explained by the poor and inadequate productive resources available to most Non-horticultural households. It also explains the fact that Horticultural and Staple households may still not be food self-sufficient based on the staples they produce from their resources alone. Indeed, reasons of weather failure means that most staple food-producing households have to buy cassava and or maize during certain seasons of the year to supplement food needs. The dummy variables related to the cultivation of NTEs and other local cash crops have negative insignificant relationships with food security. This might reflect the possible competition of resources between these cash crops and food crops. Meanwhile, it is expected that proceeds from the cultivation of the high value crops would compliment food needs but these may not happen automatically for all due to a combination of factors ranging from poor staple yields due to agro-climatic factors beyond the control of the rainfall dependent farmer, other household specific missing staple food markets, longer payment duration for NTEs and possibly on decisions taken by persons controlling income within the household. As observed from the field survey, it can thus be claimed that some households may at certain times of the year not be consuming the regular basic staples considered in this model. The level of education of the household head, another proxy for income did not significantly affect household food security, even though the relationship was positive.

Effect of Export Horticulture on Income and Land Distribution

Even though, results from descriptive and econometric regression analysis have clearly shown that households engaged in export horticulture are better of than those which do not, the results are only

Table 1: Logit function for the Likelihood of Household Reserving Sufficient Own Produced or Market Purchased Staple Food Year Round, 2003/04

Variable	Marginal effect	Standard error	T-statistics
Intercept	0.5312***	0.1883	2.822
District dummy for Akwapim south	-0.1548**	0.0728	-2.148
Age of head	-0.0065***	0.0023	-2.878
Education of head	0.0018	0.0141	0.124
Residential status (dummy)	-0.1202**	0.0575	-2.089
Household size	-0.0307***	0.0097	-3.175
Off-farm job (dummy)	0.0799	0.0565	1.414
Total farm size	0.1384***	0.0176	7.849
Other local cash crops (dummy)	-0.0756	0.0602	-1.256
Adoption of NTEs (dummy)	-0.1137	0.0691	-1.645
Food crop cultivation (dummy)	0.0106	0.0683	0.156
Credit/Input access (dummy)	0.1560**	0.0662	2.356
Tropical Livestock Units (TLU)	-0.0014	0.0032	-0.435
Labour hire out (dummy)	-0.1684**	0.0797	-2.113

Dependent variable: Household reserving sufficient staple calories for members all year round
Model Chi-Square=74.94*** ; Log Likelihood function=-88.65; Pseudo R^2=0.482
Households correctly predicted: 76% ; Number of observations= 200 ;
*, ** and *** denotes significance at 10%, 5% and 1% levels respectively.

indicative of a partial representation of the extent to which export horticulture has reduced poverty since the poor are not usually "average" households. To explore the absolute levels of poverty in the sampled households therefore, a poverty profile of the sampled households is constructed based on the income data. This is also on account of the fact that, as at now, the differences in resource endowment between households that combine export horticulture with staple crop production and those that cultivate only export crops have not been clearly established. An overview of the income distribution by quintile group in Table 2 reveals that income is strongly unequally distributed among the 200 sampled households. The upper highest 20% quintile household group earn 61.36% of the total income of the sample. Surprisingly, 57.5% of this wealthiest group including the top three richest households come from the Horticultural and Staple household group, with the remaining 42.5% originating from the Horticultural household group while none of the Non-Horticultural group was in this category. This is a reflection of the high inequality of resource distribution found within the Horticultural and Staple household group (Table 3) and also confirms the fact that some richer households still consider staple food self-sufficiency very high on the agenda of their farming priority goals. Conversely, the poorest households within the sample contribute only 2.82% of the total income of the sample. As might be expected, this quintile consists of 65% from the Non-Horticultural household group whiles 32.5% come from the Horticultural and Staple households with only one respondent from the Horticultural household group. These results are further substantiated by the Gini coefficient values presented in Table 3. The Gini coefficient for household income for the overall sample is 0.571, confirming that income is unequally distributed within the households. Per capita income is however strongly unequally distributed with an overall sample Gini coefficient of 0.838. Ownership of land is weakly equally distributed even though the amount of cultivated land is unequally distributed. Not surprisingly, it was found that there is a strong correlation between household income and land endowment with a spearman's correlation coefficient of 0.645. On the whole the highest inter-household inequality was observed among Horticultural and Staple households.

Conclusions

Households cultivating horticultural export crops are on the average better off than those that do not. Notwithstanding the enormous contribution of horticultural exports to foreign exchange earnings, the micro level distributional effects has not favoured the chronically poor households who are structurally impeded from seizing the existing opportunities of the

export boom by virtue of their poor resource endowment and liquidity constraints. These marked differences in resource base between the various household categories further accentuate the imperfections within rural markets. The majority of households are particularly exposed to the risk of inadequate technological know-how in meeting the ever increasing quality standards and health control traceability requirements by European consumers, price collapse on the export market and a break down of local marketing institutions. The findings from this paper therefore calls for an integrated policy framework approach aimed at improving rural market imperfections. Efforts to achieve the desired impacts requires the strong need for investment in infrastructure and a shift towards value-added export oriented production, whereby small farm households are progressively integrated into the changing preferences of a dynamic global food chain. The future of smallholders is even more uncertain, because the most traditional varieties of fruits including the smooth cayenne pineapple that enable Ghana enjoy horticultural export booms in the previous two decades are no longer the preferred fruit cultivars in European markets.

References

Afari-Sefa, V. 2006. Agricultural export diversification, food Security and living conditions of farmers in southern Ghana: A microeconomic and household modeling approach; Farming & Rural Systems Economics, Margraf Publishers, Vol. 81, (ISBN: 3-8236-1490-8), Weikersheim, Germany.

Dione, J. 1989. Informing food security policy in Mali: Interactions between technology, institutions and market reforms, Unpublished PhD Dissertation, Michigan State University, East Lansing, MI, USA.

Goetz, S. 1993. Interlinked markets and the cash crop-food crop debate in land-abundant tropical agriculture. Economic Development and Cultural Change 41: 343–361.

Govereh, J. and T. S. Jayne 2003. Cash cropping and food crop productivity: Synergies or trade-offs? Agricultural Economics 28: 39–50, Elsevier.

McCulloch, N. and M. Ota. 2002. Export horticulture and poverty in Kenya. Globalization, production and poverty discussion Paper No.4, Overseas Development Group, University of East Anglia, Norwich, UK.

Von Braun 1995. Agricultural commercialization: Impacts on income and nutrition and implications for food policy, Food Policy 20, 187-202.

Von Braun and E. Kennedy 1986. Commercialization of subsistence agriculture: income and nutritional effects in developing countries, Working Papers on commercialization of agriculture and nutrition, IFPRI, Washington DC.

Weber M., J. Staatz, J. Holtzman, E. Crawford and R. Bersten 1988. Informing food security decisions in Africa. Empirical analysis and policy dialogue. In: American Journal of Agricultural Economics, Vol. 70(5): 1044-1052.

Table 2: Annual Total Household Income Distribution by Poverty Quintile Groups (Cedis), 2003/04

Poverty group	Mean income	Standard deviation	Group total income	% Share of income
Poorest quintile	8,839,596	3,418,843	353,538,821	2.82
2nd quintile	19,394,705	3,190,299	775,778,188	6.18
3rd quintile	32,191,800	4,840,707	1,287,671,996	10.25
4th quintile	60,884,597	10,232,620	2,435,383,876	19.39
Richest quintile	192,654,188	144,123,774	7,706,167,530	61.36

Table 3: Decomposed and Total Gini Coefficients of Income and Land Distribution per Sampled Household Category, 2003/04

Variable	HorticulturalN=(38)	Horticultural and Staple (N=118)	Non-horticultural (N=44)	Total (N=200)
Total income	0.469	0.529	0.382	0.571
Per capita income	0.492	0.783	0.869	0.838
Land endowment	0.468	0.486	0.449	0.494
Cultivated land	0.489	0.525	0.433	0.524