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Working Paper No.32

Commercialisation of Agriculture in Kenya: Case Study of Policy Bias and Food Purchases by Farm Households

by

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Tabitha Kiriti[2] and Clem Tisdell[3]

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Commercialisation of Agriculture in Kenya: Case Study of Policy Bias and Food Purchases by Farm Households

ABSTRACT

This study considers the effect of cash cropping on food availability and investigates the determinants of household food expenditure as a proportion of gross income relying on a sample of rural households in the Nyeri district of Kenya. Results from an application of a Tobit model suggest that household food purchases and food availability may suffer as a consequence of increasing cash cropping in Kenya. Husbands favour commercial crops and, it seems, favour non-food purchases. Married women living with their husbands use proportionately less of their gross income to purchase food compared to unmarried women and to those women not living with their husbands. Male bias in food purchased is present, and is exacerbated when payment for cash crops is lumpy. Lumpy cash payments tend to reduce proportionate food purchases by households. We also find that remittances and family size are positively associated with food purchases as a proportion of gross income. Because of household food availability issues, there is a case in many developing countries for reducing policy emphasis on expansion of production of non-food cash crops and a case for greater encouragement of subsistence food production. Increased commercialisation of agriculture can result in reduced availability of food to women and children.

Key words: commercialisation, non-food cash crops, food cash crops, food availability, and non-cash food crops.

Commercialisation of Agriculture in Kenya: Case Study of Policy Bias and Food Purchases by Farm Households

1. Introduction

Commercialisation of agriculture can be defined as the use of agricultural goods for sale rather than for home consumption (Dewey, 1989). It can occur not only on the output side of production with increased marketing of agricultural surpluses, but also on the input side with increased use of purchased inputs. In this study, we shall concentrate on sales of output rather than purchases of inputs as an indicator of commercialisation. Commercialisation is not restricted to just non-food cash crops. Traditional food crops are sometimes marketed and some cash crops are retained on the farm for home consumption.

The World Bank, through Structural Adjustment Programs, and other international donors have been encouraging many developing countries to commercialise their agricultural sector in order to secure foreign exchange. Commercialisation can be accelerated by direct government action involving forced procurement of produce or by the use of certain agricultural policies and government-imposed obligations that make it impossible or difficult for producers not to sell their products because they need cash. For example, the introduction of a hut tax in Kenya during the colonial period forced Kenyan farmers to sell farm produce because they needed the cash to pay the tax.

Commercialisation makes it easier for governments, whose members are mostly urban-based, to extract taxes from agriculture and furthermore, trade provides extra employment and business opportunities that comparatively favour urban areas (Lipton, 1977). Trade facilitates the extraction of surplus value from small agricultural producers (Dewey, 1989).

A strong urban and government bias appears to exist in favour of the cash economy. Government policies tend to encourage the production of export cash crops because in the process, the nation earns foreign exchange. African countries frequently charge export taxes on commercial crops whose incidence often falls entirely on the producer. In addition, agricultural research and development is mostly concentrated on commercial crops. At the same time, food price policies involving state interventions in food marketing sometimes keep prices paid to farmers low in the interest of urban consumers. Unfavourable terms of

trade are apparent in many developing countries in the low prices small farmers receive for their products compared to the high cost of their purchased goods. Tuinenburg (1987) and Dewey (1989) contend that agricultural prices in developing countries are maintained at artificially low levels in deference to the interest of urban consumers.

Furthermore, foreign exchange from the export of agricultural products is often used to finance urban-industrial development. The government gains net revenue by taxing these exports, urban consumers get lower food prices and industry may get cheap raw materials. The net effect is income transfers out of agriculture. This depresses private investment in agriculture and may result in considerable rural-urban migration and rapid growth of urban areas (Kiriti and Tisdell, 2001; United Nations, 2001). As the degree of urbanisation increases, the push for a cash-based (market) exchange economy appears to intensify. So the views expressed by and policies supported by bodies such as the World Bank in favour of market-making may be a reflection of a basic very long-term social-political trend.

In many developing countries, cash cropping has been embraced as a means to raise household income as well as a source of foreign exchange. In many farm households, women are the providers of food for their families, traditionally doing this through cultivating non-cash food crops. They also participate to some extent in cultivating food cash crops to provide their families with income to purchase those items that they cannot produce or do so economically. However, in the African situation, male heads of households mainly control the increased cash income and they are less likely to use it for food purchases and this may affect the welfare of women and children. Income of African families from cash crops generally comes as a lump sum and much of it may be used to purchase non-food items. Therefore, male control of cash income and the lumpy nature of cash income may influence the proportion of gross income allocated for food purchases. This is one of the matters investigated in this paper.

However, apart from cash income from cash crops we believe that there are socio-economic factors that influence the proportion of income allocated by households for food purchases. For example, remittances, which are also of a lump sum nature, have been recognised in the literature as a major determinant of the proportion of income allocated to food purchases. We shall consider these factors as well as some other possible influences such as female earnings, family size, whether husbands stay with their wives or not and so on.

What follows is a brief review of background literature relevant to commercialisation of agriculture. It pays particular attention to cash income from crops and who controls cash income as possible determinants of the proportion of income allocated for food purchases. After that, we provide information about the study site in Kenya and the methods used in collecting data. We then give a summary of relevant statistics associated with the possible determinants of the proportion of income allocated for food purchases. A Tobit model is subsequently used to identify the determinants of the proportion of cash income allocated for food purchases in the Nyeri district. We then conclude.

2. A Brief Review of Relevant Literature

The literature on of household economic behaviour dates back to Becker's (1981) extension of the neoclassical model of consumer demand to families. All members of the household are assumed to jointly maximise some household welfare function and income is allocated so that the marginal rate of substitution between any two goods is the same. Essentially, the household is treated as a single individual since all resources are pooled and then reallocated according to some common rule. In this neoclassical theory of resource allocation, it is usually assumed that an increase in the proportion of land allocated to cash crops by the head of the household is advantageous to all the members of the household in the sense that increased income from cash cropping makes it possible for the farm household to reach a higher level of utility.

The neoclassical model assumes perfect information and perfectly competitive market situations. However, food markets may not be perfect due to existence of monopolies and poor infrastructure making movement of food from where it is abundant to where it is scarce impossible. Hence farm households may not be assured of availability of food in the market when they need it. As the proportion of land allocated to cash crops rises, rural households produce less of their own food, local demand for food may rise, causing a rise in food prices. Higher food prices may have a disproportionate impact on poor households who spend a higher percentage of total income on food.

The neoclassical theory also assumes that the occurrence of cash cropping, if not imposed on households, will increase the welfare of the households since income from cash crops will lead to an increase in household total income via specialisation according to comparative

advantage. Holding all other things equal, each household maximises its utility and reaches a higher indifference curve (Collier, 1983).

Even if farm households receive a cash income after commercialisation sufficient (or more than necessary) to purchase the food once produced, this does not guarantee that this cash income will necessarily be used to purchase food. In the African situation, this increased income is controlled by male heads of households who would rather spend it on other goods than on food (Kaiser and Dewey, 1991). Secondly, the income from cash cropping is often obtained as a lump sum once or twice a year. Peasant families who are not used to saving relatively large sums of cash can find it difficult to stretch their income for future purchases of food (Dewey, 1989). Third, as household income rises, staple foods, like maize and beans, are regarded as inferior goods and households substitute these for refined processed foods, which may be less nutritious than the staple foods. Apart from that, the increased income may be used to purchase household durables such as radios, television sets, building materials and so on rather than food and this may adversely affect the welfare of the household in the short run. Thus the neoclassical model's prediction that household welfare will improve with cash cropping may frequently not apply in the African situation.

There is considerable debate about the impact on women, food availability and nutrition of shifting from subsistence to cash cropping and the consequences are complex. Kennedy's (1994) study of southwestern Kenyan sugar farmers found that commercial agriculture, on the whole increased household income. This higher income, in turn, resulted in higher carbohydrate consumption by the households of sugar farmers. Nevertheless, nutrition of children appeared to suffer mainly because cash income from sugar cane accrues to male heads of households and they are less likely to spend it on food.

Other authors like Longhurst (1988); Bryceson (1989); Dewey (1981, 1989) argue that expanded cash crop production can negatively influence food availability by reducing the diversity of available food products, especially if an all or nothing technological package has to be adopted. Furthermore, greater on-farm product specialisation might increase the risk of crop failure leading in some cases to increased frequency of food scarcity.

In some societies, commercial agriculture undermines the economic power of women within households, and this can directly influence nutritional parameters (Longhurst, 1988).

According to von Braun (1996, p. 35), women usually have the desire and the knowledge to improve the nutrition of their vulnerable members but in developing countries, they frequently lack the resources and a voice in relevant decisions. Dewey (1989) found that when sugar cane production increased at the expense of local food production, a smaller quantity and fewer foods were produced in the home, leading to a loss of power by women within the household. The cash that was earned by the men farming sugar cane was not always allocated to food or family staples and the incidence of alcohol consumption by men increased. When cheques were given out, some of the men spent virtually all of the earnings on liquor and beer, while their children at home remained undernourished. When men predominantly produce for the market, the nutritional viability of the household depends upon male sensitivity to household purchased food needs and female subsistence food production (Bryceson, 1989). This means that marital status might be an important influence on the proportion of income allocated for food purchases. On the whole, men seem more likely than women to spend cash earnings on themselves (Kaiser and Dewey, 1991).

The tendency to allocate large sums of money that enter the household periodically (lump-sum income) to non-food expenditures has been advanced as a partial explanation for the failure of cash-crop income to improve nutritional levels in certain settings (von Braun and Kennedy, 1986; Pinstrup-Andersen, 1983). Semi-subsistence agriculture frequently produces a rather constant flow of income in the form of food and some cash, whereas income from cash crops, such as coffee or tea, often comes in a one lump-sum payment. Lump-sum payments are associated with the purchase of consumer durables, whereas continuous forms of income are more likely to be spent on food (von Braun and Kennedy, 1986). Furthermore, a household allocates a disproportionate share of available farmland to a non-edible cash crop with a long gestation period, it may be trapped when other income sources become less available and the terms of trade for the cash crop changes unfavourably.

Von Braun (1994) found that in the Gambia, Kenya and the Philippines, the share of income from cash crops did not significantly affect the marginal propensity to spend on food. On the other hand, in Guatemala (Von Braun and Immink, 1994) discovered that an increase in the share of cash crop income from zero to 50 percent led to a 1.3 percent decrease in the share of expenditures on food. In Rwanda, a 10 percent increase in the share of cash crop income led to a 4.8 percent decrease in the food share budget. Therefore, cash income from cash crops appears to negatively influence the proportion of total income allocated for food purchases.

Lump-sum income from cash crops was also associated with purchase of non-necessities in the Mwea Tebere Irrigation Scheme in Kenya as compared to other villages in the same region and may have worsened the seasonal pattern of food consumption (Korte, 1969). In another Kenyan study, increase in expenditures on housing and school fees by established sugar farmers was attributed to lump-sum income, controlled by male members of the household (Kennedy and Cogill (1987). Guyer (1980) points out that in West Africa, the level of nutrition depends more on women's than on men's income. There, women earn small amounts of money at regular intervals and tend to be responsible for small, regular purchases, such as food. Therefore, women's employment outside the farm is important in explaining the proportion of household income allocated for food purchases.

Other forms of lump sum income such as remittances may also influence the proportion of income allocated for food purchases. Lev (1981) found that in Tanzania, increased income that came in lump sum form, such as remittances and payment from the coffee-crop, increased wealth in the form of housing or land ownership but had little effect on the adequacy of the household diet. Hence, remittances led to a decline in the proportion of income allocated for food purchases.

Ownership of livestock may also influence the proportion of income allocated for food purchases in that some livestock products can be used as a source of protein on a daily basis while sale of livestock enters the household as a lump-sum income once in a while and can be used to purchase 'luxury' items or cater for an emergency. Dewey (1981) found that while Mexican families switching to cattle production had more land and more cash than other families, there was no improvement in the diet and nutrition of their children.

Demographic factors may in addition, influence the proportion of income allocated for food expenditures. These can include age of the woman, her marital status, whether she stays with her husband or he has migrated, family size, education level of the woman, occupation, employment status and so on. Kaiser and Dewey (1991) found the age of the woman to be positively and significantly associated with the percentage of food budget allocated to traditional foods. They also found that the number of adult equivalents consuming food together in a household was positively and statistically significant in explaining variations in the percentage of income allocated for traditional food purchases. We would, therefore,

expect in our sample that households with large families to allocate a large proportion of their cash income to food purchases. Similarly, we would expect the highly educated compared to those with little education to allocate more cash income to food purchases (holding other things, such as effects of advertising, size of family, level of income and so on, constant) as they know the nutritional value of food. Mwabu et al. (2000) found that an increase of 10 percent in mean years of education in a Kenyan household increased food consumption by 11.1 percent. However, the authors did not correct for other factors correlated with greater education, such as higher income. On the other hand, Kaiser and Dewey (1991) found the educational level of mother and father was positively and statistically significant in explaining variations in the percentage of income allocated to 'luxury' goods.

From the reviewed literature, it emerges that lump-sum income (which may come to a household in the form of cash income from cash crops, remittances, earnings from outside employment, sale of livestock and so on) may result in reduced purchases of food for the household. It has also emerged that women are more likely than men to spend cash income on food for their household.

In the next section, we provide information on the study site in Kenya, the nature of the survey and sampling procedure.

3. Study Site, Sample and Data Collection Methodology

This study is based on data collected from a sample of rural households in Nyeri district in Central Kenya. The district has a very high population density with some areas of high agricultural potential, such as Tetu division, having more than 400 persons per km^2, whereas new settlement areas such as Kieni West have 100 persons per km^2. The principal town is Nyeri with a population of about 50,000 persons and it is also the provincial headquarters. Six divisions were selected for the study based on their differences in ecology and levels of commercialisation. The divisions are Nyeri, Othaya, Tetu, Mukurweini, Mathira and Kieni. We used the Kenya Central Bureau of Statistics Welfare Monitoring Sampling Frame to randomly select our sample. The data were collected in the months of December 2000 and January 2001.

A random sample of 330 households was selected but due to death, migration, absentees and non-responses, we ended up with responses of 185 households, that is 55 percent of those

selected. There were 235 respondents and out of these there were. 98 male and 137 female respondents. The response rate was lower than hoped for because (1) the women were very busy as it was during the short rains and there were food crops in the fields and coffee, tea, pyrethrum and other cash crops to be harvested; (2) husbands refused to give permission in a number of cases for wives to participate, because some husbands were suspicious that their wives were being incited to divorce or disobey them; (3) other households thought that we had been sent by the government and since Nyeri district is an opposition zone, they would not respond kindly to any government functionaries; and (4) some households did not perceive any direct personal benefit from answering the questions.

A structured questionnaire was administered to collect information about the various products produced by households, their receipt of remittance, earnings from outside employment, amount of non-cash output, amount of non-food output, ownership of livestock, demographic information like age, education, number of children, allocation of income to food purchases and so on. Usually, the main harvest months are September and October. This, therefore, means that the recall period was quite short and for this reason, we assume the data is reasonably correct and quite representative of agricultural production in Nyeri district. The prices of various crops produced were obtained from the Nyeri District Statistical Office.

4. Cash Cropping and Food Availability: Summary Statistics

The study uses responses of the 137 women respondents. The major subsistence crops grown in Nyeri district are maize, beans, potatoes, and sweet potatoes. Maize, beans, English potatoes, sweet potatoes, bananas, cabbages, kales, pumpkins and yams are the most consumed commodities and only a small proportion of these commodities is sold. For the other commodities produced, the proportion sold is quite high and sometimes even higher than the proportion left for home consumption. Men are more involved in the sale of food crops than are females.

Apart from growing food crops, the respondents also grow non-food cash crops, such as coffee, tea, pyrethrum, tobacco, that compete for household resources. The main cash crops grown in Nyeri district are monoculture crops such as coffee, tea, pyrethrum, wheat and tobacco. They are usually not intercropped with other crops. Table 1 shows the production of subsistence food crops and cash crops by weight by marital status of the respondents.

Table 1

Production of Non-cash Food Crops and Non-food Cash Crops by Women's Marital Status for one Season

Marital status	N	Non-cash food output (kg)	Cash output (kg)	Total output (kg)
Married living with husband	63	103.78 (36.56%)	180.10 (63.44%)	283.88
Married living alone	26	107.73 (39.88%)	102.38 (60.12%)	270.11
Unmarried women	48	95.53 (42.73%)	128.00 (57.27%)	223.53
Total	137			

As Table 1 shows, the production of subsistence food was lower by weight than that for cash crops in all cases, and in the whole sample, total subsistence output was only 39.49 percent of total output. This indicates a clear bias in favour of cash cropping.

In response to a question on whether increased cultivation of non-food cash crops had led to loss of diversity, 55.4 percent of all the women respondents answered in the affirmative and 57.1 percent attributed this to increased acreage of cash crops. Low subsistence output and loss of diversity pose the risk of households facing food shortages and lacking the required nutrients in their diets.

As Nyeri district has been suffering from food shortages (the majority of the farmers were relying on famine relief from the government at the time of data collection), 56.2 percent of the women respondents reported that they started experiencing food shortages after they started growing non-food cash crops. However, only 35.4 percent of the women attributed these food shortages to increased acreage of non-food cash crops.

Cash earnings outside the household are an important source of income for women, which can be used for food expenditures, as women are known to spend a greater proportion of their income on food than men do. It was found that for those women who were employed, they were contributing between Ksh. 1000 and 9000 to total household income.

The responsibility for allocating farm resources to cash crops as well as expenditure of income received from the cash crops is overwhelmingly seen as falling under male control. In our study, most married women reported that their husbands or male relatives made most

decisions regarding cultivation of cash crops. Furthermore, only 25.4 percent of the married women living with husbands in our sample reported making decisions regarding household expenditure. Thus, in the Kenyan case, women appear to have very little influence on decisions about expenditure of income from cash crops but they seem to have leeway in matters concerning subsistence food crops. They appear to lose their power to make agricultural household decisions with increased commercialisation. As a result, agricultural commercialisation may impact negatively on household food availability, and especially on the nutrition of children.

In the next section, we use a Tobit model to identify the determinants of the proportion of cash income allocated by household for food consumption in Nyeri district.

5. Determinants of The Proportion of Cash Income Allocated for Food Purchases in Nyeri District

The way in which food is obtained is varied and can be classified in different ways. It can be self supplied, purchased in the market in exchange for cash, obtained by barter in a market or it may be secured through customary exchange, or it may be received in the form of gifts. In this study we do not consider food in the form of gifts nor customary exchange but only self supplied food and purchased food. Nutrition of a household depends on total food supplies from the market plus non-market sources.

The determinants of the proportion of cash income allocated for food purchases in rural areas considered in this study are: receipt of remittances, earnings from wage labour from outside employment, proportion of cash revenue from sale of cash crops, marital status of the woman, whether staying with her husband and family size. Other variables tried but later dropped from the analysis, as they greatly reduced the explanatory power of the whole model or were closely related to other independent variables, are the level of education of the woman, her age and ownership of livestock.

We can estimate a log-linear multiple regression model for determining the factors influencing the proportion of total income allocated to food purchases using ordinary least squares.

However, some households may report zero income from remittances, zero income from employment, zero income from cash crops and so we might have the dependent variable taking on the value of zero in some instances. In that case OLS will produce biased estimates of the coefficients. We can overcome this problem by using a Tobit model for our analysis (Wilson and Tisdell, 2002; Gujarati, 1995; Amemiya, 1985). The Tobit model can be described as follows:

$$Y_i = \alpha_0 + \beta' X_i + U_i \qquad \text{if RHS} \geq 0$$
$$Y_i = 0 \text{ otherwise.}$$

Y_i is the dependent variable, X_i is a K*1 vector of known variables as defined above. β is a K*1 vector of unknown parameters. U_i are the residuals with E (U_i) = 0 and a common variance, σ^2. We also assume U ~ N (0, σ^2).

Households were asked how much out of total cash income from cash crops, food crops, earnings from outside employment and remittances they allocated for food purchases during normal times and not during festivals. This formed our dependent variable. To calculate total income, we expressed the subsistence output in value form using the local or market prices obtained from the local branch of the Kenya Central Bureau of Statistics. We also added income from remittances, earnings from outside employment and from cash crops. Instead of taking absolute amounts of cash income from cash crops, we take the percentage of gross income obtained from cash crops as an independent variable. We then asked the respondents whether they received remittances or were employed outside the household, which we also took as independent variables. In this way, we were able to control for income level without encountering multicollinearity between total income and source of income variables. Bivariate correlation coefficients were computed for each pair of variables to determine the extent of multicollinearity. For all the variables used, the coefficient did not exceed 0.5. We used both SPSS and LIMDEP to analyse the data.

The results of the Tobit analysis of the possible factors influencing the percentage of income allocated for food purchases are shown in Appendix 1.

5.1 Regression Results with Discussion

The constants in Table 2 differ greatly. That for married women's food purchases is negative whereas it is over 46 for all women. This may be because that the relationships in our model are non-linear when considered over a wide range. Therefore, it would be inappropriate to place too much weight on the constants in these estimates. It may only be appropriate to use the equations specified in Table 2 to indicate sizes and directions of change in proportion of gross income used by households to purchase food for a limited range of variation.

Marital status was negatively associated with the percentage of income allocated for food purchases. This means that married women allocate less of their total household income for food purchase than their unmarried counterparts. The neoclassical model assumes pooled household income and the household head allocates this income according to the needs of the farm household. We had hypothesised that men (husbands) appropriate cash income and less of it is used for food purchases than desired by their wives. This hypothesis is supported because marital status is statistically significant at the 5 percent level in explaining variations in the percentage of income allocated for food purchases.

The other variable that we had considered was whether the woman stayed together with her husband or had migrated. The correlation coefficient between marital status and presence of husband was r = 0.345 so we retained both variables. Only 46 percent of the women interviewed stayed with their husbands and it was found that the presence of a husband negatively influences the proportion of income allocated for food purchases. This means that when husbands stay with their wives, the allocation of income for food purchases suffers and implies that where women do not live with their husbands they make more food purchases than if their husbands are present. The variable for presence of husband (staytog) was also statistically significant at the 5 percent level in explaining variations in the dependent variable for all women and at the 1 percent level for the married women. The statistical significance of marital status and presence of husband in our sample accord with the findings of Kaiser and Dewey (1991); Kennedy (1994); Bryceson (1989); Korte (1969); Kennedy and Cogill (1987) that when men control cash income less of it may be used for food purchases.
The correlation coefficient for the receipt of remittances and presence of husband was r = 0.204 and so the two variables were retained. Migrant income (remittances) was positively related to the proportion of income allocated for food purchases. Our hypothesis that remittances coming as a lump sum would be used to purchase things other than food was not

supported. Remittances were also statistically significant at the 1 percent level in explaining variations in the percentage of total income allocated for food purchases for all women but were not significant for the married women. This implies that households relying on remittances allocate more of their income to food purchases than do other types of households. A possible explanation for this positive association of remittances with the percentage of income allocated for food purchases could be that remittances may be very little compared with cash income from cash crops and may not have a large impact on purchases of durable goods or be used for farm inputs. Kiriti and Tisdell (2001) found that 48.5 percent of total remittances in Nyeri district were used for food purchases while the rest was distributed among farm inputs, clothes, medicines, school fees and payment of debts. Our results contradict those of Kaiser and Dewey (1991) and Lev (1981) who found that remittances were negatively associated with the proportion of income allocated for food purchases. But their sample had a high proportion of international migrants who could send large and lump-sum amounts of remittances and hence the negative effect on the percentage of income allocated for food purchases. The lack of statistical significance of remittances for married women may be attributed to the small proportion (11.1 percent) of married women receiving remittances.

Kaiser and Dewey (1991) found that mother's contribution to income was not significantly related to resource allocation decisions. In our study a woman's employment outside the farm, and hence her level of earnings, were negatively associated with the proportion of income allocated for food purchases and was statistically significant at the 1 percent level for all women and at the 10 percent for married women. Our findings are contrary to other findings on women's income in sub-Saharan Africa where women's earnings tend to be earmarked for food (Guyer, 1980; Tripp, 1982). Women's income can also be used to purchase other household related items like kerosene, charcoal, and so on. It may also be that in those households where women are employed, their economic status may be a bit higher than the rest and women may tend to use their earnings to improve their household's standard of living through such purchases as clothes, helping pay school fees, pay hospital bills or even use it for their own personal expenses. Husbands of these women may also be helping in meeting much of the family's food needs and so these women have most of their earnings at their disposal. Roldan (1988) claims that the allocation of a woman's income depends on income level of households and the manner in which husbands transfer money to their wives.

Income from cash cropping, often associated with lump sum, income is linked to differences in the proportion of income allocated for food purchases for the sample of all women but not for married women. The proportion of cash income from cash crops was negatively associated with the percentage of income allocated for food purchases, even though here the coefficient is quite small. This indicates that as cash cropping increases and cash income from cash crops rises, holding all other things constant, proportionately less cash income is used for the purchase of food. It is statistically significant at the 10 percent level for all women but not statistically significant for married women. Two factors may contribute to this relationship. First, income from cash crops is traditionally seen in Africa as belonging to husbands. They are less inclined to use income to purchase food than wives. Secondly, payments for cash crops are lumpy and this may encourage purchase of consumer durables at the expense of food. However, the statistical significance of this relationship is low.

Our results for the whole sample of women accord with the results obtained by Korte (1969); Lev (1981); von Braun and Immink (1994) who found that lump sum income from cash cropping was associated with purchase of non-necessities, land ownership and housing. But a further contributor to the results observed could be the claims of husbands to income from cash crops. However, the lack of significance of cash crop income for married women might be due to the fact that these households may be borrowing from the cooperative societies against their cash crop deliveries and using the cash borrowed to buy foodstuff on a regular basis making cash income from cash cropping less lumpy, and hence, the lack of statistical significance.

Kaiser and Dewey (1991) found that cash cropping was not linked to differences in resource allocation patterns in rural Mexico and attributed the lack of significance to the fact that very few of the respondents were making a living solely from cash cropping.

Family size positively influences the proportion of income allocated for food purchased and the variable is statistically significant at the 1 percent level in explaining variations in the proportion of cash income allocated for food purchases for all women and for the married women. This is to be expected because a large family requires a larger food budget than a small one. Our results accord with those of Kaiser and Dewey (1991).

6. Concluding Comments

In summary, though we were not able to measure food diversity directly it seems that commercialisation has led to a loss of food diversity and availability. This might have contributed to food shortages in Nyeri district based on the responses given by the women respondents. Cash crops are usually grown in a monoculture system. This increases the risk of food shortages in case of yield failure of a particular crop. Our results from our sample also show that the production of subsistence food is proportionally smaller (see Table 1) than for cash crops. Dependence on cash crops also involves risks from market price variations and their low market prices can impact negatively on farm income and availability of food to farm households.

In Kenya, cash crops are viewed as men's crops and the income from these crops accrues to them. Due to the nature of the cash income and the fact that men and women have different expenditure patterns, increased cash income may not be used for increased purchases of household food.

In the Kenyan case, women appear to lose their power to make decisions with increased commercialisation as their husbands make most of the decisions relating to disposal of cash income and allocation of household resources (Kiriti and Tisdell, 2002; Kiriti, Tisdell and Roy, 2002). This may impact negatively not only on food availability in general but also on the nutrition of children, as observed by Elabor-Idemudia (1991).

Our study found that marital status and the presence of husbands negatively influences the proportion of household income allocated for food purchases. This indicates that pooling of household income and the power of the head to allocate it is likely to reduce the welfare of women and children.

Our findings reinforce those studies that see a link between household resource and purchasing allocation patterns and income sources in particular social and cultural contexts (Dewey, 1981, 1989; Kaiser and Dewey, 1991; Jarque, 1987; Heien, Jarvis and Perali 1989; Kennedy and Cogill, 1987; von Braun and Kennedy, 1986, 1987; Korte, 1969; Lev 1981; von Braun and Immink, 1994). Households having different sources of income may have different preferences for goods and services. These sources can influence household expenditure

patterns, as our analysis and results have shown, especially when different income sources alter gender-based economic power within the family.

Our findings show that income from cash crops in the Nyeri district has a negative influence on allocation patterns for food purchases. This is particularly so because cash crop income comes in a lump sum, and is controlled by males in joint households. Another form of lump sum income that had a negative effect on food purchases was earnings from outside employment. However, remittances were positively associated with an increased proportion of income allocated for food purchases.

According to traditional economic theory, any development that extends the economic opportunity of individuals or families will lead to increased economic welfare provided choice is free. However, farmers in Kenya did not, or do not, always have a free choice as some external forces operate. These include the necessity to pay taxes in cash (hut tax during the colonial times), payment of school fees for their children and social pressures to purchase some commodities requiring cash. Also, male dominance in decision-making as in the Kenyan case, can lead to reduced welfare gains of a family, as males are more cash crop oriented than females and tend to put their own interest ahead of the nutrition of their children. This can translate into reduced welfare gains for families that participate in the commercial economy.

Our literature review shows that although in developing countries, commercialisation of agriculture is sometimes associated with rising farm household food consumption and improved nutrition, the opposite also often occurs. The latter occurrence can have several sources. It may occur because of the irregular and lump-sum pattern of receipt of cash income, the tendency in some societies for males (mostly husbands) to appropriate cash income and spend it on items for themselves and not for their family, and long-term farm decisions by males in favour of cash crops rather than subsistence crops. So complex sociological, economic and psychological influences all can play a role in determining whether agricultural commercialisation in developing countries has a positive or negative influence on the food intake and level of nutrition of farm families.

Nevertheless, on the basis of the Kenyan case study reported here, an increase in subsistence output would raise total household food consumption, that is, the quantity of self-supplied

food plus purchased food. Given the increasing food demand for food because of Kenya's growing population, there is enormous need for an increase in non-cash food production by offering extension services, credit facilities, seeds, and fertilisers especially to women instead of over emphasising agricultural commercialisation. This could increase the diversity of household diets, reduce food shortages and reduce the rural household reliance on consumption of less nutritious purchased foods.

This does not necessarily mean that cash cropping should be abandoned, nor that cash cropping necessarily reduces availability of food to families. A cash crop that is also a food crop may have multiple outlets. Some can be consumed at home, can have local use as a food as well as be used for export. Therefore, it may benefit the producers (both men and women and children) as a source of food as well as a source of income for the households and provide foreign exchange. The government should be cautious about encouraging the production of monoculture non-food export crops at the expense of food crops as this make it difficult to meet household food needs. However, too much specialisation in a particular food crop(s) could also constitute a similar problem. Payment for cash crops could be altered so that cash payments are spread throughout the year and hence remove their lumpy nature. This could result in improved household allocation for food purchases. The government should also address sources of market failures and deficiencies, especially poor infrastructure, so that even with the existing cash crops, food availability is better maintained in all areas. Furthermore, the problem of poor governance of cooperative marketing boards should be addressed because it has placed an economic burden on farm households pursuing cash cropping in Kenya.

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APPENDIX 1

Table 2

Tobit Estimates of Proportion of Income for Household Food Purchases

Variable	All women	Married women
Constant	46.238	-4.386
	(-2.944***)	(-0.245)
Mastatus	-2.824	-
	(-2.034**)	-
Staytog	-7.189	-34.554
	(-2.202**)	(-4.636***)
Remitt	10.369	1.484
	(-5.617***)	0.260)
Employed	-18.472	-14.744
	(-2.584***)	(-1.983*)
Cashrev	-0.014	-0.001
	(-1.730*)	(-0.824)
Nochild	2.107	2.839
	(2.922***)	(3.463***)
Log likelihood	-611.427	-382.295
N	137	89

Absolute t-values in parenthesis
*** Significant at the 1 percent level
** Significant at the 5 percent level
* Significant at the 10 percent level

Variables

Mastatus = marital status of woman, 1 if married, 0 otherwise

Staytog = whether woman stays together with husband, 1 if she does, 0 if she does not

Remitt = whether household receives remittances or not, 1 if it does, 0 if it does not

Employed = whether woman is employed outside the farm, 1 if she does, 0 if she is not

Cashrev = proportion of gross income from sale of cash crops

Nochild = family size

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