



**University of Malawi  
Chancellor College**

**DEPARTMENT OF  
ECONOMICS**

Working Paper No. 2006/04

**Commercialisation of Food  
Crops in Rural Malawi:  
Insights from the Household  
Survey**

**Ephraim W. Chirwa**

March 2006



*Publication Funded by the European Union*

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The Working Paper Series are published with funding from the Government of Malawi/European Union through the Capacity Building Programme for Economic Management and Policy Coordination. The views expressed in the papers are those of the authors.

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# Commercialisation of Food Crops in Rural Malawi: Insights from the Household Survey\*

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**Abstract:** Since 1981, through structural adjustment programme, the agricultural sector has undergone several reforms which were expected to raise the incomes of smallholder farmers and hence increase their entitlement to food through the market. Data from the national household survey, however, show that most of smallholder farming remains subsistence. Only 10 percent of households sold their maize while 83 percent produced purely for own consumption. The study also reveals that the quantities of maize produced fell far short of the minimum requirement for a staple, implying that most households were net food buyers in 1997/98. The inequality in the distribution of land is one of the binding constraints for smallholder farmers in achieving food security through cultivation of either food crops or cash crops. This has implications for the adoption of technologies and the viability of promoting cash crops as a vehicle for achieving food security.

## 1. Introduction

Malawi is predominantly an agricultural economy, in which the agricultural sector contributes more than 35 percent of gross domestic product and it is a major source of livelihoods for more than 85 percent of the population which is mostly rural. National surveys estimate that crop production accounts for 74 percent of all rural incomes and agriculture is the most important occupation for 71 percent of rural population. Poverty studies indicate that 65 percent

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\* This paper is an abridged version of a paper prepared for the Department of Agricultural Economics at Michigan State University in USA under a research project on *Agricultural Marketing and Policy Issues in Southern Africa*. The usual disclaimer applies.

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of Malawians live below the poverty line, with 29 percent barely surviving (NSO, 2000). The agricultural sector has two main sub-sectors - the smallholder sub-sector that contributes more than 70 percent and the estate sub-sector that contributes less than 30 percent to gross domestic product originating from the agricultural sector.

The smallholder agricultural sector in Malawi is characterized by low productivity and land constraints. Owing to population pressure, resulting in the fragmentation of land, the national mean land holding size has fallen from 1.53 hectares per household in 1968 to 0.80 hectares per household in 2000 (GoM, 2001). It is estimated that 33 percent of the smallholder sector cultivates between 0.5 and 1 hectare of land per household. In 1994, it was estimated that the yield per hectare for maize was 32 percent of the potential yield while for tobacco and rice stood at 38 percent of the potential yield (GoM, 2001). The estate sub-sector specialises in cash and export crops such as tobacco, tea, coffee and sugar. About 30,000 estates own a total of 1.1 million hectares with an average landholding of between 10 to 500 hectares (World Bank, 2003). Productivity in estates is found to be higher than it is in the smallholder sub-sector. For instance, productivity in tea estates was 2,129 kilograms per hectare compared to 810 kilograms per hectare on smallholder farms in 2002 (GoM, 2004).

This paper analyses developments in food production and marketing in Malawi with emphasis on maize, the main staple crop. We focus on the characteristics of rural households who mainly depend on agriculture for their livelihoods. In the next section, we discuss the evolution of food production and marketing in Malawi mainly outlining the policy shifts since Independence. In section 3, we analyse the data with respect to food crop production and marketing from the 1998 Integrated Household Survey (IHS) collected by the National Statistical Office. The national sample used in the analysis constitutes 9,280 households living in the rural areas.<sup>1</sup> The analysis in this paper focuses on food production, consumption and marketing particularly for maize. Finally, in section 4, we present concluding remarks and policy implications.

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<sup>1</sup> It was not possible to analyse the maize balance due to the fact that the maize and maize meal purchases data was not comparable to production and sales data since the recall period for maize and maize meal purchases was three days.

## **2. Policies towards Food Production and Marketing in Malawi**

### ***2.1 Pre-Reform Period (1964 – 1979)***

Since Independence in 1964, ensuring food security has been one of the development goals pursued by the government. Such food security in Malawi has traditionally been defined in terms of peoples' access to maize, the main staple food. Self-sufficiency in food production, therefore, has been the strategy pursued by the government. In order to achieve self-sufficiency in food production, a number of policies and interventions were put in place to support agricultural development. First, the Agricultural Development and Marketing Corporation (ADMARC), a state marketing agency, was entrusted to market smallholder food and cash crops and was used as an agent for the implementation of government agricultural pricing policies. ADMARC was mandated to market, process and dispose of agricultural produce; to provide adequate price stability and to provide storage facilities for food reserves (Christiansen and Stackhouse, 1989; Scarborough, 1990). The government invested substantially in market infrastructure in the rural areas through ADMARC. By 1991, ADMARC had 3 regional offices, 12 divisional offices, 80 area offices, 217 unit (primary) markets and 1,300 seasonal markets across the country (ADMARC, 1990). Although the Agricultural and Livestock Marketing Act of 1964 gave monopsony power to ADMARC to purchase and sell smallholder tobacco and cotton, the extensive network of markets facilitated its dominance in the marketing of other crops. While private trade in commodities produced by smallholder farmers precede official marketing institutions, it had always been accepted; only that most food crops were under price control and trader licensing requirements (Chirwa, 1998).

Secondly, there was extensive research in maize leading to development of high yielding maize varieties (Smale, 1995). This research was supported by extension services throughout the country which facilitated the adoption of technology (hybrid maize and application of fertilizers). In addition, subsidized credit and inputs to the smallholder sector delivered through farmers' clubs linked to ADMARC that facilitated adoption of technologies. Thirdly, government also implemented pan-territorial and pan-seasonal guaranteed prices of maize and other smallholder agricultural produce. Fourth, estate agriculture was promoted as a source of export crops and restrictions were imposed on the production of burley tobacco on smallholder farms.

The agricultural sector-led development strategy paid dividends in the early years of independence and Malawi was self-sufficient in food production particularly in the 1970s. The economy grew at an average rate of 6 percent per annum. However, others have argued that the policies that favoured the estate sector which concentrated more on tobacco made the economy vulnerable to external factors (Harrigan, 2003). Others have argued that the system of pan-territorial and pan-seasonal prices undermined the profitability of smallholder farming and acted as an implicit taxation extracted by ADMARC (Kydd and Christiansen, 1982). Malawi experienced a crisis that manifested in poor and negative growth of the economy, deteriorating terms of trade, transport bottlenecks, rising cost of fuel, adverse weather conditions and weakening internal demand between 1979 and 1981. Real growth rate of GDP fell from 8.3 percent in 1978 to 3.9 percent in 1979 and for the first time, negative growth rates of -1.1 percent in 1980 and -4.7 percent in 1981 were registered. Harrigan (2003) argues that the crisis exposed fundamental weaknesses of the estate-led export strategy that led to the marginalisation of the smallholder sector with consequent food security implications.

## ***2.2 The Reform Period (1980 – 2005)***

This economic crisis that manifested in negative growth rates in the economy in 1980 and 1981 drove Malawi into the adoption of World Bank structural adjustment programmes and IMF stabilisation measures (Harrigan, 1991 and 2003; Mhone, 1992; Kaluwa et al., 1992). Since 1981, the Government of Malawi has introduced several policies in a phased and sometimes in an indecisive manner, some of which were directly targeted at reforming the agricultural sector affecting the production and marketing of food crops. As Harrigan (2003) notes, the reforms in the agricultural sector were aimed at removing biases against the smallholder sector and increasing the participation of smallholder farmers in the production of high value export crops such as tobacco, cotton and groundnuts.

### ***2.2.1 Reforms in Crop Production***

There have been no restrictions on the type of food crops that could be grown by smallholder farmers. However, prior to economic reforms and during part of the reform period, smallholder farmers were restricted in the production of some cash crops under the Special Crops Act which imposed restrictions on the production and marketing of high value crops especially tobacco. Under economic reforms, several policies have been implemented affecting the

production of food and cash crops grown by smallholder farmers (Chirwa and Zakeyo, 2003). First, the government implemented annual adjustments in the price of smallholder produce prices between 1981 and 1994 and liberalisation of agricultural produce pricing in 1995 (with the exception of maize) to stimulate production. Other price incentives were provided through periodic devaluation of the currency and consequent flotation of the Malawi Kwacha against major currencies in 1994.

Secondly, there was phased removal of fertilizer subsidies albeit with policy reversals. Harrigan (2003) notes that fertilizer subsidies were re-introduced at 22 percent in 1987, a level that was higher than that applied during the pre-reform period. Fertilizer subsidies were eliminated in 1991.<sup>2</sup> Thirdly, the government liberalised production of cash crops through the repeal of the Special Crops Act in 1995. As a result, smallholder farmers have become important producers of burley tobacco, accounting for more than 70 percent of national output and almost one in every five households now cultivate tobacco (World Bank, 2003). The liberalisation of growing of burley tobacco by smallholder farmers was seen as one of the strategies of ensuring food security based on the income approach – improvements in incomes from participation in high value cash crops despite its potential to shift more land away from food crop production would enable households to buy from the market and rely on import of food (MEPD, 1995; Harrigan, 2003).

Fourthly, government promoted production of suitable drought-resistant cereals and food crops such as cassava, sorghum, millet, rice, grain legumes, bananas and vegetables. Smallholder production of non-maize food crops increased substantially in the 1990s while the share of maize in total smallholder farms declined (Chirwa and Zakeyo, 2003; Harrigan, 2003). Finally, safety nets were introduced targeting resource poor farmers including ‘Starter Pack’ programme that provided free inputs (hybrid maize seeds and fertilizers) to food insecure households (cultivating 0.1 hectares or less of maize) in 1998/99 and 1999/2000 agricultural seasons; and the Agricultural Productivity Improvement Programme which provided inputs on credit and the Targeted Input Programme which provided free inputs (including cereal seeds, legume seeds and fertilizer) to resource poor farmers. In the 2001/02 season, the number of beneficiaries of APIP was reduced to 41,800 from 160,000 in 2000/01 season due to the high default rate among smallholder farmers (NEC, 2002).

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<sup>2</sup> However, the government resumed fertilizer subsidies to smallholder farmers through the voucher system in the 2005/06 season.

### *2.2.2 Reforms in Crop Pricing and Marketing*

Within the economic reform programme the government liberalised agricultural produce pricing and marketing in various ways. First, periodic adjustments to the pan-territorial and pan-seasonal prices for agricultural products particularly maize were introduced between 1982 and 1986. In 1982, the government adopted the parity pricing approach and the producer price of maize was consequently increased by 68 percent. The pricing approach led to annual adjustments in the price of maize in the 1980s. As Harrigan (1988) notes, considerable price increases for a majority of smallholder export crops were announced in 1983/4 and 1984/5 growing seasons such that by 1985/6 prices were close to parity levels. By 1988, prices of most crops were liberalized with the state marketing agency acting as a buyer of last resort at minimum guaranteed pan-territorial and pan-seasonal prices. Private traders were therefore free to determine their own prices for purchase of crops from smallholder farmers, and by 1995 prices of all other crops, except for maize, were fully liberalised and ADMARC was given flexibility in determining the prices of other crops (Chirwa, 1998).

Secondly, government introduced a price band for maize which ADMARC was expected to defend. ADMARC was free to determine the producer price of maize within a fixed band while the consumer price of maize remained pan-territorial and pan-seasonal. However, due to increased marketing of maize by private traders, it had become rather difficult for ADMARC to defend the price band, and consequently the policy was abandoned in 2000 and the price of maize significantly increased (Chirwa and Zakeyo, 2003). However, the government has always intervened in the pricing of maize by setting the price for sale of maize particularly during the lean season and food crises.

Thirdly, there was a reduction in the scope of export licensing except for maize and cassava in 1989/90 and subsequent removal of import and export licensing requirements on all crops. However, the government has continued to impose export bans on maize periodically, particularly in periods of food shortages. This has sent mixed signals to the private sector and has led to the unpredictability of government policy.

Finally, government abolished the monopsony power of ADMARC and liberalised the marketing of smallholder agricultural produce.<sup>3</sup> The marketing of smallholder agricultural crops was

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<sup>3</sup> Others have argued that the liberalisation of agricultural marketing was hastened by the growing inefficiency of ADMARC and its broadened mandate that extended to investments in profitable enterprises,

deregulated in 1987 through the Agriculture (General Purpose) Act of 1987 which eliminated ADMARC's monopsony power in produce marketing in the domestic market. The Act required private traders to obtain licenses to engage in the marketing of crops. Nonetheless, the requirement for obtaining a license to participate in the trading of smallholder crops was relaxed over time and private traders unofficially were increasingly trading without licenses. In 1996, licensing was no longer required for marketing of smallholder agricultural crops.

The competition from private traders and the decline in subsidization from the central government further weakened the efficiency and performance of the state marketing agency, ADMARC. ADMARC had to adapt to the new marketing environment through a series of reforms including rationalisation of its investment portfolio and closing of some rural markets (Christiansen and Stackhouse, 1989). There was a sharp reduction in the number of marketing establishments operated by ADMARC. In 2001, ADMARC only operated through 441 seasonal markets, 343 unit markets, 24 parent markets, 10 depots and 14 district headquarters markets (Mvula et al., 2003).

Although over the years, ADMARC market power has been weakened, there may be still concerns about the effect of its continued involvement in the marketing of food crops. Proponents of the privatisation of ADMARC argue that its continued role in agricultural marketing stifles private sector participation in agricultural trade. Dorward et al. (2004) note that those that argue for complete withdrawal of the state fear the policy reversals and price controls and the competitive advantages of the state marketing agencies that depress returns and increase risks to private sector investments. There has been no evidence in Malawi to suggest that ADMARC with its financial constraints is an impediment to private sector trade.<sup>4</sup> Mvula et al. (2003) and Nthara (2002) find that ADMARC plays an important role in crop marketing where it has resources, particularly in the sale of maize to maize deficit households.

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exacerbated by the inadequate funding to government state-owned enterprises.

<sup>4</sup> In other countries, where state marketing agencies continue to play a role in the post-liberalisation era such as Kenya, the evidence suggests that private traders do not perceive state marketing agencies as stifling private trade (Karugia et al., 2004).

## **2.3 The Impact of Agricultural Liberalisation**

### *2.3.1 Food Production Trends and Food Security*

It is rather difficult to attribute changes in production to agricultural sector reforms in Malawi, partly due to the recurring natural disasters such as drought and floods that have occurred over the years. For example, the 1992, 1994 and 2001 were bad years for agricultural activities in Malawi due to floods and drought. The production patterns of the main food products in Malawi reveal no major changes in food crop production in the 1980s while the 1990s reveal a substantial increase in food crop production. However, there were major maize shortages in the late 1980s and in the 1990s that necessitated importation of maize (ADE, 2000; Chirwa and Zakeyo, 2003). While maize has remained the main food crop at national level, other food crops such as cassava, pulses, rice and sorghum are bridging the national shortages in maize production and supply.

The food security situation has not changed significantly. According to NEC (1999) nearly 60 percent of households experience food shortages, especially between the months of December and February – the lean season. Recent surveys indicate that the average months of food security for rural households from own production in a normal year is between 6 and 7 months. World Bank (2003) observed that food supplies in Malawi fluctuated between 1.6 and 1.7 kcal per capita per day during 1996-99 period compared to the minimum requirement of 2.2 kcal per capita per day. This implies that most rural households and urban households have to buy maize and other food products from the market economy. However, in recent years the prices of food products have increased substantially. For instance, food price index has been increasing at the average rate of 33.3 percent per annum between 1995 and 2001. This coupled with the fact that poverty has remained unchanged in the past decade implies that most households are at risk for part of the year.

The situation in urban areas is similar to that in the rural areas in the sense that wage incomes, the main source of incomes, have not increased to match levels of inflation. Some of the strategies households use to obtain food when they run out of own production include purchase from ADMARC and the private markets, food transfers from relatives, non-governmental organisations and government, engaging in *ganyu* for food payments, begging and borrowing for consumption from money lenders (Chirwa and Zakeyo, 2003). Some of the vulnerable households, particularly in the rural areas, have access to safety nets such as the public works programme that targets food insecure areas, food-for-work

programme implemented by non-governmental organisations, supplementary feeding programmes.

There are several reasons that have been advanced for the worsening food security situation in Malawi. First, Malawi has not been spared from the vagaries of nature; recurring droughts and floods have adversely affected crop production and food security; the impact of the more difficult agro-climatic conditions that affects African agriculture (Dorward et al., 2004). Secondly, the liberalisation of cash crop production has substituted smallholder land devoted to maize production in favour of tobacco. Harrigan (2003) notes that the share of maize in smallholder cultivated area declined in the 1990s while smallholder production of burley tobacco and non-maize food crops increased. However, Chirwa and Zakeyo (2003) observe that while land devoted to tobacco production increased in the 1990s, the area devoted to maize production remained relatively stable or marginally increased. While from the livelihood framework point of view the shift to cash crop is expected to lead to food security through entitlements to marketed food, smallholder farmers remain food insecure. The livelihood approach to food security has failed partly due to the declining prices of tobacco at the Auction Floors and the increasing costs of inputs, making tobacco less profitable for smallholder farmers.

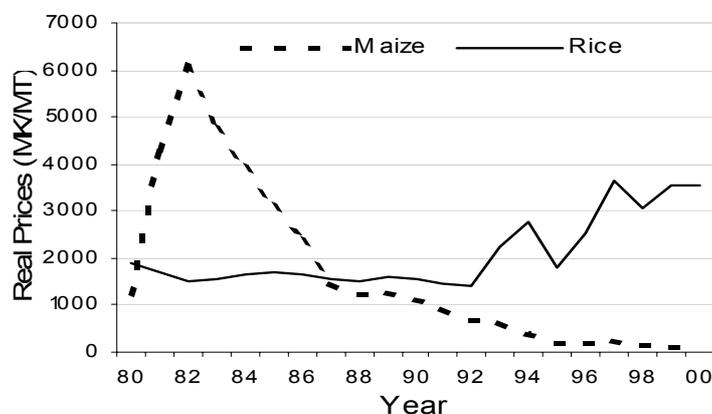
Thirdly, with the growing population, land holdings are becoming small and more fragmented through family subdivision. This has implications on the adoption of agricultural technology. Chirwa (2005) finds plot size to be a significant determinant of fertilizer adoption by smallholder maize farmers. There is also evidence that suggests a positive relationship between farm size and productivity in labour-scarce and land-scarce smallholder farmers in Malawi (Dorward, 1999). Fourthly, maize productivity remains a major problem in Malawi particularly since the 1990s. One argument is that the removal of fertilizer subsidies, in the land constrained smallholder sector, affected adoption of high yielding maize varieties. Harrigan (2003) argues that the displacement of maize by tobacco was made worse due to the removal of fertilizer subsidy which dampened the productivity and profitability of maize, particularly hybrid maize. Fifthly, the agricultural extension system collapsed due to financial and human resource constraints. According to GoM (2002), the agricultural extension system was undermined by the growing farming population, death and retirement of extension officers and lack of a replacement programme, lack of training of extension workers and generally lack of support towards operational expenses. Finally, there has been low state investment in agricultural development following economic liberalisation policies that ignored the role of institutions and the

state in the development process. This has made it difficult to kick-start cereal based intensive growth in rural areas (Dorward et al., 2004).

### 2.3.2 Food Crop Price Trends

Liberalisation has led to increased variability in agricultural prices in Malawi. Nominal consumer prices of maize between 1990 and 2000 had increased ten fold, more or less in line with the increases in the general price level measured by changes in the consumer price index (ADE, 2000). The real producer prices of maize and rice show marked differences in the trend over time (Figure 1). Real prices for rice remained fairly stable during the 1980s but show an increasing trend in the 1990s. On the other hand, the real producer prices of maize have followed a declining trend since 1982. Chirwa and Zakeyo (2003) find that production of maize has remained stable or even increased and econometric results suggest a positive supply response after controlling for other factors. The variability of prices has introduced some uncertainty in the planning of farm households.

Figure 1 Trends in Domestic Real Producer Prices of Maize and Rice, 1970 - 2000



Source: Chirwa and Zakeyo (2003)

### 2.3.3 Performance of the Private Marketing System

The liberalisation of agricultural produce marketing and the declining importance of ADMARC have attracted private traders in the marketing of smallholder agricultural produce in Malawi (Fafchamps and Gabre-Madhin, 2001; Mkwezalamba, 1989; FSG,

1991; Kaluwa, 1991). Although the number of market players has increased, studies cast doubts on the improvements in the efficiency of markets. Chirwa and Zakeyo (2003) find no improvements in market integration among spatial prices in Malawi. Fafchamps and Gabre-Madhin (2001) find that the marketing margins among private traders in Malawi are quite high, reflecting the inefficiency of the private marketing system. Others such as Mvula et al (2003) and Peters (1992) find that there is high incidence of business malpractices among private traders operating in the rural areas. These malpractices include cheating on measurements, quality evaluation and offering monopsonistic prices to producers.

Most of the private traders are small scale sole operators and operating within a specific geographic area, typically specialising in a single commodity. Most of the traders do not stock supplies and arbitrage over time is limited (Fafchamps and Gabre-Madhin, 2001). Some studies revealed that most private traders faced problems of transportation, storage, pricing, grading, crop procurement, marketing and finance; raising questions about their effectiveness in providing the necessary competition to ADMARC (Mkwezalamba, 1989; Harriss and Crow, 1992; Scarborough, 1990). The poor sequencing of structural adjustment policies might have exacerbated the constraints that the private sector experience in crop marketing. The failure to simultaneously liberalise financial markets and crop marketing perpetuated the credit constraint of private traders (Harrigan, 2003). Despite the constraints, with the declining importance of ADMARC, private traders play a significant role in the selling of food crops (Mvula et al., 2003).

Another argument has been that the continued role of ADMARC in the marketing of crop produce stifled the activities of the private sector. As a state marketing agency, ADMARC operations were being subsidised through transfers from the government and had advantage over private traders with respect to the network of markets and storage facilities. More recently, government has been under pressure from the international financial institutions and bilateral donors to privatise ADMARC, but as Harrigan (2003) notes there have been sharp differences between the World Bank and the government on the speed of liberalisation and privatisation of ADMARC.

### 3. Characteristics of Food Producing Households in Rural Malawi

#### 3.1 Production and Commercialisation of Crops

Agriculture remains the dominant economic activity in rural Malawi. About 31.9 percent of 9,280 rural households do not cultivate crops. The mean land holding size per household is 0.71 hectares and land size holding per adult equivalent is 0.2 hectares. This compares favourably with the land size distribution at national level for those with crop land reported by NSO (2002), in which the mean area of land per household is 0.99 hectares and ranges from 0.84 hectares for ultra-poor households to 1.103 hectares for non-poor households. Table 1 shows how farm sizes per capita (adult equivalent) impose binding constraints on household welfare. There is a positive relationship between gross value of crop sales and per capita farm sizes, with households in the highest quartile twice as much as those in the lowest quartile. A similar pattern emerges with respect to household income per capita, although those in the second quartile tend to earn more than those in the third quartile. This may be explained by the differences in the proportion of off-farm incomes in total household incomes. Households in the second farm size quartile generate 28 percent of incomes from off-farm activities while those in the third quartile generate 21 percent from off-farm activities.

Table 1 Rural Household Characteristics by Farm Size

| Dimension                               | Mean   | Quartiles of Per Capita Farm Size |       |        |        |
|---|--------|-----------------------------------|-------|--------|--------|
|   |        | 1                                 | 2     | 3      | 4      |
| Landholding size (ha)                   | 1.05   | 0.51                              | 0.98  | 1.13   | 1.59   |
| Gross value of crop sales (1998 US\$)   | 141.50 | 82.67                             | 124.9 | 138.37 | 220.31 |
| Household income (1998 US\$ per capita) | 58.47  | 33.39                             | 51.57 | 47.51  | 105.89 |
| Off-farm income share (%)               | 22.65  | 25.69                             | 28.16 | 21.46  | 18.27  |

Source: Computed by author based on IHS1998

Table 2 presents characteristics of households according to crop production and marketing position. Households that planted and produced crops but did not sell crops account for 28.8 percent while those that produced and sold crops account for 39.3 percent of rural households. Land holding sizes play a critical role in agricultural development. Similarly, household crop marketing position is also dictated by the size of land holdings. Households that produced but did not sell crops have smaller land than have those that produced and sold crops, and there is a positive association between crop sales value and the size of land holdings. For instance, households that did not sell crops had 0.68 hectares compared with households in the

lowest quartile of crop sales with mean land holdings of 0.85 hectares and those in the highest quartile with mean land holdings of 1.55 hectares. This relationship also holds when we use land holding sizes per capita.

Table 2 Characteristics of Rural Households by Crop Production and Marketing Position

| Dimension                            | Households producing but not selling crops | Households selling crops, ranked by quartiles of total crop sales |       |       |        |
|--------------------------------------|--|---|-------|-------|--------|
|                                      |  | 1   | 2     | 3     | 4      |
| Land holding size (ha)               | 0.68                                       | 0.85  | 0.99  | 1.16  | 1.55   |
| Land holding size/capita (ha)        | 0.21                                       | 0.27  | 0.31  | 0.32  | 0.34   |
| Value of farm equipment (US\$)       | 6.23                                       | 4.74  | 10.47 | 11.25 | 32.17  |
| Total household income (US\$)        | 142  | 118   | 157   | 218   | 670    |
| Total crop income (US\$)             | 40.3                                       | 46.1  | 77.0  | 132.9 | 475.5  |
| Gross livestock income (US\$)        | 4.2  | 6.3   | 8.0   | 10.3  | 16.6   |
| Off-farm income (US\$)               | 97.4                                       | 65.7  | 71.8  | 75.1  | 178.2  |
| Gross revenue, crop sales (US\$)     | -  | 6.79  | 22.75 | 59.35 | 368.36 |
| Maximum adult education <sup>a</sup> | 1.49                                       | 1.50  | 1.60  | 1.82  | 2.06   |

Note: a. Maximum education is categorical: 1 = Std I-IV, 2 = Std V - VIII, 3 = Junior Secondary, 4 = Senior Secondary, 5 = University, 6 = Other

Source: Computed by author based on IHS1998

The problem of land does also explain the variations in incomes of rural households. Households that produced crops but did not sell crops earn \$142 which is higher than the first quartile of those that sold crops (\$118), but lower than the upper quartiles. The difference between those that produced but did not sell crops and the first quartile of households that sold crops is explained by greater reliance on non-farm income in the former than the latter. With the exception of those that produced but did not sell crops and the first quartile of households selling crops, we find that crop income is the most dominant source of income. For households that produced but did not sell crops 68.6 percent of income originated from non-farm activities. For households that sold crops there is a positive correlation between the proportion of crop income and value of crop sales but a negative relation between the proportion of non-farm income and value of crop sales. Thus, households that sell crops tend to specialise in farming activities as their main source of income. This specialisation is also revealed by the gross revenue from crop sales for households selling crops.

Human development among rural households is also low. Most rural households have only completed junior primary school level (4 years of schooling). This may have implications on technology adoption and productivity, which is reflected in the differences in the value of crop sales by smallholder farmers. It appears smallholder

farmers in the lowest quartile of crop sales tend to have low education than those in the highest crop sales quartile.

Table 3 shows farming characteristics of rural households by crop marketing position. Most households cultivate more than one food crop. However, there is no clear relationship between number of food crops grown or sold and crop marketing position but a positive relationship between number of non-food crops and marketing position. An interesting observation from the data is that households in the lowest quartile of crop sales produce food crops mainly for own consumption.

Table 3 Farming Characteristics of Rural Households by Crop Marketing Position

| Dimension                           | Households producing but not selling crops | Households selling crops, ranked by quartiles of total crop sales |        |         |         |
|-------------------------------------|--|---|--------|---------|---------|
|                                     |  | 1   | 2      | 3       | 4       |
| Number of food crops cultivated     | 1.13                                       | 1.25  | 1.16   | 1.19    | 1.05    |
| Number of food crops sold           | -  | 0.67  | 0.61   | 0.62    | 0.40    |
| Number of non-food crops cultivated | -  | 0.45  | 0.59   | 0.74    | 0.97    |
| Maize productivity (kg/ha)          | 807.72                                     | 692.77  | 911.92 | 1,145.2 | 1,530.0 |
| Households using fertilizers (%)    | 30.75                                      | 35.28   | 44.02  | 57.84   | 86.28   |
| Commercialisation index (%)         | 0.00                                       | 30.18   | 45.90  | 60.32   | 78.08   |

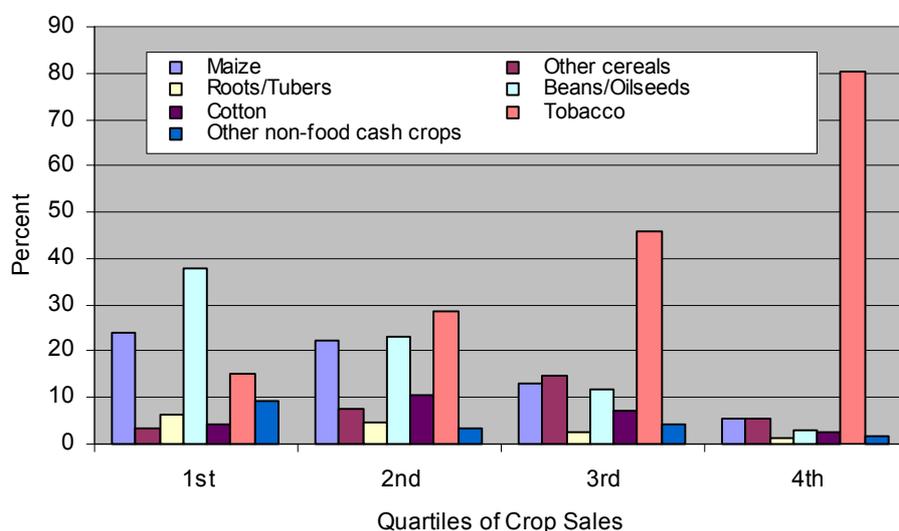
Source: Computed by author based on IHS1998

Among households that sold crops, there is a positive correlation between maize productivity and crop marketing position. The higher the commercialisation index, the higher the maize productivity. The average maize yield for rural households is 902 kilograms per hectare, and yield increases with increasing value of crop sales. The commercialisation index (crop sales value to crop production value ratio) increases from 35 percent in the lowest crop sales quartile to 78 percent in the highest quartile. Similarly, maize productivity increases from 693 kilograms per hectare in the lowest quartile to 1,530 kilograms per hectare in the highest quartile. One reason for this may be the high proportion of households that apply fertilizers as crop sales increase. Only 35 percent of households apply fertilizers in the lowest quartile of crop sales compared with 86 percent of households in the highest quartile that apply fertilizers. Only 31 percent of households that produced but did not sell crops applied fertilizers. It is worth noting that households that sold crops had larger land holding sizes than those that did not sell their crops.

Figure 2 shows the share of crop sale income by type of crop and quartiles for rural households that sell crops. In the lowest crop sales quartile, income from bean sales accounts for nearly 40 percent, followed by income from maize sales which accounts for about 24 percent. In the second quartile, income from tobacco dominates

although the difference with income from sale of maize and beans is not substantial. Tobacco dominates crop sales incomes in the third and fourth crop sales quartile by far compared to the role of other crops. In the highest quartile, tobacco accounts for 80 percent of crop sales income. The importance of tobacco in different crop sales quartiles also reflect the importance of land in engaging in high value agricultural production. The declining importance of maize in crop sales and the increasing importance of tobacco can be linked to the policy developments such as liberalisation of crop production and the policy emphasis of cash crop production as a vehicle of achieving household food security (Harrigan, 2003).

Figure 2 Share of Crop Sales Income by Crop Type and Sales Quartiles



### 3.2 Production and Commercialisation of Maize

Maize remains the main staple food in rural Malawi in spite of policies that have been promoting other food crops. Overall, over 90 percent of rural households take maize as their main staple food. Chirwa and Zakeyo (2003) observe that maize meal (*nsima*) was the main meal for lunch and supper for 78 percent and 82 percent respectively of rural households in 2002. Only 1.9 percent and 1.4 percent of household had cassava meal and rice, respectively. The national estimate of households (rural and urban) cultivating maize is 71.9 percent, and 42.3 percent of households cultivated local maize while 31.5 percent cultivated hybrid maize (NSO, 2002). The other food crops cultivated include groundnuts (25.1 percent), cassava (8

percent), rice (4.9 percent), sorghum (3.1 percent) and millet (2.8 percent). The production of these food crops varies with poverty levels, except for maize where the differences are marginal. The lower proportion of the ultra-poor tends to produce cassava, rice and millet compared with the non-poor. In addition, only 25.1 percent of the ultra-poor cultivated hybrid maize compared with 28.8 percent of the poor and 34.7 percent of the non-poor (NSO, 2002).

The 1998 integrated household survey revealed that only 56.2 percent of rural households cultivated maize and only 9.2 percent sold some of the maize. There are variations in total household income with respect to characteristics of maize production and marketing position (Table 4). Households whose maize failed had the lowest land holding size, although their land holding size is similar to those in the lowest quartile of maize sales and those that produced but did not sell maize. The extent of maize sales is positively associated with increasing land holding sizes. Households that sold maize tend to be well endowed with respect to farm inputs and human capital. For instance, households that did not sell maize had farm assets worth \$10.8 and maximum adult education equivalent slightly above Standard IV while those in the highest quartile of maize sales had farm equipment worth \$21.4 and maximum adult education of above Standard VIII.

Table 4 Characteristics of Rural Households Producing Maize by Marketing Position

| Dimension                            | HHs <sup>a</sup><br>not<br>plantin<br>g maize | HHs<br>plantin<br>g maize<br>but not<br>produci<br>ng | HHs<br>produci<br>ng but<br>not<br>selling<br>maize | Households selling maize,<br>ranked by quartiles of total<br>maize sales |       |       |       |
|--------------------------------------|---|---|---|--|-------|-------|-------|
|                                      |   |   |   | 1  | 2     | 3     | 4     |
| Land holding size (ha)               | 0.40  | 0.90  | 0.92  | 0.90   | 0.97  | 1.11  | 1.47  |
| Land holding size/capita (ha)        | 0.11  | 0.27  | 0.26  | 0.28   | 0.33  | 0.33  | 0.38  |
| Farm equipment (US\$)                | 6.6   | 3.1   | 10.8  | 6.3  | 7.9   | 10.4  | 21.4  |
| Total household income (US\$)        | 166.4   | 105.2   | 210.3   | 155.4  | 234.7 | 323.1 | 585.5 |
| Total crop income (US\$)             | 31.5  | 49.1  | 117.5   | 54.8   | 97.7  | 167.0 | 355.9 |
| Gross livestock income (US\$)        | 6.9   | 5.0   | 6.8   | 9.4  | 9.3   | 7.8   | 16.4  |
| Off-farm income (US\$)               | 128.0   | 51.6  | 85.9  | 91.3   | 127.8 | 148.3 | 213.2 |
| Crop sales revenue, (US\$)           | 24.3  | 34.3  | 56.8  | 17.6   | 40.8  | 90.2  | 204.5 |
| Maximum adult education <sup>b</sup> | 1.6   | 1.3   | 1.6   | 1.5  | 1.9   | 1.9   | 2.3   |

Note: a.HHs = Households

b. Maximum education is categorical: 1 = Std I-IV, 2 = Std V - VIII, 3 = Junior Secondary, 4 = Senior Secondary, 5 = University, 6 = Other

Source: Computed by author based on IHS1998

With respect to income, commercialisation of maize matters. Households that did not plant maize have a mean household income of \$166.4 while those that planted but did not produce maize (maize failure) the mean income is \$105.2. Households that produced but

did not sell maize have an average income of \$210 – more than the mean income of those that did not plant or produce maize. Mean household incomes of smallholder farmers that did not sell maize are higher than the mean income for households in the lowest quartile of maize sales. Otherwise, mean household incomes increase from \$234.7 for the second quartile to \$585.5 in the highest quartile of maize sales. Generally, households that did not produce maize tend to be poor. Maize production offers a better platform for diversification of income sources, thus underscoring the importance of food security in livelihood promotion.

With respect to sources of total household income, those that did not plant maize generate most of their income from non-farm sources (76.9 percent) compared to the other two sources of income - farm income (18.9 percent) and livestock income (4.1 percent). For households that planted but did not produce maize their main sources of income are non-farm activities (48.6 percent) and farm activities (46.7 percent). Although the maize crop failed for this group, due to diversification these households were able to generate income from other crops rather than maize. Households that produced but did not sell maize generated most of their income from farm income although most of this is subsistence production. Similarly, households that produced and sold maize had farm activities as their main source of income accounting between 59.4 percent and 71 percent. Maize sales contribute a significant proportion to gross income from crop sales for households that produce maize. Households that sold maize generated at least 67.1 percent of crop income from maize. For households that produced but did not sell maize, tobacco and beans are the most important source of gross income from crops. Tobacco is the second most important source of gross income from crop sales for households that sold maize in all the quartiles ranging from 11.8 percent in the lowest quartile to 18.4 percent in the highest quartile.

If we cumulatively rank maize sales, only 1.8 percent of households accounted for the top 50 percent of total maize sales while 15.0 percent accounted for the bottom 50 percent and 83.2 percent did not sell their maize (Table 5). Households that sold maize tend to be less poor than those that did not sell their maize and income differences are also substantial between the top maize sellers and the bottom maize sellers. The total income for households that account for the top 50 percent of total maize sales is twice as high as that for households that account for the bottom 50 percent of sales. It is also apparent that households that account for the top 50 percent of maize sales tend to specialise in farming activities; their off-farm income is lower than for the households that account for the

bottom 50 percent of maize sales. The top maize sellers also tend to have larger land holding sizes.

**Table 5 Characteristics of Households by Maize Marketing Position**

| Dimension                         | Maize Sellers  |                       | Households not selling maize |
|-----------------------------------|--|-----------------------|------------------------------|
|                                   | Households accounting for top 50% of total maize sales | Rest of Maize Sellers |                              |
| Number of households              | 92 (1.8%)  | 763 (15.0%)           | 4,221 (83.2%)                |
| Land holding size (ha)            | 1.7  | 1.05                  | 0.92                         |
| Value of farm assets (US\$)       | 241  | 89                    | 63                           |
| Total household income (US\$)     | 749  | 277                   | 210                          |
| Total crop income (US\$)          | 502  | 131                   | 119                          |
| Gross revenue, crop sales (US\$)  | 305  | 64                    | 57                           |
| Gross revenue, maize sales (US\$) | 115  | 18                    | 0                            |
| Gross livestock income (US\$)     | 14   | 10                    | 23                           |
| Off-farm income (US\$)            | 23   | 30                    | 7                            |

Source: Computed by author based on IHS1998

Table 6 shows the maize farming characteristics of households by their marketing positions. There are variations in the production and sale of maize for households that produce maize by their marketing position. Households that produced but did not sell maize grew more food crops and grew such crops to meet subsistence needs than those that sold some maize. However, the difference in the number of non-food crops cultivated between those that did not sell maize and those that sold some maize is marginal.

**Table 6 Maize Farming Characteristics of Rural Households by Marketing Position**

| Dimension                        | HHs <sup>a</sup> not planting maize | HHs planting maize but not producing | HHs producing but not selling maize | Households selling maize, ranked by quartiles of total maize sales |      |       |       |
|----------------------------------|-------------------------------------|--------------------------------------|-------------------------------------|--|------|-------|-------|
|                                  |                                     |                                      |                                     | 1  | 2    | 3     | 4     |
| Number of food crops cultivated  | 0.16                                | 1.69                                 | 1.83                                | 1.36   | 1.22 | 1.34  | 1.33  |
| Number of food crops sold        | 0.12                                | 0.29                                 | 0.28                                | 0.91   | 0.89 | 0.91  | 0.91  |
| Number of non-food crops         | 0.19                                | 0.20                                 | 0.37                                | 0.33   | 0.31 | 0.38  | 0.39  |
| Maize production (kg/hh)         | -                                   | -                                    | 487                                 | 356  | 580  | 870   | 1,917 |
| Maize sales (kg/hh)              | -                                   | -                                    | -                                   | 44   | 111  | 239   | 898   |
| Maize productivity (kg/ha)       | -                                   | -                                    | 846                                 | 634  | 968  | 1,394 | 2,187 |
| Households using fertilizers (%) | 21.4                                | 26.4                                 | 40.8                                | 61.4   | 56.6 | 57.8  | 71.6  |
| Commercialisation index (%)      | 16.7                                | 23.5                                 | 21.4                                | 28.8   | 34.8 | 44.0  | 55.3  |

Note: a.HHs = Households

Source: Computed by author based on IHS1998

Maize production is also higher among households that sold some maize, with the exception of the lowest maize sale quartile, than among those that did not sell their maize. There is a similar relationship with respect to maize productivity. Households that produced but did not sell maize, on average produced 487.2 kilograms more than what the households in the lowest quartile of sales but less than what the upper quartiles of sales produced. Households in the lowest quartile of sales produced 355.6 kilograms while those in the highest quartile produced 1917.4 kilograms. Maize productivity is also high among households that sold more maize, 633.8 kilograms per hectare in the lowest quartile compared with 2186.8 kilograms per hectare in the highest quartile. These variations in productivity are positively associated with the proportion of households that used fertilizers in their farming activities. Only 40.8 percent of household that produced but did not sell maize used fertilizers compared to 61.4 percent for households that sold maize in the lowest quartile and 71.6 percent of those in the highest quartile of maize sales.

#### **4. Conclusions and Policy Implications**

Agriculture is the most dominant sector in Malawi as a source of gross domestic product, employment and livelihoods for most of the rural population. As a result, the post-Independence development strategy centred on promotion of estate and smallholder agriculture. Several policies were implemented including subsidisation of fertilizers, strengthening of the state marketing agency and the implementation of pan-territorial and pan-seasonal pricing, import and import licensing, free extension services, research and development in high yielding varieties, provision of subsidised credit. The agricultural sector witnessed tremendous growth through these policies in the 1960s and 1970s. However, following external shocks in the late 1970s, the dualistic structure of agriculture revealed weaknesses in the development strategy. Structural adjustment programs of the World Bank and the International Monetary Fund were adopted in 1981 as a solution to reviving the economy. Not surprisingly most of the policy reforms under structural adjustment programs were targeted at the agricultural sector. Major policy reforms include liberalisation of agricultural produce and input prices particularly for smallholder farmers, deregulation of marketing activities for smallholder agricultural produce, liberalisation of crop cultivation by smallholder farmers and rationalisation of the state marketing agency.

In spite of the various reforms the food security situation has not changed significantly. Most rural households are still food insecure

and national production of the staple food crop has generally fallen short of the national requirements. With liberalisation, the prices of food crops have increased substantially while incomes have stagnated and real producer prices have been declining over the period of adjustment. The volatility of prices has introduced some level of uncertainty in farm planning and management.

The analysis of the 1998 national household survey data shows that maize is the most cultivated crop in Malawi. About 51 percent of the national sample households (urban and rural) cultivate maize, 19 percent cultivate groundnuts and 16 percent cultivate tobacco. Maize is generally produced to meet subsistence requirements. The study shows that even for households that produced maize for own consumption, the production levels fell short of the household minimum staple requirements. This implies that most of the households were net food buyers in 1998. Non-food cash crops contribute a significant proportion to gross farm revenues. There is also a shift from maize to tobacco as a major source of crop income among rural households. While this may be positively understood within the livelihood framework, the declining prices of tobacco undermine the pathway to achieving food security through promotion of cash crops.

We also find that about 32 percent did not cultivate any crops, 28 percent produced crops but did not sell crops and 39 percent marketed crops in 1997/98. Similarly, with respect to maize marketing position, only 56 percent of rural households cultivated maize with only 9 percent marketing maize. We also find a positive correlation between household income and the extent of selling crops and a positive relationship between commercialisation and land holding sizes. The distribution of land emerges as a critical factor explaining the marketing position of smallholder farmers in rural Malawi. Small land holding sizes are a binding constraint in improving maize productivity in Malawi. Households that sell crops also tend to have larger land holding sizes which enable them to adopt technology and use fertilizers leading to higher maize productivity. Households that accounted for 50 percent of maize sales had more land and were much better off than those that accounted for the bottom 50 percent of maize sales and those that did not sell maize.

The analysis in this study points to three policy implications. First, it is evident from the study that addressing the agrarian question is critical in the quest for food security in Malawi whether through promotion of food crop or cash crop production. This land problem has implications for adoption of agricultural technologies such as application of fertilizers on small often fragmented plots (Chirwa, 2005). Unfortunately, issues of inequality in the

distribution of land have not been a top priority of government policy despite the many studies that point to this effect. For instance, access to land is the seventh ranked agricultural strategy in the Malawi Poverty Reduction Strategy (GoM, 2002). Secondly, the livelihood approach to food security in a land constrained smallholder sector may be counter-productive particularly due to the declining terms of trade in cash crops. Thus, there is need for government to strike a balance between promoting food production and cash crop production as ways of achieving food security. This study suggests that encouraging smallholder farmers to produce marketable food surpluses may be a better strategy than to rely on cash crops whose prices are very unpredictable. Thirdly, for a policy of promoting marketable surplus of food crops to be effective, the development of markets and removing binding constraints for private participants (such as infrastructure development, credit access, storage facilities, availability of market information), consistency in role of state marketing agencies and government policy credibility are critical.

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