

# **Malawi's Maize Marketing System**

**February 6, 2010**

T. S. Jayne, Nicholas Sitko, Jacob Ricker-Gilbert, and Julius Mangisoni

This report is prepared under the Evaluation of the 2008/9 Agricultural Input Subsidy Programme, Malawi, funded by DFID and carried out by the School of Oriental and African Studies, London; Wadonda Consult; Michigan State University; and Overseas Development Institute. The study was undertaken for the Ministry of Agriculture and Food Security.

The Evaluation Team would like to express their thanks to members of staff of the Ministry of Agriculture, members of the fertiliser and seed industry, staff of donor organisations, and farmers who have generously given time and information for the compilation of this report. Any errors or omissions remain the responsibility of the authors. The views expressed in this report imply no endorsement by the Ministry of Agriculture, DFID, or any other party.

Jayne is Professor International Development, Michigan State University. Sitko is research fellow at the Food Security Research Project, Lusaka, Zambia. Ricker-Gilbert is a PhD graduate student at Michigan State University. Mangisoni is Professor, University of Malawi, Bunda College.

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## **ABBREVIATIONS AND ACRONYMS**

ADMARC	Agricultural Development and Marketing Corporation
EPA	Extension Planning Area
FBO	Faith Based Organization
GoM	Government of Malawi
IMF	International Monetary Fund
Kg	Kilogram
MK	Malawi Kwacha (142=1 USD as of October 2008).
MT	Metric Tones (1,000kg)
NFRA	National Food Reserve Agency
NGO	Non Governmental Organization
RATES	Regional Agricultural Trading Expansion Support Program
TA	Traditional Authority
WB	World Bank
WFP	World Food Program

# Malawi's Maize Marketing System

## 1. INTRODUCTION

National food security in Malawi depends on improving the performance of maize markets. Ensuring that grain is consistently available at tolerable prices is crucial for consumers' food security. At the same time, surplus producing farmers need to receive farm-gate prices consistently above production costs to intensify the use of fertilizer and other productivity-enhancing technologies in a sustainable manner. These concerns give rise to the classic food price dilemma for policy makers in Malawi: how to keep prices low enough to ensure low-income consumers' access to food while keeping prices high enough to promote farm production incentives. These tensions cannot be avoided but they can be relieved through reducing food marketing margins, which shrink the wedge between producer and consumer prices. Moreover, Malawi faces major political and economic problems associated with food price instability especially given its dependence on rainfed agriculture in a region prone to drought. These issues show that improving the performance of maize markets is at the core of achieving sustainable food security and poverty reduction in Malawi.

Agreeing upon clearly defined roles for the public and private sectors will be crucial for achieving reasonable stability and predictability in these essential markets. Discussions early in the grain market reform process in Malawi sought to define a space for the development of private sector marketing. Much of the recent discussion has concentrated on clarifying the role of the parastatal Agricultural Development and Marketing Corporation (ADMARC) as private sector participation has expanded. However, nagging questions have marked the post-reform period, especially during tight food market conditions, leading to continued interventions by government to stabilize maize prices. The most serious questions about leaving this strategic staple food market to the private sector revolve around: (1) the capacity of the private sector to store grain throughout the season at reasonable margins; (2) the willingness of traders to buy maize from smallholders in remote rural areas and deliver it to deficit areas at margins in line with marketing costs; and (3) the ability to import sufficient maize during national production shortfalls to maintain prices at tolerable levels. Surrounding all of these concerns is the common perception that Malawian maize markets do not behave competitively, hence the need for direct state intervention. These concerns culminated in August 2008 with the return to mandating that all private trade take place within prices fixed between 45 and 52 kwacha per kilogram. This fixed price band has remained in effect until today.

Malawian maize markets have been subject to serious price volatility – more so than all other countries in southern Africa for which price data is available (Table 1). The coefficient of variation (standard deviation / mean price over period) of maize prices in Malawian markets are all above 45% compared to ranges of 20% to 35% for most other markets in the region. The seasonal pattern of maize prices is also very unpredictable, with the low-price and high-price months and the extent of seasonal price rises varying greatly across years. It is widely viewed in Malawi and the southern Africa region in general that government is responsible for ensuring people's access to food (Bratton and Mattes, 2003). Food prices and availability are highly politicized issues in the region. The transition to multi-party electoral processes over the past decade has, in some cases, intensified the politicized nature of food prices as political parties compete to show how they will deliver benefits to the public in times of need. This kind of political economy creates major challenges for the private sector to develop in a way that might enable it to effectively serve the needs of the millions of small-scale farmers

and consumers in the region. These issues remain at the heart of continuing policy discussions in Malawi.

This debate continues on the basis of remarkably little information about the impact of the liberalization on trade activity. There are no records available summarizing the level and directionality of major maize flows between producers, stockholders, processors and consumers. While farm-gate and retail price data are collected, the reporting of these data to key stakeholders is delayed. There has been little attempt to analyze recent price trends.

**Table 1. Unconditional and Unconditional Coefficient of Variation by Country and Market, 1994-2008**

Country	Market	Mean Price Nominal	Mean Real Price	Standard Deviation	Coefficient of variation (%) (C/B*100)
		US\$ per Mt	(Local currency per Mt -(CPI 2007=100))		
		(A)	(B)	(C)	(D)
Malawi	Lilongwe	167	22,676	11,455	50.5
	Blantyre	201	27,285	12,544	46.0
	Karonga	167	22,807	11,324	49.6
Mozambique	Maputo	239	7,457	1,804	24.2
	Nampula	171	5,305	2,147	40.5
	Beira	168	5,171	2,024	39.1
Uganda*	Kampala	180	346,886	105,914	30.5
	Mbale	165	316,563	105,429	33.3
South Africa	Randfontein	156	1,307	376	28.8
Kenya	Nairobi	210	23,370	6,374	27.3
	Nakuru	212	15,364	2,363	15.4
	Mombasa	241	17,603	3,461	19.7
Ethiopia	Addis Ababa	169	1,868	489	26.2
	Shashemane	156	1,727	491	28.5
	Nemkept	148	1,610	574	35.6
	Jimma	151	1,646	569	34.6
Zambia*	Lusaka	151	1,119,863	411,454	36.7
	Choma	128	951,930	430,758	45.3
	Ndola	148	1,091,992	394,348	36.1
Tanzania*	Dar es salaam	192	247,801	68,888	27.8
	Mbeya	134	173,711	54,483	31.4
	Arusha	163	211,182	64,786	30.7

Notes: \*Available price data reported by the national price monitoring systems are at retail level for all countries except Tanzania, South Africa, Uganda, and Zambia, which are wholesale. \*\* Since the introduction of the EAC in January 2005, Kenya has adopted a stable trade policy regime harmonizing its import tariff rates with neighboring east African countries (from as high as 50% down to 2.75%). So in addition to the full sample results, results from the two periods are included, 1994-2004 and 2005-2008.

This study provides evidence to guide future discussions about options for improving maize market performance in Malawi, and to obtain greater clarity about farmers' and traders' perceptions about maize markets and their strengths and weaknesses. The study builds on a 2008 World Bank report (Jayne et al., 2008). The specific objectives of this study are:

- i) to understand major maize trade flows, toward the development of a market channel/flow diagram that estimates trade volumes and the degree of competitiveness in each channel;
- ii) to understand ADMARC's operations and how their operations influence the behavior of others in the value chain;
- iii) to estimate the margins between farm-gate prices and retail prices in nearby markets and to understand whether and how price changes in retail markets are transmitted back to farm-gate prices;
- v) to estimate, to the extent possible, farmers' and traders' maize storage losses;
- vi) to use data on prices, trade flows, and household survey data to examine the degree to which they can corroborate official government maize production estimates; and
- vii) to provide a better understanding of maize markets and the perceptions and concerns of various key stakeholders (e.g., large traders, small traders in rural markets, smaller traders at large business centers, farmers and government actors) about how these markets work into a policy dialogue between the Malawi government and its development partners.

## **2. DATA AND METHODS**

Four kinds of data were analyzed: (1) focus group discussions of farmers and interviews with traders (including relatively large traders, small traders in rural areas, small traders operating in large business centers), government actors, and others in the maize value chain; (2) monthly maize prices from the Ministry of Agriculture and Irrigation; (3) information on formal sector maize trade and informal cross-border trade; and (4) household survey data. These data are discussed in more detail below.

### **2.1 Focus group discussions and key informant interviews:**

The field work took place in October 2008 and in July 2009. The October 2008 field work was carried out under a World Bank study covering the districts of Blantyre, Mulanje, Lilongwe, Dowa and Mchinji. In Blantyre the team visited Chilipa Extension Planning Area (EPA), Chanika, Lunzu, Kunthembwe and Kanjedza trading centers. In Mulanje, emphasis was placed on Makokola EPA, Mulanje Boma, Chitakale Trading Center, and Chisinkha EPA. In Lilongwe, the team visited Nathenje/Kamphata, Kawale, Chinsapo, Area 49, and Chigwirizano markets. In Dowa District, visits were made to Madisi and Bowe EPAs. In Mchinji, the team visited Chiwosya EPA and Mchinji Boma. This makes a total of 18 different areas in the 5 districts. In addition, interviews were conducted with private traders and processors in Lilongwe and Blantyre cities.

The July 2009 field work covered the southern districts of Blantyre and Mulanje and the northern districts of Mzimba and Rumphi. The selection of Mzimba and Rumphi districts was carried out in consultation with the Ministry of Agriculture and Food Security (Mzuzu Agricultural Development Division). Mzimba is the largest district in Malawi and a major maize growing district. Rumphi is relatively more remote than Mzimba.

For each district surveyed, 6 EPAs believed to reflect the diversity of the district with respect to degree of remoteness/accessibility were selected. Three EPAs were considered to be remote (relatively poor access to markets) and 3 EPAs relatively good access to markets. This resulted in three villages with relatively good access to markets and three with relatively poor access to markets per district. Access to markets was defined with reference to proximity to an ADMARC market. In Mzimba, the accessible EPAs were Zombwe; Eswazini; and Mbawa and the remote EPAs were Emsizini; Manyamula and Luwerezi; from Mzimba north, Mzimba central and Southern Mzimba, respectively. In Rumphi accessible EPAs were Katowo; Nchenachena and Bolero with Mhuju; Mphompha and Chiweta taken to represent remote areas.

Thus, a total of 694 farmers in 42 villages in 7 districts were interviewed through focus group discussions. Of these 42 villages, 21 were considered remote, greater than 15 kilometres from a market town and considered as having poor infrastructural links to that market town, while 21 were considered relatively accessible, being less than 15 km from a market town. On the mornings of each day of field work, two focus group discussions of maize selling households were assembled. As the households arrived a one-page survey questionnaire was administered to the individual households on their maize sales transactions during that season. Information included the week and month of sale, the type of buyer, the reasons for choosing that buyer, the distance from the farm to point of sale, quantity sold, and price received. The focus group discussions also solicited farmers' perceptions about the pros and cons of selling to ADMARC vs. private traders, the number of traders coming into the village to buy maize in the 2008 and 2009 seasons, particular marketing problems plaguing farmers, and whether markets are performing better or worse over time.

In the afternoons of each of the first three days, approximately 4 village assemblers/small traders per village area were interviewed. Most of these were follow-up names obtained from the farmer focus group discussions. Over the three-day period in each district, this resulted in approximately 12 assemblers per district over the three afternoons. Information collected focused on trading activities, transport costs, storage cost and losses and problems that pose risk to the enterprise.

Interviews were conducted with available large millers/processors and wholesalers, including ADMARC depot managers using structured interview questions. In addition, local district authorities and Ministry of Agriculture and Food Security officials were interviewed for their impressions as well. This took 2-3 days in each of the seven districts covered in the field work.

## **2.2 Price data**

Monthly maize retail prices were obtained from the Ministry of Agriculture and Irrigation. The data were used to compute measures of price seasonality and instability, and trends in price levels over time. We also compare retail prices in town centers with farm-gate prices obtained by farmers participating in the focus group discussions to compute spatial differences between farm-gate prices and retail prices in urban markets.

## **2.3 Trade flow data**

Informal trade data was obtained from the regional Famine and Early Warning Unit (FEWSNET), which monitors monthly maize trade flows between Malawi and its neighbors since July 2004. Information is collected on both exports and imports. The government exported maize in 2007 to Zimbabwe and the study uses figures provided by the Malawi government. Finally, the South Africa Revenue System records monthly export data to countries in the region, which allowed us to compute maize imported to Malawi from South Africa during the 2006-2009 period.

## **2.4 Household survey analysis**

This study draws from 3 linked surveys of 1,210 smallholder households covering the 2002/03, 2003/04, 2006/07, and 2008/09 crop seasons. Nationally representative household survey data is provided by the National Statistics Office (NSO), which implemented the 2004 Integrated Household Survey-2 (IHS-2) and the 2007 Agricultural Inputs Support Survey (AISS). The IHS-2 survey covers the 2002/03 crop season for about half of the sample, and the 2003/04 crop growing season for the other half. These two crop seasons correspond to the 2003/04 and 2004/05 marketing years. Over 10,000 smallholder households were included in this IHS-2 survey. A sub-set of 2,591 households were re-interviewed in the AISS survey, which was conducted in June 2007. In February and July 2009, these households were surveyed again, covering the 2008/09 crop season. Across all three surveys, data is consistently available on roughly 1,210 households. Therefore, the household survey data reported in this study covers a balanced panel of 1,210 households surveyed in 2004, 2007, and 2009. Further analysis on the characteristics of household remaining in the sample and those dropping out will be forthcoming to assess potential attrition bias and means to correct for it.

### 3. ESTIMATION OF THE QUANTITY OF MAIZE MARKETED THROUGH VARIOUS CHANNELS

#### 3.1 Farm sector

Malawi's maize market is characterized by a high degree of differentiation at the level of the producer. Smallholder farmers account for over 90% of the maize production, while the estate sector accounts for less than 10%. Smallholder farmers who produce marketed maize vary dramatically in productive capacity. Within the smallholder sector, according to both the IHS-2 and AISS surveys, farm households fall into one of the following four categories with respect to grain markets, as shown in Table 2:

*i. sellers of staple grains:* Roughly 10 to 15 percent of the smallholder farms sell grain in a given year. The proportion of households selling maize was 14.3% in the 2008/09 marketing year, 10.2% in 2007/08, 18.5% in 2004/05 and 18.3% in 2003/04. According to Chirwa (2006), only 10% of smallholder households sold maize in 1997/98. Of course this figure will rise in good harvest years and fall in a drought year.

There are two sub-groups within this category of maize selling households: (i) a very small group of relatively commercialized smallholder farmers with 4 to 10 hectares of land, and (ii) a much larger group of smallholder farms (20 to 30 percent of the total rural farm population) selling much smaller quantities of grain, between 50 and 200 kgs per farm. The farmers prefer to sell at least part of their maize immediately after harvest (around April/May) because they wait for the whole year to receive their "paycheck" which is used to cover debts incurred over the farming season, pay school fees, etc. Better-off farmers with bigger surpluses to sell often reserve part of their sales for the October-November period to take advantage of seasonal price rises and to pay for the costs of fertilizer, land preparation, and other planting expenses which come at this time of year. Depending on location, the maize is sold to food insecure farmers, small-scale traders, medium-scale traders, large traders, processors and ADMARC. These households, especially the largest farmers, clearly benefit from higher grain prices.

*ii. buyers of staple maize:* these rural households made up roughly 56% of the rural population in 2007, which was considered a very good harvest year. Chirwa (2006) The proportion of households that purchase maize is therefore typically higher in most years. As shown in Table 2, maize-buying households are generally the poorest and have relatively small farm sizes and asset holdings. They are directly hurt by higher mean grain prices.

*iii. households buying and selling grain within the same year:* Roughly 7% to 10% of households both buy and sell maize. They comprise both relatively large farms that sell grain and buy back small quantities of processed meal, but are mostly relatively poor households that make distress sales of grain after harvest only to buy back larger later in the season. These farmers often sell their maize to meet immediate cash needs such as house construction, fertilizer, school fees, clothing, etc. but are forced to buy back later in the season when prices are generally higher.

*iv. households neither buying nor selling maize:* these households made up 29% of the smallholder population in the 2007/08 marketing season.

**Table 2. Farm maize market position and wealth characteristics, 2007/08 marketing season vs 2008/09 marketing season.**

Household position in maize market 2007/08	Marketing year	% of total households in sample (n=2591 in 2007/08) (n=1,210 in 2008/09)
Sold maize/did not buy	2006/07	7.9%
	2007/08	7.1%
	2008/09	10.5%
Bought maize and/or maize meal/did not sell	2006/07	53.9%
	2007/08	56.4%
	2008/09	55.4%
Bought and sold – net seller	2006/07	4.0%
	2007/08	3.1%
	2008/09	3.8%
Bought and sold – net buyer	2006/07	4.2%
	2007/08	4.1%
	2008/09	5.8%
Bought and sold – net zero	2006/07	0.5%
	2007/08	0.3%
	2008/09	0.8%
Neither bought nor sold – autarkic	2006/07	29.5%
	2007/08	29.0%
	2008/09	23.6%
		Percentages sum to 100% in each year

Source: AISS household survey, 2007, 2009. Full marketing year maize sales and purchases for the 2006/07 marketing year (in AISS I) and the 2008/09 marketing year (in AISS II).

Maize sales tend to be highly concentrated among a relatively small number of farmers in the smallholder sector. Table 3 disaggregates smallholder households included in the IHS-2 and AISS surveys into three groups: 1) the largest smallholder sellers of maize who accounted for 50% of the marketed maize output; 2) the remaining households that sold maize during the year who accounted for the other 50 percent of the marketed output, and 3) those households that sold no maize during the 12-month marketing season.

As shown in Table 3, one or two percent of the farms account for 50% of the overall marketed maize surplus from the smallholder sector. These farm households possess substantially higher levels of productive assets, crop income, and non-farm income, than the rest of the rural population. These relatively “commercialized” smallholder farmers had 1.5 to 2 times as much land and twice as much assets than the non-maize selling households, who constituted roughly 80% of the smallholder households in the sample. Land and asset constraints impede most smallholder households from producing a maize surplus to sell.

One noteworthy trend shown in the last column of Table 3 is that the inflation-adjusted value of household assets appears to have increased in the years since the AISP has been implemented. Twelve durable assets plus livestock assets were valued in constant 2009 kwacha and compared across the years in Table 3. The mean value of household assets rose from 8,100 and 9,600 kwacha in 2002/03 and 2003/04 to 11,700 and 10,800 kwacha in 2006/07 and 2008/09, respectively. However, the mean quantity of maize sold by households in the sample shows no clear trend, moving from 65kg per household in the 2003/04 marketing year, to 45kgs/hh in 2004/05, to 58kg/hh and 59kg/hh in 2006/07 and 2008/09.

**Table 3. Concentration of Maize Sales within the Smallholder Farm Sector**

	Category of farm household			Full sample
	Largest maize sellers accounting for 50% of total sales	Smaller maize sellers accounting for other 50% of total sales	Households not selling maize	
Marketing year:				
2003/04 (IHS – first year)				
Percentage of total households in sample (%)	2.00	15.63	82.23	100
Value of assets ('000 kw per hh)	23.0	10.0	8.8	9.2
Landholding size (hectares)	2.38	1.43	1.43	1.45
Kgs maize sold (kgs per hh)	1,551	202	0	65
2004/05 (IHS – second year)				
Percentage of total households in sample (%)	2.54	13.25	84.21	100
Value of assets ('000 kw per hh)	16.4	10.1	7.5	8.1
Landholding size (hectares)	1.69	1.52	1.06	1.15
Kgs maize sold (kgs per hh)	987	151	0	45
2006/07 (AISS I)				
Percentage of total households in sample (%)	1.34	15.31	83.35	100
Value of assets ('000 kw per hh)	23.5	11.5	11.5	11.7
Landholding size (hectares)	2.06	1.48	1.14	1.2
Kgs maize sold (kgs per hh)	2,203	189	0	58
2008/09 (AISS II)				
Percentage of total households in sample (%)	1.92	18.91	79.16	100
Value of assets ('000 kw per hh)	22.6	13.7	9.9	10.8
Landholding size (hectares)	1.94	1.41	1.19	1.25
Kgs maize sold (kgs per hh)	1,494	160	0	59

Source: IHS-2 survey conducted by NSO in 2004/05; AISS1 survey conducted by NSO in 2007; AISS2 survey conducted by NSO in 2009. Assets are the value of 12 durable assets plus livestock assets consistently obtained across the 3 surveys and valued in constant kwacha (2009=100).

We now estimate the amount of maize being sold by smallholder farmers in Malawi. Government of Malawi estimates of total smallholder maize production in the two years covered by the IHS-2 survey (2002/03 and 2003/04) and the two AISS surveys (2007/08 and 2009/10) are presented in Table 4, column (a). The proportion of total maize production that is sold is presented in column (b), based on the national household surveys. By multiplying the figures in columns (a) and (b), we derived the estimated quantity of maize sold by farmers in the smallholder sector for these four harvest years. Note that each of these years was considered a fairly good crop production season with favorable rainfall. The estimated quantity of maize sold by smallholder farmers – including sales to traders, other households, and ADMARC – is in the range of 160,000 to 480,000 tons.

Regarding maize sales from the estate sector, very few reliable estimates are available. However, a recent report estimated that estate sector maize sales are in the range of 150,000 tons.

**Table 4. Estimates of quantities of maize marketed from production by Malawi's smallholder sector**

Harvest year	Marketing year	Government of Malawi maize production estimate (tons)	Proportion of national maize harvest sold by farmers (%)	Quantity of marketed maize based on official production estimates (tons)	Average quantity of maize produced per household according to the HH surveys (in kg) <sup>2</sup>
		(a)	(b)	(c=a*b)	(d)
2003	2003/04	1,758,688	12.3	216,319	530 kg (n=511)
2004	2004/05	1,733,125	9.6	166,380	472 kg (n=551)
2007	2007/08	3,444,456	13.0	447,779	463 kg (n=1,126)
2008	2008/09	2,777,438	na	Na	na
2009	2009/10	3,777,316	12.9	487,274	423 kg (n=1,186)

Sources: Ministry of Agriculture (column a). Column b and d derived from Integrated Household Survey-2 and Agricultural Inputs Support Surveys, 2007, 2009. Column c derived as a\*b. Note: If post-2007 official maize production estimates are overestimated as is often suspected (see for example Lea and Hanmer, 2009, p.9), then marketed quantities in column c should be revised downward for 2007/08 and 2009/10. Among the analysts involved in the Agricultural Inputs Support Programme evaluation, there are concerns that survey figures in column (d) underestimate maize production per household.

Based on the above information, we can now construct some basic estimates of national maize supplies circulating in Malawian markets. From Table 4, the quantity of maize marketed from domestic production in recent years has been in the range of 400,000 to 450,000 tons from the smallholder sector, and perhaps 150,000 to 200,000 tons from the estate sector, depending on the quality of the weather and the amount of fertilizer used. Note that all of the years from which estimates are available in Table 4 were relatively good production years. After adding supplies from marketed domestic production, we estimate that the quantity of maize supplied in an average harvest year is roughly 500,000 to 580,000 tons after accounting for storage losses assumed at 12%<sup>1</sup> of total as shown in Table 5. This estimate of marketed maize from domestic production includes household-to-household sales in the villages which never come onto markets as such.

**Table 5. Estimated marketed maize supply from smallholder and estate sector production.**

	Poor Harvest	Average harvest	Good Harvest
	----- metric tons -----		
Supplies from smallholder production	200,000	400,000	450,000
Supplies from estate production	70,000	150,000	200,000
Total maize supply (before storage losses)	270,000	550,000	650,000
<b>Total maize supply (after assumed 12% storage loss on marketed supplies)</b>	<b>241,000</b>	<b>491,000</b>	<b>580,000</b>

<sup>1</sup> See section 3.7 on storage losses.

Based on the interviews of grain traders and farmer focus group discussions, we computed the share of smallholders' maize sales according to the type of buyer, as reported in Table 6. These figures are unweighted averages of the responses obtained for the 2008/09 season (between April and October when the 2008 field work was carried out). The aggregate picture of the maize purchases through October 2008 shows that on average only 7.99% of the maize sold by farmers has been purchased by ADMARC. The bulk of it (about 92%) has been bought by private traders. ADMARC anticipated buying more early in the season but the rise in maize prices in 2008 led to temporary working capital shortages. ADMARC's biggest presence was in the Lilongwe and Blantyre areas, where it purchased roughly 17% and 14%, respectively, of the grain sold by farmers. ADMARC purchased very little in the other areas surveyed (Dowa, Mulanje, and Mchinji). It is estimated that 16.5% of the maize sold by farmers was direct farmer-to-consumer exchanges, typically within the same village. Small/medium traders purchased 29.1% of farmers' maize, while 45.2% was purchased by large traders directly from farmers. Large traders buy from farmers and small/medium-scale traders.

**Table 6. Estimated proportion of maize sold by farmers to different categories of traders**

Area	ADMARC (%)	Category of private buyer:			
		Total (%)	Farmer to household buyer (%)	Small Traders (%)	Medium/Large Traders (%)
<b>Blantyre</b>	14.38	84.62	38.08	46.54	0.00
<b>Mulanje</b>	0.00	100.00	19.90	34.70	45.39
<b>Lilongwe</b>	16.56	83.44	16.69	41.72	25.03
<b>Dowa</b>	5.00	95.00	0.90	1.00	88.10
<b>Mchinji</b>	4.00	96.00	7.00	21.57	67.43
<b>NATIONAL</b>	7.99	91.81	16.51	29.11	45.19

Source: farmer focus group discussions, October 2008.

The findings in this section lead to a few summary observations about the structure of maize production and markets in Malawi:

- A relatively small fraction of total maize production is marketed, especially in a drought year. Malawi's maize market can be characterized as being extremely thin, with minor changes in production leading to large changes in marketed supplies. This "thinness" is the result of farm structure, with a relatively small number of farmers in Malawi selling grain, and with the volumes they sell fluctuating with the harvest.
- These supply fluctuations contribute to high price instability due to an elasticity of demand for grain that is believed to be very inelastic. In a good year, marketed output rises while demand falls, putting downward pressure on prices. In a poor harvest year, marketed output shrinks while demand rises. This means that small changes in production generally lead to large price changes.
- A very small fraction of households account for most of the maize marketed from domestic production in Malawi.

- Most farm households do not sell maize, because of numerous constraints on production – inadequate landholding size to produce a surplus, little ability to afford fertilizer, sub-optimal use of available inputs due to limited knowledge, etc.
- Private buyers were the main buyer of maize from smallholders selling maize, accounting for roughly 75% of all maize sold. Intra-village sales accounted for 17% while ADMARC accounted for 8%.

### 3.2 Consumers

According to the Government of Malawi (2006), adults 10 years and above need 270kg of maize per year and children about 135kg per annum. While this may reflect “requirements”, actual maize consumption is much lower for most of the population. The Government of Malawi (2006) estimates that actual daily caloric intake is 2,366 kcal per person per day and that roughly 55% of total caloric intake is from maize. Maize has 3578 calories per kg. From this, it is estimated that per capita consumption requirements are in the range of:

$$2,366 \text{ kcal/day} * 365 \text{ days/year} * 0.45 \div 3,578 = 108.6 \text{ kgs maize per person per year}$$

This relatively low number may reflect low purchasing power and under-nutrition among a large proportion of the Malawian population, as well as the potential for increased consumption of other staple foods in recent years, such as cassava, rice and wheat.

If it is assumed that maize accounts for more like 55% of total caloric intake, this would suggest that annual maize requirements are more in the range of 133 kgs maize per person.

Table 7 presents estimates of national maize purchases from available marketed supply. We include purchases of maize grain and maize meal by urban and rural consumers, and demand by brewers, the livestock and poultry industry, and producers of packaged maize meal. Table 7 disaggregates human maize purchases into rural vs. urban. Urban consumption estimates are based on the computations above, roughly 110 to 130kgs per person per year.<sup>2</sup> We also assume that consumption increases slightly in a good production year when prices are generally relatively low, reflecting a negative price elasticity of demand. Based on information from local sources, it is estimated that many urban households acquire about half of their maize from their own farms, relatives in rural areas and other intra-household transfers, indicating that only about 50% of urban consumers’ maize consumption is in the form of purchases from markets. Based on these parameters, it is estimated that the quantity of maize and maize meal purchased by urban consumers is in the range of 70,000 to 110,000 tons per year, depending on the season.

Key informant interviews of traders and processors in Malawi indicate that the demand for maize by brewers, livestock and poultry feeders, and maize millers is in the vicinity of 30,000 tons in a normal year, rising to 40,000 tons in a year of low maize prices, and 20,000 tons in a year of high prices.

The percentage of the rural population purchasing maize and the amounts purchased are also shown in Table 7. The information needed to compute maize consumption is (a) the population in rural areas; (b) the proportion of the population purchasing maize in a given year; (c) mean kgs purchased per person per year. These estimates suggest that the quantity of

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<sup>2</sup> If the goal of this exercise were to estimate “consumption requirements” rather than to estimate actual market flows based on effective demand, the national maize requirements would be substantially greater than shown in Table 6.

maize purchased by rural households greatly exceeds that of urban areas, ranging from 150,000 in a good harvest year to 500,000 tons per year in a drought year.

**Table 7. Estimates of maize purchased from markets for human food consumption.**

	Poor harvest	Average harvest	Good harvest
<i>Rural:</i>			
Population (millions)	11.94 (88.5%)		
% of population purchasing Maize	85%	65%	50%
Mean kgs purchased per person (among households purchasing)	50kg	40kg	25kg
Total maize purchases (tons per annum)	507,450	310,440	149,250
<i>Urban:</i>			
Population (millions)	1.55 (11.5%)		
% of urban maize consumption from	65%	50%	40%
Mean kgs purchased per person	100 – 110 kg	110-120 kg	120-130 kg
Total maize purchases (tons per annum)	100,750 – 110,825	85,250 – 93,000	74,400 – 80,600
Animal feed + brewer industry purchases (tons per annum)	20,000	30,000	40,000
<b>National quantity of maize purchased (tons):</b>	<b>628,200 – 638,275</b>	<b>425,690 – 433,440</b>	<b>263,650 – 269,850</b>
<b>National quantity of maize supplied, as per Table 5 (tons)</b>	<b>241,000</b>	<b>491,000</b>	<b>580,000</b>
<b>National maize surplus (deficit)</b>	<b>(-387,200) to (-397,275)</b>	<b>65,310 to 57,560</b>	<b>316,350 to 310,150</b>

Sources:

- population: Malawi Government, 2006
- % of rural population purchasing maize (from 2007 AISS survey by NSO);
- estimates of urban population purchasing maize from key informant interviews, October 2008.

Note that these figures presented in Table 7 are based on estimated consumption quantities, not consumption requirements. Estimated market purchases based on “recommended daily intake” would be substantially higher.

After subtracting the national quantity of maize purchased from the quantity of maize supplied from domestic production, we arrive at the estimated national maize surplus (deficit) as shown in the last row of Table 7. In a good production year, and given official production estimates, it is estimated that Malawi would have a marketed surplus of over 300,000 tons in a good season, a surplus of 50,000 to 70,000 tons in an average season, and a deficit of over 300,000 tons in a poor production season. However, data presented in the next section indicate that Malawi has been a net importer of maize in three of the past four years since the implementation of the Agricultural Inputs Support Programme, giving some rationale for reconsideration of the production and/or consumption figures.

### 3.3 Maize Imports to Malawi

Informal maize imports from Malawi's regional neighbors since the initiation of the Agricultural Inputs Subsidy Programme are estimated by FEWSNet to be in the range of 50,000 to 100,000 tons, again depending on the harvest. Imports tend to be relatively high in a drought year and relatively low in a good production season, although this of course also depends on the harvest situation in the neighboring countries, especially Mozambique and Tanzania.

Informal maize imports from Mozambique, Zambia, and Tanzania are the other major source of maize supplies in Malawi. The Famine Early Warning System monitors 12 border crossings with Mozambique, Tanzania, and Zambia and estimates the maize crossing across these border areas each month since July 2004. According to FEWSNET (2010), informal net maize inflows from these countries are as shown in Table 8. Net inflows are defined as imports minus exports. Malawi has been a net maize importer in relation to neighboring countries in every month since the informal cross-border trade monitoring was established in July 2004.

**Table 8. Informal net cross-border maize imports to Malawi, 2004/05 to 2009/10 marketing seasons**

Marketing year	Informal cross-border net imports from:				Formal net imports from:	
	Tanzania	Zambia	Mozambique	Total informal cross border net imports	Zimbabwe	South Africa
	----- metric tons -----					
2004/05*	2,656	2,157	71,229	76,042		58
2005/06	83,918	338	71,085	155,341		127,356
2006/07	-1,040	176	76,803	75,939		2,552
2007/08	-508	721	52,323	52,536	-302,000	2,492
2008/09	2,671	5,259	54,020	61,950		39,077
2009/10**	413	5,284	44,701	50,398**		Na
Average (2004/05 to 2008/09) net imports to Malawi				84,362		34,307
Average (2004/05 to 2008/09) percentage of total Malawian imports from:				71.4%		28.6%

Notes: Years cover the period April to March. net imports refers to imports minus exports. \*2004/05 covers July-March period only. \*\*covers the period April-October 2009.

Source: FEWSNET 2010.

The last column of Table 8 also shows maize imports from South Africa. This information comes from the South Africa Revenue System, which records the quantity and value of goods, including maize grain, crossing the South Africa border to other countries in the region. In only two years, 2005/06 and 2008/09, were imports from South Africa of any size relative to the Malawi market. Since the Malawi fertilizer subsidy programme was initiated in the 2005/06 crop year (corresponding to the 2006/07 marketing year), total maize imports to Malawi have been between 50,000 tons in 2007/08 to roughly 100,000 tons in 2008/09, which represents from 8.6% to 41.2% of the total quantity of maize marketed from domestic production as estimated in Table 5.<sup>3</sup> The Government of Malawi did contract to export 400,000 tons of maize to Zimbabwe under the assumption that the country had a surplus in 2007/08 of over 1 million tons, but traders could not find enough maize to fulfill the contracts, and in the end roughly 302,000 tons were exported in 2007/08 (Chirwa, 2009). The

<sup>3</sup> In a good production year when imports are relatively low, we compute the ratio of imports to domestic marketed supply as 50,000 / 580,000 as shown in the last row of Table 4 (good season scenario). In a poor production year when imports are relatively high, we compute this ratio as 100,000 / 241,000 also shown in the last row of Table 4 (poor season scenario).

exporting of maize in 2007/08 is believed to have led to the significant price escalation observed in the 2007/08 marketing season, in which maize prices exceeded \$450 per ton (Minde et al., 2008; Dorward et al., 2009). The government export of maize to Zimbabwe caused it to be a net maize exporter in 2007/08; but in the other three marketing years of the AISP (2006/07, 2008/09 and 2009/10), the country appears to have been a net maize importer.

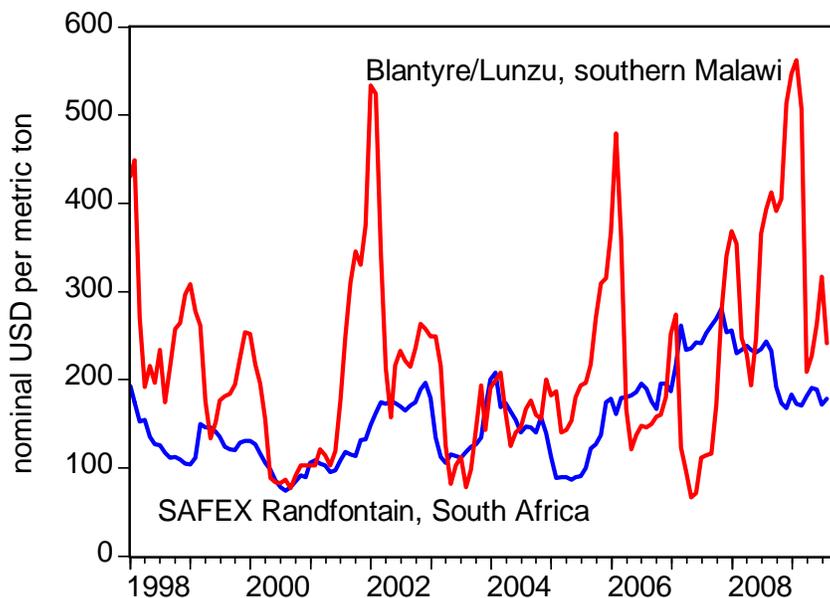
However, the evidence that Malawi has been a net maize importer in three of the four years of AISP implementation contrasts with official production estimates and consumption estimates showing Malawi to have exportable maize surplus of 50,000 to 350,000 tons in an average and good year, respectively. This may be an indication that either the consumption estimates are too low or the official maize production and marketed output estimates are too high. The appearance of an exportable surplus based on the production and consumption estimates, despite the fact that the country has been a net maize importer according to trade data raises concerns that either the production data are overestimated, and/or that consumption and storage losses are underestimated.

#### 4. MAIZE PRICE MOVEMENTS

This section examines maize price patterns in Malawi, the relationship between market prices and ADMARC selling prices, and the relationship between price movements and trade flows.

Malawi's agricultural system, being heavily dependent on rain-fed agriculture, is highly prone to adverse weather conditions such as drought and floods. Frequent unfavorable weather conditions leads to some of the maize price surges observed in Malawi shown in Figure 1. Major price spikes are observed in 2001/02, 2005/06, 2007/08, and 2008/09. These first two episodes were associated with drought in 2001 and 2005. The price spikes of 2007/08 and 2008/09 are more difficult to explain considering that official production statistics indicate that both years were associated with good harvests, the 2007 harvest being a historic production record. Chirwa (2009) attributes the high prices in 2008/09 to price transmission from world markets to Malawi, yet ironically world prices declined sharply from their highs in July 2008 to near normal levels by November 2008 and thereafter. However, food prices particularly in southern Malawi remained at extremely high levels throughout 2008 and 2009 until the 2009 harvest in May. After accounting for transport costs, the landed cost of maize imported from South Africa was significantly below prices in southern Malawi during late 2008 and the first 4 months of 2009. Interviews with grain traders during this period indicated that several traders applied for import licenses but were these applications were not approved.<sup>4</sup> Meanwhile, according to the South African Revenue Systems (SARS), Malawi imported roughly 39,000 tons from South Africa, although the firm(s) responsible for the imports is not specified. Apparently this volume of imports was not sufficient to prevent the major price spike observed in late 2008/early 2009.

**Figure 1. Blantyre/Lunzu and SAFEX / South Africa maize prices, USD per metric ton.**

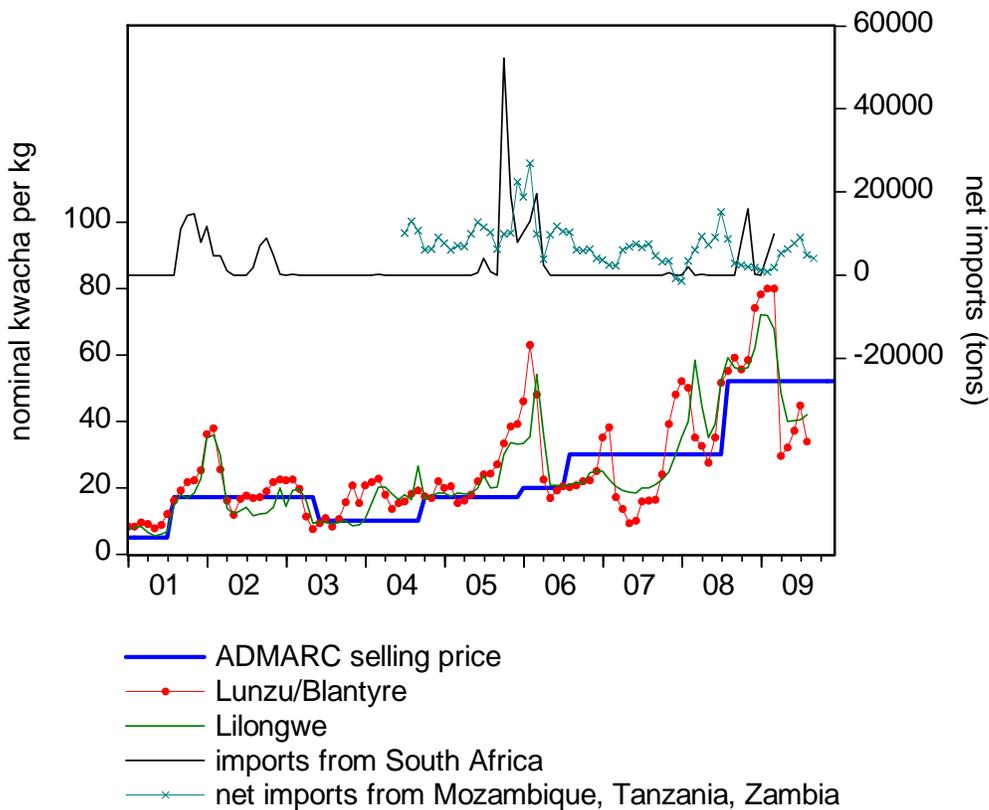


Source: Ministry of Agriculture price monitoring reports, SAFEX.

<sup>4</sup> Private traders are required to obtain an import or export license from government to engage in international trade in maize (Chirwa 2009).

The bottom half of Figure 2 shows nominal maize market prices in Lilongwe and Lunzu (a major market outside of Blantyre) as well as the ADMARC maize selling price in nominal kwacha per kg. Market prices are generally above the ADMARC selling price except in very good production years, like that of the 2006 and 2007 harvests. If ADMARC had sufficient quantities to sell to meet demand, it is unlikely that market prices would exceed the ADMARC price, as people needing grain would simply acquire their grain from ADMARC. Hence when market prices greatly exceed ADMARC prices for prolonged periods, this is likely to reflect periods of tight supplies and rationing at ADMARC depots. According to Figure 2, there are four distinct periods during which market prices exceeded ADMARC prices for prolonged periods. These are the 2001/02 famine year in Malawi, the months following the 2005 drought, the period from late 2007 to mid-2008 and again during late 2008 into early 2009.

**Figure 2. Maize market prices and ADMARC selling price (in nominal kwacha per kg) and maize imports to Malawi, January 2001 to October 2009.**



The official estimate of a record maize harvest in 2007 might have been expected to result in an abundance of maize and relatively low prices, benefiting urban consumers and most of the rural poor, who are typically net buyers of maize. In light of the estimated 1.1 million ton maize surplus based on the official 2007 production estimate, the Malawi government in early 2007 contracted with the Government of Zimbabwe to export 400,000 tons of maize to Zimbabwe. However, by the end of 2007, the government had exported only 283,000 tons and then suspended further exports due to a rapid escalation in domestic market prices. Within several months after the harvest, maize prices soared over \$400 per ton, exceeded only in the major crisis year of 2001/2 and the drought year of 2005/06 (Figure 1). Maize prices in late 2007/early 2008 were \$100 to \$150 per ton higher in Malawian markets than in

other regional markets during the same period. These outcomes are difficult to reconcile with the official estimates of a record maize harvest of 3.4 million tons in 2007.

As mentioned earlier, the price spike in 2008/09 appears to be due to restrictions on maize importation.

## 5. ORGANIZATION AND BEHAVIOR OF MALAWI'S MAIZE MARKETING SYSTEM

Maize moves from a large and highly differentiated group of farmers through an equally diverse group of primary assemblers and transporters, before reaching the silos and warehouses of the major actors in the supply chain and eventually the consumer. A large proportion of grain goes through the marketing system without being handled by the large trading and processing firms. This includes both tied exchanges between farmers and consumers associated with *ganyu* labor as well as marketed maize that is handled by small- and medium-sized traders to small retailers and consumers. As such, there are many different transaction points within the chain, many of which overlap and feed into one another (see market flow diagram at the end of this section). What follows is a description of the actors in the chain, beginning with the stage linking producers to the market and ending with consumers, while also attempting to identify the factors motivating and constraining their actions.

### 5.1 Farmer marketing options

Rural regions within Malawi tend to center around **rural market areas**. These market areas may be highly developed, with permanent buying points, including **private assemblers** and **ADMARC**, which operate daily throughout the year. These markets may also have a specific market day, which attracts **mobile traders** (traders owning a truck) seeking to buy directly from farmers. These markets may also attract seasonal buyers who are acting as **agents for large trading companies**. In contrast, other rural regions are centered upon markets with set market days, which are open 1-3 days a week and attract itinerant maize traders and **local buyers** from around the region.

Activity within these markets varies seasonally and regionally. For example, in regions dominated by poor smallholders, such as Chisinka Village near Mulanje, farmers tend to market their maize early, with the hopes that other livelihood strategies, like *ganyu* labor, will support them through the lean season. Consequently, traders tend to focus their efforts in these regions early in the marketing season. Conversely, poor smallholders that grow both tobacco and maize, such as in Matziyada Village, Dowa District, are able to live off of the proceeds from tobacco immediately after harvest and therefore hold maize until later in the season. Larger surplus producers, like those found in Chioshsya, Mchinji District, sell maize within their local market to both local traders and company agents, at various stages of the year. Generally, they sell maize in July and then again just before the planting season (around November) to buy production inputs. Traders interviewed in high production rural market areas like Madisi and Bowe confirm that maize sales are highest early in the year, as poorer producers sell their stocks for cash needs, and later in the season as larger producers prepare for the coming farming season. Early sales are also important for farmers seeking to buy chemicals to treat their maize. Larger scale farmers, those marketing 200-300 bags of maize, can spend up to K35,000 on treatment chemicals. Some poorer respondents stated that they sold maize to **local buyers** and to **ADMARC** to avoid paying for treatment costs, with the expectation of buying that maize back later in the season. For them, the price differential they pay is the cost of storage.

At the **primary assembler level**, Malawi's maize market is characterized by a relatively high degree of competition, though there are significant regional differences, and a wide geographic scope. Recent efforts by the Government of Malawi to improve rural infrastructure has made many locations accessible throughout the year, while costs of transporting maize from rural areas to urban markets have probably been lowered considerably (analysis is underway to determine if this is reflected in spatial price spreads).

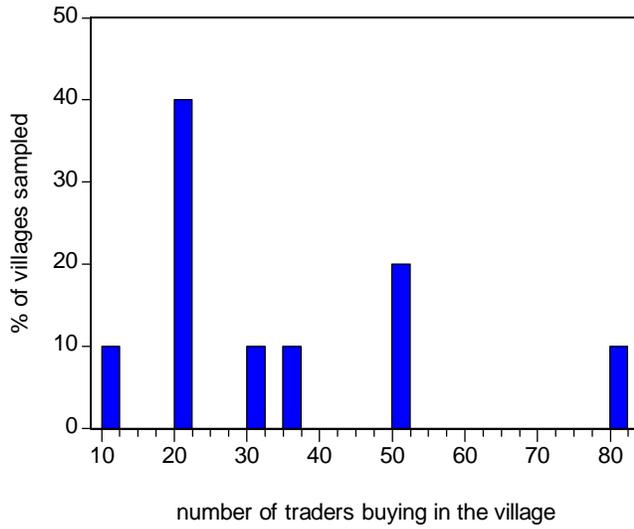
Based on our research, private maize traders do a good job of reaching even the more remote parts of Malawi. In all 18 areas where the field work was conducted, farmers were not able to provide accurate data on the numbers of traders that serviced farmers in their village; all respondents stated that “there were too many to count.” While farmers, particularly the poorest, complain about the prices they are offered early in the marketing season, none complained that they lacked a market. While some farmers complained that they were forced to take the price offered to them by a trader because there was no other local option at the time they wanted to sell, others within the same group seemed to be able to find a better market for their maize at the same time of the year as those who complained about a lack of options. This indicates that a particular farmer’s initiative and “savvy” plays a role in market access, suggesting some scope for training in farmer marketing skills.

Marketing options available for farmers vary based on their production levels and distance from either rural or urban markets. For farmers in more isolated regions, their primary marketing options are **mobile traders** who come to periodic regional markets and **traders with bicycles** who buy small quantities of maize. Hiring transport to take products to a market does not seem to be an option considered by most farmers. Farmers located closer to established rural market centers have a wider range of marketing options, including permanent **local buyers, agents for large trading companies, mobile buyers, and ADMARC.**

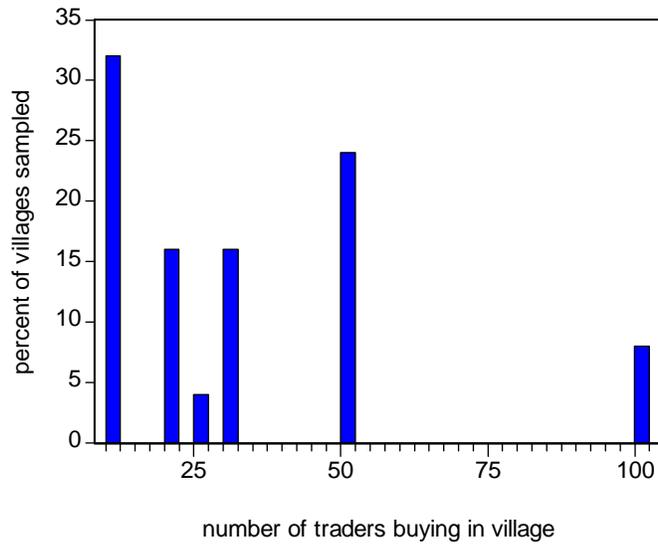
In July/August 2009, focus group discussions of farmers who sold maize since the 2009 harvest were carried out in 6 districts. One of the purposes of the FGDs was to assess the maize selling options available to smallholder farmers and the degree of competition among assembly traders. Mvula et al 2003 report that traders have monopoly power in their local markets and do not face intense competition.

One of the questions asked of farmers in the FGDs was “since the 2009 harvest, how many traders have come into this village to buy maize from farmers in this village?” Results indicate wide variations across villages, with no major differences being observed between remote villages (>20km from market town) and accessible villages (<20km from market town). The median number of traders serving these villages was 10-15, with a couple villages reporting as few as 2-3 traders, while other villages reported well over 50 traders coming to their village to buy maize. These figures are believed to be farmers’ indication of the total number of traders operating in their villages in an entire year. After the main buying season of May-July, it is likely that the number of traders operating in the villages declines somewhat. Tables 9a-c present the findings for villages in Mulanje, Blantyre, and Mzimba districts.

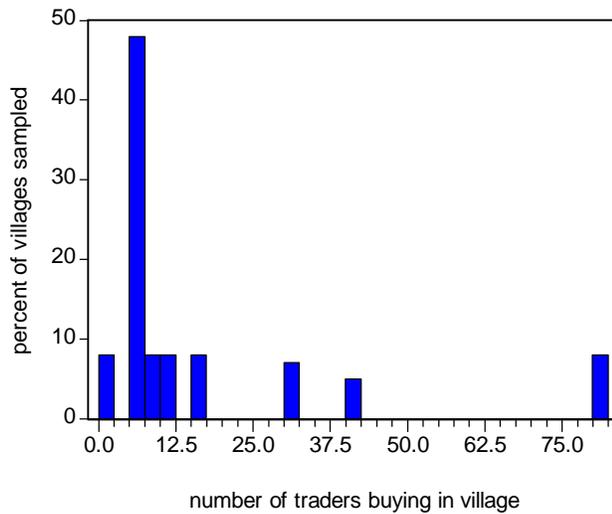
**Figure 3a. Number of traders buying maize in 2009 in villages sampled in Mulanje District**



**Figure 3b. Number of traders buying maize in 2009 in villages sampled in Blantyre District**

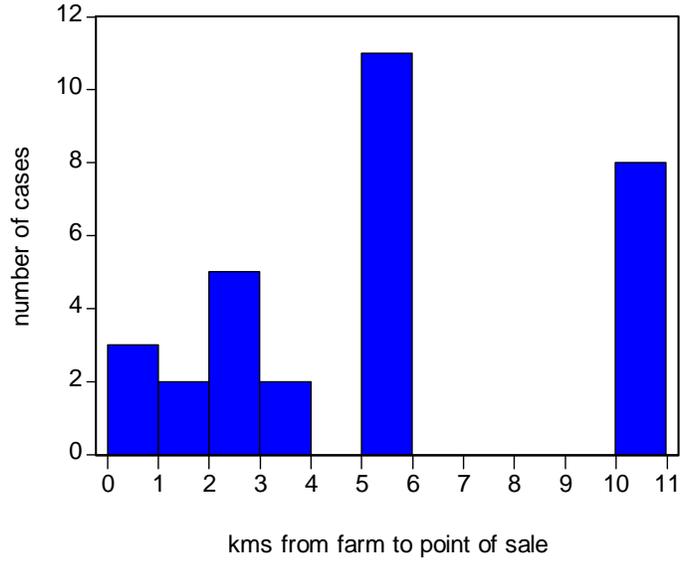


**Figure 3c. Number of traders buying maize in 2009 in villages sampled in Mzimba District**

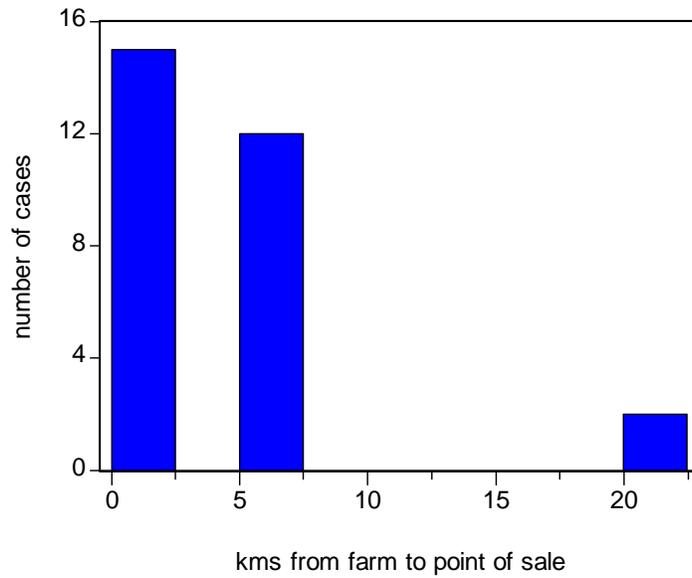


During the farmer focus group discussions, farmers were asked to provide individual-specific information concerning their largest maize sales transaction from the 2009/10 season. One of the questions concerned the distance traveled from their farm to the point of maize sale. Figures 4a-f show the frequencies of kilometer distance for villages in surveyed districts considered accessible (less than 15km from a tarmac road and retail market town) and remote (more than 15km from a tarmac road and retail market town). The average distance traveled from the farm to point of maize sale was 3.7 km. Perhaps surprisingly, farmers in remote areas travelled a shorter distance from their farms to the point of maize sale on average than farmers in accessible villages. This is because some farmers in accessible areas chose deliberately to travel to a larger market town to market their grain, whereas this was a more expensive option for farmers in relatively inaccessible areas. In the remote areas, the median distance travelled from the farm to point of maize sale was zero, indicating that traders move through the villages to buy grain directly from farmers' fields or homes. Combining this information on distance traveled with the information in figures 3a-c indicating that roughly 10-15 traders came into the village to buy maize from farmers, the picture emerges that farmers in the surveyed districts had a variety of options for selling their maize within fairly short distances from their farms.

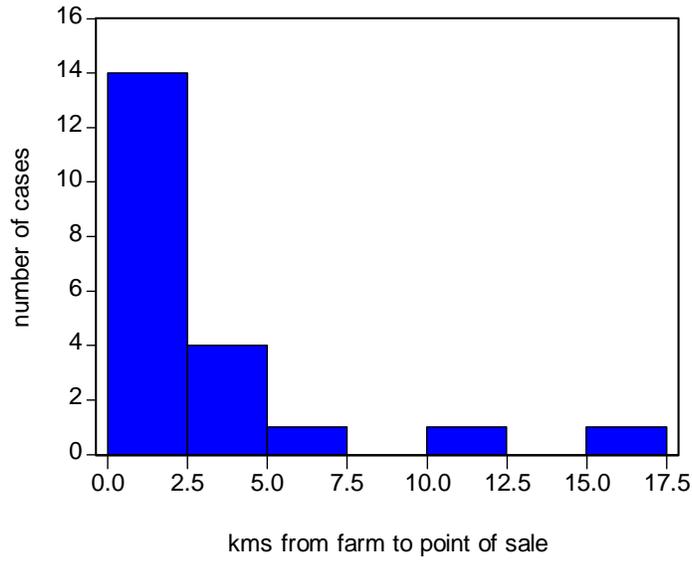
**Figure 4a. Household reported distance from farm to point of maize sale, 2008/09 marketing season, accessible villages in Blantyre District.**



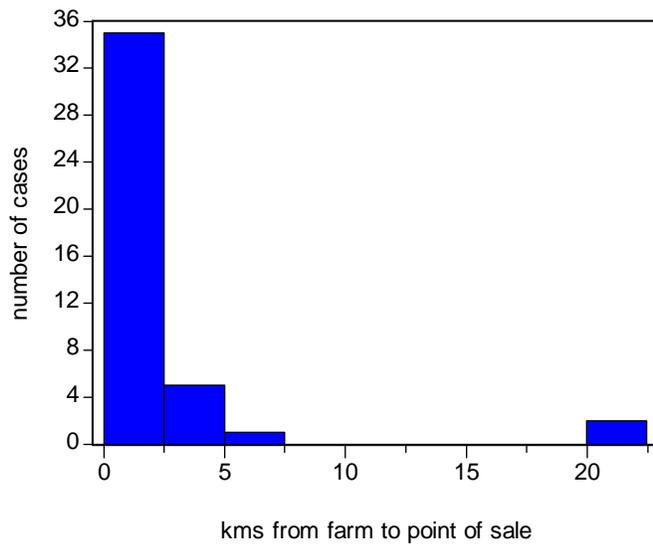
**Figure 4b. Household reported distance from farm to point of maize sale, 2008/09 marketing season, remote villages in Blantyre District.**



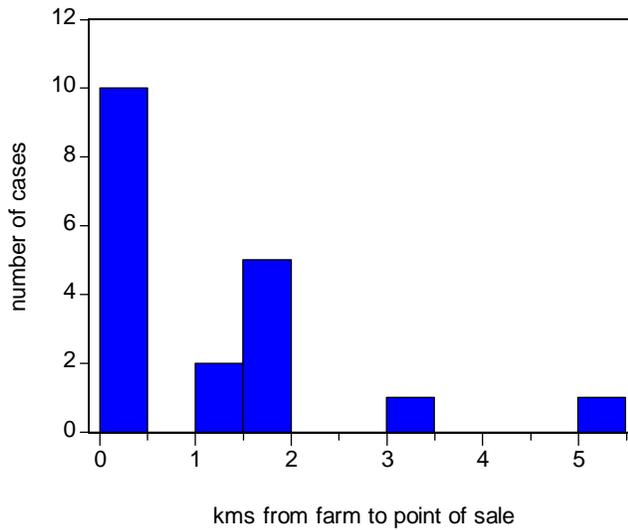
**Figure 4c. Household reported distance from farm to point of maize sale, 2008/09 marketing season, accessible villages in Mulanje District.**



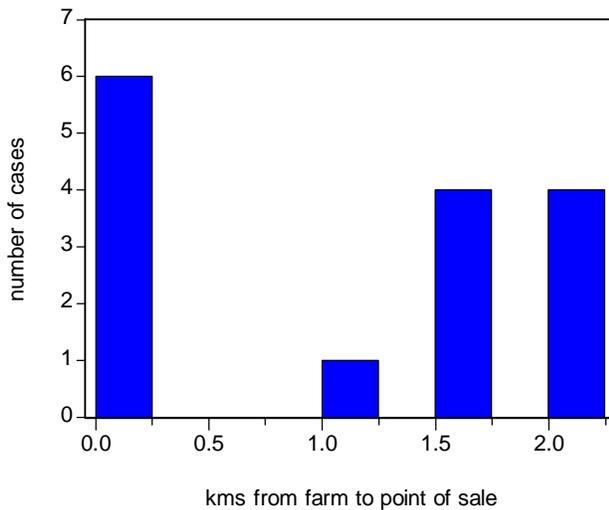
**Figure 4d. Household reported distance from farm to point of maize sale, 2008/09 marketing season, remote villages in Mulanje District.**



**Figure 4e. Household reported distance from farm to point of maize sale, 2008/09 marketing season, accessible villages in Mzimba District.**



**Figure 4f. Household reported distance from farm to point of maize sale, 2008/09 marketing season, remote villages in Mzimba District.**



## 5.2 Trading firms

### *Small-scale traders*

The local maize assemblers were the main marketing option for smallholder farmers in all the sites visited during the study. These small-scale assemblers started buying maize in April. They go to the villages to purchase grain after harvest. Such traders either construct makeshift shades or hang their scales on a pair of poles to purchase maize from farmers. In certain situations, such traders move from farmer to farmer in search of grain. This saves the

farmer the trouble of arranging transport to an organized market. However, the farmer may be at a disadvantage in bargaining unless he knows what other possible buyers would offer.

Each small-scale trader was able to buy 5-15MT from producing areas. Their purchased quantities are constrained primarily by their access to working capital, and by the size of the trucks they use and road quality (which determines the size of truck that can be used to assemble grain. Small trade volumes keep trading costs relatively high. Marketing costs could be reduced by better road infrastructure to accommodate larger trucks and by greater access to working capital. Most claim that their biggest obstacle is a lack of capital, which forces them to survive on small margins taken from the constant turnover of stocks. These traders rarely hold maize longer than it takes to find a market.

**Local buyers** located in rural markets like Chikuli, Bowe, Chioshya, and Bua buy and sell maize throughout the year. Their markets vary throughout the year. From June to November, they sell most of their maize to **mobile traders** who come to rural markets to buy maize for **large traders** and **processors**. This trade diminishes as the planting season approaches, which forces them to shift their focus to meet growing local demand. These traders buy maize from a variety of sources, including directly from **farmers** and **bicycle traders**. They deal in various volumes, from buckets to multiple bags depending on their economic strength. They will also buy maize from **large trading companies** or traders in surplus areas if local supplies diminish. As such, these local traders are considered to be a reliable source of maize by rural residents even in lean years and during lean seasons. All rural markets we visited had at least one of these traders, while Bowe and Chioshya had up to eight. It was difficult to gauge the quantities of maize these traders would buy and sell throughout the year, but based on the current stocks they holding, most operated in the range of 50-300 bags of maize at a time. Storage did not seem to be a constraint for these traders, since most rural markets had several houses available for rent that were capable of holding up to 500 bags of maize. Many of these traders lack their own transport and are therefore dependent on mobile traders/transporters to link them with large-scale buyers in urban areas. The small-scale traders sell directly to consumers, ADMARC, medium-scale traders and large traders depending on situations and locations.

Small-scale traders' prices tended to be higher than ADMARC prices. In 2008, many small traders indicated that when they raised their prices ADMARC followed suit. In Chilipa EPA, the ADMARC price was MK30/kg when the traders were already buying at MK40/kg in May and MK60/kg in July and August. The larger traders by contrast indicated that ADMARC was the price leader and traders altered their prices in response to ADMARC. Still other traders felt that they did not have to match ADMARC's price in order to still get most of the surplus grain from farmers. This is because the traders paid cash promptly and were perceived by most farmers interviewed as being more honest with their weighing scales. As one trader from Lunzu market said "I don't fear buying in areas where ADMARC operates".

Some small-scale traders in the border districts of Mulanje and Mchinji also buy some maize from across the border to bring into Malawi. This is actually more common in Mulanje, which is located near a border trading center called Mpala in the town of Muloza. The small traders in Mulanje purchase two to three bags of maize per time and transport them to their warehouses using bicycles. The maize was bought from Mozambique at MK20/kg in February but the price later rose to MK60/kg from September to October. In fact, in October, 2008, traders interviewed in Mulanje said that maize was more expensive in Mozambique than in Malawi (3,000 MK per 50 kg in MZ and 2700 in Malawi).

### *Medium-scale traders*

Medium-scale traders usually trade 500-2000 tons of maize per year and are often found in major trading centres such as Madisi or Bowe, Lunzu, Chitakale or Mchinji. Usually they are linked to small assemblers in the producing areas who act as their agents to buy maize from farmers. These traders buy maize from farmers and small scale traders until they have enough to fill a reasonably large truck or a mobile trader comes and offers an attractive price. The medium-scale traders sell to large traders such as ADMARC, Mulli Brothers, Rafik, NFRA, and processors such as Chibuku Products, and Rab Processors or animal feed manufacturers such as Central Poultry, Feltons, and Multifoods. Since medium-scale traders communicate regularly with the larger traders they know the prevailing maize prices at national level.

Medium scale traders are quite flexible in the geographic scope of their purchasing areas, often moving maize across districts from surplus to deficit areas. For example, a medium scale trader in Lunzu, Blantyre District sources maize from locations as diverse as Ncheu, Lililongwe, and Kasungu Districts. These medium-scale traders sometimes set up their own buying points to acquire maize directly from farmers but more frequently buy from small assemblers. This usually happens from May to October. However, these traders are always active in rural markets and they are always buying and selling maize, from both farmers and small-scale traders (bicycle traders).

The medium-scale traders have good access to transport and storage facilities. Some have their own transport while others rely on “mobile buyers” i.e., truckers who are contracted by larger warehousemen and large trading companies to purchase from small/medium scale traders in rural markets. Mobile traders (typically agents of the large trading companies) frequent rural markets and buy maize from medium-scale traders who are consolidating maize from farmers and bicycle traders. Maize collected by these traders will move immediately to warehouses or processing plants. During the course of the field work, we spoke with one transporter who was buying 10 tons of maize for Mulli Brothers, but was delivering it directly to ADMARC silos in Lilongwe. We also spoke to two private entrepreneurs who owned 8 trucks between the two of them. These trucks were used to move maize for their companies. These mobile traders serve as the primary link between rural market areas, serviced by local buyers, and national warehouses.

### *Large scale traders*

The big wholesale traders in Malawi include Mulli Brothers, Transglobe, Farmers World, RAB, Export Trading, and Rafik. These firms flourish because of their relatively high skills, know-how, connections, and access to relatively low-cost capital.

The large private traders get their maize from a variety of sources. In certain cases, the maize comes from medium scale traders and from neighboring countries particularly Mozambique and Zambia. These traders tend to have a good network of traders either medium or small-scale within Malawi and across the border who assist them in identifying available supplies and in bulking such supplies in economic lots for transportation to their warehouses. Sometimes the larger traders set up their own buying points in major producing areas to purchase maize directly from farmers. For example, in Mulanje, Mulli Brothers, Export Produce and Rafik bought maize directly from farmers from June to September. The large traders gave the farmers a price of MK25/kg in April and MK30-MK40/kg in June/July. The large traders often buy maize to meet contract requirements from the National Food Reserve Agency (NFRA), World Food Program (WFP), Non-Governmental Organizations, processors and institutions. A single contract for these traders is about 1,000MT. Large traders have good warehousing facilities, either rented or owned in Lilongwe, and Blantyre cities.

Some of these large traders have contracts with the Government of Malawi through National Food Reserve Agency (NFRA), and some international agencies such as World Food Program, other Non Governmental Organizations and Faith Based Organization (Kadale, 2007). Wholesalers after consolidating the maize, they clean it, and transport it directly to customer.

### *Changes in the number of maize traders over past 5 years*

The focus group discussions of smallholder farmers almost unanimously indicated that there has been a noticeable increase in the number of small traders buying maize in their villages. In some focus group discussions, farmers laughed at the question “how many traders buy maize in this village” because there were so many. Some people tried to "ballpark" the figure at 30-40 small traders, however, this number cannot be considered very reliable. In any case, there was a strong consensus among farmers that there were many traders from whom to choose to sell one's maize. This doesn't necessarily mean that farmers felt positively about the traders and the way they were treated, yet competition did not seem to be the problem.

In addition to farmers, we also asked traders about the changes in the number of traders operating in the market. We asked specifically about small, medium, and large scale traders. For all traders, millers, and stockfeeders interviewed, we asked them to indicate on a 1 to 5 scale how the number of marketing actors has changed over the past 5 years (1=substantial decline; 3=no change; 5=substantial increase). These participants indicated that there has been a major rise in the number of small-scale traders over the past 5 years (mean score of 4.7 over all market participants interviewed). The number of medium-scale traders was also perceived to have risen over the past 5 years (score of 4.2). By contrast, traders felt that the number of large-scale traders had actually declined slightly over the past 5 years (score of 2.8). The 2007 government tender for maize export appears to have contributed to a greater number of medium-scale traders in operation. Several traders interviewed indicated that they got into the business in 2007 to respond to the government's tender for maize contracts. However, a few of the firms entering in 2007 indicated that they were not seriously engaged in maize trading in 2008.

### **5.3 Maize processors and animal feeders**

The main processors and manufacturers mentioned by farmers and traders were food processors such as Rab Processors, Chibuku Products, and animal feed processors such as Central Poultry, Feltons and Multifoods. Rab Processors is engaged in both processing and trading of maize. They process maize into maize flour, and other products such as Likuni Phala. Bakarasa Milling in Blantyre works closely with Export Traders, who supplies grain for their milling operations. The processors obtain their requirements through the medium scale and large traders. Sometimes they buy directly from large-scale farmers who can supply economic loads to the processors. For cost-effectiveness and efficiency reasons, the processors often do not engage in setting up of their own buying points in the rural areas.

There are many hammermills operating in rural areas. It is common for small scale traders to be located near one of these hammermills to buy small quantities of maize from people who need cash to grind their maize. The hammermills also trade some maize, but according to traders not in very significant numbers.

#### 5.4 Agricultural Development and Marketing Corporation (ADMARC)

ADMARC has historically been a major player in Malawi's maize marketing system. Government has often used ADMARC to implement its smallholder-oriented pricing policies. According to farmers interviewed, ADMARC's role in the market has apparently declined in recent years, although data is not readily available to substantiate this. ADMARC's annual maize purchases and sales figures were last published in 2002; in recent years, such data is considered confidential. However, some substantiation of a decline in ADMARC's role can be surmised from the fact that ADMARC had approximately 350 depots spread throughout the country in 2002 (Kutengule, Nucifora and Zaman, 2006), while ADMARC staff interviewed in 2008 indicate that less than 70 depots were purchasing grain. However, any declining trend in ADMARC role was recently reversed in August 2008 when the Government announced a ban on private maize trade and re-established ADMARC as the exclusive legal buyer and seller of maize in Malawi.

In the 2008/09 market year, ADMARC started to purchase maize from farmers late in the season, around June in some areas, July in others.<sup>5</sup> Because a large percentage of maize is marketed immediately after harvest, farmers therefore sold their maize mainly to private traders. Moreover, farmers indicated that ADMARC offered slightly lower prices than private traders. For example, in Blantyre, farmers reported that when ADMARC was buying maize at MK30/kg private traders were already buying at MK60/kg in July/August. Farmers felt the MK60/kg price from private traders was acceptable because it enabled them to make some profit on their investments in chemicals and fertilizer. For this reason, farmers in Chilipa area in Blantyre sold much of their maize to private traders before ADMARC opened their markets.

Farmers also indicated that ADMARC often runs out of money or stocks and this frustrates both farmers and consumers, and provides an opportunity for the private traders to consolidate their trading activities in areas hitherto dominated by ADMARC.

In the current season, ADMARC has bought approximately 70,000MT. All the maize ADMARC has bought was delivered to its own markets for sale to households. According to ADMARC, approximately 70% of its purchases have come from smallholder farmers, 20% from medium/small-scale traders and 5% each from large-scale traders and large farmers. However, this figure stands in opposition to the data collected during field visits with farmers. Very few farmers interviewed in the five districts covered in the study sold to ADMARC, while myriad small-medium scale traders mentioned that they were forced to sell maize to ADMARC when the trading ban made it illegal for them to sell their maize to other traders. Reports also indicate that one of the large-scale traders has negotiated an agreement with the government to continue operating despite the ban on private maize trade in order to buy maize from farmers and small traders in order to supply NFRA with maize. This would suggest that the majority of ADMARC's grain supplies in 2008 were directly or indirectly supplied by traders, not farmers. Hence, the field work conducted for this study seems to have uncovered some discrepancies about the major source of ADMARC supplies.

In the current season, ADMARC's sales have been mainly to household consumers, although institutional buyers such as schools and prisons have also purchased maize from ADMARC. ADMARC has so far sold 10% of its maize and has approximately 63,000 tons still to be sold before the 2009 harvest.

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<sup>5</sup> As for the reasons why ADMARC tends to start buying several months after private traders, some interviews indicated that ADMARC waits till July when the grain is sufficiently dry to buy; others interviewed indicated that ADMARC was late in securing financing for purchasing maize.

From 2006 to date, ADMARC's greatest difficulty is inadequate funds for buying grain. The rapid rise in maize prices in 2008 especially hurt ADMARC's ability to buy grain because their limited funds ran out quickly in light of the higher price paid, and hence ADMARC was not able to buy as much grain as they had intended through the first 4-5 months of the 2008 season. The price of maize went up before the ban because of competition from private traders. This increased the corporation's expenses in maize procurement. Consequently ADMARC needed more funds to purchase the same quantity of maize it bought in the previous season. ADMARC therefore desperately needs to get loans from banks to make funds available for buying crops from farmers.

Maize imported by private traders from neighboring countries has occurred every year since 2004 when a monitoring system was put in place, but the volumes have yet to exceed 200,000 tons. In years of major maize deficits, the Government tends to be the main importer of maize, generally from South Africa. When the government announces that it will import maize, this generally acts as a disincentive for wholesalers to engage in cross-border trade (RATES, 2003). This is because the government generally sells maize at below the cost of importation, hence undermining the price at which private traders would be able to sell.

## 5.5. Retailers

A two-way flow of grain occurs between wholesalers and small traders. The first one was that of first assembler-wholesaler whereby small traders are categorized as first assemblers who, after buying maize from farmers, sell to medium traders who are known as wholesalers. Later in the season, and especially in poor harvest years when rural demand for grain is high, the larger traders sell maize to small retail traders who sell to consumers. Wholesalers have the capacity to store maize until late in the marketing season unlike first assemblers who just buy and sell due to limited capital and storage capacity. As such during lean period the former sells to the later who are in direct contact with the consumer. For example Mr. Kawana at Nathenje in Lilongwe does sell to small traders who sell to consumers at Nanjiri trading center. He also sells directly to consumers who come to his warehouses and shops.

### *Interrelationship between retailers and consumers*

The last relationship observed on the maize trade flow in Malawi is that of retailer-consumer. These consumers are both small maize farmers (net buyers) and non-maize producers. The study has observed that the majority of buyers are grain-deficit rural households. Most of these farmers are the ones who sell maize very early in the season and by September most of them run out of food. Eventually they tend to concentrate on the market for home consumption. The other consumers are individuals who do not grow maize. These consumers are typically found in major cities and towns like Lunzu in Blantyre, and in some trading centers like Madisi in Dowa, Chitakale in Mulanje, and Buwa in Mchinji.

Urban consumers buy maize from ADMARC, from **small scale venders**, and directly from farmers/relatives in nearby rural areas. Urban consumers face the same constraints when dealing with ADMARC as their counterparts in rural areas. Buying from ADMARC can require standing in long queues, while there is no guarantee that the depot will have sufficient maize or that the measurement will be accurate. As such, many urban consumers buy from local venders, even though the price may be significantly higher. These **venders** can be differentiated based on size, volume, and business organization. Some venders contacted in Kawale market buy their maize directly from farmers and rural buyers for much of the year. They generally go directly to rural areas, buy maize, and then bring it to their small

warehouses. Like rural buyers, these venders operate with limited capital and do not store maize longer than needed to find a market. They generally deal in volumes ranging from 50-300 bags. In markets like Kawale there were three such venders. These venders sell directly to consumers, small venders who sell into other urban markets, and large trading companies. They will also begin to buy maize from large private entrepreneurs when it becomes difficult to purchase maize in rural markets, around late December. Small venders who sell in markets like Chisapo and Chigwirizono sell directly to urban consumers, and purchase maize either from farmers on the outskirts of Lilongwe, from larger wholesale venders, such as those in Kawale, and large entrepreneurs.

## 5.6 Storage

While seasonal price rises are sometimes viewed as evidence of hoarding and profiteering, seasonal price rises in fact play a socially valuable function in ensuring food security. The harvest comes only once a year, but humans must eat continuously throughout the year. Hence, storage from the harvest till the months directly preceding the new harvest is necessary. Storage involves costs, mainly the costs of fumigation and storage chemicals, rent on the storage facilities, and interest charges on the inventory, and the cost of security to guard the warehouse.<sup>6</sup> Hence, maize prices must rise throughout the season to compensate people for storing the commodity at harvest. An important question is how the rate at which prices rise through the year compares to actual storage costs. This question is beyond the scope of this study, but is addressed by Myers (2009) who finds evidence that seasonal price rises tend to rise roughly in line with storage costs, with some notable exceptions that are often due to trade policies and/or marketing board operations.

During the interviews of traders, we asked about storage costs, and were given figures ranging from MK650/ton/month to MK1300/ton/month (USD4.60 to USD9.20 per month). Storage costs were relatively high in the urban areas of Lilongwe and Blantyre where rental costs were high.

Small traders are typically not in a position to store their own maize because this requires access to finance. Purchasing maize in bulk requires a loan, on which they must pay interest until they sell the maize and repay the loan. Hence, small traders tend to sell maize soon after they have bought it. Several exceptions were noted in Dowa but even there small traders stored only very small amounts for a month or two.

However, for medium traders, maize is stored for longer periods in anticipation that the price would rise more so than storage costs.

Table 9 shows monthly USD prices per ton in Lilongwe and the ratio of high to low price months, which amounts to the percentage increase over the season between high and low prices. There is great variability in this ratio, indicating high risks of storage. In the year when prices rose very dramatically (2001/02), this year was characterized by only a modest production shortfall, 8% below the country's 10-year mean. In September 2001, the grain trading parastatal, ADMARC, announced a fixed price for maize to be sold at its distribution centers and announced its intention to import maize from South Africa to defend this price (Rubey, 2004). Because ADMARC's selling price was considerably lower than the landed cost of importing maize, private traders had little incentive to import maize in this

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<sup>6</sup> The cost of buying 100 tons of maize from farmers at MK30/kg is MK 3 million (US22,000). Hence, most traders generally must take out loans to buy grain in any significant scale. For every month the trader stores grain, it delays the time he/she can repay the loan and hence interest charges accumulate.

environment. However, the government imports arrived late and were not sufficient to meet demand. As a result, ADMARC depots began to experience stock-outs, and prices soared over \$450 per ton in early 2002. The major price run-up in 2007/08 was also due to a complex combination of policy decisions combined with a likely overestimate of maize production in 2007.

**Table 9. Monthly retail maize prices, Lilongwe (USD per metric tonne)**

Year	Month												# months between lo-hi price	ratio of hi/lo month price
	May	June	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr		
1994/95	96	104	116	111	92	67	71	95	103	103	91	69	-3	73%
1995/96	60	76	83	92	101	117	126	165	164	181	229	171	10	282%
1996/97	117	102	99	103	104	112	124	123	148	172	201	159	8	103%
1997/98	129	129	129	133	138	154	209	146	274	316	200	128	-2	147%
1998/99	103	110	117	96	118	183	200	212	235	263	163	103	6	174%
1999/00	104	101	107	104	121	112	140	140	130	163	164	107	9	62%
2000/01	74	42	61	71	70	58	83	80	94	100	104	83	9	148%
2001/02	71	81	98	222	290	269	275	338	515	496	400	182	8	625%
2002/03	160	170	185	151	150	153	170	231	160	213	216	180	3	54%
2003/04	99	109	98	84	87	92	80	81	96	141	186	186	4	133%
2004/05	165	150	165	150	244	150	161	168	170	159	167	159	3	63%
2005/06	155	164	192	162	164	242	272	267	266	269	405	267	10	161%
2006/07	148	149	147	151	156	152	176	180	180	161	146	136	-4	32%
2007/08	132	129	142	143	150	161	175	213	248	283	411	315	9	219%
2008/09	246	275	369	421	386	386								
<b>mean</b>	115	115	124	127	142	144	162	174	199	216	220	160	5	163%

Source: Ministry of Agriculture price reporting system. Note: 2008/09 prices not counted in mean monthly price computation. The last column in this table refers to the percentage by which the high month price exceeds the low month price.

### *Storage losses*

Storage losses were estimated from samples collected in the target districts. Collected samples were analyzed at Bunda College Seed Technology Laboratory. The analysis involved first determining the moisture content of the maize and using conversion factors to bring the weight of 100 seeds to their standard 12.5% moisture content weight. The estimated weight was compared to a standard weight of 28-40g for 100 seeds. The difference in weight computed as a percentage was used as a rough estimate of storage losses. Because the samples were taken during field work in October, the losses measured may underestimate the storage losses to be incurred over a full season. Moreover, the method used here does not account for physical storage losses due to rodents. However, since farm households continuously draw down their maize stocks over the season, the majority of their stocks will be consumed in the first few months after harvest. Relatively little or none of a household's stocks (in the case of households running out of their stocks prior to the next harvest) would be subjected to storage losses late in the season because there tends to be little maize left by that time. Many if not most rural households run out of grain stocks after a few months. Hence, the methods used in this report to determine storage losses may only slightly underestimate mean storage losses if at all, particularly for the majority of households who run out of their stocks mid-way through the season. Table 10 presents results of the mean estimated storage losses at the farm and at small-scale private trader levels.

**Table 10. Estimated mean percentage grain storage losses by district, 2008**

<b>District</b>	<b>Farmer Level (%)</b>	<b>Trader level (%)</b>
Blantyre	12.20	21.67
Mulanje	19.34	14.88
Dowa	8.66	9.67
Mchinji	14.53	12.16
Average	13.68	14.60
Overall average		<b>14.14</b>

The overall storage loss is about 14%. The highest levels were among Blantyre and Mulanje traders. Mulanje farmers also have the highest losses in the southern Region while Mchinji farmers and traders had higher losses in the Center. These storage loss estimates reported by Bunda College researchers are lower than those reported by the government (over 30% loss).

### **5.7 The system: market channels and flows**

As maize moves from **rural markets** to **national warehouses** the number of actors contracts dramatically. While rural markets are characterized by a high degree of competition among buyers, the number of actors involved in warehousing and provisioning urban markets is remarkably small. This sector is dominated by the large trading companies, including Rab Brothers, Mulli Brothers, Transglobal, Export Trading, and Farmer’s World. Processing companies like Central Poultry and Chibuku Processing are also major actors in maize markets. In addition to these large companies, there are a handful of entrepreneurs who have the ability to buy and warehouse significant quantities of maize. I spoke with two of these buyers. One is currently holding 600 MT while the other has 1000 MT. Neither of these buyers could give me good figures on the number of entrepreneurs of a similar size operating in the market.

#### *Seasonality of market structure*

The importance of the various channels in Malawi’s maize marketing system changes according to the time of the season. These changes are driven by reliance on rain-fed agriculture, changes in market demand throughout the year, changes in prices, and costs of storage. Overall, the imposition of price bans and other regulations by the government this year made collecting data on the “normal” structure of Malawi’s maize extremely difficult. People have trouble describing their “normal” practices because there is so much variability and change in the markets, as well as production levels between years and within years.

Post-Harvest Maize Market (April and May): The maize harvest in Malawi begins in late April and continues through May. During this period of time producer prices for maize are at their lowest point of the year. These low prices are driven by a number of factors: First, most of Malawi’s maize is produced by rain-fed agriculture. As a result, the majority of maize in the country is harvested at the same time, leading to a sharp rise in supply. Second, the high moisture content of maize marketed soon after harvest drives down the price, because maize traders factor moisture shrinkage into their buying price. Third, many of the producers marketing maize at this time are doing so out of desperation, making them price takers rather than price seekers. Fourth, there is no official floor price, because ADMARC does not become active in the market until June.

Most of the producers marketing maize during this period are doing so out of desperation. All maize producers understand that maize prices rise throughout the year. However, the need to

repay debts incurred during the farming season, the need to pay school fees, and other social obligations force small scale maize producers to sell their maize early in the marketing season. Yet not all small scale producers are the same. Some producers have alternative crops, like tobacco, which provide them with income early in the harvest period, therefore allowing them to hold maize until prices appreciate. Additionally, some farmers produce significant surplus, which allows them to sell maize strategically throughout the year, releasing some early in the season and holding some to sell later as the farming season approaches.

The primary assemblers who are active during this period of time include: small scale traders on bicycles, local buyers in rural markets, mobile buyers coming from urban centers to buy in rural markets, and agents buying for large trading companies in rural markets. It is difficult to estimate the relative volumes of maize passing through each of these channels. Overall it seems that the quantities of maize being marketed by individual farmers is relatively small, since farmers who produce large surpluses hold these surpluses until prices rise later in the year. Thus, this period of time is characterized by numerous maize sales by a large number of producers, some of whom expect to buy maize back later in the season. These numerous, small sales are then assembled by these various buyers, who then sell their stocks to large scale traders and maize processors. No primary assemblers interviewed for this study stated that they hold maize to sell later in the year. Rather, these primary assemblers gain a margin by bulking maize that is sold in small quantities and then selling it on to large scale traders. Selling to large scale traders can either occur directly, whereby the primary assembler organizes his/her own transport or indirectly, whereby the assembler sells to a mobile buyer who buys from several primary assemblers until filling a truck. There are also a handful of private entrepreneurs, as well as large scale trading companies, who have their own buyers located in rural markets. Unlike the marketing structure later in the year, there is little or no local demand for maize during this time of the year. The majority of maize that is sold during this time period goes to large companies, though there is a handful of local small scale traders who buy small quantities of maize that they will sell back to rural people later in the year.

Overall there is a high level of competitiveness at both the primary assembler and wholesaler/large scale trader level during this time of the year. Some of this competition is driven by trading companies competing to acquire as much maize as possible before ADMARC sets a floor price in June. This seems to lead to a relatively quick appreciation in maize prices throughout this period. However, this is not a linear appreciation. Instead, a person's ability to negotiate prices with primary assemblers or their proximity to rural markets, where a number of primary assemblers operate side-by-side, leads to variations in producer prices. As a result, producers who sold maize in the same area at roughly the same time may receive significantly different prices for their maize (sometimes 5-10 kwacha per kg difference).

The market channels and structure of the market during this initial period of the marketing season is represented in Figure 5.

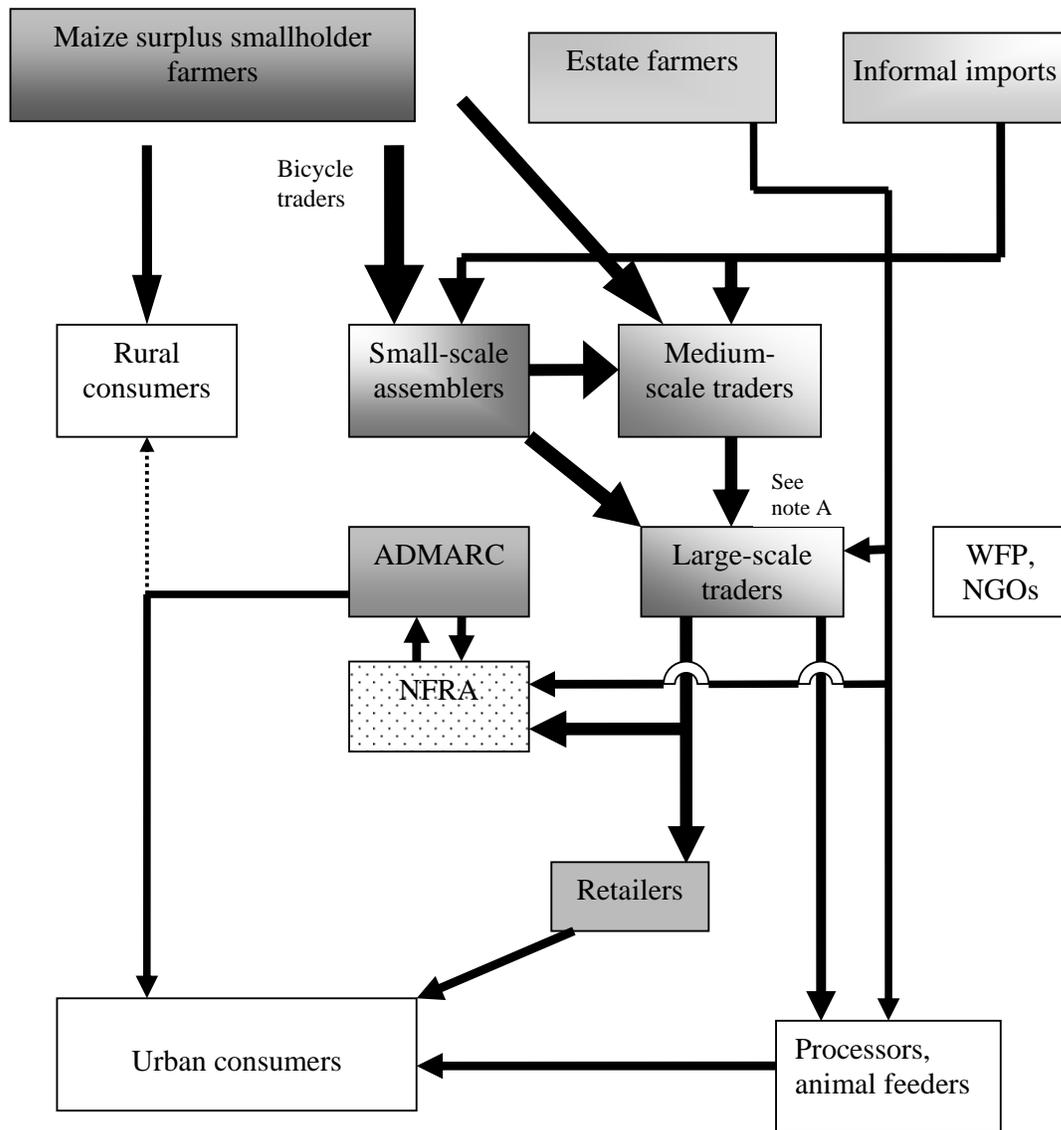
The entrance of ADMARC: June to August: The maize market in Malawi changes dramatically in June when ADMARC enters the market (Figure 6). According to traders, ADMARC's presence in the market has a significant affect on price, since traders must now compete with each other as well as the State to acquire maize. During this period of time primary assemblers communicate with large scale traders, informing them of ADMARC's prices and activities. These primary assemblers are generally encouraged to offer farmers prices slightly higher than those offered by ADMARC. Farmers generally agree that traders offer them better prices than ADMARC. As a result of the competition between traders and ADMARC, prices tend to rise quickly during this period. It also appears that volumes of

marketed maize increase early in this period, as farmers start to market larger surpluses, producer prices are higher, and cash generated from crops like tobacco dries up. The volumes of marketed maize may then taper off, because many surplus maize producers will hold maize off the market until the farming season approaches. Overall, the majority of maize marketed during this period goes through primary assemblers, who then sell to large wholesalers/traders, though a minority of producers will sell directly to ADMARC. The reason for this flow pattern is due in part to the price differential between private buyers and ADMARC, but equally important is the convenience of selling to a private buyer rather than to ADMARC. Private traders will often buy directly from the farmer's "doorstep" and always have cash to make purchases. Conversely, when selling to ADMARC farmers have to transport their maize to the depot, where they may find that the depot manager has run out of money to purchase maize. Of course the tendency for maize to flow into private channels may change depending on the year. There are times when ADMARC offers a better price than private buyers, which has the effect of redirecting maize into ADMARC warehouses. Because of ADMARC's limited reach, it is mostly primary assemblers, not farmers, who sell maize to ADMARC. However, due to their regular interactions with large scale maize buyers, these primary assemblers may be more price sensitive than many farmers, and generally have the luxury of being price seekers rather than price takers. Because of this structure, coupled with ADMARC's limited flexibility in buying price and the inconvenience associated with selling to them, the majority of maize acquired during this time is channeled from producers, through primary assemblers, to large scale traders. Again, the demand for maize by rural consumers is still relatively low during this period, meaning that most if not all maize is channeled out of rural regions.

Preparation for the farming season: September to November: This is the lead up to the farming season. Many larger scale maize producers have held significant quantities of maize off the market with the expectation that prices will be higher during this period than in previous periods, thus lowering the relative cost of inputs. During this period there is normally an up-swing in maize sales, as farmers prepare for the coming farming season. Again, the structure of the market is essentially the same. Farmers sell to primary assemblers, who then turn and sell to large scale traders and wholesalers, though some will sell to ADMARC if the price ADMARC offers is good or if large scale traders have scaled back their purchasing. Additionally, some warehouseers scale back their purchases during this time, because they have stockpiled maize early in the season to sell during the lean period, and may run out of warehouse space by this time. This may translate into a shrinking market for primary assemblers. There is also an increase in local demand during this period, as more and more rural households run out of their own maize supplies. While much of this demand is met through farmer to farmer exchanges, some is met through purchases from primary assemblers.

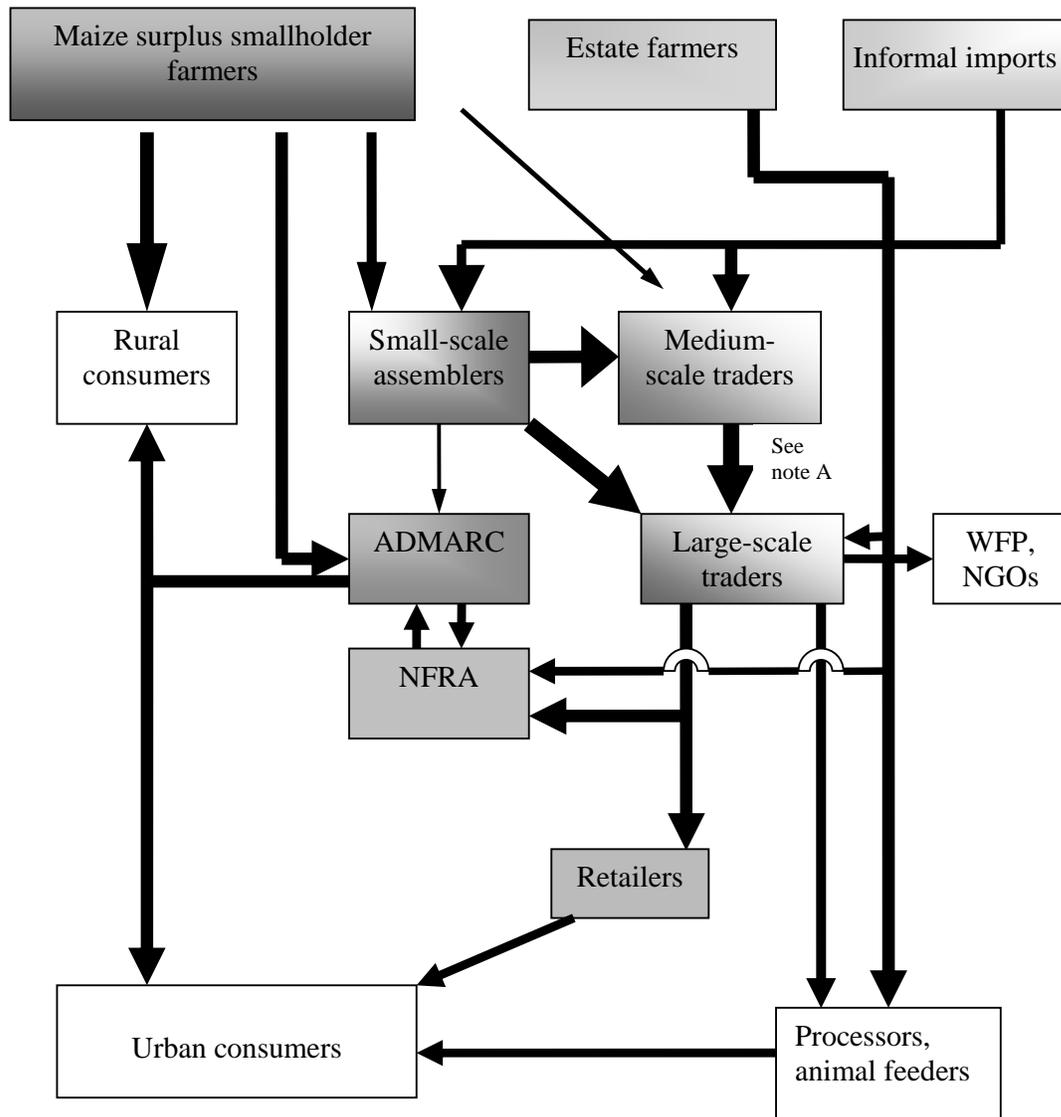
Lean period December to March: Figure 7 shows the main market channels and flows during the hungry season of December to March. Most farmers have already marketed their maize by this time, though some do hold maize to use to hire piecework laborers to weed in their fields. Much of the country's maize demand is now met by large scale wholesalers, who have acquired maize throughout the year and release it on to the market through small scale vendors and wholesalers. Primary assemblers continue to purchase maize, though volumes from producers are tiny relative to other times of the year. To make up for any local shortfalls in maize, these primary assemblers travel to remote areas and border regions to acquire maize. Mozambique, Zambia and Tanzania were all mentioned as potential sources of maize during the lean season, as are regions with significant production on irrigated fields, like Mchinji and Dedza.

**Figure 5. Marketing Channel Diagram (Phase 1: April - May)**



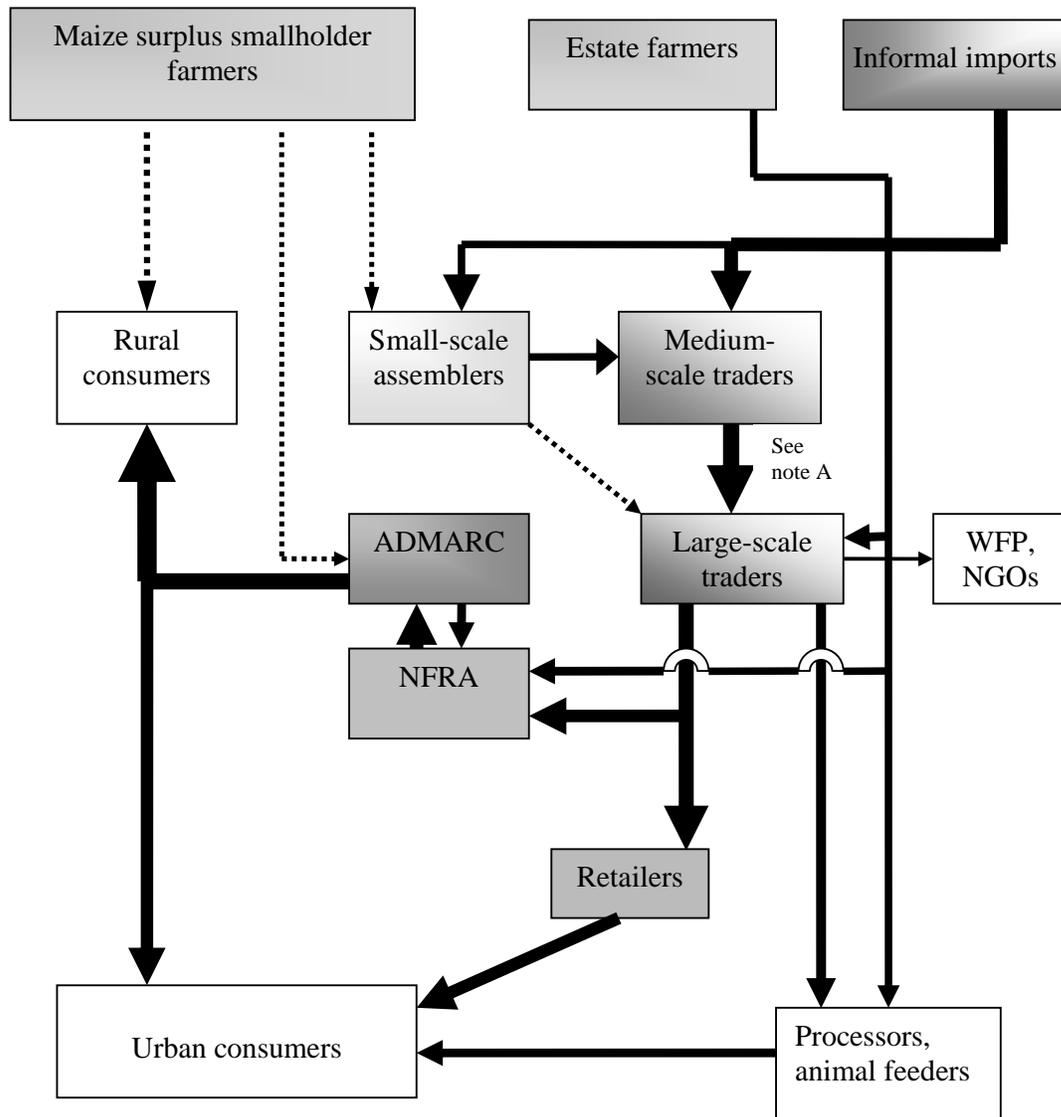
**Note:** the shaded boxes signify the main channels in terms of volume during this phase of the marketing season. The thickness of the arrow signifies the volume of flow. Dashed lines represent minor flows. **Note A:** transactions between medium-scale and large-scale traders are sometimes direct sale and sometimes through warehouse-transporters who buy as agents of the large-scale traders.

**Figure 6. Marketing Channel Diagram (Phase 2: July – October)**



**Note:** the shaded boxes signify the main channels in terms of volume during this phase of the marketing season. The thickness of the arrow signifies the volume of flow. Dashed lines represent minor flows. **Note A:** transactions between medium-scale and large-scale traders are sometimes direct sale and sometimes through warehouser-transporters who buy as agents of the large-scale traders.

**Figure 7. Marketing Channel Diagram (Phase 3: November – March)**



**Note:** the shaded boxes signify the main channels in terms of volume during this phase of the marketing season. The thickness of the arrow signifies the volume of flow. Dashed lines represent minor flows. **Note A:** transactions between medium-scale and large-scale traders are sometimes direct sale and sometimes through warehouser-transporters who buy as agents of the large-scale traders.

*Factors influencing the major trade channels and trade volumes:*

- Year-to-year production variability, driven by weather and changes in fertilizer use, driven by subsidy program
- Changes in market demand
- World market conditions – in 2008/09 led to aggressive buying early in year, implicitly driving prices up toward import parity early in the season
- Interest rates, which influence storage costs
- Access to capital on the part of small-medium scale traders
- Fuel and transport costs
- Infrastructure development: improvements in rural infrastructure have made more places accessible to private traders.
- ADMARC's access to adequate funds -- working capital situation
- Government policies toward regional trade and domestic trade

## **6. FARMERS' PERCEPTIONS OF TRADERS, ADMARC, AND THE 2008 TRADE BAN**

The following discussion summarizes some of the comments offered by farmers and commercial traders about market performance. These perceptions are obviously most influenced by problems of concern during the recent 2008 marketing season. Though some also reflect worries about persistent trading problems or risks. These perceptions provide a flavor of the factors influencing the sales and purchase decisions of these two groups of stakeholders.

### **6.1 Farmers' perception of ADMARC**

Farmers, many of whom are rural purchasers of maize, had a range of different perceptions about ADMARC. On the positive side, farmers had three positive things to say about ADMARC. First, farmers appreciated ADMARC and NFRA because it is their view that these agencies are the main storers of maize and other agricultural products for the hungry season.

Second, there was an appreciation that ADMARC's presence offered a source of competition with the private traders and hence was a way of ensuring that traders were less able to exploit them.

Third, farmers needing to buy maize could do so from ADMARC at lower prices than from private traders during times of food scarcity e.g. December to February. ADMARC is viewed as a government market where the price is known and the farmers are able to buy fertilizer and storage chemicals from ADMARC when the situation is normal. Farmers selling maize felt that they were doing their grain deficit neighbors a favor by selling to ADMARC, because ADMARC "keeps the grain in the area", whereas the perception is that traders ship grain out of the area.

On the negative side, farmers had perhaps five commonly expressed frustrations with ADMARC.

First, farmers agreed that ADMARC's role in smallholder crop marketing has diminished in recent years. We could not verify this by examining official government data on ADMARC maize purchases and sales because such data has not been published or available since 2002.

Second, farmers noted that ADMARC markets constantly run out of funds. This frustrates farmers because after harvest the farmers want a ready market to dispose of their products. Some farmers stated a preference to sell to ADMARC instead of private traders if ADMARC could pay cash promptly.

Third, farmers frequently complained about the behavior of ADMARC clerks. For example, farmers in Chilipa in Blantyre indicated that a bag that weighed 50kg at a private trader buying/selling point, weighed 40kg at an ADMARC market. When farmers run out of maize and want to buy from ADMARC, they also incur problems. According to farmers, ADMARC restricts the amount of maize the farmers/consumers need to buy while the same clerks sell truckloads to truck drivers. This also happens when ADMARC is selling fertilizer to farmers. It is alleged that sometimes ADMARC clerks ask farmers to pay MK200 on each bag of maize or fertilizer bought. Most farmers consider cheating and extortion by clerks to be a serious and perennial problem with ADMARC.

Fourth, ADMARC currently has few clerks in their markets and therefore are unable to assist farmers to the fullest. One farmer group indicated that ADMARC needs at least two managers and two clerks per station.

Fifth, ADMARC opens its markets late around July/August, yet farmers harvest crops in April/May. Farmers want ADMARC to open its markets in April/May immediately after harvest.

Farmers have a very ambiguous relationship with ADMARC. On the one hand, farmers view the institution of ADMARC as beneficial to small scale farmers. On the other, their experiences with ADMARC employees undermine their confidence in the institution. Overall, farmers stated that private traders offered higher prices than ADMARC, had greater geographic reach, began purchasing early in the season, and were more reliable in terms of having money to buy maize and having maize to sell in lean periods. Additionally, ADMARC is not seen to provide farmers with trustworthy scales, both when selling and buying maize. The principle advantage farmers identified for ADMARC relative to private traders is that selling maize to ADMARC keeps the maize in the area, while selling to private traders means that the maize will be shipped out. This perception of course does not coincide with reality, because ADMARC normally ships maize out of the region and also sells to local traders, while most people agree that local private traders do a good job of ensuring that there is maize to buy in rural markets, even during lean periods.

## **6.2 Farmers' perception of private traders**

First, farmers perceive that private traders are there to buy maize when the farmers are desperately in need of cash in April/May and ADMARC delays to open its markets. The private traders never run out of money and they pay cash on the spot.

Second, the traders offer better prices than ADMARC and there is often competition among the traders to buy as much maize as possible particularly at the start of the season.

However, farmers harbor many negative perceptions of private traders. First, some of them use unreliable weights and measures while others do not want farmers to see the reading on their scales. Some farmers stated that private traders, unlike ADMARC, buy maize from the villages and are never seen again in the same village during times of food shortage. Some farmers perceive that traders sell Malawian maize outside the country, which is considered to be "unpatriotic." However, some of these perceptions appear to be unfounded. First, most farmers described the existence of established rural markets and that medium-small scale maize traders have permanent buying and selling points and are considered reliable sources of maize throughout the year. This makes charges that "traders move grain out of the region" to be inconsistent with the view that maize is almost always available in rural markets. Secondly, FEWSNET's estimates of cross-border trade flows suggest very little informal maize exports from Malawi.

Second, in certain cases, private traders get produce from farmers on loan. At other times, private traders lie to farmer by arguing that produce prices have gone down. The aim is to persuade farmers to offer them a low price.

### 6.3 Farmers' perception of the maize trading ban

On August 21, 2008, the government issued a press release banning private maize trade in Malawi. The government later issued a clarification note in September stating that small traders buying and selling in village markets was legal as long as trade was carried out "in the periodical and traditional markets scattered in the villages across the country." Moreover, "the Ministry of Agriculture and Food Security is further asking all those involved in the buying and selling of maize in these daily operated markets to observe the Government set selling price of MK52 per kilogram..." Most large traders have interpreted this press release as constituting a *de facto* ban on their operations.

The farmers' perception on the maize ban was mixed and generally negative. Some farmers who had already sold their maize before August felt that they were unaffected by the trade ban. Among farmers who had yet to sell their maize by August, the main disadvantage of the ban has been that frequent charge that ADMARC has no money to buy and no maize to sell. Farmers are therefore unable to sell to or to buy maize from ADMARC even after waiting for several days or weeks. "Why restrict us to a market that has no money?" queried some farmers. There are always long lines at ADMARC markets.

Farmers who produce significant maize surpluses tend to sell their maize later in the year, in order to maximize their returns and to improve the ever important maize/fertilizer price ratio. This contrasts with less productive farmers who generally sell maize early in the marketing season. It is these productive farmers who are most negatively affected by the government's price regulations and trading ban. Decreasing the price of maize from 60 per kg to 45 translates into an increase from 4 bags of maize per bag of fertilizer to 6 bags of maize per bag of fertilizer. As such, the price regulations will lead directly to a decrease in inputs access for the upcoming farming season for the farming sector most able to produce surpluses of maize for the national market. As a result of these price interventions, maize production could actually be lower next year because many productive farmers will have less capital to invest in the coming farming season. Additionally, the interventions in the market act as a disincentive for these farmers to continue to invest in maize production. In fact, government interventions in maize markets creates an incentive for the most productive farmers in Malawi to cling to the production of crops like tobacco, which offers a more stable and transparent market than maize.

Maize farmers in surplus areas continue to hold significant maize stocks, which they had hoped to sell at a price above 60 kwacha. When the price regulations were imposed, many of these farmers were stuck holding maize stocks that decreased significantly in value. This is a group of farmers that is not dependent on fertilizer subsidies, but rather buys most of their fertilizer through private channels. It is anticipated that anywhere where there is a significant market for private sector fertilizer sales, there will be a large number of farmers still holding maize stocks that they hope to sell at a price higher than the 45 kwacha mandated by the government. These surplus producers do see a glimmer of hope in the maize market, since some small scale traders are now buying maize at around 50 per kg. However, large scale traders capable of buying 100 or more bags are still not very active in the market, and if they are, they are buying at 45. The only large scale buyer encountered in October 2008 buying maize was Mulli Brothers, who apparently has some sort of contract to buy maize for either ADMARC or NFRA.

#### **6.4 Private traders' perception of the marketing system**

There is competition among traders to buy as much maize as possible subject to their working capital constraints. The competition also takes place when selling maize to consumers. Traders focus on maize because it is easier to source large volumes in one spot, thus reducing search and transport costs. For beans and groundnuts, one incurs high search and transport costs as one needs to move to many different places to secure adequate amounts for cost-effectiveness in transportation.

Some traders felt that the ban on maize trading is fine because it would help small traders to sell and buy at similar prices as large traders, who sometimes undercut the smaller trader. Furthermore, the ban would help the small traders to buy at reasonable price from farmer and to sell the maize to consumers at affordable prices. The setting of prices helps traders to make informed decisions on how much to buy and sell as well as where to buy and sell.

Other traders felt that the ban on maize trading is bad for business and it shows government's ambivalence in its pricing policies. At one time traders are told that they are operating in a free/liberalized market and at other times the traders are restricted. This is not good for business. Frequent and unexpected changes in prices scare business people. Traders buy maize from distant places; incur transportation and storage costs, which shrink their margins. Traders should be allowed to set their own prices. Government should not set prices because this constrains the trading business. The maize ban made traders lose their money because they had already bought maize at a higher price and were told to sell at a lower price. If the ban is to control cross-border trade, government should use the police and the military to control that as opposed to restricting the prices in the domestic market.

Many traders felt that the trade ban is illogical because it restricts farmers ability to sell maize. They note that ADMARC does not buy from farmers because it lacks funds. The government should allow some of the larger traders such as Mulli Brothers and Transglobe to operate in competition with ADMARC. Such traders have the financial muscle to assist farmers in the rural areas instead of relying on a corporation that is constantly without money. If government wants to set prices, such price bands should be announced much earlier in the season e.g. in April to allow business people plan properly. Such price bands should also be set in consultation with traders and farmers or their representatives.

Small scale traders buying maize in surplus areas have seen a drop off in maize purchases relative to the same time last year. In normal years, maize purchases in surplus regions pick up in September and October, as larger farmers release their inventories to buy inputs. This is not happening this year to the extent that it did last year because traders are not allowed to offer an attractive price to farmers. In fact, for many of these traders, their stocks of maize are shrinking as the number of local maize customers grows and purchases slacken.

A chain reaction began when the trading ban and price regulations were imposed in August 2008. First, the long-distance trade between surplus and deficit regions which these traders depend on dried up. Traders could not operate within the stipulated margin of 45 to 52 MK/kg (a 7 MK/kg margin), which was insufficient to cover inter-district transfer costs. The long-distance inter-district trade has dried up because of the price regulations, leading to a cash flow crisis. This cash flow crisis forced small traders to sell maize at a loss to ADMARC, since it was the only buyer capable of buying significant quantities of maize. As such, the price regulations essentially taxed small to medium scale traders, thereby allowing ADMARC to acquire their stocks at a low price.

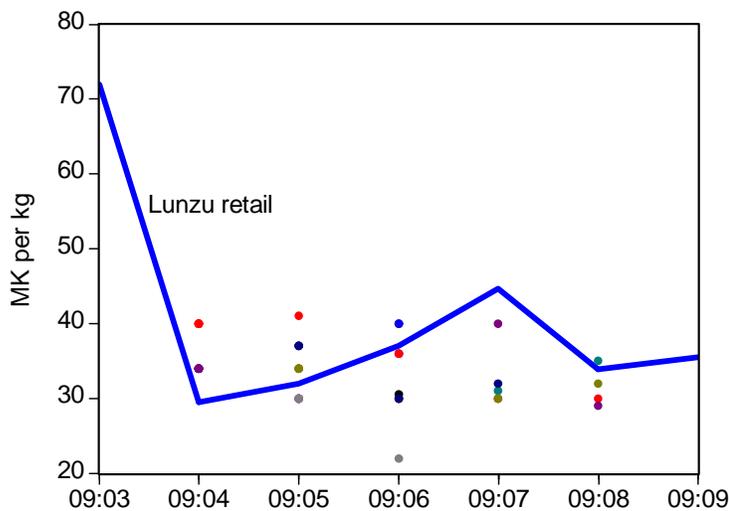
Prior to the regulations, ADMARC was unable to purchase maize because of uncompetitive prices. With maize only trickling in, and more local consumers now buying maize, stocks held by these traders are diminishing. This means that these traders, who normally are the most effective providers of maize to rural consumers during the lean period, are more likely to lack maize stocks to service these markets and capital to acquire maize.

For wholesalers in urban centers like Lilongwe a couple things are happening as a result of price regulations. First, for large scale wholesalers, holding more than 500 tons of maize, they are unable to sell their maize to their usual customers, like processing companies and urban retailers, because they are holding maize that was purchased for more than the prices mandated by the government. Lacking cash and a market, these traders have essentially withdrawn from the market and are waiting for serious maize shortages to pressure the government to free up maize prices. Second, business for smaller scale wholesaler/retailers in Lilongwe has become more difficult because of the price regulations. Instead of buying maize from traders in rural markets, which is a more efficient way of obtaining significant quantities of maize, they are forced to scour rural areas buying directly from farmers and smaller bicycle traders. This is because many rural market traders and urban wholesalers are operating within the same buying and selling ranges mandated by the government. As a result, an important link in the maize chain is damaged, as small scale urban traders have to compete directly from rural traders, rather than buying from them. This slows the movement of maize from rural to urban areas, since urban traders must now spend a lot of time in rural areas buying maize directly from farmers.

## 7. FARM-GATE TO RETAIL MAIZE MARKETING MARGINS

As described earlier, focus group discussions of maize selling smallholder farmers were carried out in September 2009. Farmers participating in the FGDs were asked to provide individual-specific information on their various maize sales transactions, including the price received and the month and week of sale. This information was matched with the price in the nearest retail market center as reported in the Ministry of Agriculture’s monthly market price bulletins. Each of the dots below represents the price received by a farmer in the month shown. The solid line shows the retail market price in the nearest retail market catchment area. Figures 8a-d show the relationship between farm-gate and retail prices disaggregated by villages defined as “accessible” (15km from market town and/or tarmac road) and “inaccessible” (at least 15km to market town and tarmac road).

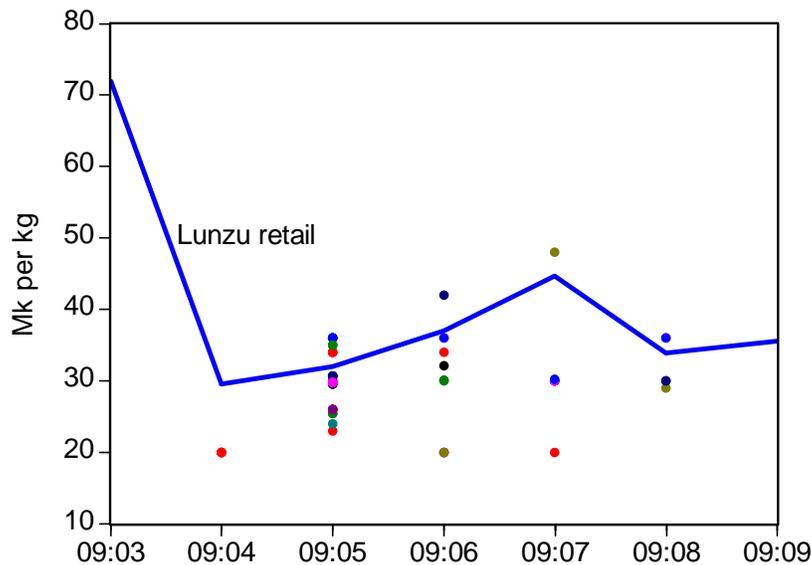
**Figure 8a. Relationship between Lunzu retail price and farmer-reported prices received in accessible villages in Blantyre District, 2009/10 marketing year**



Note: Solid line is Lunzu retail maize prices as reported by the Ministry of Agriculture and Irrigation. Dots represent prices received by individual farmers participating in farmer interviews in Makata, Undani, and Kunthembwe villages. These villagers reported being 10, 5 and 4km from a market town (Lunzu or Blantyre) and the same distances from a tarmac road.

Ratio of farm-gate to  
Lunzu retail price  
April: 1.22  
May: 1.03  
June: 0.91  
July: 0.73  
Aug: 0.93

**Figure 8b. Relationship between Lunzu retail price and farmer-reported prices received in remote villages in Blantyre District, 2009/10 marketing year**



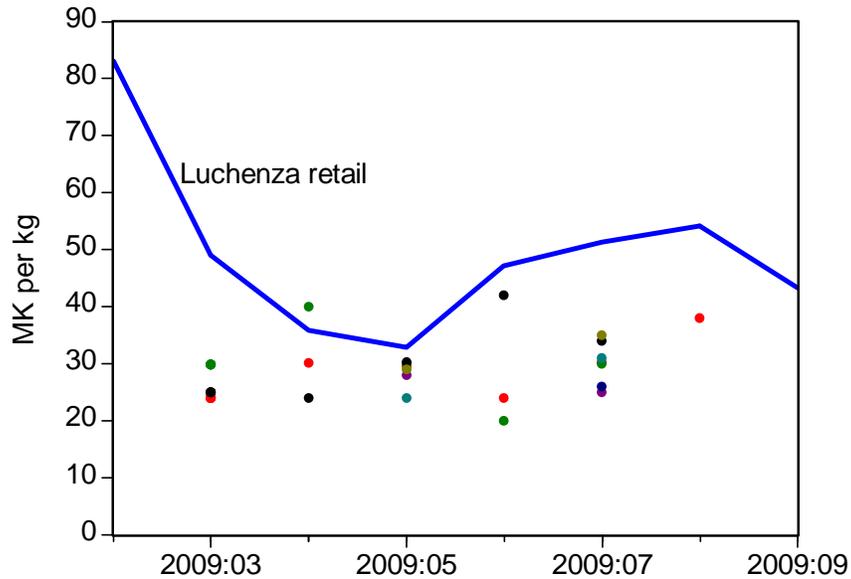
Note: Solid line is Lunzu retail maize prices as reported by the Ministry of Agriculture and Irrigation. Dots represent prices received by individual farmers participating in farmer interviews in Ndala, Chingonawaya, and Fred I villages. These villagers reported being 19, 29 and 25km, respectively from a market town, and 19, 29 and 15km, respectively from a tarmac road.

Ratio of farm-gate to Lunzu retail price, inaccessible areas:

March: 0.68  
 April: 0.92  
 May: 0.81  
 June: 0.70  
 July: 0.95

Findings from Blantyre district indicate that farmers in accessible villages received between 73 and 120 percent of the price of maize grain selling in retail markets in the same month. By contrast, farmers in inaccessible areas received a somewhat lower share of the retail price, between 67 and 94%. It is not possible to assess whether the implied marketing margins are competitive or not because information on traders' marketing costs are unavailable. However, the margins are quite high when compared with margins in other African countries, perhaps because this area of Malawi has fairly dense road infrastructure and settlement, even in the relatively inaccessible areas.

**Figure 8c. Relationship between Luchenza retail price and farmer-reported prices received in accessible villages in Mulanje District, 2009/10 marketing year.**

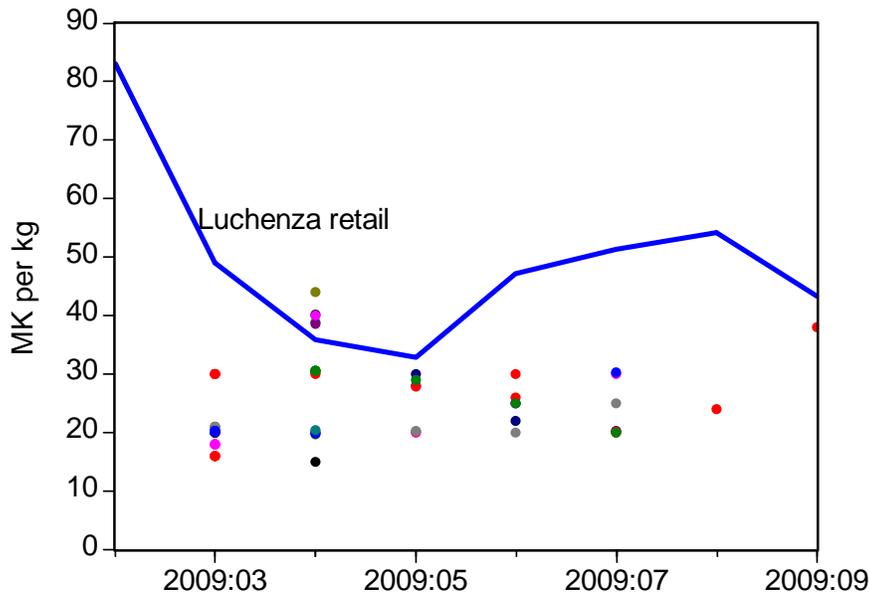


Note: Solid line is Luchenza retail maize prices as reported by the Ministry of Agriculture and Irrigation. Dots represent prices received by individual farmers participating in farmer interviews in Mbewa and Mujiwa villages, These villagers reported being 10 and 8 km, respectively from a tarmac road and the same distances from a market town.

Ratio of farm-gate price  
to Luchenza retail price  
Mar-Aug 2009:

- March: 0.54
- April: 0.88
- May: 0.86
- June: 0.61
- July: 0.59
- August: 0.70

**Figure 8d. Relationship between Luchenza retail price and farmer-reported prices received in remote villages in Mulanje District, 2009/10 marketing year.**



Note: Solid line is Luchenza retail maize prices as reported by the Ministry of Agriculture and Irrigation. Dots represent prices received by individual farmers participating in farmer interviews in Chinyama, Mwakhiwa, Matiya, and Makokola villages. These villagers reported being 50, 28, 25, and 20km, respectively from a market town, and 35, 28, 14, and 20km, respectively, from a tarmac road.

Ratio of farm-gate prices to Luchenza retail price – Mar-sept 09

March	April	May	June	July	August	September
0.43	0.81	0.76	0.52	0.46	0.44	0.88

Farmers' share of the retail price in Mulanje district is somewhat lower, between 45% to 90% depending on the month. Food prices from March into April were declining fast after the new harvest was starting to come in after the unusually high food prices observed in the 2008/09 marketing year. Farmers selling in March were probably in dire need of cash, and it appears that they were unable to negotiate for the temporarily high prices observed in March 2009 since the incoming harvest was sure to make prices fall soon thereafter. This may explain the relatively low ratio of farm prices to retail prices observed in March. In April and May, the farm-gate share rose over 80% in both accessible and remote areas, but then declined in June and July as retail prices rose with no apparent transmission of these higher prices to farmers.

Figures 8a-d also highlight that there are large differences among farmers in the farm-gate prices received in the same village in the same month. This indicates that there are potential gain to be achieved from farmer training in marketing their crops. For example, while the majority of farmers now own or have access to a mobile phone, few feel that owning a mobile phone helps them to find a better price for their maize. Instead, the majority of farmers use their phones to notify a buyer that they have maize to sell, not to negotiate a price or to search for price differences between buyers. This passive approach to marketing is the result of a common belief among farmers that private buyers collude to set prices and price negotiation is futile. This belief, however, is not supported by empirical data. According to Figures 8a-d, there is great scope for raising farm-gate prices for producers who currently tend to passively accept prices offered to them by traders.

## 8. CONCLUSIONS AND IMPLICATIONS

### 8.1 Assessment of Maize Market Performance

1. Malawi's maize marketing system is complex and characterized by many alternative and competing channels. There are many different channels by which maize could flow from farmers to final consumers.
2. Shortages in markets and stock-outs at ADMARC markets, leading to huge price surges, are perhaps the greatest problem with maize markets in Malawi. This has happened at least three times since 2000. The years of large seasonal price hikes are generally due to poor coordination and consultation between the public and private sectors and unreliable crop production information. Regardless of the causes, the fact that maize prices have exceeded \$400 per ton in at least three years since 2000 indicates an urgent need to identify cost-effective strategies to ensure adequate grain supplies in local markets at tolerable prices. Several options are discussed in Section 6.3.
3. The evidence points to growing private investment and new entry in maize marketing in recent years. One of the fundamental concerns about the performance of markets in Malawi concerns smallholders' "access to markets". In the field work carried out in 2008 and 2009, we found that even in the most inaccessible areas, smallholders cite numerous traders visiting their villages during the 4-5 months after harvest to buy surplus grain. When pushed to estimate a number, smallholders in most areas talk about at least 20 different traders visiting their village each year to buy maize. Rarely did farmers report having under 5 traders to choose from. According to farmers interviewed in 28 focus group discussions, most traders go right into villages to buy, with the median distance traveled from farm to point of sale being less than 3 km in all cases. This points to evidence of steady investment in grain assembly and transport over the 20 years since private grain trade was legalized. Moreover, there has been improvement in road infrastructure in recent years, and few if any farmers interviewed in the focus group discussions felt that they were "cut off" from markets. These observations call for a re-examination of the meaning of "access to markets", "isolated area" and similar phrases. Access to markets at a remunerative price is more likely to be the more important issue.
4. While proximity to demand centers and access to markets are important determinants of smallholder farmers' ability to participate in food markets, survey data reveal that limited land and capital are perhaps the primary constraint preventing the majority smallholder farmers to enter into commercialized staple food production. Even with major improvements in the performance of food markets, a large percentage of smallholders will continue to be unable to produce a surplus that would enable them to link to markets. An important conclusion appears to be, therefore, that "access to markets" may not be the primary constraint for the bottom 50% of smallholders with inadequate land or productive assets to produce a staple food surplus in the first place. For this bottom 50% of the rural farm population, there is a double burden of providing the means to put improved farm technology in their hands that is appropriate for their conditions, and then provide a market for the output that protects against severe downward price risk. This boils down to simultaneous improvements in farm technology (including for semi-arid conditions in which a large fraction of the smallholder population in Malawi resides), access to credit, improved rural road infrastructure, and hospitable conditions for private investment in rural input retailing and crop assembly. For the consistently surplus-producing smallholders, the main challenges are reducing the transaction costs of marketing output and protection against downside price risk.

5. Farmers' perceptions of both ADMARC and private traders were mixed. Both sets of traders were deemed to use unreliable weights and measures to cheat farmers. More farmers indicated that ADMARC staff were the worst, and that maize weighing 10kg on a private traders' scale would generally weigh less than 10kg on an ADMARC scale. Consumers wishing to buy grain commonly complained that they received less than what they paid for. Farmers also complained that ADMARC constantly runs out of money and that its personnel were very unprofessional in the way they dealt with farmers. Farmers felt that private traders have an increasingly important role in maize marketing and government needs to facilitate this role so that the private traders can complement the efforts of ADMARC, which currently has serious financial problems.
6. There remains little trust of private traders either, but this perception appears to be supported and even encouraged by many in government.
7. There were also mixed feelings on the maize price ban. Some farmers and small private traders felt that the maize price ban was good because it leveled the playing field. Other felt that it stifled their ability to invest in the upcoming farming season and that it went against the rhetoric of the government that "farming is a business." One farmer in Chioshya noted that "if the government wants farming to be a business, then why do they destroy our profits with their price ban."
8. Some large traders and farmers felt that the ban was bad for business and for maize marketing in the country. The ban demonstrates ambivalence to market liberalization on the part of the government; one day traders are told that the market is liberalized and the next the government steps in to control the prices. The current ban has led large traders to "hoard" the maize they bought earlier in the season arguing that selling such maize at the government regulated prices would lead to losses. The phrase "hoarding" is somewhat politically loaded and vague as well, because it is not clear how hoarding differs from the act of buying maize after harvest in order to release it later in the season given that consumers need to eat during all months of the year. Some farmers are also continuing to hold maize because they believe that they would not recover the cost of production if the maize was sold at the government-controlled prices.
9. Storage losses: Although government has speculated that storage losses in 2007/08 may have been greater than 30%, our study estimated such losses to be about 14%. This compares to 12.9% by a Government of Malawi survey of grain storage losses conducted in 2005. Estimates further show that Malawi will need about 270,000MT of maize between October 2008 and March 2009. This is much higher than the 70,000MT ADMARC bought this year. However, considering that private traders are holding maize stocks and that NFRA has about 70,000MT, it is unlikely that the country would have a shortage of maize, assuming that the traders released their stocks.
10. Traders frequently indicate constraints on availability of quality storage facilities. There are four main causes of storage capacity shortages:
  - i) Threat of grain confiscation. There are perceptions of risk that stored commodities will be confiscated or destroyed, especially since August 2008 when government regulated the prices at which grain traders could buy and sell maize.
  - ii) Unpredictable government operations in grain markets injects a great deal of additional risk into grain storage. Growing concerns over manipulation of national crop production estimates and food balance sheets also further erodes confidence in

publicly provided information that plays an important role in encouraging storage activity in other parts of the world.

- iii) Local banks tend to prefer investing their capital in safe high-return government treasury bills. Malawi, as with most governments in the region, is running deficits, which they finance by offering high-interest bills and bonds. Local banks naturally are content to earn a safe return rather than make loans to highly risky investments in grain arbitrage. Most of the silo capacity in Malawi remains in public sector hands. The potential for selling parastatal storage facilities at concessionary prices as part of some future privatization plan acts as a deterrent to new commercial investment in storage. This pattern of bank investment also shifts major investible liquidity in a country into government operations and programs rather than private sector investment.
- iv) The fourth major factor depressing grain storage is the lack of quality standards with respect to moisture content. Assembly traders and wholesalers make little effort to discourage the buying of wet maize or to separate it from higher quality dry maize. If anything, the tendency is to combine wet and dry maize in order to mask the ability to detect wet maize by the next buyer. The storage of high-moisture content maize results in rotting and high storage losses.

11. There is great need for more accurate and reliable estimates of annual maize production. There is increasing speculation that the official government maize production forecasts in the past several years may have been overestimated. Reduced confidence in official crop forecasts creates difficulties in determining whether formal imports are required. Evidence of overestimated official crop estimates is that while national maize production estimates for the 2007 and 2008 harvests were both far above national consumption requirements, imports from Mozambique and Tanzania have been streaming into the country almost continuously since mid 2007, and prices in both years have reached levels previously seen only in years of severe food crises. According to FEWSNet, Malawi imported 59,000 tons of maize in the 2007/08 season through informal cross-border trade flows. In the first 5 months of the 2008/09 season alone, Malawi has imported over 49,000 tons of maize (FEWSNet, 2008).

These conclusions are generally consistent with Myers (2008), who used threshold autoregressive analysis to investigate whether spatial and temporal price patterns observed in Malawi retail maize markets are consistent with conditions required for efficient inter-regional trade and storage. The efficiency conditions were generally found to hold in the long-run, and short-run deviations from the efficiency conditions generally dissipated quickly (half-life of 1-3 weeks). These adjustment speeds compare favorably to maize and rice markets in other parts of Africa, and even to maize markets in the U.S. Myers' overall conclusion is that private sector maize markets in Malawi have worked quite well over the past decade as they have grown in economic importance. However, his analysis does find several possible exceptions to this general conclusion, e.g., inter-regional trade between Lilongwe and Mzuzu, and storage in Mzuzu and Nchalo, all of which display evidence of much longer adjustment periods than other trade routes and storage locations. In the case of inter-regional trade between Lilongwe and Mzuzu it could be that there is little direct trade between these locations because they are a long distance apart with multiple intermediate markets operating between them.

Despite Myers' finding that price patterns over time reflect efficient commercial storage, maize stockouts in Malawi stemming from poor harvests may still lead to widespread hardship and socially unacceptable hunger and malnutrition. A social safety net for

dealing with these problems might have two main dimensions—a strategic grain reserve that makes additional public stocks available when a private stockout occurs during times of severe shortage; and a contingency plan for imports. Both of these safety nets would require treasury support and choosing the right combination is an important public policy issue. Furthermore, it is important to have transparent rules for managing the strategic grain reserve and a transparent set of contingent contracts in place for importing maize. Transparency and predictability are necessary so that the private sector has incentives to continue their historically effective role in transporting and storing maize in Malawi.

## **8.2 Competitiveness of Maize Marketing Players**

The major conclusions of the report about competitiveness are as follows:

1. farmers say that they have many marketing options.
2. some farmers may complain about the price they receive, in all cases they had many different traders to which to sell. We found other farmers in the same village who received considerably higher prices selling about the same time of year. This suggests that there is scope for training farmers how to be more “market-savvy” and improve their negotiation skills.
3. Schultz's "efficient but poor" observation of low-resource farmers may also appropriately describe the functioning of Malawi's maize marketing system. Marketing margins may approximate costs, but these costs may be too high and unstable to encourage rapid private investment in the marketing system and promote on-farm productivity growth. So far, liberalization and privatization have replaced often unreliable, high-cost, and centralized forms of state marketing with private markets that are competitive but often lacking in information, infrastructure, and poorly integrated with other key activities. Smallholders do not have reliable access to forward markets in which a high level of trade occurs on standardized quality, quantity, and contract terms. Supply of credit to farmers is severely constrained by the absence of a clear mechanism for recovering loans in drought years. Financial market failures constrain the demand for productivity-enhancing inputs, which in turn limits private investment in durable input delivery systems especially in the more remote smallholder areas. In spite of tangible benefits to many consumers and farmers close to markets, food market reform has not by itself successfully addressed the problem of sustainably raising farm productivity growth for the millions of low-input semi-subsistence rural households in the country.

The challenge for the future is to design coordinated and sustainable systems of input delivery, farm finance, and reliable output markets to reduce the costs and risks of input intensification in smallholder agriculture.

## **8.3. What is the role of the public and private sectors in Malawi's maize marketing system?**

The essential policy question remains: what should be the role of the public versus private sector?

Current thinking has been to consider ADMARC as a residual buyer and seller, operating around a designated floor and ceiling price. This approach may be warranted as long as the margin between the floor and ceiling price is (a) wide enough to allow long-distance trade

between surplus and deficit areas, and is (b) enough to cover seasonal storage costs so that the private trade will retain incentives to continue storing maize on its own. Achieving these objectives would require that ADMARC move away from pan-territorial and pan-seasonal pricing.

In areas where farmers have a lack of buyers at competitive prices, ADMARC can create more competition and force traders to offer more competitive prices. This has been the major rationale for the continuation of ADMARC. But our field work has not found any clear cut evidence that traders are reaping excess profits from either spatial or temporal arbitrage. We also found little evidence that farmers in the 18 sites studied (5 of them considered “remote”) were cut off from markets or dependent on one or two traders only. In fact, farmers in all villages surveyed cited many maize buyers in the April-October buying season. So, it is not clear whether ADMARC’s resources are best placed by focusing on purchasing maize directly from farmers.

c) NFRA can store strategic buffer stocks for release onto markets when price levels get too high. Adopting a “rules-based” approach to stockholding policy would require that the terms under which NFRA would acquire and release these stocks be transparent, known by all marketing actors, and that these rules would be closely adhered to. The same is true of import tariff rates and licensing of traders to engage in external trade.

Whatever involvement government wishes to retain in the maize market, predictable and transparent rules governing state involvement in the markets would reduce risks and enable greater coordination between private and public decisions in the market. The phenomenon of subsidized government intervention in the market, or the threat of it, leading to private sector inaction, is one of the greatest problems plaguing the food marketing systems in the region. Effective coordination between the private and public sector would require greater consultation and transparency with regard to changes in parastatal purchase and sale prices, import and export decisions, and stock release triggers. As stated by Oygard et al. (2003), “unless some very predictable and credible management rules can be established for the reserve, private agents will be reluctant to hold stocks, out of a fear that the reserve will be sold out at unpredictable times at subsidized prices, undercutting the value of their stored commodity.”

Private sector role: Try to support the Malawi agricultural commodity exchange to develop a transparent price discovery process and source of market information that is costless for all market participants.

Warehouse receipt system – this requires a building up of the marketing system more so than it currently is. Warehouse receipts are not an isolated service or function; rather they are a derived service which is based on a functioning and transparent exchange system that will drive the demand for warehouse receipt services (Business Growth Initiative, 2007).

#### **8.4. Potential recommendations:**

A major challenge is how to move away from a situation where leaders feel they have to be seen as “doing something” by taking populist stances that may entrench dependence on food or fertilizer handouts in response to instability-related food crises, but which do little to alleviate poverty or hunger in the longer run, and how to create constituencies for policies that are believed to promote market stability and small farm incentives to sustainably use improved seed and inputs, but which may not necessarily provide short-term patronage

benefits. Given that the GOM is likely to continue operating heavily in maize markets, there are several guidelines that might be followed to improve overall market performance:

1. Follow clearly-defined and transparent rules for triggering government intervention:

In countries where government involvement in food markets is seen as part of a transitional phase towards full market reform, predictable and transparent rules governing state involvement in the markets would reduce market risks and enable greater coordination between private and public decisions in the market. The phenomenon of subsidized government intervention in the market, or the threat of it, leading to private sector inaction, is one of the greatest problems plaguing the food marketing systems in the region. Governments and private trading firms strategically interact in staple food markets – they respond to each others’ actions and anticipated actions. Effective coordination between the private and public sector will require greater consultation and transparency between the private and public marketing agents (Brunetti, Kisunko, and Weder, 1997), especially with regard to changes in parastatal purchase and sale prices, import and export decisions, and stock release triggers. This approach does not imply that government needs be impassive. The big problem is to avoid swamping the whole system with government stock releases or relief aid that is uncoordinated with what the private sector is doing.

2. Institute a forum for regular consultation and coordination between the private and public sectors to manage the potential need for maize imports and exports. There is an urgent need for timely information on price movements, stock levels, and trade flows to serve as the basis for regular discussion between public and private sector stakeholders. Accurate information plus frequent communication is required for a coordinated private and public sector response to mitigate the chances of extremely high maize prices and associated food crises.

3. Eliminate maize export bans, import tariff rates, and licensing requirements for trade with the region. These proposed changes will stabilize supplies within the region and benefit farmers and consumers in the long run. Tariffs and other trade policy instruments may still be appropriate vis a vis international markets. However, when food prices are abnormally high in the entire region, there appears to be little merit in maintaining barriers to importation. While trade bans do not stop trade across borders, they do increase the transaction costs associated with it, thereby inflating food prices for consumers and contributing to lower prices for farmers.

4. Streamline border and custom clearing processes and removing controls on the issuing of import and export permits. This would promote the interests of both producers and consumers over the long run.

5. Promote supply chain development for a wider set of crops: Governments may promote more stable farm revenue and consumption patterns through supporting private systems of input delivery, finance, and commodity marketing for a range of crops that offer higher returns to farming in the changing environment of Africa’s rural areas. Such investments would represent a shift from the strategy of price stabilization and price support for a dominant staple grain to a portfolio approach that puts greater emphasis on a range of higher-valued commodities. This approach would shift the emphasis from direct approaches to stabilize and/or support the price for a dominant staple grain to one of minimizing the impact of food price instability by making the socio-political economy less vulnerable to the effects of food price instability.

6. Invest in an improved crop production forecasting system to serve as a foundation for improved consultation and coordination between the public and private sectors.

Currently, crop forecasting in much of the region is unreliable. There is mounting evidence that the national maize forecasts in Malawi may be overestimated, perhaps greatly. Unreliable crop estimates inject a great deal of guesswork into the food balance sheets that governments use to estimate import requirements and/or export potential, which in turn increases the probability of undershooting or overshooting import requirements and the wide price swings commonly associated with them. Relatively inexpensive investments in improved crop production estimates could greatly reduce the probability of future food crises.

7. Training programs for farmers to provide them with knowledge and strategies for marketing their crops.

While new technologies, crop diversification, and cooperative marketing arrangements may provide farmers with the tools to move from being price-takers to price-seekers, few of these options are successfully exploited by farmers. For example, while about 35% of farmers interviewed now own or have access to a mobile phone, few feel that owning a mobile phone helps them to find a better price for their maize. Instead, the majority of farmers use their phones to notify a buyer that they have maize to sell, not to negotiate a price or to search for price differences between buyers. This passive approach to marketing is the result of a common belief among farmers that private buyers collude to set prices and price negotiation is futile. This belief, however, is not supported by empirical data. According to individual price data collected during focus group discussions in four districts in 2009, farmers in the same locations obtained widely varying prices for their maize in the same month (Figures 8a-d).

8. REPO Contract: The REPO contract allows the government to extend its grain reserves at short notice if needed. In practice, a premium is paid to assure private sector players hold a physical stock of grain for a stipulated period of time. At the end of this period, the government may either purchase this stock at a pre-arranged price (to supplement its stock held by the NFRA), or allow the stock to be sold on local or export markets by its private owners. In effect, the physical inventory remains in country and on call, if the government later requires this.

This transaction works best following a harvest with a grain surplus. The additional grain purchases underlying the REPO help establish a floor under farmgate prices. The REPO size and strike price, at which the government would exercise the option, signals to private traders when a market intervention is likely.

Two things are important for the success of this strategy. First the contract should be completed on a timely basis to assure it helps to lift farmgate prices when these are most likely to be lowest – just after a favorable harvest. Second, the size and pricing of the transaction should be publicly known. Private traders then retain an incentive to buy, stock, and sell grain at price levels up to the designated strike price. And these actors know what size of inventory will be dropped on the market when the strike price is exceeded.

It may be worth noting that the government has considered implementing a REPO contract during both the 2007 and 2008 post-harvest period. If this deal had been completed in 2007, more stocks would have been available to offset the rise of prices in early 2008. If the REPO had been implemented shortly after the 2008 harvest, this could have helped support farmgate prices while improving the transparency of the government's stockholding strategy. Once the strike price rose above import parity

prices, however, Malawi may have been better off considering a physical call option to import grain.

9. Call option: If there is a strong prospect for the domestic price of maize to rise above import parity price levels (generally calculated based on the price of maize in South Africa plus transport costs), Malawi should consider negotiating a physical call option. This allows the country to import a given quantity of grain at an agreed price at some agreed date in the future. The payment of a premium creates the opportunity to make this purchase. If the domestic prices remain below import parity prices, the option may not be exercised. If domestic prices rise well above import parity, the import would logically be pursued. This sort of contract can be particularly valuable when regional grain prices and transport costs are rising – for example after a broad regional drought. Due to rising grain prices, Malawi is estimated to have saved US\$70 per ton of maize imported in 2005 under a call option. Since the contract was negotiated a bit late, domestic grain prices still rose to unprecedented levels. However, these prices might have increased even further if the call option had never been pursued.

10. Focus government budgets on cost-reducing public investments to support the development of input and output markets and smallholder farm productivity. Many agricultural market failure problems in Africa reflect an under-provision of public goods investments to drive down the costs of marketing and contracting. Ameliorating market failure is likely to require increased commitment to investing in public goods (e.g., road, rail and port infrastructure, R&D, agricultural extension systems, market information systems) and institutional change to promote the functioning of market-oriented trading systems. Unfortunately the large share of government expenditures devoted to food and input marketing operations represents a high opportunity cost in terms of foregone public goods investments to promote the functioning of viable food markets.

Important public goods investments would include:

- a) Human and financial resources dedicated towards seed varietal development, improved soil fertility management, and other crop management activities to raise smallholder farm productivity.
- b) Seed system development initiatives, based on either private sector leadership or public/private partnerships.
- c) Farmer extension programs: weak public programs to improve farmer knowledge and management practices are dragging down the potential for farm productivity growth in many countries in the region (World Bank 2007). The farmer focus group discussions highlighted some differences in farmers' marketing skills when it came to negotiating with traders and knowing when to sell. It is often NGO extension agents that interact with smallholder farmers to improve their crop husbandry and marketing practices and to raise the efficiency of their use of fertilizer, rather than the public sector extension service. The substantial variation in maize yields even within villages as commonly observed in household survey data attest to the productivity growth that could be achieved simply by raising the yields and fertilizer response rates of the bottom half of the farmers to match mean levels achieved in each village.
- d) Initiatives to organize farmers into viable groups for accessing seasonal loans to finance crop input purchase, obtaining support services (e.g., crop husbandry crop husbandry knowledge, marketing skills and techniques, soil testing for fine-tuning efficient fertilizer use recommendations), and achieving scale economies in crop marketing. Major progress in organizing grass-roots farmer groups to access

knowledge, financing and inputs has been made in Kenya through the Kenya Market Development Programme, and the benefits being achieved there provide a blueprint for wider replication throughout the region.

- e) Public goods investments in physical infrastructure, e.g., roads, electrification, and port development.
- f) Stable state institutions to support commerce and private investment. Providing a stable institutional environment is critical for private investment in communications, means of transport, storage, and other investments complementary to the public investments listed above.

While calls for increased investments in these areas are not new, their high payoffs have been well documented in the Asian green revolution experience (see Fan, Gulati, and Thorat, 2007) and continue to be major priorities for agricultural growth and food security in most of Africa.

11. An important component of an agricultural markets programs should be on-the-ground monitoring of program/policy implementation and impact. Close monitoring in the field would provide the potential for quick feedback to policy makers regarding on-the-ground implementation of reform policies and allow for mid-course corrections if activities are not conforming to expectations. It would also enable researchers to more accurately measure the impacts of particular marketing policy strategies (as actually implemented instead of basing their impact assessments on stated policy documents). This will reduce the tendency to mis-identify policy effects and thereby provide a more accurate empirical foundation for future discussions of food marketing and trade policy options.

## 9. REFERENCES

- Brunetti, A., G. Kisunko and B. Weder, 1997. Institutional Obstacles to Doing Business: Region-by-Region Results from a Worldwide Survey of the Private Sector. Policy Research Working Paper 1759, World Bank, Washington DC.
- Business Growth Initiative. 2007. Building a Warehouse Receipts Program that Works for All Stakeholders. Emerging Markets Group, Ltd., [www.BusinessGrowthInitiative.org](http://www.BusinessGrowthInitiative.org)
- Chilowa, W. 1991. "Liberalization of Agricultural Produce Marketing and Household Food Security in Malawi." Working Paper, Chr. Michelsen Institute, Fantoft, Norway.
- Chirwa, E. 2006. Commercialisation of Food Crops in Rural Malawi: Insights from the Household Survey. Working Paper 2006/04, Department of Economics, University of Malawi, Chancellors College, Zomba, Malawi. [http://www.economics.chanco.mw/papers/wp2006\\_04.pdf](http://www.economics.chanco.mw/papers/wp2006_04.pdf)
- Chirwa, E. 2007. Assessment of Alternative Maize Trade and Market Policy Interventions in Malawi, paper presented at the FAO workshop on "Staple Food Trade and Market Policy Options for Promoting Development in Eastern and Southern Africa", FAO Headquarters, Rome, Italy, March 1-2, 2007.
- Chirwa, E. 2009. The 2007-08 Food Price Swing: Impact and Policies in Malawi. Discussion paper, project on Policies for Good Economic Management of Food Price Swings in Africa, FAO Trade and Markets Division, Rome.
- Chirwa, E., P. Mvula, and J. Kazandira. 2005. Agricultural Marketing Liberalisation and the Plight of the Poor in Malawi. Working Paper 2005/08, Dept. Economics, Univ. Malawi, Chancellors College, Zomba, Malawi. [http://www.economics.chanco.mw/papers/wp2005\\_08.pdf](http://www.economics.chanco.mw/papers/wp2005_08.pdf)
- Dorward, A., J. Kydd, J. Morrisson, and I. Urey, 2004. A Policy Agenda for Pro-Poor Agricultural Growth. *World Development* 32(1): 73-89.
- Fan, S., A. Gulati, and S. Thorat. 2007. Investment, Subsidies, and Pro-Poor Growth in Rural India. IFPRI Discussion Paper 00716, September. Washington, D.C.: IFPRI.
- FEWSNet, 2008. Informal Cross Border Food Trade in Southern Africa. Famine Early Warning Systems Network, July 2008.
- FEWSNet, 2008. Report on the joint field trip on post-harvest food security and maize marketing monitoring: 16th - 25th June, 2008, FEWSNet, WFP, Government of Malawi, and FAO, <http://www.fews.net/docs/Publications/Joint%20Trip%20report-%20Post-Harvest%20Food%20Security%20and%20Maize%20Marketing%20Monitoring%20June%202008.pdf>
- Galushko, V. 2003. "Has Spatial market Integration Increased over Time: The Evidence from the Ukrainian Food Markets?" MS Thesis. National University of Kyiv-Mohyla Academy.
- Goletti, F. and S. Babu. 1994. "Market liberalization and integration of maize markets in Malawi." International Food Policy Research Institute, Washington, DC, USA Bunda College of Agriculture, Lilongwe, Malawi. *Agricultural Economics* 11:311-324.
- Govindan, K. and M. Kherallah. 1997. "The Sequencing of Agricultural Market Reforms in Malawi: Mssd Discussion Paper, Market and Structural Studies Division; International Food Policy Research Institute; Washington, D.C. U.S.A.
- Harrigan, J., 2003. "U-Turns and Full Circles: Two Decades of Agricultural Reform in Malawi 1981-2000." *World Development*, 31: 847-863.

- Kadale Consult. 2007. The Maize Market (Madisi/Bowe EPAs). Concern Worldwide, Malawi Final Report.
- Kutengule, M., A. Nucifora, and H. Zaman, 2006. "Agricultural Development and Marketing Corporation Reform." In by A. Coudouel, S. Paternostro, and A.A. Dani, *Poverty and Social Impact Analysis of Reforms: Lessons and Examples from Implementation*. World Bank Publications.
- Lea, N. and L. Hanmer. 2009. Constraints to Growth in Malawi. Policy Research Working Paper 5097, Africa Region, Southern Africa Poverty Reduction and Economic Management Unit, World Bank, Washington, DC.
- Malawi Government. 2006. Malawi Poverty and Vulnerability Assessment Investing in Our Future. Lilongwe. Jointly published as World Bank Report 36546-MW, Washington DC [http://www.agirn.org/documents/Malawi\\_PVA\\_Volume\\_I\\_II\\_Jun2006.pdf](http://www.agirn.org/documents/Malawi_PVA_Volume_I_II_Jun2006.pdf)
- Malawi Government. 2008. Impact and Output Indicators for Agriculture, Food Security, Nutrition and Natural Resources Projects/Programmes in Malawi. Lilongwe: Malawi Government.
- Malawi Government, Ministry of Agriculture and Food Security. 2008. 2007/08 Annual Agricultural Statistical Bulletin. Lilongwe: Planning Department.
- Mangisoni, J.H. 2008. Impact of treadle pump irrigation technology on smallholder poverty and food security in Malawi: A case study of Blantyre and Mchinji districts. Forthcoming. International Journal of Agricultural Sustainability.
- Myers. R. 2008. Efficiency of Inter-Regional Trade and Storage in Malawi Maize Markets. Report prepared for the World Bank, Lilongwe, Malawi.
- National Statistical Office. 1998. 1998 Malawi Population and Housing Census. Zomba: National Statistical Office.
- National Statistical Office. 2005. Integrated Household Survey 2004/05: Poverty Rates by District. Zomba: National Statistical Office.
- Nijhoff, J.J., D. Tschirley, T. Jayne, G. Tembo, P. Arlindo, B. Mwiinga, J. Shaffer, M. Weber, C. Donovan, and D. Boughton. 2003. Coordination for Long-term Food Security by Government, Private Sector and Donors: Issues and Challenges. Policy Synthesis No. 65. Michigan State University, Department of Agricultural Economics.
- Nucifora, A. 2004. "Lessons in Managing Policy Dialogue in Malawi: Reforming the Agricultural Development and Marketing Corporation (ADMARC)." The World Bank, Washington D.C.
- Office of the President and Cabinet, Department of Economic Planning and Development. 1990. Nutrition Facts for Malawian Families. Lilongwe: Inter-Ministerial Food and Nutrition Committee, Food Security Unit.
- Øygard, R., R. Garcia, A. Guttormsen, R. Kachule, A. Mwanaumo, I. Mwanawina, E. Sjaastad, and M. Wik. 2003. The Maze of Maize: Improving Input and Output Market Access for Poor Smallholders in Southern African Region, the Experience of Zambia and Malawi, Agricultural University of Norway Department of Economics and Resource Management Report No. 26, ISSN 0802-9210.
- Phiri, MAR. 2006. "Malawi Agriculture Commodity Exchange Baseline Survey." Bunda College of Agriculture, Lilongwe, Malawi.

- RATES (2003). "Maize Market Assessment and Baseline Study for Malawi", RATES Center, Nairobi, Kenya. Available at [rates@ratescenter.org](mailto:rates@ratescenter.org)
- Rubey, L. 2004. Do No Harm? How Well Intentioned Government Actions Exacerbate Food Insecurity: Two Case Studies from Malawi. Report, USAID/Malawi, Lilongwe.
- Shahidur, R. 2004. "Spatial Integration of Maize Markets in Post-Liberalized Uganda. International Food Policy Research Institute (71). Available at <http://www.ifpri.org>.
- Simler, K. R. 1997. "The Transition to a Market-Based Agricultural Economy in Malawi: A Multi-Market Analysis." Cornell Food and Nutrition Policy Program; New York. Cornell University Ithaca.
- World Bank, 2007. World Development Report. Washington, DC.
- World Bank. 2003. Reforming the Malawi Agricultural Development and Marketing Corporation (ADMARC): Synthesis Report of the Poverty and Social Impact Analysis, Report No.: 27512, Poverty Reduction and Economic Management, Africa Region, Washington, D.C.

## APPENDIX 1: TRANSPORT AND STORAGE COSTS

**Appendix Table 1: Storage Costs for Farmers and Small-Medium Traders on Monthly and Yearly Basis per 50kg Bag – excluding financing costs, 2008**

AREA	Farmers						Small-Medium Traders					
	Rent (MK/Bag)		Chemicals (MK/Bag)		Total (MK/Bag)		Rent (MK/Bag)		Chemicals (MK/Bag)		Total (MK/Bag)	
	Monthly	Yearly	Monthly	Yearly	Monthly	Yearly	Monthly	Yearly	Monthly	Yearly	Monthly	Yearly
Blantyre	0.00	0.00	2.78	33.33	<b>2.78</b>	<b>33.33</b>	26.67	320.00	2.78	33.33	<b>29.44</b>	<b>353.33</b>
Mulanje	0.00	0.00	3.21	38.50	<b>3.21</b>	<b>38.50</b>	16.50	198.00	3.21	38.50	<b>19.71</b>	<b>236.50</b>
Dowa	0.00	0.00	2.30	27.55	<b>2.30</b>	<b>27.55</b>	12.45	149.43	2.30	27.55	<b>14.75</b>	<b>176.98</b>
Mchinji	0.00	0.00	2.38	28.60	<b>2.38</b>	<b>28.60</b>	13.90	166.82	2.38	28.60	<b>16.29</b>	<b>195.42</b>
Lilongwe	-	-	-	-	-	-	30.62	367.39	2.87	34.38	<b>33.48</b>	<b>401.78</b>

**Appendix Table 2: Storage Costs for Farmers and Small-Medium Traders on Monthly and Yearly Basis per Kilogram – excluding financing costs, 2008**

AREA	Farmers						Small-Medium Traders					
	Rent (MK/kg)		Chemicals (MK/kg)		Total (MK/kg)		Rent (MK/kKg)		Chemicals (MK/kg)		Total (MK/kg)	
	Monthly	Yearly	Monthly	Yearly	Monthly	Yearly	Monthly	Yearly	Monthly	Yearly	Monthly	Yearly
Blantyre	0.00	0.00	0.06	0.67	<b>0.06</b>	<b>0.67</b>	0.53	6.40	0.06	0.67	<b>0.59</b>	<b>7.07</b>
Mulanje	0.00	0.00	0.06	0.77	<b>0.06</b>	<b>0.77</b>	0.33	3.96	0.06	0.77	<b>0.39</b>	<b>4.73</b>
Dowa	0.00	0.00	0.05	0.55	<b>0.05</b>	<b>0.55</b>	0.25	2.99	0.05	0.55	<b>0.29</b>	<b>3.54</b>
Mchinji	0.00	0.00	0.05	0.57	<b>0.05</b>	<b>0.57</b>	0.28	3.34	0.05	0.57	<b>0.33</b>	<b>3.91</b>
Lilongwe	-	-	-	-	-	-	0.61	7.35	0.06	0.69	<b>0.67</b>	<b>8.04</b>

**Appendix Table 3: Gross Marketing Margin Analysis for Small-Medium Traders for the Period April to October 2008**

AREA		Average Selling Price (MK/kg)	Average Buying Price (MK/kg)	Gross Marketing Margin (MK/kg)	Average Cost/Month (MK/kg)			Net Marketing Margin (MK/kg)
					Transport	Storage	Total	
<b>BLANTYRE</b>	<b>Lunzu Area</b>							
	Close to ADMARC (Chanika Village)	59.00	50.00	<b>9.00</b>	1.20	0.59	1.79	<b>7.21</b>
	Far from ADMARC (Chilipa EPA)	59.00	43.75	<b>15.25</b>	2.50	0.59	3.09	<b>12.16</b>
	<b>Kunthembwe Area</b>							
	Close to ADMARC (Kuthembwe EPA)	57.00	48.75	<b>08.25</b>	2.20	0.59	2.79	<b>5.46</b>
	Far from ADMARC (Kusena Village)	57.00	30.00	<b>27.00</b>	4.10	0.59	4.69	<b>22.31</b>
	<b>Blantyre Average</b>	58.00	43.13	<b>14.87</b>	2.50	0.59	3.09	<b>11.78</b>
<b>MULANJE</b>	<b>Chisinkha Area</b>							
	Close to ADMARC (Chisinkha Village)	55.00	37.50	<b>17.50</b>	0.10	0.39	0.49	<b>17.01</b>
	Far from ADMARC (Ndala Village)	55.00	33.75	<b>21.25</b>	0.40	0.39	0.79	<b>20.46</b>
	<b>Makokola Area</b>							
	Far from ADMARC	55.00	37.50	<b>17.50</b>	1.00	0.39	1.39	<b>16.11</b>
<b>Mulanje Average</b>	55.00	36.25	<b>18.75</b>	0.50	0.39	0.89	<b>17.86</b>	
<b>DOWA</b>	<b>Madisi Area</b>							
	Close to ADMARC (Madisi EPA)	54.00	41.00	<b>13.00</b>	0.50	0.29	0.79	<b>12.21</b>
	Far from ADMARC (Kabanga Village)	54.00	37.00	<b>17.00</b>	1.30	0.29	1.59	<b>15.41</b>
	<b>Bowe Area</b>							
	Close to ADMARC (Mwalala Village)	52.00	40.00	<b>12.00</b>	1.20	0.29	1.49	<b>10.51</b>
	Far from ADMARC (Madziyada Village)	52.00	36.00	<b>16.00</b>	2.30	0.29	2.59	<b>13.41</b>
<b>Dowa Average</b>	53.00	38.50	<b>14.50</b>	1.33	0.29	1.62	<b>12.88</b>	
<b>MCHINJI</b>	Close to ADMARC (Chiwosya EPA)	55.00	48.00	<b>7.00</b>	2.10	0.33	2.43	<b>4.57</b>
	Far from ADMARC (Mphanga Village)	55.00	45.00	<b>10.00</b>	3.90	0.33	4.23	<b>5.77</b>
	<b>Mchinji Average</b>	55.00	46.50	<b>8.50</b>	3.00	0.33	3.33	<b>5.17</b>