

**Food Crises and Food Markets:
What has been Learned in Southern Africa over the Past Decade?**

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1. INTRODUCTION

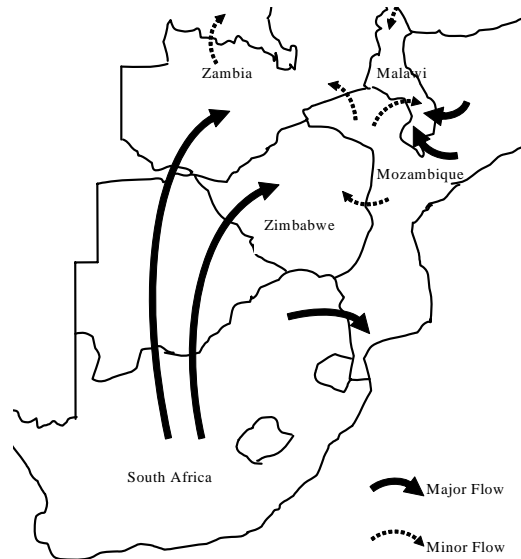
Southern Africa is an increasing focus of concern for humanitarian response agencies. The rate of perceived food crises in the region has increased sharply during this decade, with identified crises in 2001/02, 2002/03, and 2005/06. Among emergency response agencies, NGOs, and some academics, explanations for this trend have loosely coalesced around ideas such as the “triple threat” or “new variant famine”: HIV/AIDS, environmental stress (especially increasingly unreliable rainfall and declining soil fertility), and worsening governance have combined to make more people more susceptible to destitution from what might have been manageable shocks in the past (SARPN, 2007; FAO 2007; Devereux 2002; Devereux 2003; Devereux 2006; Haddad and Frankenberger 2003; Frankenberger et al. 2003; Mano, Isaacson, and Dardel 2002).

These crises are occurring in a policy environment far different from what it was 10-15 years ago. In every country (with the possible exception of Zimbabwe), the level of subsidy to and control of the maize sector has fallen dramatically since the early 1990s, with two principal effects. First, production patterns in more isolated or agro-ecologically less advantaged areas have begun to diversify away from maize, with cassava especially filling the gap. In Zambia, for example, maize production has trended negative since the late 1980s, while cassava production has doubled over the same period (Chitundu, et al, 2006). Second, decentralized private food distribution systems have emerged to redistribute maize and other locally produced foods between surplus and deficit households within local areas, between surplus and deficit areas within countries, and across borders. Informal trade between northern Mozambique and Malawi is well known; less appreciated is the active trade which occurs between Tanzania, Malawi, Zambia, Zimbabwe, and Mozambique, in often reversing directions depending on relative prices (Figure 1). These systems, based on small-scale trading and milling and consumption of a wider range of types of maize meal, have proven far less costly than the more centralized and large-scale systems that they have grown up around (Jayne et al. 1996). South Africa becomes a major supplier to Zambia, Zimbabwe, and Malawi when those countries suffer production shortfalls.

Additionally, there is evidence that consumer expenditure patterns are also diversifying away from maize. In rural areas of the three provinces of southern Mozambique, for example, rice and wheat have a higher combined budget share (about 15%) than maize (11%) (Tschirley and Abdula, 2007). In the capital city of Maputo, maize’s share is only 2.4%, compared to nearly 25% for wheat and rice. In four cities of Zambia, maize’s share is less than 8%, only slightly exceeding the share of wheat and rice. While maize’s budget share is higher in rural areas, the direction of change there is likely to be the same, towards greater diversity in consumption habits. All three of these trends – more diversified production and consumption, and more decentralized food distribution systems – should reduce the region’s dependence on external food aid during droughts by broadening the consumption base and making it easier to move local surpluses to populations in need.

This paper asks whether governments in the region have learned to take advantage of this improved market environment as part of their response to perceived food crises. We focus primarily on Zambia, Malawi, and Mozambique during the three crises of this decade, but place them in the broader southern Africa context; we also draw selected insights from Zimbabwe and

Figure 1. Map of principal maize trade flows in southern Africa



Mozambique during the 1992 regional drought. The paper focuses on the handling of markets within emergency response while recognizing that substantial market skepticism has arisen in recent years. Among some donor, operational agencies and researchers, and even more among some government officials, there is the sense that liberalization has gone too far or too fast, that it has not delivered (and may not deliver for a long time) its promised benefits in productivity, efficiency, and income growth, and that a much more comprehensive set of safety nets – and renewed government action in cereals and input markets -- is needed to reverse the increasing destitution of rural populations in the region². Recent policy in Zambia and, especially, Malawi has been heavily informed by this market skepticism. This paper will examine the extent to which markets have been allowed to respond to food crises, will conclude that they typically have not been allowed to do so in a robust fashion, and will ask what analysts and policy advisors can do to influence decisions on this most political of issues in southern Africa.

Section Two presents background to the problem. In section three we outline the data used. Section four characterizes each crisis in terms of production, incoming stocks, the scope for trade, and, in broad terms, the elements of the emergency response. Section five then assesses each country's handling of grain markets during the various crises and draws conclusions as to how much has been learned. Section six concludes.

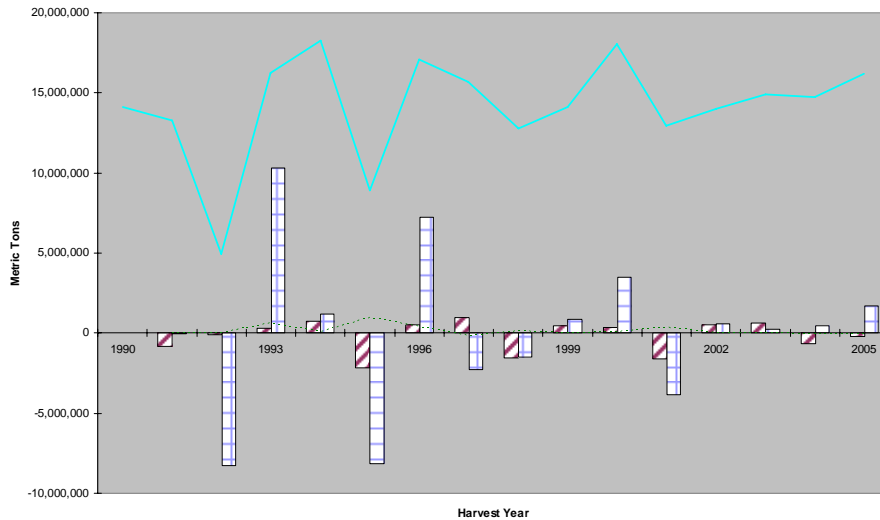
2. BACKGROUND

Maize production in southern Africa is commonly perceived to be highly variable and highly covariant across countries. Official production data suggest that both perceptions have been less accurate over the past 10 years than previously. From 1990 to 1999, the median year-on-year

² See, for example, Dorward and Kydd (2004).

change in production was nearly 20%, with changes exceeding 50% during four of the 10 years (Figure 2). From 1996 to 2005, the median year-on-year change was only 10%, and no single change exceeded 30%. Coefficients of variation in production fell during the second (overlapping) ten-year period in all countries except Zimbabwe; driven by South Africa, the overall coefficient of variation fell from 0.29 to 0.11. During the first period, changes in yield, driven largely by rainfall fluctuations, drove huge changes in production in 1992 (drought), 1993 (recovery), 1995 (drought) and 1996 (recovery). Yield continued to be the prime cause of change during the second period, but did not have nearly the quantitative impact it did during the first period.

Figure 2. Maize production and contribution of yield and area to changes in production, southern Africa, 1990-2005



Production in the region was far more covariant during the first period than during the second (Figure 3). From 1990 to 1999, correlation coefficients on production between South Africa, Zimbabwe, and Zambia were large, positive, and highly statistically significant; during the second period they were much lower and none were significant. Correlations between those three countries and Mozambique and Malawi were small and insignificant during both periods, with one exception: a large, significant, and *negative* correlation between Mozambique and Zimbabwe during the second period. Mozambique's lack of correlation with other countries in the region³ is driven by the predominance of the North in national production, and by the lack of correlation of weather patterns in this area with those in the rest of the region. For example, during the droughts of 1992 and 1995, production in northern Mozambique was largely unaffected. Since northern Mozambique regularly produces exportable maize surpluses, its lack of correlation with production in the region makes it a potentially important source of supply for both commercial and humanitarian responses to drought. Production in Mozambique co-varied

³ The negative correlation with Zimbabwe is a special case, driven by the economic chaos in Zimbabwe contrasted with recovery from the civil war in Mozambique.

Figure 3. Correlation coefficients of reported maize production among selected southern African countries, 1990-2005

		South Africa	Zambia	Zimbabwe	Mozambique	Malawi
South Africa	1990-1999		0.66**	0.93***	0.18	0.12
	1996-2005		0.36	0.51	0.04	-0.18
Zambia	1990-1999	0.66**		0.77***	-0.04	0.36
	1996-2005	0.36		0.27	-0.08	0.06
Zimbabwe	1990-1999	0.93***	0.77***		0.30	0.22
	1996-2005	0.05	0.27		-0.88***	0.21
Mozambique	1990-1999	0.18	-0.04	-0.30		0.65**
	1996-2005	0.04	-0.08	-0.88***		-0.20
Malawi	1990-1999	0.12	0.36	0.22	0.65**	
	1996-2005	-0.18	0.06	0.21	-0.20	

with that in Malawi during the first period, but not the second, reinforcing its potential role as a source of supply during droughts.

It is also noteworthy that per capita maize production in the region has shown no trend since 1990, despite clear declines in per capita area harvested (Figure 4). More surprisingly, aside from Zimbabwe, per capita maize production has unambiguously declined only in Zambia, and there, the decline has been largely offset by increased cassava production (Chitundu, et al. 2007). Malawi's per capita maize production trended upwards from 1990 through 2000, and has fallen since that time back to levels seen at the beginning of the period. One of the perceived threats in the "triple threat" explanation of the region's food crises is food insecurity due to declining soil fertility and other farm-related environmental degradation (SARPN, 2007; FAO 2007); recently, climate change has been added as a key concern. It is possible that factors such as increased intensity of input use could explain steady per capita maize production in the face of declining per capita area. Yet these data do suggest the need to examine more closely the empirical basis for the environmental concerns embodied in the triple threat.

Doubts can be raised about the quality and even the objectivity of production figures in some countries. Maize price data are much less affected by such concerns, and they reinforce the overall production story: nominal USD prices in the region show no appreciable trend since 1994, with the statistically significant positive trend since 2001 largely offset by a comparable negative trend before that time (Figure 5). These price trends suggest that, if food access is more difficult for more people in the late 2000s than it was in the early 1990s, it must be due to

declining incomes among sub-populations in the region; on an aggregate level, both production and prices suggest steady food access over the period.

Figure 4. Per capita area planted and production of maize in southern Africa, 1990-2005

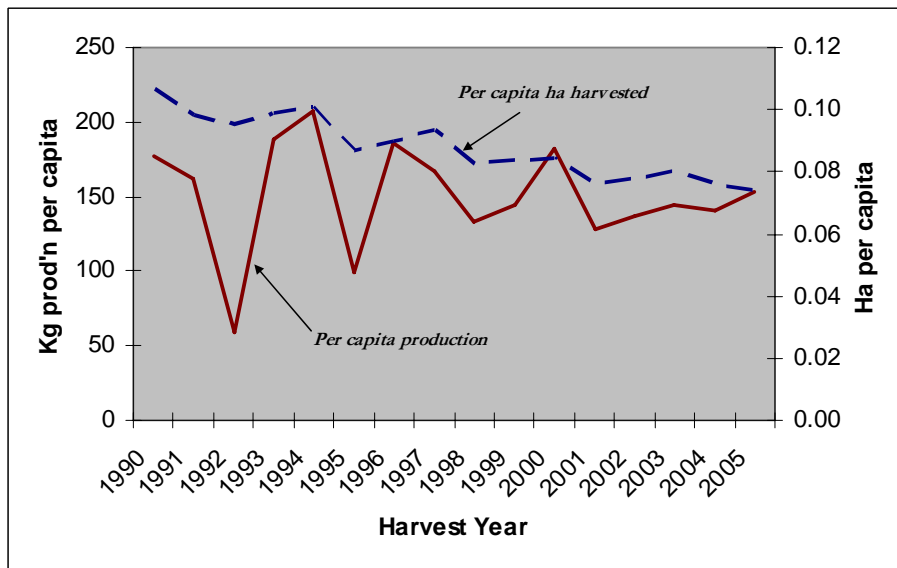
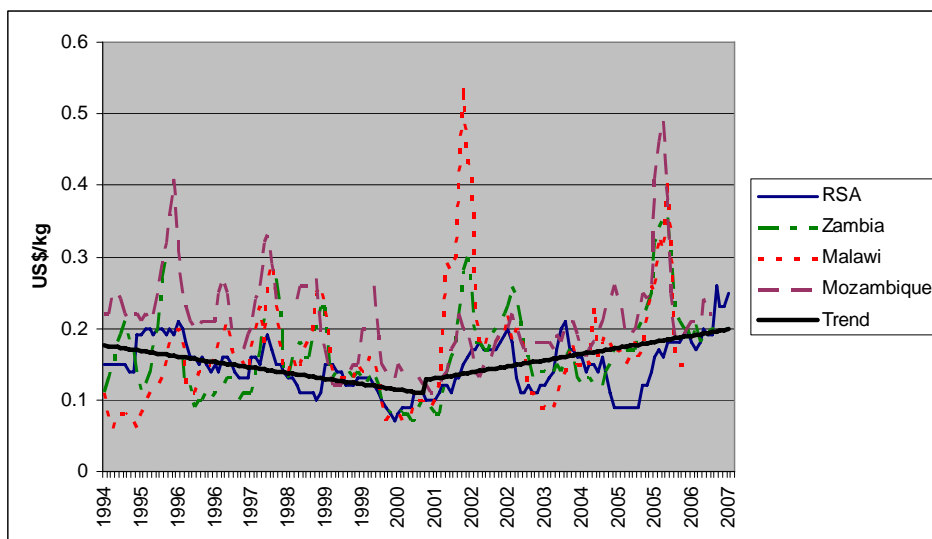


Figure 5. Maize grain prices in southern Africa and time trends, 1990-2007 (US\$)



4. CHARACTERIZING THE CRISES

Table 1 provides summary information on regional production outcomes and beginning stocks, production outcome for the four countries we look at in this paper plus South Africa, food aid arrivals during the marketing season (April-March), and an assessment of the scope for regional trade to play an important role in emergency response. The **1992/93 crisis** was spurred by a massive, region-wide drought. Production fell by more than half in every country, and by nearly two-thirds across the region. Regional stocks were also depleted due to below-average rains across Southern Africa in 1989/90 and 1990/91. Though market mechanisms would prove critical in distributing imports (DeRose et al, 1998), the scope for trade based on regional production was severely limited.

Satellite and rainfall monitoring activities provided clear and early warning of the shortfall. An estimated 12 million metric tons of food aid arrived in the (broader SADC) region during 1992, the U.S. government provided US\$112 million in non-food assistance for transport and logistics, and all this was complemented by US\$4 billion dollars spent on commercial imports and transport (DeRose, Messer, and Millman 1998; Dilley 2003). By all reports, the response was sufficiently well orchestrated that drought related deaths in the region were avoided.

1995/96 saw a major but less severe drought in South Africa, Zambia, and Zimbabwe. Production in Malawi, however, was up 60% from the previous year and about equal to the 1990-2005 mean. Production in Mozambique rose 50%, though from a low base. Regionally, the harvest was nearly double that of 1992, but about half the average of the previous two years, and more than a third below the 1990-2005 mean. Scope for regional trade was thus greater than in 1992/93, but still limited, as Mozambique's surplus was in the north, far from all but Malawi (which needed few imports), and South Africa had a substantial deficit. According to INTERFAIS, cereal food aid arrivals into Zambia, Zimbabwe, Malawi, and Mozambique totaled more than 600,000 mt.

During **2001/02**, regional production was less than 10% below its 1990-2005 mean, and high beginning stocks in South Africa, Malawi, and Zambia meant that the region could meet most of its aggregate cereals needs through efficient trade⁴. FEWSNET put out regular monthly bulletins in each country and regionally, detailing supply/demand balances, price movements, stock levels, and progress on imports. INTERFAIS indicates that only 300,000 mt of cereals food aid entered the four countries, two-thirds of it destined for Mozambique. Yet prices spiked in Malawi beyond historic highs and in Zambia to the highest levels since the 1995/96 crisis. Key questions for this crisis include whether important early warning information was missed,

⁴ Food aid or other income transfers would still be needed for households struck by crop failure or whose production, as in Malawi, was wiped-out by floods.

Table 1. Summary of production and stock outcomes for southern African crises, scope for trade, and food aid response

Marketing year	Regional Situation			Country Production Outcomes					Scope for Regional Trade	Cereals Food Aid (mt) (total/of which external)			
	Prod'n Outcome	Beg. Stocks	Overall Supply	Malawi	Mozambique	Zambia	Zimbabwe	South Africa		Malawi	Mozambique	Zambia	Zimbabwe
1992/93	-65%	Very low	Massive deficit, > 10 mmt	-60%	-85%	-49%	-75%	-64%	Very little. Need for massive imports (commercial and food aid). Market mechanisms important in distribution of imports.	-----	-----	-----	-----
1995/96	-37%	Very high, > 4mmt	Deficit 2 mmt	+2%	-19%	-22%	-42%	-47%	More than 1992, but modest; Mozambique still deficit, imported from RSA, and RSA itself had a deficit.	240,000/ 230,000	308,000 /267,000	76,000 /58,000	11,000 /7,000
2001/02	-9%	About average, > 2mmt	Small deficit, ~ 1mmt	-3%	+26%	-37%	+1%	-12%	Great scope for trade; high beginning stocks meant regional supplies sufficient to cover needs. Exports from RSA and northern Mozambique.	39,000/ 19,000	211,000 /199,000	38,000 /21,000	12,000 /12,000
2002/03	-1%	Historically low, <500,00 mt	Deficit up to 3mmt	-5%	+36%	-37%	+1%	+10%	Great scope for trade due especially to surplus in RSA. Exports from RSA and northern Mozambique; also from Tanzania.	172,000/ 159,000	143,000 /133,000	97,000 /86,000	206,000 /206,000
2005/06	+15%	Above average, ~ 3 mmt	Surplus up to 2 mmt	-23%	+55%	-9%	-38%	+29%	Great scope for trade due to large surplus in RSA (especially early in season, as prices in RSA were very low). Exports from RSA and northern Mozambique	46,000 /12,000	47,000 /38,000	63,000 /16,000	42,000 /35,000

Note: Production outcomes are relative to the 1990-2005 mean. Source: FAOSTAT for production data; FEWSNET for stocks; INTERFAIS for food aid.

whether any of the information was wrong, and why Zambia and Malawi were unable to prevent price spikes through efficient trade.

The proximate cause of the **2002/03 food crisis** was slightly below normal production in 2002 in the face of historically low incoming stocks, as a result of the 2001 shortfall. Together, these led to an estimated regional food deficit of about 3m metric tons. Regional production in 2002 was slightly higher than in 2001, and about equal to the 1990-2005 mean. Regional stock levels at the start of the 2002/03 marketing season, however, estimated at 329,000 metric tons, were at least 1.5m metric tons below the lowest level of the previous five years, and nearly 3m metric tons below incoming stocks the previous year (Mano, Isaacson, and Dardel 2003).

Tschirley et al (2005) suggest that, despite concerns about slow response during the crisis, the response was in fact quite timely. Warnings were first made public in April 2002. The World Food Program launched its Emergency Operation (EMOP) between April and June, stating that “approximately 13 million people are facing a severe food crisis over the next nine months”. Throughout the crisis, the food gap and progress toward meeting it were highlighted, and other relevant information (such as the GM maize controversy) was presented. The role of commercial markets in filling the gap was also highlighted and policies to improve their contribution were discussed.

The response from the international community was relatively swift. By December, 395,000 MT of food aid had been received, and 1,359,000 MT of commercial imports had arrived. This meant that over half the estimated food gap of 3.3m MT had been filled by registered inflows into the region. Informal imports appear to have played a major role in Malawi (see below for more detail). By the end of March 2003, 77% of the regional food aid appeal had been “committed” by donors. The early warning and response process also reflected an exceptional degree of collaboration among governments in the region, the emergency response community, and donor agencies. Darcy and Hofman (2003, p. 43) consider it a “striking example of a coordinated multi agency assessment process” and suggest that the assessment methods achieved greater standardization than has been typical in past crises.

Regional production in **2005** was 15% *above* the 1990-2005 mean. This high production, however, was driven almost entirely by South Africa, whose production was 29% above average. Mozambique’s harvest was also reported to be good, though this was concentrated in the northern region of the country. Production in Malawi and Zimbabwe was about 30% below normal, and Zambia was nearly 10% below normal. In addition to the good aggregate production, stocks were relatively high, creating an estimated regional surplus of 2 mmt. By February of 2005, prior to the start of the harvest, FEWSNET and the SADC early warning system were giving clear early warnings for southern Mozambique, Malawi, and most of Zimbabwe; Zambia began to be included by April, though SADC and FEWSNET expected high carryover stocks to cover any deficit there.

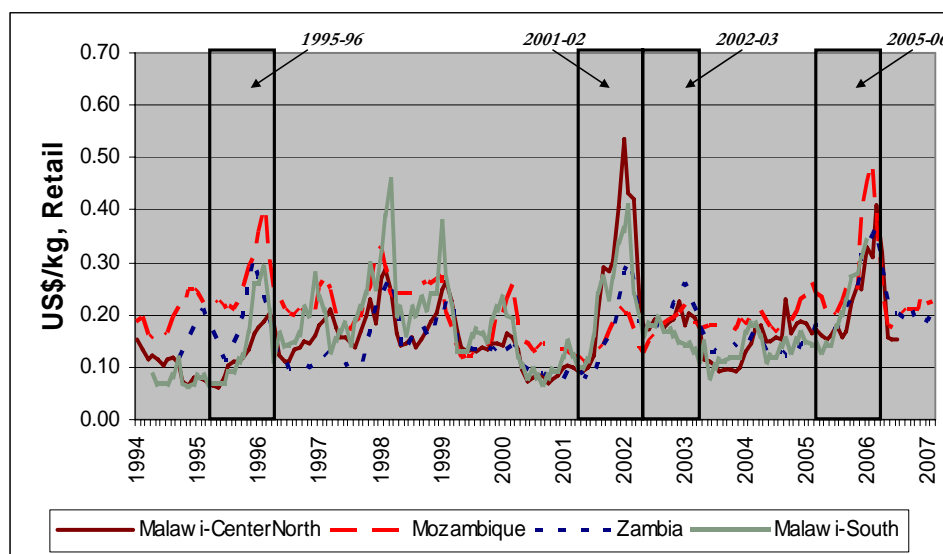
From February through August 2005, prices in South Africa were lower than they had been since 2000, averaging about US\$90/mt, just over half the level during the same period of 2002. The combination of predicted production shortfalls in Malawi, Zimbabwe, and Zambia with high

production and low prices in South Africa prompted FEWSNET to make this statement in March: “FEWSNET advocates early planning (to) help avert any food crisis ... With a good harvest expected in South Africa and currently low prices (there) for maize, early import planning is urged for those countries facing a national shortfall”. This warning proved to be unfortunately predictive of problems to come, which we will see in the country discussions.

5. ASSESSING COUNTRY RESPONSE: HOW WELL HAVE POLICY MAKERS ADJUSTED TO THE NEW ENVIRONMENT?

Figure 6 shows mean retail prices for white maize grain in the three focus countries. In Malawi, we present separate series for center-north and southern markets, because both can be severely affected by food crises (though this is most common in the south), and prices between the two areas can differ substantially. Prices in southern Mozambique and in our three chosen markets of Zambia do not differ nearly so much. Five points stand out. First, prices throughout Malawi greatly exceeded those in Mozambique and Zambia during the 2001/02 crisis. Second, prices in southern Mozambique trended steadily downwards through 2003, and price peaks there during the 2001/02 and 2002/03 crises were not nearly as high as in Malawi or Zambia. Third, however, prices in Mozambique skyrocketed during the 2005/06 crisis, reaching historic highs in dollar terms and exceeding those in the other two countries by nearly 40%. Mozambique’s previous historic high, during the 1995/96 crisis, could be seen as driven by a production and marketing system that was still recovering from the devastating civil war; that claim cannot be made for the most recent crisis. Fourth, unlike the other two countries, Zambia saw price spikes during both the 2001/02 and 2002/03 crises. Finally, prices in dollar terms reached historic highs in southern Mozambique and Zambia during the 2005/06 crisis, but not in Malawi.

Figure 6. Maize grain prices in southern Mozambique, southern/eastern Zambia, and southern and central Malawi, 1994-2007 (US\$/kg)



These price spikes matter for rural- as well as urban households. An empirical regularity in East and southern Africa is that, among rural households, those in drought prone areas are the most likely to be net buyers of maize on a regular basis, even during non-drought years. For example, 71% of rural households in southern Mozambique were net buyers of maize during the 2001/02 marketing season, compared to about 50% in the surplus north (Tschirley and Abdula, 2007). In Zambia, over 50% of households in drought prone Southern Province were net buyers during 2004, compared to about 20% in northern province, which is much less drought prone. In both countries, the poorest are the most likely to be net buyers and spend far higher shares of their income on these purchases; in Zambia, the bottom quintile of households nationally spends about 40% of its income on maize purchases (Tschirley, 2007). Price spikes thus have enormous effects on the real incomes of exactly those households that can least afford it: the poorest households in the most drought prone areas of the region.

The earlier characterization of production and stocks in each crisis made it clear that, during all three crises of this decade, regional trade could have played a major role in meeting national deficits and stabilizing prices. This was true either because the region was in surplus (2005/06), or because South Africa and Mozambique had surpluses and the regional deficit was small (2001/02) or moderate (2002/03). During the two crises of the previous decade, the potential role of regional trade was much smaller. We will also find that early warning during all three recent crises was early, frequent, detailed, and relatively accurate (we address concerns about Malawi's early warning during 2001/02 below). Despite all this, Zambia and Malawi experienced price spikes during two of the crises, and Mozambique did so during the last crisis. In the next section, we review each country's experience in more detail, in an attempt to understand why this happened. In doing so, we will also draw on insights from Zimbabwe and Mozambique's experiences during 1992/93.

5.1 Zimbabwe in 1992/93

We include Zimbabwe's response to the 1991/92 drought in this comparative review to assess how far emergency response capabilities have improved in the region over the past 15 years, and to assess how far markets have progressed in the region to reduce the magnitude of food crises. In the early 1990s, private cross-border trade was illegal in most countries of southern Africa. Food marketing was still tightly controlled, forcing governments to assume the full burden of estimating food requirements, logistically distributing and repositioning food to various parts of the country, and rationing it to preferred buyers.

After being a reliable maize exporter for most of the 1980s, Zimbabwe experienced a mild drought in 1990/91, followed by the devastating regional drought of 1991/92. The national early warning unit within the department of Agricultural and Technical Extension Services produced monthly bulletins on predicted crop production, demand, stock levels, and implications for imports and exports. The June 1991 bulletin reported that available maize stocks would be exhausted by January 1992, and that imports would be required to meet requirements from January to May 1992, when the 1992 harvest would become available. The parastatal Grain Marketing Board (GMB) also came to the same conclusion in July 1991. Yet steps to import maize were not made until January of 1992, when GMB maize stocks were virtually depleted.

By this time, South Africa's ports and rail lines were congested with food imports for other southern African countries that had responded more quickly. Unable to import maize fast enough to meet requirements, Zimbabwe's urban areas started experiencing shortages in late February 1992. Distribution of maize meal to drought-affected rural areas had almost entirely ceased, causing acute food shortages and encouraging rural-urban migration. Anecdotal reports indicate that the roots and wild fruits normally used to cope with drought had already been exhausted. It is important to note that the maize shortfall in early 1992 had little to do with the devastating 1992 drought; it occurred because maize stocks from the 1991 harvest ran out three months before the 1992 harvest in May-July.

The delay in the decision to import maize reveals that the shortage in 1992 was not due to an inadequate national early warning capability. Rather, the crisis underscored a poor interface between technical analysis and senior policy making. GMB and early warning assessments were not accepted by senior policy makers resulting in the government's decision to continue exporting over 120,000 tons of maize after June 1991.⁵

Once maize shortages started occurring in early 1992, the government faced the political choice of how to allocate existing scarce supplies of maize. The GMB originally intended to leave whatever grain remained in rural depots for purchase by rural consumers and for use in rural drought relief operations. However, it was later decided to reallocate most of the 70,000 tons to industrial millers for urban consumption. Moreover, import supplies were channeled preferentially to industrial millers. Small private traders and millers were restricted from buying more than one 90kg bag per month from the GMB, under the assumption that these agents were hoarding or would feed the maize to livestock. These policies were ostensibly intended to maximize scarce maize supplies for human consumption. Lastly, the government put a large subsidy on industrial roller meal to keep food costs low.

These policies had several unforeseen effects. First, the roller-meal subsidy that was hurriedly introduced in early 1992 became prohibitively expensive. Maize imports were costing the government four times as much as it was receiving for selling the grain at subsidized levels to industrial millers for the manufacture of roller-meal. The total maize subsidy was expected to cost about US\$340 million, or 11 percent of gross domestic product over the 1992/93 season.

Second, the maize subsidy was not fully conferred to consumers as intended. Because of import constraints, the demand for maize meal outstripped supplies, causing excess demand. For the first time in eight years, the government was not able to defend the controlled price of roller meal, whose street price rose to as much as double the control price (Jayne and Rukuni, 1994). Thus, the government was unable to pass the full subsidy – conferred at the miller level – along to consumers. The subsidy instead benefited traders and retailers. Furthermore, the subsidy created substantial differences in Zimbabwean maize-meal prices, ex mill, and prices in neighboring countries, causing illegal outflows of maize to Mozambique and Botswana.

Third, the government's decision to reallocate most remaining supplies of maize in rural areas to industrial millers exacerbated rural maize shortages and inflated rural maize prices far beyond

⁵ Part of this, however, was because of prior commitments to provide grain to other southern African countries.

those in urban areas. The failure to make grain available in rural areas through food-for-work and drought relief operations forced many rural household to sell livestock and buy food. Yet draft animals are a critical input in land preparation for crop production. Surveys of Zimbabwean farmers during this period indicated that shortage of draft power was a major constraint on increased crop cultivation (Rohrbach, 1989). The loss of this resource in smallholder areas had adverse effects on crop production into future years.

Fourth, the government's policy of blocking small-scale traders' access to maize held by the Grain Marketing Board appears to have inflated average maize meal prices for consumers. The industrial-produced maize meals were substantially more expensive than the whole meal produced and sold by small-scale millers, despite the huge government subsidy on industrial roller meal. Over two-thirds of urban consumers interviewed in March 1992 stated that they would prefer to buy whole meal at an 8 percent discount to industrial-produced meal (Jayne and Rubey, 1993). Thus, the selling restrictions at GMB depots restricted consumers' access to a cheaper and more nutritious meal.

Fifth, by forcing all maize through the industrial milling sector, the government may have incurred higher maize import costs. The extraction rate of roller meal and super-refined meal were about 0.82 and 0.60, compared to 0.98 for whole meal processed by small hammer mills. One ton of maize imported for roller meal or super-refined meal produced a considerably lower amount of maize meal for human consumption than whole meal, thus raising the country's maize import requirements. Allowing small hammer mills to process as little as 20 percent of the maize imported in the 1992/93 marketing year would have reduced the country's import bill by US\$40 million (Jayne and Rubey, 1993).

Zimbabwe's experience in 1992 underscores the need for timely identification and dissemination of emerging trades, and a mechanism to translate this information into timely action. The maize scarcity of 1992 reflected a political failure to initiate import procedures once impending shortages were anticipated and reported by the GMB and national early warning unit in mid-1991. Once the shortages had occurred, the situation was worsened by government action that was designed to control the distribution and price of maize meal but that in several cases actually reduced consumers' access to it.

5.2 Malawi

Malawi's food policy is marked by the heaviest direct government involvement of any country in the region, in three ways: government controls all formal maize imports, the National Food Reserve Agency uses local purchases and imports to stock a food security reserve as high as 180,000 mt of maize, and it sells preferentially to ADMARC (periodically banning sales to private traders), which operates a large network of retail shops selling at below market prices. This combination of factors makes it very risky for a large formal trader to consider importing maize grain, even if they were to be allowed to do so. Informal, smaller-scale trade can get around these restrictions and can also source grain much more rapidly than government, but requires that supplies be available in northern Mozambique, southern Tanzania, or eastern Zambia; if these areas are in deficit, the informal trade's ability to meet market demand is

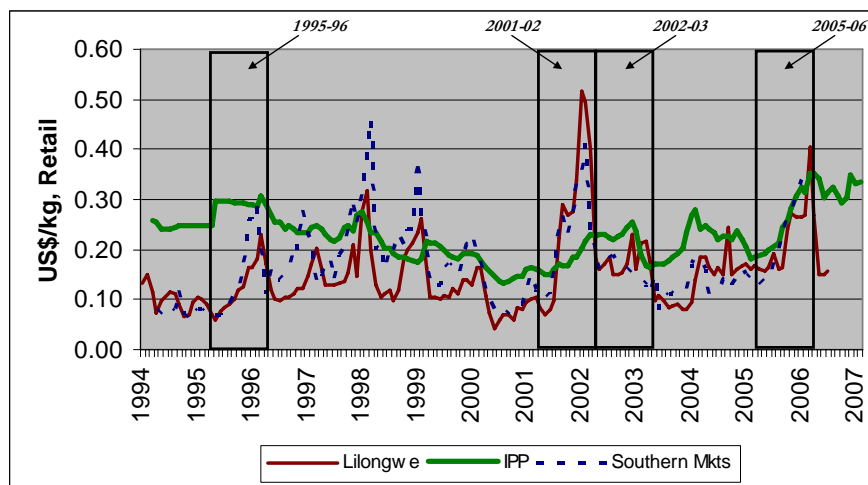
limited, and the country must rely on formal imports and food aid coordinated by government and donors.

Figure 7 shows retail maize grain prices in Lilongwe in the center, an average of three southern markets, and wholesale import parity from Zambia. 2001/02 stands out for skyrocketing prices far above import parity. Perhaps the most unusual feature of this crisis is that prices went higher in the north than they did in the south. 2002/03 stands out for low and declining prices in the south throughout the marketing season, while 2005/06 saw large price increases in domestic markets that essentially tracked sharp increases in import parity.

5.2.1 The 2001/02 Crisis: An unexpected and very large price spike

Much has been written about Malawi's 2001/02 crisis, with some referring to it as a famine and even "the worst famine in living memory" (Devereux 2003; see also Save the Children 2003). What is clear in hindsight is that the country was extremely vulnerable to mismanagement of markets and trade during this crisis, for a number of reasons. After a record crop in 2000, 2001 crop estimates were revised downward on three separate occasions, from a 15% reduction below the previous year in February, to 24% in April, and finally to 32% in June. Yet final total production figures were thought to be only slightly below average, and good production of tubers was expected to more than cover any food gap (FEWSNET). Government and donors rely heavily on such estimates to develop import and food aid plans, and thus had no reason to be alarmed by June of 2001, despite official maize stocks being the lowest on record (after having been near an all-time high the previous year; see Devereux (2003) for a discussion of the management of the food reserve). Additionally, Mozambique had reported a production increase of 12%, suggesting that informal trade would also help cover any deficits. Prices in northern Mozambique during May and June reinforced this idea, lying well within the normal range for that time of the year.

Figure 7. Maize grain prices at retail in Lilongwe and three southern markets, and import parity from South Africa, 1994-2007 (US\$/kg)



Circumstances began to change rapidly in July and August, but the indicators of this change – prices in Malawi and northern Mozambique – are not the type of information that governments and relief agencies are accustomed to reacting to quickly. Retail maize grain prices in USD in southern Malawi surged nearly 50% from June to July, then rose even more in August, exceeding their previous recorded high by 25%, and continued rising in September. This price information would have been widely available in Malawi to those wishing to track markets, and were reported by FEWSNET in their monthly bulletins. Meanwhile, prices in northern Mozambique also surged. By August, real prices in Nampula and Lichinga had equaled their previous high for the month, then moved 40% above previous highs in September, and continued to rise sharply after that. By the height of the hungry season in March 2002, real prices would be double their previous high for that month. This extraordinary price increase clearly suggests that production in northern Mozambique was substantially lower than official estimates had indicated.

Policy makers and donors were thus left in a position of serious cognitive dissonance: information they are accustomed to acting on (production, stocks) suggested no cause for alarm, while prices in both Malawi and northern Mozambique clearly indicated serious maize shortages. Reinforcing the price information was the fact that ADMARC and NFRA announced plans in June to purchase 180,000 mt of maize in the local market, but had been able to procure almost nothing by August, when ADMARC doubled its buying price. Also in August, government announced plans to import 150,000 mt of maize from South Africa; planned government imports rose to 220,000 mt by October (because of the inability to procure significant quantities in the local market), but by January 2002 only 40,000 had arrived. Meanwhile, USD prices in the north rose to double their previous high, while in the south (which had experienced much worse price spikes than the north in the past) they rose higher than any level since 1997/98.

Most discussion of this crisis has focused on the draw-down of the national stock during 2000 and 2001, and on the apparent over-estimation of the cassava harvest during 2001. The delayed imports are explained by “transport bottlenecks” in Zimbabwe and Nacala port in Mozambique. It would be useful also to ask other questions. First, why did government believe that purchasing grain locally in the midst of a (national) shortage would help stabilize markets? This belief has to be based on the idea that private traders would inevitably exploit hungry people. Yet traders can charge high prices only if supply is restricted. At best, purchases by NFRA for sale through ADMARC would have done nothing to improve supply, and may have effectively reduced it if inefficiencies led to delays in making the maize available to consumers. Second, why did government continue to control imports in the face of skyrocketing prices, rather than opening the borders to any private trader wishing to import? Again, this decision appears to have been based on the conviction that private markets would not respond, and poor consumers would be exploited. Yet the result from open borders could hardly have been worse than what actually occurred. Is there evidence that the import trade in Malawi is not, or could not be, competitive? We suggest that the focus on inadequate buffer stocks and over-estimation of tuber production, while not irrelevant, has distracted attention from these more fundamental questions which need to be answered if Malawi is to find an efficient and effective way to respond to food shortfalls in the future.

5.2.2 2002/03: A desire to avoid a repeat of the previous year results in huge government imports, over-supply, and heavy financial losses the following year

The 2001/02 crisis unleashed a social and political dynamic that made government and donors especially sensitive about potential future crises (House of Commons 2003, p. 29). Thus, when decision makers in Malawi were presented with a food balance sheet in May 2002 that forecast a deficit of 433,000 metric tons for the 2002/03 season, they acted promptly. The country imported 253,000 metric tons of maize grain entirely through government channels (NFRA), and arranged for 151,000 metric tons of food aid, for a total formal inflow of more than 400,000 metric tons, nearly covering the forecasted deficit. Despite very large informal flows of white maize from Mozambique into southern Malawi in 1997/98 and 1998/99 (and some in 2001/02), decision makers did not take any of this potential flow into account in their plans. Best estimates are that, during the 2002/03 season, 150,000-250,000 metric tons of maize entered Malawi informally from Mozambique, leaving the country with a maize surplus of about the same amount (Whiteside 2003). In March 2003, facing a good incoming harvest and the prospect of storing maize for over a year, the government decided to sell some of its stock at very low prices.

The impacts of these actions on maize markets are apparent in Figure 7. From their peak in February 2002, prices in the south of the country in both US\$ (shown in the graph) and nominal Kwacha terms declined nearly continuously until June 2003, the longest period of sustained price decline in at least ten years. Mean prices during calendar year 2003 were comparable to those in 2000, lower than any year since 1995, and less than two-thirds the levels in Zambia and southern Mozambique. While such low prices were clearly a benefit to consumers, they provided little incentive to farmers, and also reflected very large government costs for holding stock and for selling at prices that did not cover costs. Finally, by eliminating any seasonal price rise during the 2002/03 marketing season and pushing prices near historic lows, government may have exacerbated two medium- to long-term problems. First, it eliminated incentives for private traders to store grain, and also reinforced the sense, developed over past experience, that future shortages may not necessarily provide profit opportunities for importers. This undermines market development and consumer interests.⁶ Second, it reduced prices received by Mozambican farmers, thus reducing their incentive to produce for the Malawi market; since Mozambican farmers could be the most reliable suppliers of maize to Malawian consumers for many years to come, reducing their production incentives runs counter to Malawi's long-term interests.

⁶ Arguing that trader profit opportunities are important for the well-being of consumers – and not just traders – rests on the empirical regularity that more highly developed markets throughout the world generate far less seasonal variation in prices than do underdeveloped markets. For example, typical seasonal increases in retail maize grain prices in South Africa are less than 20%, compared to 50% in southern Mozambique, over 90% in southern Malawi, and about 65% in Zambia (Tschirley et al, 2006). Within a given country, larger more developed markets show less seasonality than smaller outlying markets: Maputo's typical seasonal price rise is about half that of outlying markets in the south, and Lusaka's is about three-quarters that in smaller southern markets. Note also that Malawi, with perhaps the most comprehensive government involvement in maize markets in the region, nominally with the purpose of stabilizing prices for consumers, shows the *highest* seasonal price movement. Mozambique, with no direct government involvement in the market, shows the lowest (except for South Africa).

5.2.3 2005/06: Continued reliance on a cumbersome planning approach means that large potential gains are missed

Early warning information during the 2005/06 season was less ambiguous than during 2001/02. By February, FEWSNET was reporting Ministry of Agriculture estimates of a 25% reduction in the coming harvest, leaving an anticipated maize deficit of 300,000-500,000 mt. In the regional bulletin of the same month, FEWSNET advised governments and donors in Zimbabwe, Malawi, and Zambia to plan immediately for imports, based on expected national deficits but high production and low prices in SOUTH AFRICA. FEWSNET also paid much closer attention to price movements this year than they did in 2001/02. By June, they were highlighting the fact that prices in many markets began to rise in May, far earlier than normal; by June and July, the bulletins were clearly showing prices above even those of 2001.

The government of Malawi placed an early season tender for only 27,000 mt, meant to replenish the Strategic Grain Reserve. Another tender, for 93,000 mt, was not placed until late July, and grain under that tender did not begin arriving until at least September, by which time local prices had risen dramatically. Import parity prices from South Africa also began their dramatic rise that month, driven primarily by increased transport costs, as a result of heavy demand by other deficit countries⁷. Meanwhile, monitored informal imports from Mozambique totaled 50,000 mt between April and August, but fell sharply from that time forward. From September 2005 to March 2006, real prices in northern Mozambique were at the second highest levels ever recorded (lower only than 2001/02), indicating once again (as in 2001) that official figures had over-estimated production in that country. Informal traders began switching to Tanzania in September. By February of 2006, about 146,000 mt of monitored maize had entered from Mozambique (67,000) and Tanzania (79,000), with unknown additional quantities entering through unmonitored border points. This trade, plus formal imports and food aid that eventually began to arrive, prevented prices from rising to the levels seen in 2001/02, but both US\$ and real kwacha prices in the center of the country reached the second-highest levels on record, while in the south they rivaled the levels of 2001/02.

Summarizing, prices during this crisis did not rise above import parity, but they rose much higher than they would have if trade had been efficient; large potential gains were foregone due to reliance on a cumbersome planning process.

5.3 Zambia

Unlike Malawi, the government of Zambia does not operate a retail network and does not attempt directly to control retail prices. It does, however, comprehensively regulate external trade, placing and lifting export or import bans and tariffs depending on perceived supply conditions, and involving itself directly in import decisions when the national crop is short. It also preferentially channels imported grain to industrial millers, as in Zimbabwe in 1992, and sometimes subsidizes the cost of those imports to the millers. Private traders are typically

⁷ Transport costs actually began rising in April of 2005. From that time through the end of the 2005/06 marketing season, IPP rose by nearly US\$130/mt, and changes in transport costs accounted for 43% of the rise; during previous periods of sharp rises in IPP, transport accounted for only 13% (2003/04) and 1% (2001/02) of the rise.

allowed to import grain, but must carefully factor government decisions into their plans. The dependability of government statements and the level of subsidy to commercial millers thus become critical factors in market performance in Zambia.

If grain markets in Zambia functioned efficiently, the wholesale price of maize would not exceed the cost of importing maize from South Africa for any sustained period of time. If local prices rose above the cost of imports, then traders could make profits by importing grain from South Africa (or other neighboring countries with surplus maize). However, Figure 8 shows that domestic wholesale prices rose well above the cost of imported maize (import parity) during the 2001/02 and 2002/03 crises. During the 2005/06 crisis, USD prices went higher than during the two previous crises, but remained within the rapidly rising import parity level. This means that, during the first two crises, consumers paid higher prices for maize than would have occurred if markets had performed efficiently. Why didn't traders import maize during these periods?

5.3.1 2001/02: Heavy control of imports, confusing signals, and maize imports preferentially channeled to commercial millers result in big price spikes⁸

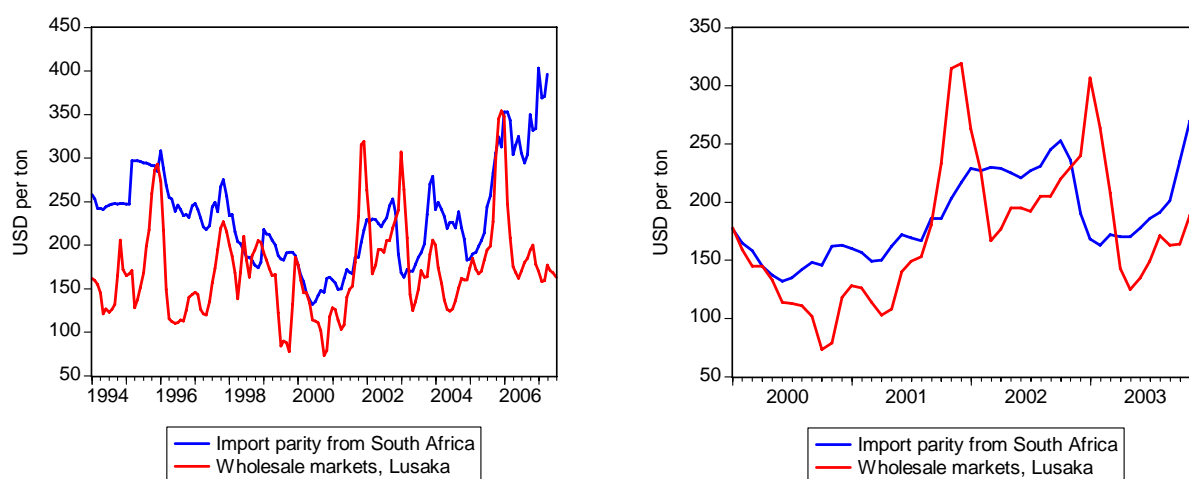
In July 2001, Zambia's national crop forecast and food balance sheet indicated a commercial import requirement of 200,000 tons of maize. In August 2001, the Zambian government announced its intention to import 200,000 tons of maize to be sold to specified commercial millers at a discount of roughly \$75 per ton below the full c.i.f cost in Lusaka. However, by October, news leaked that government was experiencing delays in mobilizing the necessary financing. Almost no government maize imports had arrived by December 2001. During this period, the private sector had refrained from importing, based on the knowledge that government was bringing subsidized supplies into the country. As a result, maize shortages started occurring in the last four months of 2001 and local prices soared above \$300 per ton (see Figure 8a, a "blowup" of the Figure 8 for the 2000-2003 period). A run on maize meal bid up its price beyond \$350 per ton in major urban centers in late 2001 and early 2002. If imports had arrived on time, they could have been made available without subsidy at \$200 to \$225 per ton during this period. Government imports started arriving in January 2002, and maize prices declined below import parity starting in February 2002. However, by the end of May 2002, only 130,000 tons had been imported under these government arrangements, not the intended 200,000 tons.

The Zambian government's approach to addressing the 2001 maize production shortfall and its implementation of this approach had three major effects. First, it stymied the potential for the market to respond to import incentives. Because Government arranged to supply selected milling firms with imported maize at a landed cost of \$160/mt, this ensured that these millers would have a major advantage compared to other millers and traders who faced commercial import costs of \$220-260/mt. This situation effectively froze out of the market all millers except those chosen to receive subsidized imports under the Government program. The second outcome was temporary maize shortages and high prices. During the 3-4 months between the tender announcement in August 2001 and the arrival of the first substantial imported volumes in December 2001, local maize prices rose sharply and exceeded import parity (Nijhoff et al., 2002). Third, the subsidy that Government conferred on maize importation was not passed

⁸ This section draws from Nijhoff et al., 2002.

through to consumers. Despite the subsidy on maize and subsequent price reductions of maize grain, breakfast meal prices remained at high levels throughout 2002. While maize grain prices dropped from US\$320/mt in December 2001 to US\$170/mt in April 2002 (a decrease of more than 60%), breakfast meal prices in Lusaka declined by only 15% during the same period. This suggests that much of the subsidy was conferred to millers or retail traders who bid up the price in response to continuing local scarcity, indicating that the imported volumes were insufficient to meet the entire shortfall.

Figure 8. Maize prices in Zambia, wholesale markets and import parity from South Africa, January 1994 to September 2007



The general public and some analysts have interpreted this situation as evidence of market failure, since in a well-functioning market, local prices should not exceed import parity levels. However, since the time when wholesale maize prices started to be collected by the Ministry of Agriculture in 1994, these market prices have never exceeded import parity except when the government has announced that it would arrange imports.

5.3.2 The 2002/03 Crisis: Government controls and a restricted definition of “private sector” again results in high price spikes

The May-June FEWSNET bulletin in Zambia clearly laid out the dimensions of the potential crisis facing the country: the national maize crop had declined by 24%, 2.3m people would need relief food, ending stocks on 1 May were only 20,000 mt, and the country had a likely maize deficit of 630,000, including 200,000-300,000 in estimated effective demand. FEWSNET further stated “the government has sufficient information to base its import plans on and should avoid a repeat of unnecessary delays, which resulted in serious commercial grain shortage last marketing season. Firm import commitments need to be made very quickly.”

Government did try to do exactly this, working with “the private sector” to agree on import targets and facilitate such imports. However, all indications are that essentially the only private sector firms that government worked with were the commercial millers; government controlled import permits, worked with millers to agree on how many permits and how much volume to approve, and appears not to have involved private traders in any of these discussions. There are at least two problems with this approach. First, the commercial milling sector in Zambia is quite concentrated. Real prices on maize meal in Zambia began to decline several years ago primarily because grain became more commonly available in markets, which provided competition for the large millers from thousands of small-scale mills; concentrating maize in the hands of the commercial millers thus favored the least competitive sector in Zambia’s maize system. Second, the refined maize meals that commercial millers produce are necessarily more expensive than the whole meals that come out of the small-scale sector, and produce less human food due to high extraction rates (see above).

Two predictable results flowed from this approach. First, government ended-up accusing millers (“the private sector”) of not importing enough grain, while millers said they imported what the market would bear, and suggested that at least 60,000 mt had entered informally from Mozambique and Tanzania. Second, maize grain and meal prices surged, once again, well above import parity, with large negative effects on urban consumers and rural net buyers. This price surge is *prima facie* evidence that, in fact, not enough grain was imported. The primary reason for this surge, however, was almost certainly the fact that only Zambia’s concentrated milling sector, rather than its competitive maize marketing system, was allowed to import. Ironically, it is very likely that the sector least expected by some policy makers to operate in the interests of farmers and consumers would have, due to competition and not charitable intentions, helped substantially reduce prices during this crisis.

5.3.3 2005/06: Prices remain around import parity, but slow decision making results in lost opportunities to keep prices substantially lower⁹

At the time of the 2005 harvest, a 15% tariff on imported maize was in effect. Early estimates of a poor maize crop from the 2005 harvest began to clarify the need for imports. The 15% tariff would have raised overall import costs by roughly \$40 per ton. To avoid passing this cost to consumers during a high-price year, millers and traders requested in June 2005 that the government waive the import tariff. As shown by the chronology of events in Table 2, the unpredictability of how the import duty issue was handled caused importers to not make firm import commitments until the import duty was waived. This was a rational response by private traders, since importing before the duty was waived would have forced them to pay at least \$30-40 per ton more than competing firms who waited to import until after the duty was waived. The delay in waiving the duty also pushed imports into a period when import parity prices in Zambia were rising dramatically, driven by increased prices in South African and rapid rises in transport costs (see footnote 6). Further delays occurred for imports in late 2005, due to the government’s adoption of new phytosanitary requirements. Random testing of grain in South Africa destined for Zambia added to these delays, even though the management of Mount Makulu indicated that testing is not time consuming and should not cause additional delays. The combined effect of

⁹ This section draws on Mwanaumo et al., 2005.

the delayed import duty waiver, phytosanitary certification issues, and resulting logistical constraints is that, as of mid-December 2005, the private sector had imported only 40,000 tonnes of maize, and the government Food Reserve Agency had yet to import any maize.

Table 2. A Chronology of events in the Maize Market, 2005

Date	Action/No Action	Implications/Comments
January	<ul style="list-style-type: none"> Government raises maize import duty from 5% to 15% 	Raises the price at which importation becomes attractive, adversely affecting consumers in a shortfall year
May	<ul style="list-style-type: none"> National Food Balance Sheet presented to government showing an import requirement of 85,000 tonnes Millers, traders, and donors estimate that the commercial import requirement is instead 150,000 tonnes 	To what extent is the National FBS able to accurately determine import requirements?
June	<ul style="list-style-type: none"> Private sector requests lifting of the 15% import duty Government refuses 	Import parity from South Africa is at US \$210/mt
August 12	<ul style="list-style-type: none"> Millers agree that 186,000 imports required Millers request import permits from MACO and duty waiver from MFNP 	Import parity increases to \$236/mt
August 26	<ul style="list-style-type: none"> MACO announces lifting of import ban and that it will issue import permits for 150,000 tons to millers and 50,000 tons to FRA Ministry of Finance and National Planning still refuses to waive the import duty 	Private sector continues to lobby government on waiving of duty
September 13	<ul style="list-style-type: none"> After heavy lobbying by all stakeholders, MFNP agrees to waive duty 	No imports yet as permits not yet issued
September 26	<ul style="list-style-type: none"> MACO issues permits Millers begin to contract for imports 	Import parity now \$256/mt
October and November	<ul style="list-style-type: none"> FRA releases 50,000 tons of locally procured maize through tender at \$210/ton 	Import parity stands at \$266-287; FRA's selling of maize below import price causes many millers to opt for cheaper FRA maize instead of importing
November 8	<ul style="list-style-type: none"> MACO advised private sector to stop importing because they are failing to comply with new phytosanitary regulations 	Imports further slowed
November 15-18	<ul style="list-style-type: none"> Millers finance trip to South Africa for Mt. Makulu phytosanitary unit Inspector to confirm that 8 new pests are not present in regions where traders are arranging exports to Zambia 	"Wait and see" approach taken by private sector as they await the outcome of the inspection
November 21	<ul style="list-style-type: none"> President Mwanawasa declares a national disaster at the request of Parliament. 	
November 23:	<ul style="list-style-type: none"> Mt. Makulu issues phytosanitary clearance; permits imports to resume 	Thirteen days lost; CIF price from South Africa rises to \$278/mt
December 3	<ul style="list-style-type: none"> President Mwanawasa announces that millers should lower maize prices significantly due to the abrupt strengthening of the Kwacha (up 26% in two weeks) 	Traders and millers who have already paid up contracts at the old exchange rate stand to lose 26% on their imports
December 7	<ul style="list-style-type: none"> Stakeholders meet with MACO to discuss the maize situation 	Exchange rate reduces Kwacha price of imports; but rising grain prices and transport costs combine to offset these gains
December 19	<ul style="list-style-type: none"> Importation period extended to 31st March, 2006 MACO writes to Ministry of Finance and National Planning to extend the import duty waiver 	Potential for the uncertainty over the extension of the waiver to constrain imports (CIF price from South Africa rises to \$320/tonne)
December 28	<ul style="list-style-type: none"> Import duty waiver extended to 31st March 	

The magnitude of the crisis was moderated by informal cross border trade. Representatives from the maize industry estimate that 40,000 to 60,000 tonnes of maize has been imported from Tanzania into Zambia by small traders¹⁰. It is likely that the maize imports from Tanzania were stimulated by the high FRA buying price of roughly US\$160/mt). Maize prices in Kasama, an urban center located in a generally maize-deficit region close to the Tanzanian border, were almost 20% lower than in Lusaka during the 2005/06 marketing season. The informal maize imports from Tanzania constituted a major benefit for many Zambian consumers.

However, the full benefits of cross-border trade were missed because of a discriminatory duty waiver system. The duty waiver was provided only to millers and traders with import licenses. Small traders not able to acquire import licenses were paying roughly US\$15/mt more to import maize across the border. As these traders are the main source of maize for small millers, the duty resulted in higher maize prices for low-income consumers during a deficit year.

To summarize, the response to the 2005/06 production shortfall averted prices surging above import parity for several months. However, import delays caused by unpredictable government action, and the import duty on informally imported maize combined to increase consumer prices well above what they would have otherwise been.

5.4 Mozambique

Mozambique has maintained a remarkably open trade policy since at least the late 1980s. Because of the country's strong north-south orientation and poor transport links, the surplus north of the country is unable to supply the perpetually deficit and more urbanized south. As a result, the north exports maize nearly every year to Malawi, primarily through informal channels, while industrial millers in the south import grain from South Africa for processing. The center of the country is typically but not always surplus. Compared to the north, its weather patterns are much more correlated with those of other countries in the region. Informal traders bring grain from the center to the south every year, but volumes can fall dramatically when the region has poor weather. Over the past five years, Zimbabwe has also drawn maize out of central Mozambique, through informal channels.

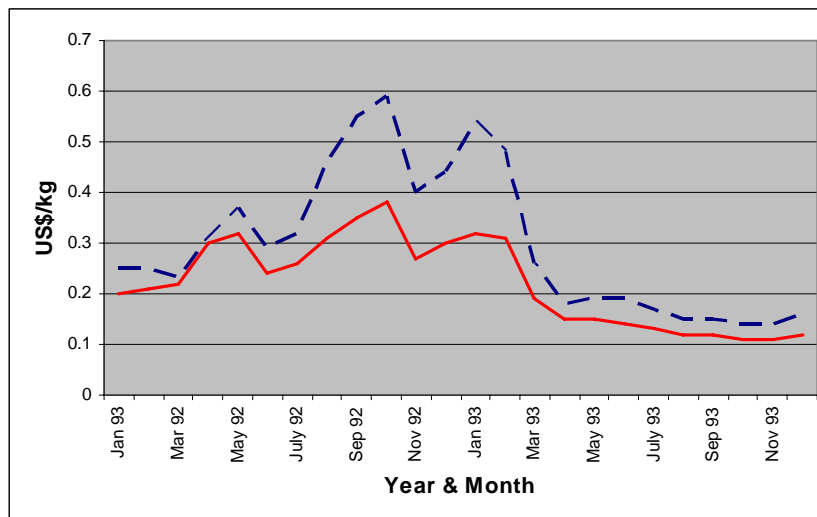
Mozambique does not hold a food reserve, has never placed an import or export ban on maize, and does not place and remove import or export tariffs depending on supply conditions. The country does, however, have one important policy failing on maize trade: importers of maize grain are eligible for full reimbursement of the 17% VAT only if they process the grain into meal. For this and other reasons (see Tschirley, Abdula, and Weber, 2005, for more detail), the only maize grain ever available for sale as grain in informal markets of the south is from the south and center of Mozambique. As we will see below, this can cause sharp price spikes in southern markets when the center is affected by drought.

¹⁰ The FEWSNET informal trade monitoring effort recorded just over 13,000 mt of imports from Tanzania. While the exact figure is impossible to know, this confirms the widespread perception that the FEWSNET data puts a very useful *lower bound* on informal trade volumes.

5.4.1 1992/93: Food aid sold into markets ensures food security for millions of consumers, despite ongoing war

From a markets perspective, the outstanding story in Mozambique in 1992 is of the massive monetization of maize food aid ensuring affordable supplies of food to millions of very poor households who had not received food aid allocations. Figure 9 tells the story. Driven by the devastating drought, prices of white maize skyrocketed to all-time highs in Maputo. However, yellow maize grain was abundant in the market, thanks to the monetization of over XXX,000 metric tons of Title III food aid from the U.S. This grain was sold in the port to a sufficiently large number of wholesalers to ensure some competition among them as they sold into the burgeoning informal marketing sector (Tschirley, Weber, and Donovan, 1996). These sales allowed yellow maize prices in Maputo to remain relatively stable in the face of the skyrocketing price of white maize¹¹. While data are not available for other cities, it is well known that this yellow maize reached markets throughout the south of the country, despite the continuing civil war. In so doing, these supplies allowed the informal marketing sector and small-scale milling sector to continue growing, with major positive benefits for millions of consumers. While the duration of the entire response to the drought in Mozambique can be criticized for having depressed maize prices throughout the following year (Tschirley, Weber, and Donovan, 1996), the Title III monetization program has to be counted among the greatest successes of the 1992 regional response.

Figure 9. Prices of white and yellow maize grain in Maputo, January 1992 - December 1993



Data sources: Sistema de Informação de Mercados Agrícolas.

¹¹ Prior to and after the drought, white maize and yellow maize prices tracked each other closely, reflecting their strong substitution in consumption under normal supply conditions for each.

5.4.2 The current decade: Trade prevents price spikes in 2001/02 and 2002/03, but not in 2005/06

During the present decade, Zambia and Malawi highlight how government action can create price spikes when efficient trade would have avoided them. Prior to the 2005/06 crisis, Mozambique was the counterfactual: open trade allowed the perpetually surplus north to export regularly to Malawi while the perpetually deficit south (which also holds the largest urban population) imported from South Africa. As a result, typical seasonal price increases in southern Mozambique are 40% less than those in Malawi, and about 25% less than in Zambia (Tschirley et al, 2005). Also, and unlike Zambia and Malawi, Mozambique weathered the 2001/02 and 2002/03 regional food crises with seasonal price spikes that were lower than any year since 1993, (Figure 10).

2005/06 was very different; while prices spiked in Zambia and Malawi, they spiked even higher in southern Mozambique, rising to levels not seen since 1992. Furthermore, these prices reached more than double import parity at the height of the hungry season. Three factors explain why. First, prices in the center of the country – the dominant domestic source of supply for the deficit south – suggest that production there was more heavily affected by the drought than official figures suggested. In USD terms, prices in the center reached levels not seen since the height of the 1995/96 crisis¹², when it is known that production in the center was very low. In real metical terms, prices in 2005/06 were exceeded only by those in 1995/96 and 2001/02. Second, the price of industrially processed maize meal in Mozambique has been extraordinarily high since 2003, averaging nearly two times the price in Zambia during this period (US\$610/mt compared to US\$320/mt). Tschirley and Abdula (2007) attribute such prices to the highly concentrated structure of maize milling in Mozambique, to policy and cultural impediments that make it difficult for small-scale traders to procure maize grain in South Africa for sale as grain in southern Mozambique, to the lack of interest of large traders in maize grain imports due to the low consumer budget share of maize in the south, and to the fact that grain imported for sale as grain must pay a 17% VAT, while grain imported for processing can recover the VAT. Third, rice has a higher consumer budget share than maize in the south, and its real price in that region rose by nearly 40% from early 2005 to early 2006¹³. Together, the low maize grain supply from the center of the country, the impediments to bringing grain from SOUTH AFRICA for sale as grain, the extremely high price of maize meal throughout the country, and the rapidly rising price of rice created room for the price of maize grain to rise as it did. In fact, by the height of the 2005/06 crisis in early 2006, the price of maize grain rose to parity with the price of rice, before falling back with the onset of the 2006 harvest.

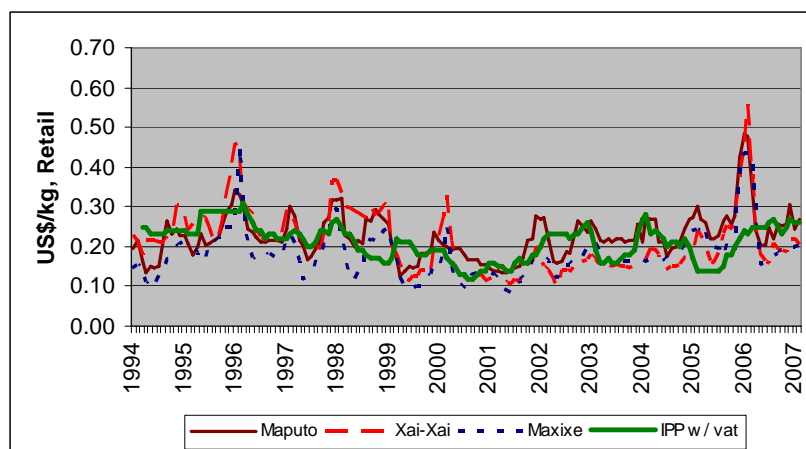
Mozambique is rightly cited as an important example in southern Africa of how open trade can benefit both farmers and consumers while avoiding the misallocation of government time and resources. Despite lying nearly 1,000 km from surplus producing areas, average maize grain prices in southern Mozambique since 1999 have exceeded those in Zambia and Malawi by only 10%, and their coefficient of variation has been 30% lower than in those two countries; in the center, prices have been 15% *lower* and the coefficient of variation has been 25% lower than in

¹² No price data are available for the center during the 1992 crisis.

¹³ Real rice prices rose by more than 50% from the height of the 2002/03 crisis to the height of the 2005/06 crisis.

Zambia and Malawi. Meanwhile, government has spent no time or political capital placing and then modifying or lifting import and export tariffs and bans, and has spent no money holding maize stocks or subsidizing the sale of imported maize during crises. Yet this success is being undermined by policies that allow strong market power in maize milling to maintain extraordinarily high industrial maize meal prices throughout the center and south of the country,

Figure 10. Retail prices of maize grain in three markets of southern Mozambique, and import parity from SOUTH AFRICA (1994-2007)



Data sources: SAFEX Randfontain South Africa prices as reported by the South African Grain Information System, transport data from Mozambican millers, Mozambique prices from *Sistema de Informação de Mercados Agrícolas*.

5. TOWARD MORE EFFECTIVE USE OF MARKETS IN EMERGENCY RESPONSE

This review suggests that governments in the region have shown great inertia in how they handle markets during food crises. To a large extent, Zambia and Malawi do now what they have done in the past, resorting to even greater control of markets during food crises than during normal supply years. Even Mozambique, the only country in the region that does not actively manage its staples trade, is doing what it has done for nearly 20 years in allowing private sector to import and export at will; and it has been difficult to generate any interest among policy makers there regarding the one policy weakness that this review has identified, despite its dramatic effect on prices in 2005/06.

It is not difficult to generate a list of actions that government could take to improve market performance during food crises – and thus reduce the magnitude of the crisis and the cost of responding to it. The most basic is to focus their own actions on such response, to be transparent, detailed, and timely in sharing information about response plans, and to give the private sector – traders as well as millers and other processors -- full latitude to decide, in light of this information, what volume of commercial imports to procure.

Implications of such an approach include eliminating recourse to export and import bans and progressively reducing other non-tariff barriers to trade, investing in the professionalization of customs services so that they facilitate legal trade rather than using trade legalities to promote its informalization, and improving a wide array of information: better food balance sheets (requiring, in part, better production estimates for more crops), much more active use of market information to refine assessments of market conditions and spot alarming trends, household behavioral parameters such as budget shares and cross-price elasticities of demand to assess substitution possibilities, and the incidence of different coping mechanisms by households, classified by their level of sustainability. Others could be mentioned, including the need for longer-term investment in market infrastructure, crop diversification, and more efficient supply chains.

It is important that policy analysts continue to make the case, in as many ways as possible, for these types of actions on the part of governments. Learning does have a role to play in policy change. Yet, especially in Malawi but also to some extent in Zambia, the food policy problem shows characteristics of a “wicked problem”, in which beliefs are grounded in competing cultural norms and resolution resists factual analysis (McBeth, et al (2007)). The turn towards political democracy may make the problem more intractable, since governments need to be seen to be “doing something” about the fundamental conditions of their populace’s lives, and emergency response provides a compelling stage on which to do so. Economic policy analysts need to understand better the dynamics of the policy process and the levers for policy change in these circumstances.

One potentially useful observation is that policies are sometimes overtaken by events on the ground, become less relevant, and eventually change for this reason. Informal trade in staples has grown up over the past decade in the shadow of continuing government control of key marketing and trade parameters. Such trade has made major contributions to alleviating food crises, most dramatically in Malawi in 2002/03. Because it can happen quickly and quietly, it is often less affected by the policy uncertainty that cripples formal private trade. Yet informal trade is currently limited in its geographic reach (northern Mozambique, southern Tanzania, and eastern Zambia in the case of Malawi), which leads to large fluctuations in the contribution that it can make to national shortages. It is also limited by impediments put up by local officials, and by often poor information about supply conditions in those areas; witness the fact that production in northern Mozambique was almost certainly below reported levels in 2001 and 2005. Mechanisms that expand the scope and reduce the cost of such trade may offer the prospect of effecting policy change from below, by quietly allowing markets to make incrementally larger contributions to meeting national food needs and gradually eroding the importance of the formal control mechanisms that governments wield.

We close, however, by acknowledging that, as such trade grows, it will be increasingly affected by the policy uncertainty so often created by governments during food crises. The negative impact of such uncertainty on the (mostly poor) voting public of southern African countries needs to be illustrated and patiently explained whenever possible.

REFERENCES

- Barrett, Christopher, and Daniel Maxwell. 2004. *Food Aid After Fifty Years: Recasting Its Role*. London: Routledge.
- CHC Commodities Market Report. December 2005. Lusaka, Zambia.
- Chitundu, Maureen, Klaus Droppelmann and Steven Haggblade (2006). “A Value Chain Task Force Approach for Managing Private-Public Partnerships: Zambia’s Task Force on Acceleration of Cassava Utilization”. Working Paper No. 21. Food Security Research Project. Lusaka, Zambia.
- Darcy, James, and Charles-Antoine Hofmann. 2003. *According to Need? Needs Assessment and Decision-making in the Humanitarian Sector*. Report No. 15. United Kingdom: ODI Humanitarian Policy Group. <http://www.odi.org.uk/hpg/papers/hpgreport15.pdf>
- DeRose, Larie, Ellen Messer, and Sara Millman (1998). “Who’s hungry? And how do we know? Food shortage, poverty, and deprivation”. United Nations University Press. New York
- Devereux, Stephen. 2002. Can Social Safety Nets Reduce Chronic Poverty? *Development Policy Review* 20: 657-675.
- Devereux, Stephen. 2003. *State of Disaster: Causes, Consequences & Policy Lessons from Malawi*. An ActionAid Report Commissioned by ActionAid Malawi. June.2002. <http://www.actionaid.org.uk/wps/content/documents/malawifamine.pdf>
- Devereux, Stephen (2006). “The Impact of Droughts and Floods on Food Security and Policy Options to Alleviate Negative Effects”. Paper submitted for plenary session on Economics of Natural Disasters. International Association of Agricultural Economists (IAAE) conference. Gold Coast Convention and Exhibition Center, Queensland, Australia.12-18 August.
- Dorward, Andrew and Jonathon Kydd (2004). “The Malawi 2002 Food Crisis: The Rural Development Challenge”. *The Journal of Modern African Studies*. 42: 343-361.
- FAO. 2007. “Southern Africa Programme”. Technical Cooperation Department, Emergency Relief and Development. http://www.fao.org/reliefoperations/southafrica_intro_en.asp.
- FEWS NET. 2002b. *Is a Famine Developing in Southern Africa?* Famine Early Warning Systems Network Position Paper, July 15. Washington, D.C.: FEWS <http://www.fews.net>
- Frankenberger, Tim, Kristina Luther, Karyn Fox, and John Mazzeo. 2003. *Livelihood Erosion Through Time: Macro and Micro Factors that Influenced Livelihood Trends in Malawi Over*

the Last 30 Years. Tucson, Arizona: Tango, Inc. and CARE Southern and Western Africa Regional Management Unit (SWARMU).

Haddad, Lawrence, and Tim Frankenberger. 2003. *Integrating Relief and Development to Accelerate Reductions in Food Insecurity in Shock-Prone Areas*. Occasional Paper No. 2. Washington, D.C.: USAID Office of Food for Peace.

House of Commons. 2003. *The Humanitarian Crisis in Southern Africa*. Volume I: Report and Proceedings of the Committee. London: International Development Committee.

Jayne, T.S., L. Rubey, D. Tschirley, M. Mukumbu, M. Chisvo, A. Santos, M. Weber, and P. Diskin. 1996. *Effects of Market Reform on Access to Food by Low-Income Households*. International Development Paper No. 19. East Lansing: Michigan State University.

Jayne, T.S. and Lawrence Rubey, 1993. "Maize Milling, Market Reform and Urban Food Security: The Case of Zimbabwe," *World Development*, Vol. 21, No. 6 (June): 975-988.

Jayne, T.S. and Mandivamba Rukuni, 1994. "Managing Zimbabwe's Food Economy in the 1990s," in Carl Eicher and Mandivamba Rukuni (eds), in *Zimbabwe's Smallholder Maize Revolution*, Harare, University of Zimbabwe Press.

Kabeer, Naila. 2002. Safety Nets and Opportunity Ladders: Addressing Vulnerability and Enhancing Opportunity in South Asia. *Development Policy Review* 20.5: 595-6.

Mano, Reneth, Bruce Isaacson, and Philippe Dardel. 2002. Identifying Policy Determinants of Food Security Response and Recovery in the SADC Region: The Case of the 2002 Food Emergency. FANRPAN Policy Paper prepared for the FANRPAN Regional Dialogue on Agricultural Recovery, Food Security and Trade Policies in Southern Africa, 26 – 27 March. Gaborone, Botswana.

McBeth, Mark, Elizabeth Shanahan, Ruth Arnell, and Paul Hathaway (2007). "The intersection of narrative policy analysis and policy change theory". [Policy Studies Journal](#), February 2007.

Mwanaumo, A., T.S Jayne, Ballard Zulu, Julius Shawa, Green Mbozi, Steven Haggblade, and Misheck Nyembe. 2005. *Zambia's 2005 Maize Import and Marketing Experiences: Lessons and Implications*, Policy Synthesis #6, Food Security Research Project, Lusaka.

NEPAD. 2004. *NEPAD Study to Explore further Options for Food-Security Reserve Systems in Africa*. Pretoria: New Partnership for Africa's Development.

Nijhoff, J.J., T.S. Jayne, Billy Mwiinga, and Jim Shaffer. 2002. *Markets Need Predictable Government Actions to Function Effectively: the Case of Importing Maize in Times of Deficit*. Policy Synthesis No. 6. Lusaka: MSU/MACO Food Security Research Project. <http://www.aec.msu.edu/agecon/fs2/zambia/polsyn6zambia.pdf>.

- Nijhoff JJ., David Tschirley, T.S. Jayne, Gelson Tembo, Pedro Arlindo, Billy Mwiinga, James D. Shaffer, Michael Weber, Cynthia Donovan, and Duncan Boughton. 2003. *Coordination for Long-term Food Security by Government, Private Sector and Donors: Issues and Challenges*. Policy Synthesis No. 65. East Lansing: Michigan State University. <http://www.aec.msu.edu/agecon/fs2/polsyn/number65.pdf>.
- Rohrbach, D.D., "The Economics of Smallholder Maize Production in Zimbabwe: Implications for Food Security," International Development Paper No. 11 (E. Lansing: Michigan State Univ., 1989).
- SARPN. 2007. "Strengthening responses to the Triple Threat in the Southern Africa region – learning from field programmes in Malawi, Mozambique and Zambia". Report of the regional workshop. Maputo.
- Tschirley, David, Cynthia Donovan, and Michael T. Weber. 1996. Food Aid and Food Markets: Lessons from Mozambique. *Food Policy* 21.10.
- Tschirley, David, Danilo Abdula, and Michael T. Weber (2006). "Toward Improved Maize Marketing and Trade Policies to Promote Household Food Security in Central and Southern Mozambique". Research Paper No. 60E. MA/MSU Food Security Project. Maputo. <http://www.aec.msu.edu/agecon/fs2/mozambique/wps60e.pdf>
- Tschirley, David and Danilo Abdula (2007). "Toward Improved Maize Marketing and Trade Policies to Promote Household Food Security in Central and Southern Mozambique": 2007 Update". Paper Prepared for the Conference on "Trade Policy for Food Products Conducive to Development in Eastern and Southern Africa". Food and Agriculture Organization of the U.N. Rome, Italy. March 2007
- Whiteside, Martin. 2003. *Enhancing the Role of Informal Maize Imports in Malawi Food Security*. A consultancy report for DFID. London: UK Department for International Development.