

Exploring the Logic Behind Southern Africa's Food Crises

DAVID L. TSCHIRLEY and T.S. JAYNE*

Michigan State University, East Lansing, MI, USA

Summary. — Government action during food crises in southern Africa frequently exacerbates the problems, driving food staple prices well beyond import parity. We argue that an inability to make credible commitments, due largely to a lack of trust between public and private sectors, contributes to this dynamic. Empirical policy analysis can facilitate resolution only within a consultative process involving a broad range of stakeholders. The policies emerging from such a process are not likely to approximate first best recommendations. Yet the precise policies may be less important than the fact that they exist and that main stakeholders find them credible.
© 2009 Elsevier Ltd. All rights reserved.

Key words — southern Africa, Malawi, Zambia, markets, emergency response, commitment

1. INTRODUCTION

Southern Africa is an increasing focus of humanitarian concern, with identified crises in 2001–02, 2002–03, 2005–06, and 2008–09. A range of explanations have emerged for what appears to be a worsening trend. One view, loosely coalescing around ideas such as the “triple threat” or “new variant famine,” focuses primarily on arguably exogenous factors related to the ability of households to cope with stress. In this explanation, HIV/AIDS and environmental deterioration (exacerbated in some cases by worsening governance) have made more people more susceptible to destitution from what might have been manageable shocks in the past (Devereux, 2002a, 2002b, 2006; De Waal & Whiteside, 2003; FAO, 2007; Frankenberger, Luther, Fox, & Mazzeo, 2003; Haddad & Frankenberger, 2003; Mano, Isaacson, & Dardel, 2003; SARPN, 2007).

Another broad stream of thought places primary emphasis on policy and markets. Here, the main distinction regards the relative emphasis placed on market failure (Dorward, Kydd, Morrison, & Urey, 2004; Poulton, Kydd, Wiggins, & Dorward, 2006) compared to governance failure (Jayne, Govereh, Mwanaumo, Nyoro, & Chapoto, 2002; Jayne, Chapoto, & Shiferaw, 2009a). Differences between these two views are real. Yet both recognize that though food policy in the region is substantially more liberalized than it was 15 years ago, private sector response to this liberalization continues to be seriously constrained by ad hoc, unpredictable, and often counter-productive government policy. Both suggest that a more rule-based, less discretionary, food policy is needed, but acknowledge that governments have in most cases been unwilling or unable to commit themselves to such a course. Indeed, during the four crises this decade, it is widely appreciated that governments engaged in policy actions, especially with regard to regional trade and management of domestic public stocks, that often exacerbated the crises, driving food staple prices well beyond import parity (see Devereux (2002b) for Malawi in 2001–02; Mano *et al.* (2003) and Tschirley *et al.* (2006) for the region in 2002–03; and Jayne, Chapoto, Minde, and Donovan (2009b) for the region in 2008–09).

The purpose of this paper is to examine why, when repeated experience seems to highlight its serious human costs, this *ad hoc* and unpredictable policy regime has persisted, and how a more predictable regime might be created. In the political science literature, Van de Walle (2001) uses concepts of neo-

patrimonialism and clientelism to argue compellingly that governance in African democracies “almost inevitably produce(s) highly interventionist economic policies...because (it) is based on the extensive use of state resources for political purposes” (p. 9). In this view, the technical “mismanagement” of food policy seen in the region during this decade could be explained as a strategic tool both for private gain by government officials and to generate resources for the party in power to finance future elections.

We fully acknowledge this possibility but suggest that it captures only part of the dynamic; nearly 10 years after Van de Walle’s seminal contribution, with continuing elections, independent media, and arguably stronger civil society organizations in these countries, the political *costs* of such mismanagement—extreme dissatisfaction by the (mostly poor) voting public—need also to be considered and the dynamic generating them needs to be explained. We begin to do this in this paper, focusing on the first three crises of the decade in Zambia and Malawi. We start with a conceptual framework that uses the concepts of *credible commitment problems* and *wicked problems* to elucidate the dynamic driving repeated counter-productive policy response to food crises. After explaining our data and methods, we review emerging trends and characteristics in the region’s maize production and marketing systems, emphasizing that the region enjoys demonstrably greater opportunities for domestic and regional markets to contribute to more stable food availability and prices than it did 15 years ago. We then summarize key characteristics of each food crisis before assessing each country’s response. We conclude with thoughts on how to structure processes that deal with the credible commitment problem and wicked problem so that countries can begin to move toward more transparent and predictable policy regimes that generate improved results for all stakeholders.

2. CONCEPTUAL FRAMEWORK

Our conceptual framework is based on five premises; we explain each of these in more detail below and draw on two

* We would like to thank colleagues in the Food Security Research Project in Zambia and four anonymous reviewers for their comments on an earlier draft of this paper. All errors are the authors’ sole responsibility. Final revision accepted: September 17, 2009.

concepts in the political science and sociology literature—the *credible commitment problem* and the *wicked problem*—to develop implications.¹ Our premises are (i) government and traders interact in the same political and economic space but with differing objective functions; (ii) the two are dependent on each other in that the behavior of each affects the outcome of the other; (iii) trust between government and traders is difficult to develop because of differing objectives, values and world views; (iv) information about the other's behavior is imperfect, and the effects of some behaviors are seen only with a time lag; and (v) as a result, each must base their own behavior in part on expectations about the behavior of the other.

Government's objective is to remain in power. In the electoral democracies that have prevailed in southern Africa for the past 15 years,² this requires gaining sufficient votes to win the next election. Given the importance of food staples in the budgets of these countries (mostly poor) consumers', ensuring adequate supplies of staple foods throughout the country at prices accessible to the poor, and gaining political credit for this outcome, makes an important contribution to government's ultimate political objective.

Traders' main objective is to maximize profits over some time horizon. Traders' profits are clearly affected by government policies and practices. For example, sudden imposition of trade restrictions, or direct government importation of food and targeted sales to selected buyers at subsidized rates, can dramatically affect a trader's bottom line for good or bad, depending on their market position in relation to the government action: a trader sitting on large stocks of maize when an export ban is imposed could lose large sums of money, while another without stocks but with a contract to supply maize to an institutional buyer could earn much higher profits than in the absence of the export ban. Likewise, any ability that traders might have to engage in non-competitive behavior can negatively influence the achievement of government's instrumental objective of broad and affordable access to food.

Government and traders cannot be certain what the other will do, so each must base their behavior in part on expectations regarding the likely behavior of the other. This dynamic creates a "*credible commitment problem*," in which the inability of parties to make credible commitments to each other precludes a course of action that would resolve a conflict (Acemoglu, 2003; Fearon, 1995; Greif, Milgrom, & Weingast, 1994; North, 1993; Schaffer, 1989). For example, government may state a commitment to importing a certain quantity of grain within a specified time period; but even in the absence of mistrust, the complexity of decision making means that traders cannot be certain that government will actually do this. Nor can traders be certain of who will be allowed to buy the grain from government if and when it does import, or at what price. These unknowns are major sources of risk and potential financial loss for traders. For its part, government cannot be sure that traders will import sufficient food during a crisis to assure broad access at politically acceptable prices. In fact, because demand for food staples is price-inelastic, governments know that trader profits will be increased in the short-run by restricting supply, and so are sensitive to the possibility that traders may collude to do this.

The typical solution to commitment problems involves *third party guarantees* (Acemoglu, 2003, p. 638; Fearon, 1995, pp. 6 and 10). In economies with well-developed institutions, the judicial system frequently plays this role: parties to a contract do not need to fully trust each other (though this helps) as long as they believe that the courts will efficiently and effectively enforce the contract in the case of default by one party. In our commitment problem, a competitive market could provide a

third party guarantee, by imposing sufficient discipline on individual traders that their profit seeking actions result in government also achieving its goal. In the terminology of the social trust literature (Castelfranchi & Falcone, 2002), government could delegate the task of maintaining adequate supplies and accessible prices to traders as a collective, that is, to the market.

Several factors stand in the way of such a choice. First, markets may not be fully integrated and competitive and so may not provide this discipline. This may be especially true of markets for large-scale food imports, which require substantial financial and physical (e.g., transport, storage) capital, though evidence presented below suggests that integration in the region is improving. Informal markets may be more competitive, but are by definition smaller in scale, have more limited geographical scope, and thus may not by themselves be able to respond adequately to a large national shortfall.

Second, high transport costs in African markets mean that, even if markets are competitive, final costs to consumers during national production shortfalls can be high (Poulton *et al.*, 2006, p. 346; Tostau & Brorsen, 2005). Finally, government officials—and the public whose votes they need—may have little appreciation for how competitive markets can convert individual profit seeking into socially beneficial outcomes. This understanding is further hindered by the differing beliefs, values, and world views that broadly characterize the government and trading sectors in the region³; as noted by Poulton *et al.* (2006, p. 346), civil society also frequently "feels vulnerable to 'speculators' and may be particularly wary where prominent traders come from minority ethnic groups." The trade problem, especially during a food crisis, thus takes on elements of a "*wicked problem*," in which "core beliefs are at stake, competing sides...defend their...belief systems and attack" those of others, and the problem "(resists) resolution by appeal to the facts" (McBeth, Shanahan, Arnell, & Hathaway, 2007; see also Conklin, 2006, Chapter 1).⁴

The result of this dynamic is that government often prefers to take an active and direct role in assuring adequate food supplies. Yet no government in the region is capable of handling this challenge on its own. It thus enlists the private sector, but attempts to control its behavior through some mix of import/export permits, awarding access to subsidized government imports only to particular firms, direct public distribution, and use of the political "bully pulpit"⁵ regarding the amount of food that the private sector should import. With no third party solution to the commitment problem, and with trust undermined by the wicked problem, the parties behave in ways that undermine the interests of both. Key among these is *inaction* by the private sector: because many firms are motivated more by fear of loss than by desire for gain (Kahneman, Knetsch, & Thaler, 1991), uncertainty regarding government behavior may lead to private sector not importing even when current or anticipated domestic prices suggest that they should. As a result, consumers are harmed by skyrocketing food prices, governments lose political standing, the private sector foregoes current profits, and both miss an opportunity to build a competitive commercial trading network that could serve everyone's interests during future production shortfalls.

3. DATA AND METHODS

We use an assortment of data in the paper. National maize production comes from FAOSTAT. Prices from Malawi and Zambia come from the national market information systems in these countries, while South African prices are the

Randfontein “cash price” listed on SAFEX. Data on household production, marketing, and consumption patterns in Zambia come from various household surveys: Zambia’s Central Statistical Office/Michigan State University 2001 and 2004 Supplemental Post-Harvest Surveys of rural farm households, and their 2007–08 Urban Consumption Survey. Information characterizing the various food emergencies and assessing country response came from a review of FEWSNET and SADC early warning bulletins and key informant interviews.

Our quantitative benchmark for assessing the effectiveness of response to each food crisis was a comparison of local wholesale prices in each country to import parity prices (IPPs); efficient trade should prevent local prices from exceeding IPP for any sustained period of time. IPP was based on SAFEX Randfontein cash prices plus costs of transport to the capital city of each country. Data for Zambia come from a transport cost series developed by Michigan State University’s Food Security Research Project (FSRP) in Zambia in consultation with the Road Hauliers Association. Lacking specific data for Malawi, we use transfer costs to Zambia.

4. TRENDS IN THE PERFORMANCE OF REGIONAL MAIZE MARKETING SYSTEMS

A review of the literature and survey data from southern Africa highlights seven trends with important implications for emergency response strategies: (i) more diverse staple food production and consumption patterns; (ii) improvements in spatial market efficiency; (iii) a decline in maize marketing costs; (iv) reduced instability in regional maize production; (v) less positively co-variant maize production among countries in the region; (vi) evidence of improved affordability of staple foods over time; and (vii) rising informal cross-border maize trade.

(a) *More diverse production and consumption patterns*

The reduced subsidy to and control of maize systems that began in the early 1990s has led to more diversified production patterns. Production in more isolated or agro-ecologically less

advantaged areas has 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 (Chitundu, Droppelmann, & Hagblade, 2006; SARNET, 2007). Cassava production has also grown rapidly in Malawi, and has always been an important staple in the most heavily populated rural areas of Mozambique.

Consumer expenditure shares on maize are in many cases substantially lower than commonly thought (Table 1). In rural areas of the three provinces of southern Mozambique, for example, rice and wheat have a substantially higher combined expenditure share than maize. In the capital city of Maputo, combined expenditure shares for wheat and rice are nearly 10 times that of maize. Wheat’s expenditure share exceeds that of maize in Zambia’s two largest cities (Mason, Jayne, Chapoto, & Donovan, 2009). In Nairobi, maize’s consumption share in food staples fell from 42% to 36% during 1995–2003, while the combined share of wheat and rice rose from 56% to 64%. While maize’s expenditure share is certainly higher in rural areas, production data at least in Zambia suggest that the direction of change is toward greater diversity in consumption habits.

(b) *Increased spatial market integration*

Spatial market integration studies for maize in Malawi, Mozambique, Zambia (Awudu, 2007; Chirwa, 1999; Goletti & Babu, 1994; Loy & Wichern, 2000; Myers, 2008; Tostau & Brorsen, 2005), and the broader region (Rashid, 2004; van Campenhout, 2008) are broadly consistent in their conclusions: maize markets are reasonably well integrated, are becoming more efficient over time, and marketing costs are declining. Some of the studies attribute increased market efficiency to liberalization. Others note that some markets continue to be poorly integrated mainly due to high transport costs and government activities in the maize market, particularly in Malawi. In fact, most of these studies are likely to understate true spatial market efficiency because of the difficulty in accounting for *ad hoc* government operations and suddenly announced trade bans and changes in tariff rates, all of

Table 1. *Percentage of total food expenditure allocated to food items in selected areas of Mozambique, Zambia, and Kenya. Sources: Tschirley and Abdula (2007), Muyanga et al. (2005), Mason et al. (2009), Barlund (2007)*

Location	Year	% Share of food group in total value of consumption of main staples ^a				% Share of main staples in total value of food consumption
		Maize	Wheat	Rice	Cassava	
<i>Urban center</i>						
Nairobi, Kenya	1995	42.4	35.3	22.4	0.0	—
	2003	36.3	39.0	24.7	0.0	28.4
Urban Maputo Province	1996	2.6	50.7	35.0	11.7	42.8
	2002	8.9	57.4	28.9	4.8	27.0
Urban northern Mozambique (incl Nampula city) ^b	2002	32.6	8.2	14.7	44.4	47.5
Lusaka, Zambia ^c	2007–08	39.0	49.4	10.7	0.9	19.5
Kitwe, Zambia ^c	2007–08	42.5	45.3	10.3	2.0	23.2
Mansa, Zambia ^c	2007–08	45.8	28.2	10.0	16.0	23.8
<i>Rural area</i>						
Maputo Province, Mozambique	2002	27.9	22.7	35.0	14.4	32.6
Gaza and Inhambane Provinces, Mozambique	2002	36.6	9.6	28.5	25.2	33.3
Manica and Tete Provinces, Mozambique	2002	91.6	2.7	4.8	1.0	52.4

^a Main staples refers to maize, wheat, rice, and cassava. Budget shares of these four staple foods sum to 100% +/- 0.1%. Shares for Nairobi and northern Mozambique are % of total food purchases.

^b Cassava category also includes potatoes for urban northern Mozambique (separate figures for cassava only not available).

^c Excludes foods purchased and consumed away from home. Information not available.

which introduce differential spatial price shocks in local markets.

Improved information has likely been one driver of this improved spatial efficiency. A daily spot and futures price discovery mechanism is now available in the region in the form of SAFEX. Cell phone ownership on the continent has exploded, from 15 m in 2000 to 160 m by end of 2006 (International Telecommunications Union, 2007), and call rates have fallen, dramatically increasing the ability of market actors to exchange information (see Aker (2008) for evidence from Niger).

(c) *Reduction in vertical marketing margins in some countries*

Margins between industrially manufactured refined maize meal ("breakfast meal") and maize grain prices in the region have declined sharply in Zambia and Kenya. In Zambia, real retail breakfast meal prices and marketing margins between maize grain and these meals have fallen substantially since reform was initiated (Jayne & Chapoto, 2006): from 1994 to 2005, trend breakfast meal prices fell about 30% from 1994 to 2005 while marketing margins fell by roughly 50%. Though not considered in this review, reform has had similar impacts in Kenya. These declines are driven by the informal maize processing and trading systems that arose after reform, which have proven less costly than the industrial milling sector and which compete effectively against it for low- and middle-income consumers, forcing these industrial millers to reduce their margins (Chapoto & Jayne, 2006; Jayne & Argwings-Kodhek, 1997).

Over the same period, real margins have increased in southern Mozambique and South Africa (about a 50% rise in margins in each country). In both countries, the rising margins appear related to highly concentrated maize milling sectors and to regulatory barriers that limit the availability of grain for milling in hammer mills during the hungry season (Traub & Jayne, 2008; Tschirley & Abdula, 2007).

(d) *Less co-variant production across countries*

Production in the region is widely seen as highly co-variant across countries. Yet production has been far less co-variant over the past decades (Table 2). From 1990 to 1999, correlation coefficients on maize production between South Africa, Zimbabwe, and Zambia were large, positive, and highly statistically significant; from 1996 to 2005 they were much lower and none were significant. Correlations between those three countries and Mozambique and Malawi were small and insignificant during both periods.⁶

Mozambique's lack of correlation with other countries is driven by the predominance of the North in national production, and by the low correlation of weather patterns in this area with those in the rest of the region.

(e) *Improved affordability of staple foods in the region*

Mason *et al.* (2009) show that average formal sector wages (in various public and private sector categories) in urban Kenya and Zambia rose at a faster rate than retail maize meal and bread prices between the mid-1990s and 2007. Although the recent food price crisis partially reversed this trend, the quantities of maize grain, and maize and wheat flour affordable per daily wage in urban Kenya and Zambia during 2008–09 marketing season were still roughly double their levels of the mid-1990s. Available wage series in Mozambique also grew more rapidly than rice and wheat flour prices in Maputo from the mid-1990s through the mid-2000s. For the 23 wage-to-food price ratios for which data were available, linear trend estimates are positive and statistically significant at the five percent level in 17 cases, even when the 2008 food price crisis was included. These findings hold only for formal sector workers with average earnings in Kenya and Zambia and minimum wage earners in Mozambique; more research is needed on this topic but these results have to be considered surprising and suggest meaningful improvements in the performance of maize systems and of the broader economy.

(f) *Substantial informal border trade*

Informal border trade has become a regular feature of the region's maize economy since market reform in the 1990s. Trade between northern Mozambique and Malawi is well known; less appreciated is that between Tanzania, Malawi, Zambia, Zimbabwe, and Mozambique. From 2004–05 to 2007–08, FEWSNET (2008) shows an average of over 120,000 mt of maize per year traded by small "informal" traders across borders in the region, with a peak of nearly 180,000 mt during 2005–06. Over half the yearly volume flows from northern Mozambique to Malawi. And because these data are for monitored border posts only, they underestimate total informal trade. Whiteside (2003) estimates that up to 150,000–250,000 mt of maize flow just from Mozambique to Malawi during years of good production in Mozambique and high demand in Malawi. Tanzania also becomes a major supplier to Malawi in some years; FEWSNET recorded about

Table 2. Correlation coefficients of reported maize production among selected southern African countries, 1990–2005. Source: FAO production statistics

		South Africa	Zambia	Zimbabwe	Mozambique	Malawi
South Africa	1990–99		0.66**	0.93***	0.18	0.12
	1996–2005		0.36	0.51	0.04	–0.18
Zambia	1990–99	0.66**		0.77***	–0.04	0.36
	1996–2005	0.36		0.27	–0.08	0.06
Zimbabwe	1990–99	0.93***	0.77***		0.30	0.22
	1996–2005	0.05	0.27		–0.88***	0.21
Mozambique	1990–99	0.18	–0.04	–0.30		0.65**
	1996–2005	0.04	–0.08	–0.88***		–0.20
Malawi	1990–99	0.12	0.36	0.22	0.65**	
	1996–2005	–0.18	0.06	0.21	–0.20	

** 0.05.

*** 0.01.

85,000 mt flowing this way during the 2005–06 crisis. These volumes are a substantial share of total imports during crisis years and play a crucial role in alleviating food shortages and high prices. Small-scale informal traders are not as encumbered by customs clearance regulations as larger formal grain traders and hence can respond to arbitrage opportunities more quickly. Increased productivity leading to greater surplus production within the region would allow informal cross-border trade to play an even larger role to relieve future food production shortfalls. However, Zambia and Malawi frequently impose maize export bans during crisis years.

All these factors—more diverse consumption patterns, improved spatial market efficiency, declining maize marketing costs, less co-variant regional maize production, greater affordability of staple foods, and rising informal cross-border maize trade—suggest that trade could play a greater role in the response to food crises than it did in previous decades. We now characterize the first three crises of this decade before assessing how these two countries dealt with them.

5. CHARACTERIZING THE CRISES

Table 3 provides summary information on the five main regional crises since 1992. A key point is the widely divergent characteristics of each crisis. 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 depleted prior to the harvest, severely limiting the scope for intra-regional trade. Satellite and rainfall monitoring provided clear and early warning of the shortfall. An estimated 12 million metric tons of food aid arrived in the (broader SADC) region, complemented by US\$ 4 billion of commercial imports (DeRose, Messer, & Millman, 1998). By all reports, the response was sufficient to avoid drought related deaths in the region.

1995–96 saw a major but less severe drought in South Africa, Zambia, and Zimbabwe. Official production data in Malawi and Mozambique showed increases of 60% and 50% from the previous year, respectively. Regionally, the harvest was nearly double that of 1992, but about half the average of the previous two years. Scope for regional trade was thus greater than in 1992–93, but still limited, since Mozambique's surplus was in the north, far from all but Malawi (which needed few

imports), and South Africa had a substantial deficit. INTERFAIS shows that cereal food aid arrivals in Zambia, Zimbabwe, Malawi, and Mozambique exceeded 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 intra-regional trade could meet most countries' aggregate cereals needs.⁷ FEWSNET put out monthly bulletins in each country and regionally, detailing supply/demand balances, price movements, stock levels, and progress on imports. INTERFAIS data indicate 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 and Zambia far beyond import parity. Key questions are whether important early warning information was missed, 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 crisis⁸ 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 3 m metric tons. Regional production in 2002 was slightly higher than that in 2001, and about equal to the 1990–2005 mean. Regional stocks at the start of the 2002–03 marketing season, however, were at least 1.5 m metric tons below the lowest level of the previous 5 years, and nearly 3 m metric tons below incoming stocks the previous year (Mano *et al.*, 2003). Tschirley *et al.* (2006) suggest that, despite concerns about slow response during the crisis, the response was in fact quite timely. Darcy and Hofmann (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. Mozambique's official data also reported a good harvest, though this was concentrated in the north 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, 3 months prior to the start of the harvest, FEWSNET and SADC were giving clear early warnings for southern Mozambique, Malawi, and most

Table 3. Summary of production and stock outcomes for southern African crises, and scope for trade. Source: FAOSTAT for production data; FEWSNET for stocks; INTERFAIS for food aid

Marketing year	Regional situation			Scope for regional trade
	Production outcome (%)	Beginning stocks	Overall supply	
1992–93	–65	Very low	Massive deficit, >10 mmt	Very little. Need for massive imports (commercial and food aid). Market mechanisms important in distribution of imports
1995–96	–37	Very high, >4 mmt	Deficit 2 mmt	More than 1992, but modest; Mozambique still deficit, imported from RSA, and RSA itself had a deficit
2001–02	–9	About average, >2 mmt	Small deficit, ~1 mmt	Great scope for trade; high beginning stocks meant regional supplies sufficient to cover needs. Exports from RSA and northern Mozambique
2002–03	–1	Historically low, <50,000 mt	Deficit up to 3 mmt	Great scope for trade due especially to surplus in RSA. Exports from RSA and northern Mozambique; also from Tanzania
2005–06	+15	Above average, ~3 mmt	Surplus up to 2 mmt	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

Note: Production outcomes are relative to the 1990–2005 mean.

of Zimbabwe; Zambia began to be included by April, though SADC and FEWSNET expected high carryover stocks to cover any deficit there.

From February to August 2005, prices in South Africa were lower than they had been since 2000, just over half their 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 in March to “advocate early planning (to) help avert any food crisis. . .early import planning is urged for those countries facing a national shortfall.” This warning proved to be unfortunately predictive of problems to come, as we will see below.

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

Figure 1 shows mean retail prices for white maize grain in the two focus countries. Three points stand out. First, prices throughout Malawi greatly exceeded those in Zambia during the 2001–02 crisis. Second, Zambia saw price spikes during both the 2001–02 and 2002–03 crises but Malawi saw prices decline throughout the 2002–03 marketing season. Finally, prices in dollar terms reached historic highs in Zambia during the 2005–06 crisis, but not in Malawi.

These price spikes matter for rural as well as urban households. Among rural households in East and southern Africa, 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, 59% of rural households in Malawi only bought maize even in the unprecedented bumper harvest of 2007, while another 6% were net buyers (Dorward *et al.*, 2008). In Zambia, over 50% of households in drought-prone southern Province were net buyers during 2004, compared to about 20% in northern Province. 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 spent about 40% of its income on maize purchases in 2004 (Tschirley, 2007). Price spikes thus have enormous effects on the real incomes of those

that can least afford it: the poorest households in the most drought-prone areas.

The earlier characterization of production and stocks in each crisis made it clear that, during all three crises reviewed here, regional trade could have played a major role in meeting national deficits and stabilizing prices. We will also find that early warning during all three crises, with some exceptions for 2001–02, was early, frequent, detailed, and relatively accurate. Despite this, both Zambia and Malawi experienced price spikes during two of the three crises. In the next section, we review each country's experience in more detail and link observed behavior by private and public sectors to our conceptual framework.

(a) Malawi

Malawi's food policy is marked by the heaviest direct government involvement of any country in the region, in three ways⁹: government controls all formal maize imports, the National Food Reserve Agency (NFRA) uses local purchases and imports to stock a food security reserve as high as 180,000 mt of maize, and it sells preferentially to its government parastatal, 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 large formal traders to consider importing maize grain, even if they were allowed to do so. Informal, smaller-scale trade can get around these restrictions and can also source grain 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 from South Africa and food aid coordinated by government and donors.

Figure 2 shows retail maize grain prices in Lilongwe in the center, an average of three southern markets, and wholesale import parity from South Africa. 2001–02 stands out for skyrocketing prices far above import parity. 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.

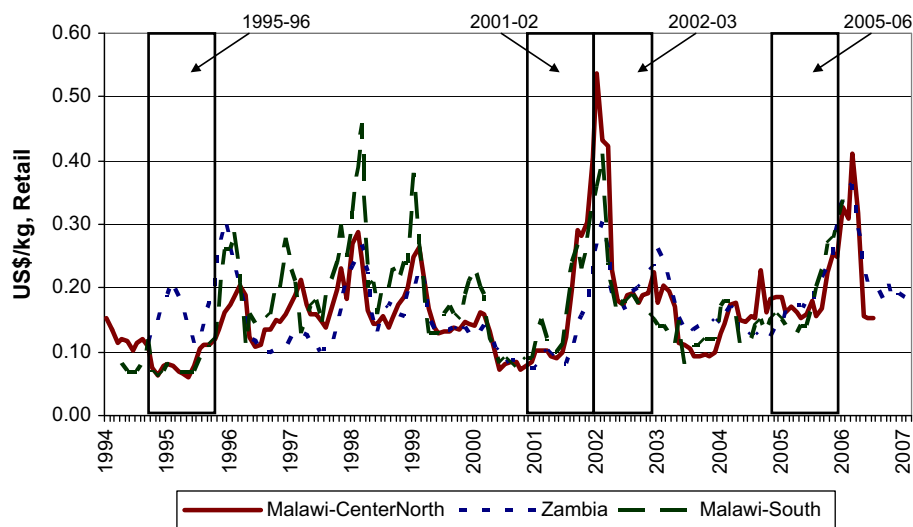


Figure 1. Maize grain prices in southern/central Zambia, southern Malawi, and central Malawi, 1994–2007 (US\$/kg). Data sources: Mozambique: Sistema de informação de Mercados Agrícolas; Malawi: FEWSNET; Zambia: Central Statistical Office monthly price files.

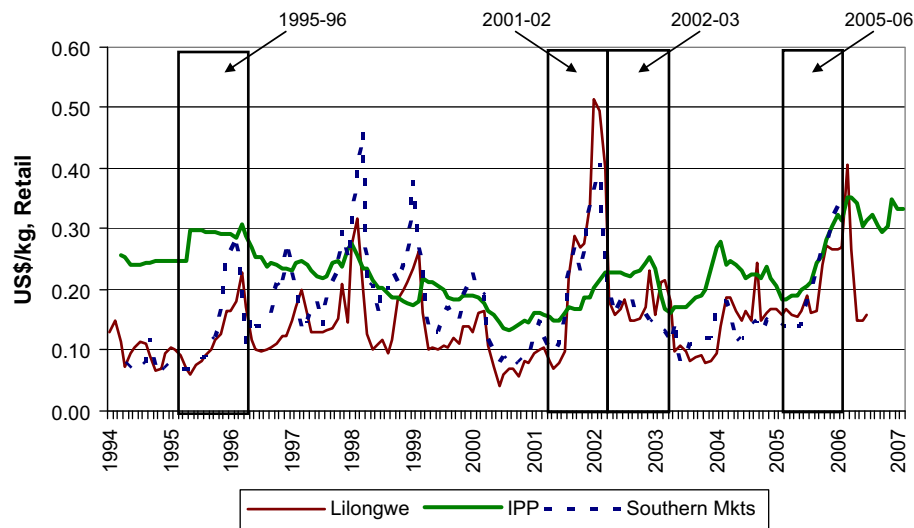


Figure 2. Maize grain prices at retail in Lilongwe and three southern markets, and import parity from South Africa, 1994–2007 (US\$/kg). Data sources: SAFEX Randfontein South Africa prices as reported by the South African Grain Information System, Zambian haulier data files on monthly transport rates from Johannesburg to Lusaka, FEWSNET on local market prices.

(i) 2001–02: An unexpected and very large price spike

Malawi's 2001–02 crisis has been referred to as “the worst famine in living memory” (Devereux, 2002b; see also Save the Children, 2003). It is clear in hindsight 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 thus had no reason to be alarmed by June 2001, despite official maize stocks being the lowest on record. Additionally, Mozambique had reported a production increase of 12%, suggesting that informal trade could 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.

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 US\$ in southern Malawi surged nearly 50% from June to July, then rose even more in August and September. This price information was widely available in Malawi to those wishing to track markets, and was reported by FEWSNET in its monthly bulletins. Meanwhile, prices in northern Mozambique also surged. By August, real prices there had equaled their historical highs 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 were double their previous hungry season high. This extraordinary price increase clearly suggests that production in northern Mozambique was substantially lower than official estimates had indicated.

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 procured almost nothing by August, when government announced plans to import 150,000 mt of maize from South Africa. Planned government imports rose to 220,000 mt by October, but by

January 2002 only 40,000 had arrived. Meanwhile, ADMARC depots ran out of maize and could not defend the ceiling price. Amidst the ensuing panic, maize prices in the north soared to double their previous high, while in the south they rose higher than any level since 1997–98.

Most discussion of this crisis has focused on the rent seeking involved in the draw-down of the national stock during 2000–01 (just before the 2001–02 crisis) and on the apparent over-estimation of the cassava harvest during 2001. The delayed imports are explained by “transport bottlenecks” (Devereux, 2002b). It would be useful, however, to ask other questions. First, why did government believe that purchasing grain locally in the midst of a (national) shortage would help stabilize markets? 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? Van de Walle's neo-patrimonial objectives are almost certainly part of the explanation. Yet both decisions appear to have been based also on the authentic conviction that private markets would not respond and that poor consumers would be exploited; the differing values and worldviews central to the wicked problem were clearly at work, and in fact were so severe that government did not even attempt to commit itself to a course of action that would leave room for private sector action.

(ii) 2002–03: A desire to avoid a repeat of the previous year leads to other mistakes

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 the food balance sheet in May 2002 forecasts a deficit of 433,000 mt for the coming season, decision makers acted promptly. The country imported 253,000 mt of maize grain entirely through NFRA (independent private imports were not allowed), and arranged 151,000 mt of food aid, for a total formal inflow of more than 400,000 mt, nearly covering the forecasted deficit. Despite large informal flows of white maize from Mozambique in 1997–98 and 1998–99, decision makers did not take this potential flow into account. Best estimates are that 150,000–250,000 mt 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, government began selling its stock at very low prices.

The impacts of these actions on maize markets are apparent in Figure 2. From their peak in February 2002, prices in the south in both US\$ (shown in the graph) and nominal Kwacha declined nearly continuously for 16 months through June 2003, the longest period of sustained price decline in at least 10 years. Mean prices during 2003 were lower than any year since 1995, and less than two-thirds the levels in Zambia and southern Mozambique. While such prices benefitted consumers, they provided little incentive to farmers, and also reflected very large government costs for holding stock and for selling at prices below costs. By eliminating any seasonal price rise during the 2002–03 marketing season and pushing prices near historic lows, government may also have exacerbated two medium- to long-term problems. First, it eliminated incentives for private traders to store grain, and also reinforced the sense that future shortages may not provide profit opportunities for importers. This undermines market development and consumer interests.¹⁰ Second, it reduced prices received by Mozambican farmers; since these farmers could be the most reliable suppliers of maize to Malawi for many years to come, reducing their production incentives runs counter to the country's long-term interests.

(iii) 2005–06: *Large potential gains are missed due to a cumbersome planning approach*

Early warning during 2005–06 was less ambiguous than during 2001–02. By February (3 months before the start of the harvest), FEWSNET reported Ministry of Agriculture estimates of a 25% reduction in the coming harvest, leaving an anticipated maize deficit of 300,000–500,000 mt. The regional bulletin of the same month 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 in 2001–02. In June, they highlighted the sharp price rises in May, far earlier than normal; by June and July, the bulletins clearly showed prices above even those of 2001. These were clear and early indicators of problems.

Despite the warnings, government 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 September, by which time local prices had risen dramatically. Import parity prices from South Africa also began a dramatic rise in September, driven primarily by increased transport costs, as a result of heavy demand by other deficit countries.¹¹ 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 that official figures had overestimated 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 informally 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, 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.

In this case, both the wicked problem and the credible commitment problem were on display (at play). Government attempted to control the situation but did not prohibit private imports; yet formal imports arrived late due to uncertainty about what government would actually do, thus failing to take advantage of the very low prices in South Africa early in the season, despite the shortage being clearly forewarned and anticipated. Informal trade, as it always does, escaped the credible commitment problem by acting quickly and limiting the scope of its operations.

(b) *Zambia*

Unlike Malawi, the government of Zambia does not operate a retail maize selling network and does not directly attempt to control retail prices. It does, however, purchase substantial quantities through its Food Reserve Agency (FRA). Driven in part by the need to protect FRA, government comprehensively regulates external trade, placing and lifting export or import bans and tariffs depending on perceived supply, and involving itself directly in import decisions when the national crop is short. Private traders are required to apply for licenses to export grain, allowing government to impose selective export bans on private trade by not granting licenses. Although these bans cannot stop informal trade, they raise the transaction costs incurred, which are ultimately passed on and borne by consumers and/or farmers.

In years when the Zambian government arranges imports or releases stocks, it preferentially channels these supplies to industrial millers and typically subsidizes the cost of those imports to the millers. The credibility of government commitments to stated courses of action and the level of subsidy to commercial millers thus become critical factors in market performance in Zambia.

Figure 3 shows that domestic wholesale prices rose well above import parity during the 2001–02 and 2002–03 crises. Patterns during the 2005–06 crisis are similar to Malawi: US\$ 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 they would have if markets had performed efficiently. Why did not traders import maize during these periods?

(i) 2001–02: *Heavy government control and confusing signals result in big price spikes*¹²

In July 2001, Zambia's food balance sheet indicated a commercial import requirement of 200,000 tons of maize. In August, government announced its intention to import that quantity of maize and to sell it to specified commercial millers at roughly \$75 per ton below CIF. Yet almost no government maize imports had arrived by December. During this period, private traders refrained from importing, due to government's plans to deliver subsidized supplies to millers. As a result, local prices soared 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. Government imports started arriving only in January 2002 and were able to drive prices below IPP the next month (Nijhoff *et al.*, 2002).

Government's handling of the 2001 maize production shortfall had three major effects. First, it stymied the potential for the market to respond to import incentives. Millers receiving imported maize from government at \$160/mt had a major advantage compared to other millers and traders who faced commercial import costs of \$220–260/mt. This situation effec-

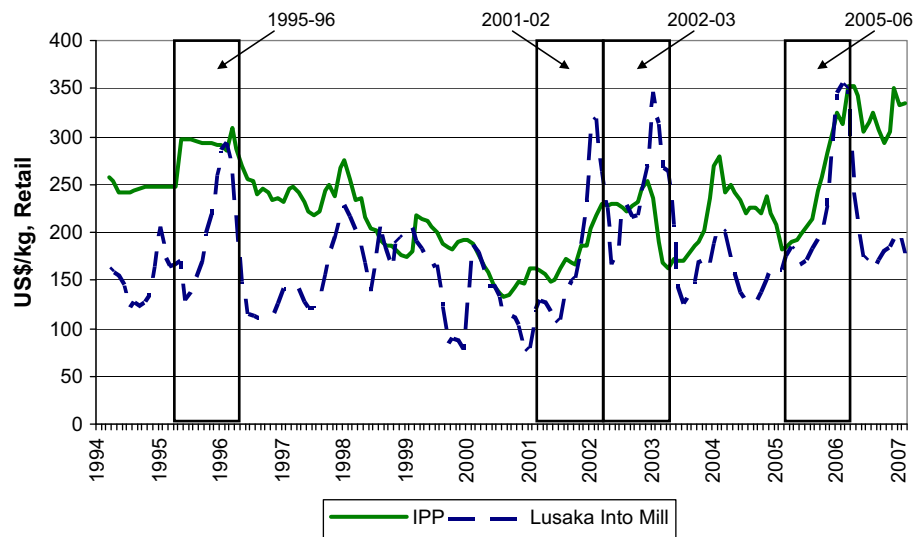


Figure 3. Maize prices in Zambia, wholesale markets and import parity from South Africa, January 1994–September 2007. Data sources: SAFEX Randfontain South Africa prices as reported by the South African Grain Information System, Zambian haulier data files on monthly transport rates from Johannesburg to Lusaka, Agricultural Market Information Centre wholesale maize price data, and CHC local price reports.

tively froze out of the market all traders, and all millers other than those chosen to receive subsidized imports. The second outcome was temporary maize shortages and prices well above import parity. Third, the subsidy on maize importation was not passed through to consumers: breakfast meal prices remained high throughout 2002. Maize grain prices dropped over 60% from December 2001 to April 2002, but breakfast meal prices in Lusaka declined by only 15% during the same period. This suggests that much of the subsidy was captured by the few millers receiving the subsidized imported grain from the government, 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.

The general public and some analysts have interpreted the skyrocketing prices as evidence of market failure. However, since wholesale maize prices started to be collected by the Ministry of Agriculture in 1994, these market prices have never exceeded import parity except in years when the government attempted to arrange imports.

(ii) 2002–03: Government control and restricted definition of “private sector” again result in high-price spikes

The May–June 2002 FEWSNET bulletin in Zambia clearly laid out the dimensions of the potential crisis facing the country: the national maize crop had declined by 24%, 2.3 m 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 mt. FEWSNET further stated “the government has sufficient information...and should avoid...unnecessary delays... Firm import commitments need to be made very quickly.”

Government tried to do exactly this, working with “the private sector” to agree on import targets. However, government worked only with commercial millers; it 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 began to decline several years ago primarily because grain became more commonly available in markets, which generated competition from thousands of small-scale

mills. The decision to work exclusively with a concentrated commercial milling industry during a period of local maize shortages restricted competition when it was sorely needed. 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 low extraction rates.

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. This price surge is *prima facie* evidence that, in fact, not enough grain was imported. The primary reason for this, however, was almost certainly that government actions confined private importation to Zambia’s concentrated milling sector and excluded participation in the market of the more competitive maize trading firms. Once again, mistrust and misunderstanding prevented government from committing itself to a course of action—open trade complemented by needed food aid distributions—that would have allowed a broad, robust private sector response to the food crisis.

(iii) 2005–06: Slow decision-making squanders opportunities to keep prices substantially lower

At the time of the 2005 harvest, a 15% tariff on imported maize was in effect. Early estimates of a poor maize crop began to clarify the need for imports. To avoid passing the approximately \$40/mt cost of the tariff to consumers during a high-price year, millers and traders requested in June 2005 that the government waive the import tariff. As shown by Mwanau et al. (2005), 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. The delay in waiving the duty also pushed imports into a period when IPP in Zambia (as in Malawi) was rising dramatically, driven by increased prices in South African and rapid rises

in transport costs. Further delays occurred in late 2005, a result of new phytosanitary requirements. Random testing of grain in South Africa destined for Zambia added to these delays, even though government indicated that testing is not time consuming and should not cause additional delays. The combined effect of these factors is that, as of mid-December 2005, the private sector had imported only 40,000 mt of maize, and government had yet to import any.

The magnitude of the crisis was moderated by informal cross-border trade. Maize industry representatives estimate that 40,000–60,000 mt of maize were imported from Tanzania by small traders.¹³ Maize prices in Kasama, an urban center located in a generally maize-deficit region close to the Tanzanian border, were almost 20% lower than those in Lusaka, highlighting the benefits of informal trade to Zambian consumers.

However, the full benefits of cross-border trade were missed because of a discriminatory duty waiver system. The waiver was provided only to millers and traders able to obtain import licenses. Small traders not able to acquire import licenses paid roughly US\$ 15/mt more to import. 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. 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.

7. TOWARD MORE EFFECTIVE USE OF MARKETS IN EMERGENCY RESPONSE

Our conceptual framework and review of government and private sector behavior during this decade make it clear that defining food policy in southern Africa is a fundamentally political and cultural process: interest groups pursue differing objectives based on differing values and world views and, not surprisingly, have differing perspectives on what is the “best” policy for ensuring national food security. Yet this is true throughout the world. More importantly, we suggest that the *commitment problem* and the *wicked problem* combine to generate repeated outcomes that are not in the best interests of government, traders, or civil society.

Many factors prevent government from credibly committing itself to throwing its borders open and remaining out of the market: pressures from civil society in an electoral democracy were a major cause of the actions that caused depressed and declining prices in Malawi throughout the 2002–03 regional food crisis; doubts about markets’ ability to respond are real and widespread (if not always fully informed) among government and civil society in most countries of the region; neo-patrimonial objectives were major contributors to Malawi’s (mis)management of its food reserve in 2000–01 (immediately prior to the 2001–02 crisis); and as pointed out by Poulton *et al.* (2006), all countries in the region are plagued by high costs of transport and credit that could make the level of price fluctuation in a “free market” politically unacceptable. Lack of trust has also impeded government from following a transparent rule-based approach with its interventions, fearful as it is that traders will somehow use knowledge of how it will behave against it; the Zambian government’s exclusion of traders in its dialog with “private sector” in 2002–03 encapsulates this mistrust. The result has been the ad hoc, “interventionist liberalization” described by Jayne *et al.* (2009a) and in this paper.

The critical challenge is how to build trust and credible commitment between the state and private sector in these politically sensitive food markets. There is no easy answer to how to do this, and certainly no quick solution; as North (1993) notes, “credible commitment can only be realized over a very long period of time.” Time is needed in part because the worldviews that different stakeholders bring to the table are not easily changed through factual analysis; this is the essence of the wicked problem and is also clearly recognized by North.¹⁴ Recognizing this, we suggest that this challenge be approached in a stepwise fashion in which governments initially commit, not to a set of technical rules, but to a process of negotiated, transparent, and monitored *movement* toward a set of rules acceptable to key stakeholders. Principal features of such a process would include:

Multi-stakeholder participation, including of civil society; as emphasized by Byerlee, Jayne, and Myers (2006), there is no shortcut to seriously addressing the concerns of influential groups.

Assurance that government will be seen as “doing something” to ensure the food security of its population. This involves defining instruments that government could use, and conditions under which they could use them, to directly or indirectly influence imports, exports, and domestic prices. Any agreement that lacks such instruments will not be seen as credible and thus will founder on the commitment problem. Transparency and accountability. Information presented, agreements reached, and the “rules of the game” on market actions by government must be made fully available in a timely manner to the public.

An emphasis on two-way education. This involves regular provision of and debate around empirical analysis and perspective provided not just by policy researchers but by traders, farmers, and civil society. The literature on wicked problems indicates that they “(resist) resolution by appeal to the facts.” Yet careful, open-minded empirical analysis can make a crucial contribution to eventual resolution when it is embedded within the type of ongoing consultative process proposed here.

A commitment by donors to the integrity of the process and not to pushing quick movement on their own agenda. Few governments would commit to an open process like this if they risk being seen to cave in to donor pressure.

The question remains of what incentives the various stakeholders have to commit to such a process of negotiated and monitored movement toward less ad hoc policy. Incentives for civil society, traders, and farmers would seem clear: each is at times acutely dissatisfied with government policy on these matters and would like to have more influence over what decisions are made. Incentives for government are less clear, but our conceptual framework suggests that they will increase as civil society strengthens and the demand for democracy broadens.

Donors could play a useful role here through a coordinated approach to covering the research and administrative costs needed to carry out such a process. Conditionality could focus on the launching and demonstrated integrity of the process, rather than on the achievement of specific policy goals. A multi-donor approach is critical to avoid perception of any one donor pushing their particular agenda. It will also be crucial that donors demonstrate their commitment to funding impartial research and equitable access by stakeholders to the negotiation process. The rules that emerge from such an inclusive and fundamentally political process are unlikely to impress policy analysts. Yet the precise content of the rules may be less important than the fact that they exist and that key stakeholders find them credible.

NOTES

1. Our conceptual framework is stylized in the sense that we focus on the essential features of the model and omit secondary objectives and behaviors that bear less directly on market outcomes.
2. We do not argue that these are liberal democracies; see Van de Walle (2001) on the distinction between liberal and illiberal democracies, both of which are electoral. See *Afrobarometer* (2009) for trends in democracy on the continent over the past decades.
3. The public and trading sectors are of course not completely separate. Individuals in government sometimes collaborate with the trading (and maize milling) sectors, frequently in secret and for purposes of personal enrichment. We have also acknowledged the validity of neopatrimonialism as a (partial) explanation for the dynamic we are investigating. We maintain, however, that this collaboration is most often merely strategic, and does little to bridge the gulf in world view between the two parties.
4. The literature on commitment problems and wicked problems runs largely in parallel; we know of no conceptual approach that has brought them together. Our analysis suggests that the two are very much related and that further insight could be generated by treating them together.
5. "Bully pulpit" refers to the use of the persuasive powers and moral authority of the office of the president/prime minister to cajole and otherwise verbally push actors to behave in a fashion believed to be in the public interest.
6. The negative correlation between Mozambique and Zimbabwe is a special case, driven by the economic turmoil in Zimbabwe contrasted with recovery from the civil war in Mozambique.
7. 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.
8. The discussion of this crisis draws heavily on *Tschirley et al. (2006)*.
9. Given the uncertainty regarding the extent to which the announced ban on private maize trade will be implemented, this discussion focuses on policy and practice in place at the time this paper was submitted.
10. The argument that trader profit opportunities are important for the well-being of consumers rests on the empirical regularity that more developed markets generate less seasonal price variation 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, about 65% in Zambia, and over 90% in southern Malawi (*Tschirley et al., 2006*).
11. Transport costs actually began rising in April 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.
12. This section draws from *Nijhoff, Jayne, Mwiinga, and Shaffer (2002)*.
13. FEWSNET recorded just over 13,000 mt of informal imports from Tanzania, confirming the perception that these data put a lower bound on informal trade volumes.
14. Quoting *Hahn (1987)*, North states "there is a continuum of theories that agents can hold and act upon without ever encountering events which lead them to change their theories"; in terms of the wicked problem, problems "resist resolution by appeal to the facts" due to persistently differing worldviews that result in differential weighting of those facts.

REFERENCES

- Acemoglu, D. (2003). Why not a political Coase theorem? Social conflict, commitment, and politics. *Journal of Comparative Economics*, 31(4), 620–652.
- Afrobarometer (2009). Neither consolidating nor fully democratic: The evolution of African political regimes, 1999–2008. In *Afrobarometer briefing paper no. 67*. East Lansing: Michigan State University.
- Aker, J. (2008). Does digital divide or provide? The impact of mobil phones on grain markets in Niger. *Center for Global Development working paper no. 154*.
- Awudu, A. (2007). Spatial and vertical price transmission in food staples market chains in eastern and southern Africa: What is the evidence? In *Paper prepared for the conference on staple food trade and market policy options for promoting development in eastern and southern Africa, March 1–2, 2007*. Trade and Markets Division, FAO Headquarters, Rome, Italy.
- Barslund, M. (2007). *Regional differences in food consumption in urban Mozambique: A censored demand system approach*. Discussion Papers No. 07-15, Department of Economics, University of Copenhagen, August 2007.
- Byerlee, D., Jayne, T. S., & Myers, R. J. (2006). Managing food price risks and instability in a liberalizing market environment: Overview and policy options. *Food Policy*, 31(4), 275–287.
- Castelfranchi, C., & Falcone, R. (2002). Social trust: A cognitive approach. In Castelfranchi, & Tan (Eds.), *Trust and deception in virtual societies*. Springer.
- Chapoto, A., & Jayne, T. S. (2006). Trends in breakfast meal and maize marketing margins in Zambia. *Policy synthesis 14, Food Security Research Project, Lusaka, Zambia*.
- Chirwa, E. (1999). Food marketing reforms and integration of maize and rice markets in Malawi. In *Working paper WC/05/99*. Zomba, Malawi: University of Malawi, Chancellors College, Department of Economics.
- Chitundu, M., Droppelmann, K., & Hagglblade, S. (2006). A value chain task force approach for managing private–public partnerships: Zambia's task force on acceleration of cassava utilization. In *Working paper no. 21. Food Security Research Project, Lusaka, Zambia*.
- Conklin, J. (2006). Wicked problems & social complexity. *Dialogue mapping: Building shared understanding of wicked problems*. Wiley.
- Darcy, J., & Hofmann, C.-A. (2003). According to need? Needs assessment and decision-making in the humanitarian sector. *Report no. 15*. United Kingdom: Humanitarian Policy Group.
- DeRose, L., Messer, E., & Millman, S. (1998). *Who's hungry? And how do we know? Food shortage, poverty, and deprivation*. New York: United Nations University Press.
- Devereux, S. (2002a). Can social safety nets reduce chronic poverty? *Development Policy Review*, 20, 657–675.
- Devereux, S. (2002b). State of disaster: Causes, consequences & policy lessons from Malawi. *An ActionAid Report Commissioned by ActionAid Malawi, June 2002*.
- Devereux, S. (2006). The impact of droughts and floods on food security and policy options to alleviate negative effects. In *Paper submitted for session on economics of natural disasters. International Association of Agricultural Economists (IAAE) conference, 12–18 August*. Queensland, Australia: Gold Coast Convention and Exhibition Center.
- De Waal, A., & Whiteside, A. (2003). New variant famine: AIDS and the food crisis in southern Africa. *The Lancet*, 362, 1234–1237.

- Dorward, A., Kydd, J., Morrison, J., & Urey, I. (2004). A policy agenda for pro-poor agricultural growth. *World Development*, 32(1), 73–89.
- Dorward, A., Chirwa, E., Kelly, V., Jayne, T., Slater, R., & Boughton, D. (2008). *Evaluation of the 2006/7 Agricultural Input Supply Programme, Malawi*. Final report, School of Oriental and African Studies, Wadonda Consult, Michigan State University, and Overseas Development Institute, undertaken for the Ministry of Agriculture and Food Security, Government of Malawi, March.
- FAO (2007). *Southern Africa Programme*. Technical Cooperation Department, Emergency Relief and Development.
- FEWSNET (2008). *Informal cross border food trade in southern Africa*. Issue 42, May.
- Frankenberger, T., Luther, K., Fox, K., & Mazzeo, J. (2003). *Livelihood erosion through time: Macro and micro factors that influenced livelihood trends in Malawi over the last 30 years*. Tucson: Tango Inc. and CARE Southern and Western Africa Regional Management Unit (SWARMU).
- Goletti, F., & Babu, S. (1994). Market liberalization and integration of maize markets in Malawi. *Agricultural Economics*, 11(2–3), 311–324.
- Greif, A., Milgrom, P., & Weingast, B. R. (1994). Coordination, commitment, and enforcement: The case of the merchant guild. *The Journal of Political Economy*, 102(4), 745–776.
- Haddad, L., & Frankenberger, T. (2003). Integrating relief and development to accelerate reductions in food insecurity in shock-prone areas. *Occasional paper no. 2*. Washington, DC: USAID Office of Food for Peace.
- Hahn, F. (1987). Information, dynamics and equilibrium. *Scottish Journal of Political Economy*, 34, 321–334.
- House of Commons (2003). *The humanitarian crisis in southern Africa. Report and proceedings of the committee* (Vol. I). London: International Development Committee.
- International Telecommunications Union (2007). *World Information Society 2007 Report: Beyond WSIS*.
- Jayne, T. S., Chapoto, A., & Shiferaw, B. (2009a). Improving the performance of staple markets to exploit the productive potential of smallholder agriculture. In *Paper presented at the conference on agricultural markets, organized by the CGIAR system and alliance for a green revolution in Africa (AGRA)*, May 13–15, 2009, Nairobi, Kenya.
- Jayne, T. S., Chapoto, A., Minde, I., & Donovan, C. (2009b). The 2008/09 food price and food security situation in eastern and southern Africa: Implications for immediate and longer run responses. *International Development working paper #97*. East Lansing: Michigan State University.
- Jayne, T., Govereh, J., Mwanaumo, A., Nyoro, J., & Chapoto, A. (2002). False promise or false premise? The experience of food and input market reform in eastern and southern Africa. *World Development*, 30(11), 1967–1985.
- Jayne, T. S., & Argwings-Kodhek, G. (1997). Consumer response to maize market liberalization in Urban Kenya. *Food Policy*, 22(5), 447–458.
- Jayne, T. S., & Chapoto, A. (2006). Emerging structural maize deficits in eastern and southern Africa: Implications for national agricultural strategies. *Policy synthesis 16. Food Security Research Project, Zambia*.
- Kahneman, D., Knetsch, J. L., & Thaler, R. H. (1991). Anomalies: The endowment effect, loss aversion, and status quo bias. *The Journal of Economic Perspectives*, 5(1), 193–206.
- Loy, J. P., & Wichern, R. (2000). Integration of Zambian maize markets. *Quarterly Journal of International Agriculture*, 39(2), 173–198.
- Mano, R., Isaacson, B., & Dardel, P. (2003). Identifying policy determinants of food security response and recovery in the SADC region: The case of the 2002 food emergency. In *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.
- Mason, N., Jayne, T. S., Chapoto, A., Weber, M. T. (2009). *Staple food consumption patterns in urban Zambia: Results from the 2007/2008 Urban Consumption Survey*. Working Paper. Food Security Research Project, Lusaka, Zambia.
- McBeth, M., Shanahan, E., Arnell, R., & Hathaway, P. (2007). The intersection of narrative policy analysis and policy change theory. *Policy Studies Journal*, 325(1), 87–108.
- Mwanaumo, A., Jayne, T. S., Zulu, B., Shawa, J., Mbozi, G., Haggblade, S., et al. (2005). Zambia's 2005 maize import and marketing experiences: Lessons and implications. *Policy synthesis #11, Food Security Research Project, Lusaka*.
- Muyanga, M., Jayne, T. S., Argwings-Kodhek, G., & Ariga, J. (2005). *Staple food consumption patterns in urban Kenya: Trends and policy implications*. Working paper 16. Nairobi: Egerton University, Tegemeo Institute for Agricultural Policy and Development.
- Myers, R. (2008). *Evaluating the Efficiency of Inter-Regional Trade and Storage in Malawi Maize Markets*. Report commissioned by the World Bank, Lilongwe, Malawi.
- Nijhoff, J. J., Jayne, T. S., Mwiinga, B., & Shaffer, J. (2002). Markets need predictable government actions to function effectively: The case of importing maize in times of deficit. *Policy synthesis 6. Food Security Research Project, Lusaka*.
- North, D. (1993). Institutions and credible commitment. *Journal of Institutional and Theoretical Economics*, 149(1), 11–23.
- Poulton, C., Kydd, J., Wiggins, S., & Dorward, A. (2006). State intervention for food price stabilization in Africa: Can it work? *Food Policy*, 31(4), 342–356.
- Rashid, S. (2004). Spatial integration of maize markets in post-liberalized Uganda. *Discussion paper 71*. Washington, DC: Markets, Trade, and Institutions Division, International Food Policy Research Institute.
- 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.
- SARRNET (2007). *Cassava value chain analysis for southern Africa: A case of Malawi, Mozambique, Zambia, Angola and South Africa*: IITA and SARRNET.
- Schaffer, M. (1989). The credible-commitment problem in the center-enterprise relationship. *Journal of Comparative Economics*, 13(3), 359–382.
- Tostau, E., & Brorsen, W. (2005). Spatial price efficiency in Mozambique's post-reform maize markets. *Agricultural Economics*, 33(2), 205–214.
- Traub, L., & Jayne, T. S. (2008). The effects of price deregulation on maize marketing margins in South Africa. *Food Policy*, 33(3), 224–236.
- Tschirley, D. (2007). Markets, food aid, and poverty in emergency response: Learning from the 2002/03 crisis in southern Africa. *Presented at Health and wealth: Linking policy developments to economic livelihoods in East and southern Africa*. Washington, DC: Society for International Development, May 16, 2007.
- Tschirley, D., Nijhoff, J. J., Arlindo, P., Mwiinga, B., Weber, M. T., Jayne, T. S. (2006). Anticipating and responding to drought emergencies in southern Africa: Lessons from the 2002–2003 experience. *International Development working paper #89*. East Lansing: Michigan State University.
- Tschirley, D., & Abdula, D. (2007). Toward improved maize marketing and trade policies to promote household food security in central and southern Mozambique: 2007 update. In *Prepared for trade policy for food products conducive to development in eastern and southern Africa, March 2007*. Rome: Food and Agriculture Organization of the UN.
- Van Campenhout, B. (2008). Modelling trends in food market integration: Method and an application to Tanzanian maize markets. *Food Policy*, 32(1), 112–127.
- Van de Walle, N. (2001). The impact of multi-party politics in sub-Saharan Africa. *Forum for Development Studies*, 28(1), 5–42.
- Whiteside, M. (2003). Enhancing the role of informal maize imports in Malawi food security. A consultancy report for UK Department for International Development.

