
FOOD SECURITY RESEARCH PROJECT

**Who Gained and Who Lost from Zambia's 2010
Maize Marketing Policies?**

by

**Chewe Nkonde, Nicole M. Mason,
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Chewe Nkonde¹, Nicole M. Mason¹, Nicholas J. Sitko, and T. S. Jayne

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Chewe Nkonde and Nicole M. Mason are Ph.D. students in the Department of Agricultural, Food, and Resource Economics, Michigan State University (AFRE/MSU); Nicholas J. Sitko is research fellow, AFRE/MSU, currently affiliated with the Ministry of Agriculture/Agricultural Consultative Forum/Food Security Research Project (FSRP), Lusaka, Zambia; and T.S. Jayne is professor of International Development, AFRE/MSU.

¹ Senior authorship not assigned.

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Comments and questions should be directed to the Food Security Research Project Director, 86 Provident Street, Fairview, Lusaka: tel +260 (21)1 234539; fax +260 (21)1 234559; email: kabaghec@msu.edu

FOOD SECURITY RESEARCH PROJECT TEAM MEMBERS

The Zambia Food Security Research Project (FSRP) field research team is comprised of Chance Kabaghe, Thomas Jayne, Antony Chapoto, William Burke, Hichaambwa Munguzwe, Solomon Tembo, Stephen Kabwe, Auckland Kuteya, and Mary Lubungu. MSU-based researchers in the Food Security Research Project are Steven Haggblade, James Shaffer, David Tschirley, Nicole Mason, Chewe Nkonde, and Margaret Beaver.

EXECUTIVE SUMMARY

Zambia's record-breaking maize harvest of nearly 2.8 million metric tons (MT) in 2010 is a major achievement and a testimony to what input subsidies, output price incentives, and favorable weather can do to elicit a major supply response. Maize-growing smallholders harvested more than in previous years and so have more to eat. Public markets are currently well stocked with maize grain, to the benefit of urban consumers and maize-buying rural households. Farmers who were able to sell their crop to the Food Reserve Agency (FRA) at K65,000 per 50-kg bag, a price well above market levels, have clearly benefited from the bumper crop and FRA's involvement in maize marketing. The FRA's high buy price and purchase of nearly 900,000 MT of maize are also likely to have put upward pressure on market prices for maize. As a result, farmers who sold maize to private sector buyers may have benefited indirectly from the FRA's activities.

However, the policies adopted by the Zambian government (GRZ) to handle the 2010 maize bumper crop have produced both winners *and* losers. This paper examines the key features of the 2010/11 GRZ maize marketing policies and their likely income distributional effects on various stakeholder groups: large-scale farmers, three categories of smallholder households (net sellers of maize, net buyers of maize, and those that neither buy nor sell maize), urban consumers, millers, traders, and government. We then propose a set of alternative policies GRZ could use to manage future maize bumper crops and explore the likely distributional effects of these policies on the various stakeholder groups.

The key features of the GRZ's maize marketing policies in response to the 2010 bumper maize harvest as follows. First, the FRA announced a price of K65,000 per 50-kg bag on May 1, 2010 (at the beginning of the 2010 harvest). This price, after adding the FRA's own marketing and operating costs, was roughly equal to import parity – the cost of importing maize to Zambia from South Africa – even though Zambia was in a clear export situation. Second, the FRA set purchase targets that were progressively increased during the course of the season as it became clear that FRA's original purchase targets would not be sufficient to absorb the majority of the marketed surplus and therefore would do little to lift maize market prices in the country. By the end of October 2010, the FRA's maize purchases rose to 878,570 MT of maize (or 83% of expected maize sales by smallholders, according to the 2010 Crop Forecast Survey, CFS).

These policies produced the following outcomes. First, the FRA's operations resulted in its accumulation of massive maize stocks that could not be sold except at a major financial loss. While the FRA's financial situation has not been made public for several years, it is estimated that its operations in 2010 have imposed a K1.5 trillion cost on the Zambian Treasury. Moreover, much of the FRA's maize is at risk of spoilage due to inadequate access to storage facilities and poor prospects of offloading Zambian maize on regional export markets.

Second, despite the record maize harvest, the majority of Zambian smallholders did not produce a maize surplus in 2010. Only 36% of smallholder farmers (45% of maize-growing smallholders) were expected to sell maize in 2010/11, and the expected marketed surplus was extremely concentrated. About 49,000 farmers, or 3.3% of the total smallholder population, accounted for 50% of all the maize expected to be sold by the small- and medium-scale farm sector during the 2010/11 marketing year. Evidence from the CFS and other nationally representative household surveys suggests that a small proportion of relatively well-capitalized farmers accounted for the bulk of the additional maize produced and sold in 2010/11 compared to prior years.

Third, because the FRA set its maize buying price at import parity, millers could obtain maize more cheaply from South Africa than from the FRA unless it relied on the Zambian Treasury to subsidize the FRA's sale price.

Fourth, the upward pressure that FRA's activities exerted on maize market prices made maize meal more expensive for urban and rural consumers than otherwise would have been the case. The price-raising effects of the FRA's activities effectively transferred income from rural and urban maize purchasing households to a small minority of surplus-producing farmers.

Fifth, because the FRA purchase targets were progressively increased during the course of the buying exercise, private traders' entry into the market to start their own buying campaigns was progressively delayed. The uncertainty associated with the magnitude and timing of FRA's operations in the market effectively crowded out private traders' participation in the market, which in turn exacerbated many farmers' access to markets who could not sell their maize to the FRA.

Sixth, maize bought at the FRA price was also not competitive in regional export markets. FRA exports in 2010 have entailed a loss of US\$91-177 per ton exported. And because the FRA has been willing to export maize at a financial loss in order to unload its own stocks, export marketing opportunities for private traders have been very limited. In this way, government policies have discouraged the private sector's involvement in exportation that otherwise could have relieved the national surplus without imposing major financial losses on the Treasury.

The government's 2010 maize policies produced both winners and losers. Because they raise maize prices, in the short-term the government's policies in 2010 positively affect households that sell maize: large-scale farmers and the roughly 26% of smallholder households that sell more maize than they buy (net sellers). But the benefits of the high FRA buy price and large quantities purchased accrue to a small number of relatively better off medium-scale farmers that account for the majority of the maize sold by smallholders. By raising maize prices, the 2010 GRZ maize marketing policies negatively affect households that buy maize: urban consumers and the approximately 36% of smallholder households that buy more maize than they sell (net buyers). Government is a 'winner' in the short-term because the highly visible maize marketing policies demonstrate that GRZ is 'doing something' to help its rural constituents. However, eventually, the populace is likely to come to understand how concentrated and inequitably distributed the benefits of GRZ's maize marketing policies are. Furthermore, in the medium-term the FRA's 2010 operations may create political challenges for government, especially once it becomes more widely apparent that they have imposed upwards of K1.5 trillion on the Zambian Treasury. And if large quantities of maize are lost due to spoilage, government will be blamed for mishandling the bumper crop.

Key elements of the proposed alternative policies are: (i) FRA maize purchases and sales triggered when market prices fall below and rise above pre-established floor and ceiling prices, respectively; (ii) consistent government policies with respect to private sector exports (e.g., by setting and respecting an export quota); and (iii) other strategies to create a more enabling environment and build capacity for private sector participation in exports. Under the proposed alternative policies, maize grain and maize meal prices in a bumper crop year would not be as high as they were in 2010 given the heavy involvement of the FRA. This would be to the benefit of net-maize-buying smallholders and urban consumers but to the

detriment of large-scale farmers and net-maize-selling smallholders. However, a stable price band system as proposed would positively benefit all farmers through the reduction of price uncertainty. Moreover, facilitation of private sector participation in exports could help move surplus maize out of Zambia during bumper crop years. This would mitigate downward pressure on producer maize prices as a result of the bumper harvest, to the benefit of maize sellers but to the detriment of maize buyers. Nevertheless, an environment of less-constrained trade would contain prices within import and export parity price bands. Therefore, the overall effect of the policies on net-buying smallholders and urban consumers would be positive. Millers and traders may also benefit from a shift to the proposed alternative policies.

Under the alternative policies, the fiscal burden on the Zambian Treasury would be reduced due to less involvement by the FRA. Although a transition to this alternative set of policies might initially cost the government some political capital, in the long-run, with better outcomes for more constituent groups, government can take credit for improving smallholder and urban consumer welfare in Zambia. This loss of political capital could also be mitigated by an effective outreach campaign aimed at educating the public about the benefits of this new policy approach.

Beyond the alternative policies outlined in the paper to help government better manage a bumper crop in future years, there are other complementary policies and investments that could help government to avoid having more maize than it can find markets for and to improve the profitability of maize production for farmers and keep food prices low for urban consumers. Raising productivity on-farm and throughout the maize value chain is one such strategy. Promoting crop diversification and a more demand-driven mentality on the part of large-scale farmers and commercially oriented smallholders (“producing *for* the market, not *to* market”) could help avoid unmanageable maize surpluses in the future. Finally, there may be opportunities for profitable investments in maize processing and value-addition in Zambia, which could provide other uses for Zambian maize.

Ultimately, Zambian farmers should be congratulated for their accomplishments this year. There are alternative strategies that government could use to ensure that Zambians reap the full benefits of bumper crops in the future.

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ACRONYMS

ACTESA	Alliance for Commodity Trade in Eastern and Southern Africa
ADB	African Development Bank
AFRE	Department of Agricultural, Food and Resource Economics
AMIC	Agricultural Marketing Information Center
CFS	Crop Forecast Survey
CMACS	Copperbelt Mining, Agricultural and Commercial Show
COMESA	Common Market for Eastern and Southern Africa
CSO	Central Statistical Office of Zambia
DRC	Democratic Republic of Congo
FAO	Food and Agricultural Organization
FEWSNET	Famine Early Warning Systems Network
FRA	Food Reserve Agency
FSRP	Food Security Research Project
GRZ	Government of the Republic of Zambia
GMO	Genetically Modified Organisms
KG	Kilogram
K/ZMK	Zambian Kwacha
MACO	Ministry of Agriculture and Cooperatives
MAZ	Millers Association of Zambia
MSU	Michigan State University
MT	Metric Tonnes
NAMBOARD	National Agricultural Marketing Board
NAPSFZ	National Association of Peasant and Small-Scale Farmers of Zambia
OVO	Offer Volume Only
SAFEX	South African Futures Exchange
SIDA	Swedish International Development Agency
USAID	United States Agency for International Development
US\$	United States Dollar
ZACA	Zambia Consumers Association
ZAMACE	Zambia Agricultural Commodity Exchange
ZNFU	Zambia National Farmers Union

1. INTRODUCTION

At nearly 2.8 million MT, Zambia's 2010 maize harvest is unprecedented. The bumper crop is expected to improve food security for the vast majority of smallholders and urban consumers in Zambia. Public markets are currently well stocked with maize as a result of the bumper crop (FEWSNET 2010a). Farmers that have been able to sell maize to the Food Reserve Agency (FRA) have benefited from the high price offered by the Agency this year. At K1,300/kg, the FRA price is well above prices in wholesale markets in Zambia, which ranged from K600/kg to K900/kg from May to September 2010. The FRA's high buy price and purchase of nearly 900,000 MT of maize are also likely to have put upward pressure on maize market prices. As a result, smallholders and large-scale farmers who sold maize to private sector buyers may have also benefited indirectly from the FRA's activities.

Despite these benefits, the 2010 maize bumper crop has raised a number of thorny challenges for the Zambian government (GRZ). First, the large quantity of maize purchased by the FRA at the high FRA price is a huge budgetary cost to the Zambian Treasury. FRA estimated purchases are 878,570 MT or 83% of expected maize sales by smallholders during the 2010/11 marketing year. At K1.3 million/MT, the cost of purchasing grain alone was approximately K1.14 trillion. With other costs included such as transportation, financing, storage and other logistical costs, the total cost may well exceed K1.5 trillion.² Given the high FRA purchase price relative to market prices and these additional handling costs, the Agency will have difficulty recovering its costs through maize sales in Zambia or in regional export markets. However, the K1.4 trillion in loans obtained by the FRA to finance the maize purchase exercise will have to be repaid, and much of the burden is likely to fall on the Treasury, which only budgeted K100 billion in 2010 for FRA's activities.

Second, there is the threat of major losses due to spoilage. Storage at the household level is generally poor and the FRA has inadequate storage capacity to accommodate the maize it has purchased this year plus carryover stocks from last year (FEWSNET 2010a). FRA facilities can house 1.2 million MT of maize but 40% of this capacity is currently leased to the private sector, leaving 720,000 MT of space for FRA stocks. To increase its storage capacity, the FRA is renting storage space for at least 98,000 MT and has spent US\$11 million on the construction of storage sheds.³ The Agency has also purchased tarpaulins to cover the grain in some areas without sheds. Despite these efforts, storage is inadequate for FRA stocks and at the household level, and there is a high probability of large losses as the 2010/11 rains set in.⁴

Third, Zambia has had difficulty exporting maize despite the record surplus. The 2010 maize harvest was generally good in most countries in the southern Africa region. However, Zimbabwe, DRC, and the structurally grain deficit countries (Botswana, Lesotho, Namibia, and Swaziland) face maize deficits, which present export opportunities for Zambia (FEWSNET 2010b). Unfortunately, the FRA buy price has made Zambia a high-cost supplier

² To put this number in perspective, consider that the entire Zambian government budget is K16.7 trillion in 2010 and K20.5 trillion in 2011.

³ As of 3 December 2010, GRZ was in talks with cooperating partners to obtain an additional US\$50 million for constructing storage sheds throughout the country (Chitala 2010).

⁴ Zambian newspapers have already reported numerous cases of spoilage. In mid-November, *The Post* reported that some maize held by FRA in Monze and Kalomo had gone to waste (Bupe and Kapekele 2010). In early December, *The Post* reported that "in most areas [where FRA has not yet transported maize to holding depots], such as Chongwe, Chisamba and Southern Province, there have been cases of maize getting soaked and thereafter germinating because it was not secured" (Mwenda 2010).

compared to South Africa. Based on AMIC wholesale prices in Lusaka and Ndola, it appears that Zambian maize purchased at market prices would be competitive with South African maize landed in Harare and Lubumbashi but, to date, very little maize has been formally exported by the private sector.⁵ At the higher FRA price of K1,300/kg, the FRA will have to heavily subsidize exports in order for Zambian maize to be competitive in these markets.⁶

Fourth, large carryover stocks into 2011 could discourage maize production by large-scale farmers and commercially oriented smallholders. The FRA is expected to have large carryover stocks going into 2011, given sufficient domestic stocks and limited exports. Large carryover stocks are likely to depress maize prices during the next marketing season. This could discourage maize production by large-scale farmers and commercially oriented smallholders. However, with elections slated for 2011, farmers might expect the FRA to continue to purchase large quantities of maize at above-market prices. For this reason, commercially oriented farmers may not reduce maize production despite large carryover stocks. Nevertheless, the discretionary approach to grain procurement by the Zambian government through the FRA may have long-run negative effects on private sector participation in maize marketing.

In light of the challenges posed by the 2010 maize bumper crop, the purposes of this paper are to discuss the likely impacts of the policies adopted by GRZ this year and to propose alternative approaches GRZ could use to cope with a maize bumper crop in future years.⁷ More specifically, the paper's two objectives are: (1) to explore the likely distributional effects (current and dynamic) of the GRZ maize marketing policies used to date during the 2010/11 marketing season on different stakeholder groups (large-scale farmers, surplus smallholder producers, deficit smallholder producers, smallholders that neither buy nor sell maize, urban consumers, millers, traders, and government); and (2) to consider alternative policy scenarios and/or instruments for managing a bumper crop in future surplus years and to explore their likely distributional effects.

The rest of the paper is organized as follows. Section 2 describes the key aspects of the 2010/11 maize marketing season and presents the likely distributional effects of GRZ maize marketing policies on the various stakeholder groups. The third section proposes alternative policies and their likely distributional effects, and section 4 concludes by presenting the lessons learned and the implications for maize marketing policy in future bumper harvest years.

⁵ Evidence for this claim and potential reasons for limited private sector exports are presented below.

⁶ The Zambian popular press has noticed these difficulties. For example, the editor of the *Zambia Weekly* electronic magazine, Camilla Hebo Buus, wrote in mid-November, "The national food balance sheet for 2010/11 indicates that Zambia needs 1.3 million tons for human consumption and 230,000 tons for industrial use. This leaves Zambia with a surplus of 1.27 million tons of maize – not including the stocks from last year. But what are we going to do with 1.27 million tons? Export it? Unlikely! After all, the rest of Southern Africa has also reaped well, since rain does not respect borders. We also have the problem that the Food Reserve Agency is buying the maize – so far, it has bought 873,779 tons – at a price far above market price, which makes it rather difficult to sell later on. Surely, the bumper harvest should not be used to subsidise the rest of the region?" (Buus 2010: 1).

⁷ See Burke, Jayne, and Chapoto (2010) for analysis of the factors contributing to the 2010 maize bumper crop including unusually favorable rains during the 2009/10 growing season and an increase in fertilizer use. In 2009/10, GRZ distributed 100,000 MT of subsidized fertilizer to farmers through its Farmer Input Support Programme to promote maize production and marketed supplies.

2. THE 2010 MAIZE MARKETING EXPERIENCE

The 2010 maize crop is one of the largest recorded by Zambia in recent history. The 2009 harvest was also good but the 2010 crop exceeded it by 48%. Crop Forecast Survey results for 2010 suggest that the nationwide total production for maize was 2,770,063 MT with smallholders producing 2,463,523 MT (89%) and the remaining 306,540 MT (11%) produced by large-scale commercial farmers. In addition, there were 298,681 MT of carryover stocks from 2009, bringing the total available maize stocks to 3,064,774 MT. The National Food Balance for Zambia for the 2010/11 marketing season estimated that the requirements for maize domestic consumption would be 2,008,455 MT, leaving an exportable surplus of 1,060,289 MT. Of the total 2010 maize harvest, smallholder farmers expect to sell 1,062,010 MT and large-scale farmers expect to sell 280,995 MT, bringing total expected sales to 1,342,995 MT.

2.1. Maize Marketing Environment in 2010⁸

The Zambian government influences the dynamics of maize markets in numerous ways. In the last six years, the Mwanawasa and subsequent Banda administrations have progressively introduced greater state intervention in food marketing and trade (Abbink, Jayne, and Moller 2010). This is particularly the case for maize. Indeed, private sector participation in maize markets now largely depends on price and quantity purchasing decisions made by the FRA. While some stakeholders pushed for an FRA price of as high as K85,000, in May 2010 the FRA announced that it was going to purchase maize at K65,000 per 50kg bag or US\$262 per ton.⁹ Given the world price of US\$160 at the time of this announcement, the FRA price was considerably higher and not favorable for private sector players. As depicted in Figure 1, if transportation and other marketing costs were added to the FRA buy price of K65,000, then FRA-priced maize would have been more expensive than South African maize landed in Lusaka throughout the 2010 marketing season. This means that millers could obtain maize more cheaply from South Africa than from the FRA unless the Zambian Treasury subsidizes the FRA's sale price. The FRA buy price is also well above the wholesale market price in Lusaka. This high FRA price may have attracted informal maize imports from Mozambique and Tanzania.¹⁰

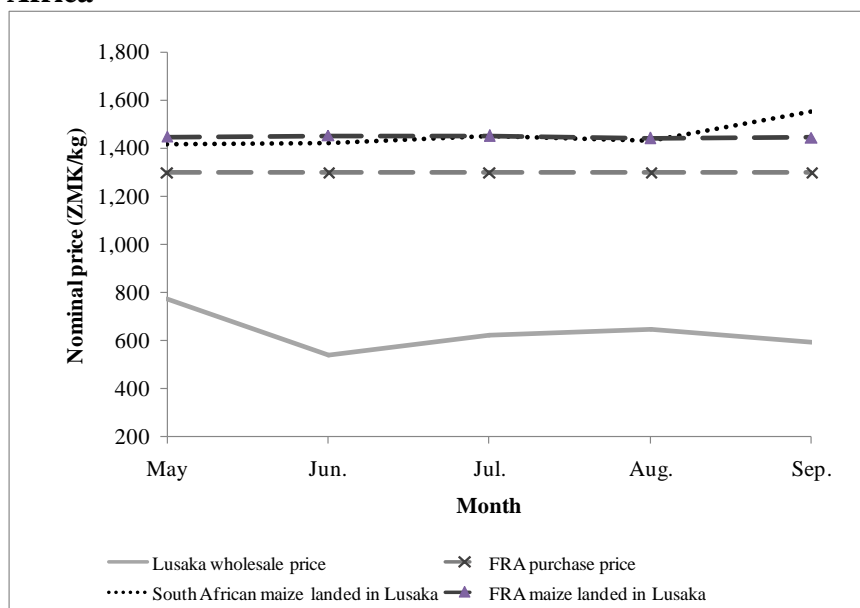
Not only is the FRA price high relative to imports from South Africa and to wholesale market prices in Zambia, but the high FRA price and large FRA purchases may also have put upward pressure on market prices in Zambia. As a result, market prices in Zambia have likely been higher this marketing season than they would have been in a bumper crop year without such heavy FRA involvement. A high FRA price relative to the market price and large quantities purchased by the Agency mean lower maize supplies in private sector markets. All else equal, this would result in higher private sector prices. Empirical evidence from Kenya supports this claim. Analysis by Jayne, Myers, and Kyoro (2008) shows that the activities of the Kenyan maize marketing board (the National Cereals and Produce Board), which buys maize at above-market prices and sells maize at subsidized prices, raised market price levels by approximately 20% between 1995 and 2004. The FRA's activities are expected to have similar effects on market prices in Zambia.

⁸ See Table A1.1 in Appendix 1 for a timeline of key events in the 2010 maize marketing season through early December.

⁹ The monthly ZMK/USD exchange rate for May 2010 was K4,951 to US\$1.

¹⁰ Indeed, FEWSNET cross-border trade data show an increase in informal imports from Mozambique and Tanzania beginning in May 2010.

Figure 1. Nominal Maize Prices for the Period May to September 2010 at Lusaka Wholesale, FRA Purchase Price and Landed Price of Maize Imported from South Africa



Source: AMIC, SAFEX, FRA.

Note: The price of South African maize landed in Lusaka is calculated as the monthly SAFEX spot price plus US\$140/MT for transportation from Johannesburg to Lusaka and other costs. Transportation costs are estimated at US\$78/MT and other costs (a non-genetically modified organism (GMO) premium, South African export permit and clearing fees, financing, and insurance) are estimated at US\$62/MT. Cost estimates are based on figures obtained from CHC Commodities, November 2010. The price of FRA maize landed in Lusaka is calculated as the FRA buy price (K65,000 per 50-kg bag) plus US\$30/MT transportation costs.

Upon announcing its buy price for 2010, FRA made an initial commitment to buy 300,000 MT and encouraged the private sector to purchase the rest of the marketable surplus. However, the FRA made an upward adjustment to its target volumes on two occasions. Following a pronouncement by the Republican Vice President in late May that government would buy all of the surplus maize, the FRA increased its target to 700,000 MT, and then later to 1 million MT. Ultimately, the Agency purchased close to 879,000 MT by the end of October. Changes in FRA purchase plans over the course of the marketing season created an atmosphere of uncertainty among private sector market participants. Government actions (setting a very high purchase price and sending mixed signals about its intended purchase quantities) undermined its own calls for the private sector to help ‘mop up’ the surplus. As a result, Government had to shoulder more of the burden of securing the harvest.

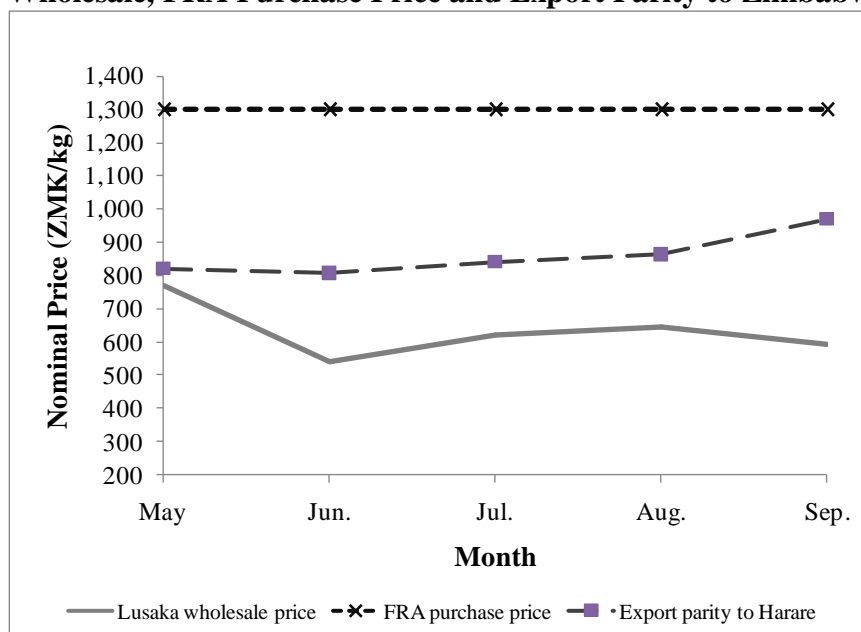
With the FRA purchasing 83% of smallholders’ expected marketed maize, there was very little room left in the market for private traders to buy from smallholders. Millers, traders, brewers, and stock feed companies have also bought less maize this year than in previous years. By mid-October, it was estimated that the entire private sector (millers, traders, brewers, and stock feed companies) had purchased only about 60% of their normal requirements for the marketing year. This means that private players still need to purchase approximately 300,000 MT to meet their requirements. Going forward, millers and others will have to source grain from farmers, from private traders, and/or from the FRA once it begins offloading maize on the domestic market. If private players expect FRA to sell maize at subsidized prices (which is likely given how high the FRA price is relative to the market

price and landed price of maize from South Africa), they may be willing to wait for FRA sales rather than buy maize from farmers or private traders.

Another crucial aspect pertaining to the maize marketing environment in 2010 is Zambia's competitiveness in potential export markets such as Zimbabwe and Democratic Republic of Congo (DRC) given the exportable surplus of 1,060,289 MT. To date, very little maize has been formally exported by the FRA or by the private sector. This is in spite of the fact that there has been no export ban since July 2009 and export permits have not been restricted since the export ban was lifted (FEWSNET 2010a).

Because of the high price at which the FRA has procured maize in 2010 (compared to market prices in the region), FRA maize has become uncompetitive for export. Figures 2 and 3 show the competitiveness of Zambian maize in two potential export markets: Zimbabwe (Harare) and DRC (Lubumbashi). If Zambia considers exporting maize to Zimbabwe, exports would have to be priced at or below the export parity price, which ranges from K800/kg to K1,000/kg, in order to compete with South African maize. Using the FRA price of K1,300/kg, this export decision would prove to be a loss-making venture since the export parity price is lower than the FRA purchase price (Figure 2). However, if the exporter purchased maize at the lower wholesale price in Lusaka, exporting Zambian maize would be a worthwhile proposition. The situation is similar for DRC except that since mid-August, the export parity price in Lubumbashi has been higher than the FRA price, making Zambian maize competitive in Lubumbashi even at the high FRA price (Figure 3).

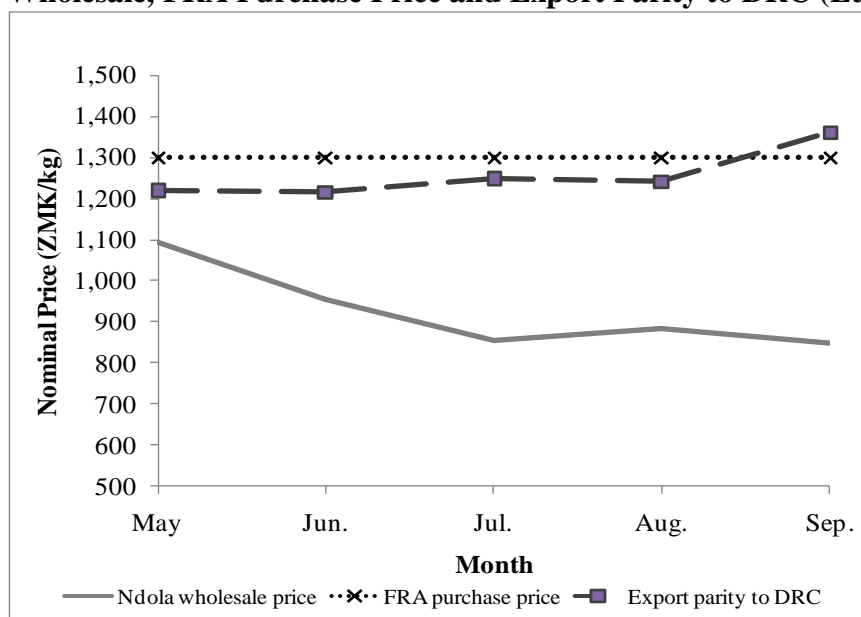
Figure 2. Nominal Maize Prices for the Period May to September 2010 at Lusaka Wholesale, FRA Purchase Price and Export Parity to Zimbabwe (Harare)



Source: AMIC, SAFEX, FRA.

Note: Export parity to Harare (per ton) determined using the monthly SAFEX futures prices plus \$70 per ton for transport from Johannesburg to Harare minus \$50 transport from Harare to Lusaka.

Figure 3. Nominal Maize Prices for the Period May to September 2010 at Ndola Wholesale, FRA Purchase Price and Export Parity to DRC (Lubumbashi)



Source: AMIC, SAFEX, FRA.

Note: Export parity to Lubumbashi (per ton) determined using the monthly SAFEX futures prices plus \$190 per ton for transport from Johannesburg to Lubumbashi minus \$90 transport from Lubumbashi to Lusaka.

Even though Zambian maize purchased at the market wholesale price appears to be competitive with South African maize in Harare or Lubumbashi, there have been virtually no formal exports by the private sector so far this year. (Since April 2010, Zambian traders have *informally* exported approximately 1,350 MT of maize per month, mainly to the DRC (FEWSNET 2010c).) Interviews with large formal sector traders indicate two main reasons for the lack of formal private sector exports so far this year. First, the ever-changing quantities of maize the FRA announced that it would purchase sent signals throughout the region that private buyers in Zambia may not actually be able to meet the terms of an export contract. Traders in Zambia could enter into a contract but if FRA ended up squeezing them out of the market, then they may not actually be able to procure the needed quantities stated in the contract at the determined price. Zambian private traders are therefore seen as unreliable suppliers relative to South Africa, primarily due to the FRAs actions in the market.

Second, the perception that Zambian traders are unreliable partners is exacerbated by the FRAs current process of releasing stocks for export to private traders. Once a tender is won, FRA may take weeks to release the stocks. Moreover, the costs associated with meeting export requirements (e.g., sanitary and phytosanitary certification) are high. Thus, buyers in other countries who have locked in a purchase at a particular price (and interest rate) find that they are not receiving the shipment for several months. By the time the shipment is received, prices have changed and interest charges have accrued.

Beyond these two reasons, there may be other factors constraining private sector participation in formal export markets. First, the transactions costs associated with formal exports are high and therefore a barrier for those considering exporting. Issuance of export permits for maize

is only done in Lusaka, which increases transactions costs for potential exporters, especially those coming from outside the capital. Customs-related delays at border points are also common.

Second, many informal private sector players may lack the capacity to engage in formal export markets. Some traders interviewed in Choma indicated that formally exporting maize is not an option and that they view exports as the role of the government. They consider formally exporting maize to be beyond their current capabilities. They do not know or understand the process of obtaining permits and have not explored potential markets in Zimbabwe.

Third, production in the region has been relatively good in 2010 with countries such as Kenya, Uganda, Malawi, Mozambique, and South Africa recording surplus production. This limits the number of countries to which Zambia can export. Fourth, traders' low engagement in export markets may be related to trade policy uncertainty. The government of Zambia has announced export bans in recent years. Large traders sourcing maize in anticipation of export could be very adversely affected by a sudden policy restriction on exports.

Due to the uncertainty of the market, in terms of price and available quantities, and the limited ability of traders to enter into export contracts (for reasons stated above), most traders concentrated their efforts this year on meeting local contract and demand. This involved quick turnovers of stock and limited storage. Traders did not want to expose themselves to the risks associated with sitting on large stocks.

The FRA itself has also had difficulty securing exports markets so far this year. Eighty two thousand MT were exported to Zimbabwe in October at US\$226-236/MT at a financial loss of at least \$90 on every ton. In early November, the Agency sold 2,950 MT for export to Zimbabwe through the Zambia Agricultural Commodity Exchange (ZAMACE) at US\$200/MT. FRA offer volumes posted on ZAMACE in mid-November for the sale of 7,050 MT for export and 10,000 MT for the domestic market have received bids in the range of US\$161-166/MT and US\$150-196/MT, respectively. Compared to the FRA buy price of K1.3 million/MT or US\$270/MT at an exchange rate of K4,820/US\$, the FRA is losing US\$34-120/MT when it sells at US\$150-236/MT. If additional costs such as transportation from satellite depots to main depots, storage, bagging, finance charges, and other logistics costs are included, the 2010 maize purchase exercise has cost the FRA US\$327/MT as of November (see Tables A2.1 and A2.2 and Box A2.1 in Appendix 2 for details on the estimate of US\$327/MT). At this rate, the Agency is losing US\$91-177/MT when it sells at US\$150-236/MT.¹¹ Because the FRA has been willing to export maize at a financial loss in order to unload its own stocks, export-marketing opportunities for private traders have been very limited. In this way, government policies have discouraged the private sector's involvement in exportation that otherwise could have relieved the national surplus without imposing major financial losses on the Treasury.

¹¹ Chongwe Constituency Member of Parliament Sylvia Masebo took MACO to task in mid-November, asking the Ministry to clarify its position on maize exports and explain why it was exporting maize at a loss: "Why should we subsidise foreign countries? ... This is a very serious matter, there is no way we can produce maize at a high cost and sell for half the price", she said (Bupe 2010). *The Post* also reported that Alliance for Democracy and Development president Charles Milupi "challenged the government to explain where they would get the money required to subsidise maize exports." Maize is locally being bought at close to US\$400 per tonne but government wants to export at US\$200 per tonne. Now, where will government get money to subsidise the intended exports?" he wondered" (ibid).

Box 1 summarizes the key features of the maize marketing policy environment in Zambia in 2010.

Box 1. Key Features of Actual GRZ 2010 Maize Marketing Policies and Alternative Policies to Manage a Maize Bumper Crop in Zambia

Key Features of GRZ Maize Marketing Policies in 2010

- FRA buy price of K65,000 per 50-kg bag, well above market prices in Zambia and higher than the landed cost of maize from South Africa when marketing costs are added to GRZ buy price.
 - FRA buys 878,570 MT or approximately 83% of smallholder expected maize sales. High cost to Zambian Treasury and taxpayers. FRA purchase targets adjusted upward throughout marketing season, creating uncertainty for and crowding out private buyers.
 - High FRA price and quantities purchased put upward pressure on market prices (market price levels probably higher than they would have been without FRA involvement).
 - Maize exports to DRC and Zimbabwe not competitive at the FRA price of US\$270/MT (K1.3 million/MT). With transportation, storage, and other costs included, FRA spending US\$327/MT to buy maize. FRA exports maize at US\$150-236/MT, so losing US\$91-177 on each ton sold. High cost to Zambian Treasury and taxpayers.
 - Export permits not restricted but little private sector participation in formal exports. Zambian maize bought at prevailing wholesale market prices competitive with South African maize landed in Harare or Lubumbashi but uncertainty over FRA/GRZ policies, high transactions costs, and lack of experience with formal exports constrain private sector participation.
 - Large FRA carryover stocks into 2011 could depress prices and discourage maize production by large-scale farmers and commercially oriented smallholders. High risk of spoilage due to inadequate storage for FRA stocks and at the household-level.
-

An alternative set of policies to manage a bumper harvest in future years

- Rules-based GRZ/FRA operations and a return of FRA to its core goal of stabilization of national food security and maize market prices, for example:
 - GRZ uses a strategic grain reserve and price band system to help cope with food emergencies/supply shortfalls and to stabilize market prices
 - GRZ establishes and announces maize floor and ceiling prices (“price band”). Prices set with consideration of prevailing market prices, import and export parity prices, and expected production and demand based on Food Balance Sheet/Crop Forecast Survey results and other relevant information. Floor and ceiling price levels may differ by region/location.
 - FRA purchases triggered if market price falls below floor price in a given location.
 - FRA stocks released on market if market price rises above ceiling price in a given location.
 - Additional purchases (sales) on the local market and imports (exports), all in partnership with the private sector, used to add to (reduce) FRA stocks to maintain the target level of strategic reserves.
 - In bumper harvest year, if GRZ not comfortable with unrestricted private sector exports, could establish and announce an export quota for private sector exports as early as possible and not reduce it during the course of the marketing year.
 - Create an enabling environment and build capacity for private sector participation in exports, for example:
 - Reduce transaction costs associated with obtaining proper paperwork for formal exports (e.g., decentralize issuance of export permits and phytosanitary certificates).
 - Reduce bottlenecks at border points (e.g., as has been done with Chirundu one-stop border post)
 - Educate prospective private sector exporters on export requirements, procedures.
 - Explore opportunities for public-private partnerships for exports.
 - Consistent policies year-on-year with respect to export rules and regulations, thereby allowing private sector to gain experience and confidence, and to develop relationships with contacts in potential importing countries
-

Table 1. Distributional Effects of the 2010 GRZ Maize Marketing Policies and of Proposed Alternative Maize Marketing Policies during a Bumper Harvest Year

<i>Stakeholder groups</i>	Policy scenario		Proposed alternatives General distributional effects
	<i>Immediate</i>	<i>Dynamic</i>	
Large-scale farmers	+	-	+
Smallholders:			
Net maize sellers	+	+/-	+
Neither buy nor sell maize	0	0	0
Net maize buyers	-	-	+
Urban consumers	-	-	+
Millers	?	?	+/?
Traders	-/?	?	+
Government	+	-	+/-

Note: + positive effect, - negative effect, 0 no effect, and ? no clear positive or negative effect. Based on 2008 CSO/MACO/FSRP Supplemental Survey results, 26% of maize-growing smallholder households in Zambia are net-maize sellers (sell more than they buy), 36% are net-maize buyers (buy more than they sell), and 38% neither buy nor sell maize.

2.2. Distributional Effects of 2010 Policies on Stakeholders

The maize marketing policies used by GRZ during the 2010 marketing year are likely to have different effects on various stakeholder groups in Zambia. Table 1 summarizes the likely distributional effects of these policies and of an alternative set of policies to manage a bumper harvest in future years. (The dimensions of the alternative policy scenario are summarized in Box 1 and will be described in detail in section 3 below.)

The maize marketing policies employed by GRZ in 2010 are likely to have varying effects across stakeholder groups and in the short term (immediate) versus the medium term (dynamic). Our assessment of the distributional effects begins with the large-scale farmer group. The immediate effect of the 2010 maize marketing policies on large-scale farmers is most likely positive. Farmers in this category who sold to FRA are winners due to the high FRA buy price. The high FRA price and purchase quantities are also likely to have put upward pressure on market prices. Therefore, large-scale farmers selling to private traders would have also benefited (indirectly) from the FRA's actions. In the medium-term, however, the effects of the GRZ policies on large-scale farmers are likely to be negative. The bumper crop and minimal exports have led to an increase in supply of maize in the domestic market. With increased domestic supply and large FRA carryover stocks into 2011, large-scale farmers may be concerned that maize prices will be low in the next marketing year. Therefore, they may consider reducing the area cultivated to maize during the 2010/11 agricultural season.

The immediate effect of the 2010 maize marketing policies on net-maize selling smallholders is mainly positive. Based on results from the 2008 Supplemental Survey conducted by the Central Statistical Office (CSO) and Ministry of Agriculture and Cooperatives (MACO) in conjunction with the Food Security Research Project (FSRP), approximately 26% of smallholder households (33% of maize-growing smallholders) fell into this category during the 2007/08 marketing year. Thirty six percent of smallholder households (45% of maize-growing smallholders) expected to sell maize during the 2010/11 marketing year according to the 2009/10 Crop Forecast Survey (CFS). (The percentage of *net*-maize selling households

cannot be computed for 2010/11 because the CFS does not collect information on maize grain and meal purchases by smallholder households.) As in the case of large-scale farmers, the high FRA price and purchases are likely to benefit net-maize-selling smallholder farmers who sell to the FRA and receive the high FRA price directly. Smallholders selling to private traders are also likely to have been positively affected by the FRA's operations, to the extent that market prices are higher than they would have been in the absence of the FRA's heavy purchase operations. However, the FRA has been slow to pay smallholders for the maize they sell to the Agency. This may have caused cash-flow problems and consumption shortfalls for such households and/or disrupted or delayed their preparations and input purchases for the 2010/11 agricultural season. In general, however, it appears that most farmers selling maize have benefited from the government's high price policy in 2010.

However, most smallholder farmers in Zambia are not surplus maize producers. For this reason, the benefits from higher maize prices have accrued to a relatively small share of households within the smallholder farm sector. Data are not yet available on the percentage of net-maize-selling smallholder households that sold to the FRA during the 2010 purchase exercise. However, results from two separate nationally-representative household surveys covering the 2007/08 and 2009/10 marketing years, respectively, suggest that only about 30% of maize-selling smallholders or 11% of maize-growing households sell to the FRA *regardless of the scale of the FRA purchases*. CSO/MACO/FSRP 2008 Supplemental Survey results indicate that 31.5% of smallholder net-maize-sellers sold to the FRA during the 2007/08 marketing year. The FRA purchased nearly 400,000 MT or 52% of smallholder marketed maize that year. Data collected on the 2009/10 CSO/MACO Crop Forecast Survey indicate that 29.1% of maize-selling smallholders sold to the FRA during the 2009/10 marketing year. The FRA purchased approximately 200,000 MT or 32% of smallholder marketed maize that year. Thus, despite the fact that total FRA purchases in 2007/08 were double their levels in 2009/10, the percentage of smallholder sellers selling to the FRA was only slightly higher in 2007/08 than in 2009/10. Assuming a similar pattern held during the 2010 FRA purchase exercise, the majority of smallholder sellers (~50-70%) probably did *not* sell maize to the FRA and therefore did *not* benefit directly from the high FRA price and purchases.

Not only do a small percentage of smallholder households sell maize to the FRA, but also most of the volumes sold are coming from an even smaller group of relatively well-off smallholders. During the 2007/08 marketing year, just 2.5% of maize-growing households accounted for 50% of all smallholder marketed maize (to FRA and private sector buyers) (Kuteya et al. 2010). This group of 2.5% of maize-growing households accounted for 55.1% of all smallholder maize sales to the FRA. In addition, within this group, 71.3% of the maize sold to FRA came from relatively better off smallholder households that cultivated 5 to 20 hectares (medium-scale households). Non-land assets are also much higher among these medium-scale households than among those cultivating less than 5 hectares. In other words, the direct benefits of the high FRA price in 2007/08 accrued to a tiny sliver of the total smallholder population, specifically those households with more land and non-land assets. A similar pattern is likely to hold in 2010. 4.1% of maize-growing households account for 50% of 2010/11 marketing year expected smallholder maize sales according to the 2009/10 CFS. This small group of households is also likely to have accounted for the majority of maize sales to the FRA during its 2010 maize purchase exercise. Because sales to the FRA are highly concentrated among a small, relatively well-off group of smallholders, when the FRA buys more maize, many of those same households sell more to the FRA and very few 'new' smallholder maize sellers join the ranks of sellers to the FRA and benefit directly from the high FRA price.

The highly concentrated group of smallholders that accounts for the majority of maize sales to the FRA tends to be in a better economic position than other small- and medium-scale farmers, and can therefore more easily withstand the delays in payment that plague sales to the FRA. The majority of net-sellers do not have this luxury. Due to limited access to credit and capital constraints within the smallholder sector, many net-sellers require immediate cash payment for their maize sales in order to generate revenue to purchase inputs, prepare land, and meet other pressing financial demands.

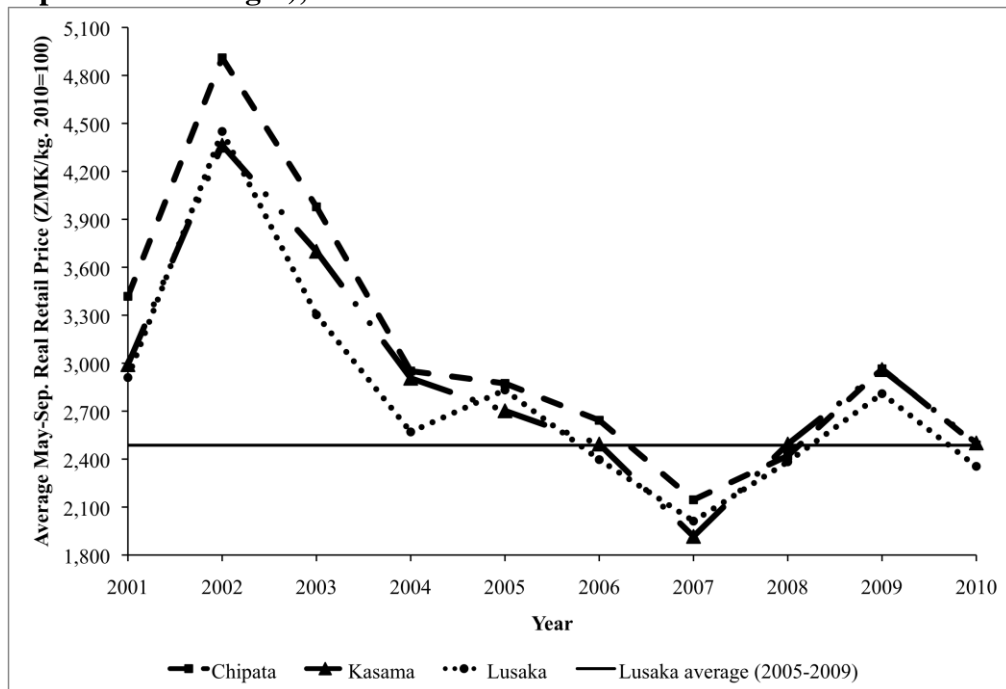
A potentially negative effect of the 2010 maize marketing policies on surplus smallholders is that the FRA's crowding out of private sector buyers and the unfavorable policy environment for private sector exports may have stranded some surplus smallholders with maize to sell but no market for it. Because the FRA purchase targets were progressively increased during the course of the buying exercise, private traders' entry into the market to start their own buying campaigns was progressively delayed. The uncertainty associated with the magnitude and timing of FRA's operations in the market effectively crowded out private traders' participation in the market, which in turn exacerbated many farmers' access to markets who could not sell their maize to the FRA. Furthermore, due to the FRA's activities and high transactions costs and uncertainty surrounding buying maize for export, private traders generally only buy maize to be sold on the domestic market (to millers, brewers, stockfeed companies, etc.), and not for export. Private traders would likely buy more from smallholders if formal private sector exports were considered an attractive opportunity. Hence, GRZ/FRA policies and activities may have caused private traders to scale back or withdraw from maize purchase operations in some areas and may have thereby exacerbated access to markets for households that cannot sell to the FRA.

The expected dynamic effect of the 2010 maize marketing policies on smallholder net-sellers is mixed. Net-maize-selling smallholders with good returns this year may be motivated to plant more maize during the 2010/11 season if they anticipate high FRA prices and purchases again in 2011. A negative dynamic effect could result if surplus smallholders are concerned that prices in 2011 will be low because of large carryover stocks and therefore plant less maize. Furthermore, FRA's activities may stifle future private sector investment in maize assembly, which could have consequences for farmers' access to markets in future seasons.

The current maize marketing policies are unlikely to have any immediate or dynamic effects on smallholder households that neither buy nor sell maize, which represented the 38% of smallholders during the 2007/08 marketing year (CSO/MACO/FSRP 2008 Supplemental Survey data, "SS08").

The FRA's operations in 2010 are expected to adversely affect those who buy maize. This includes net-maize buying smallholders (36% of smallholder households fall into this category according to SS08) and urban consumers. Although the bumper harvest entails increased availability of maize for the production of mealie meal, the high FRA buy price and large FRA purchases are likely to have raised private sector maize prices above what they would have been without FRA involvement. As a result, maize meal prices are also likely to be higher than they would have been in a bumper crop year with less FRA market participation. The price-raising effects of the FRA's activities effectively transfer income from rural and urban maize purchasing households to a small minority of surplus-producing farmers. According to data collected by CSO, average real retail breakfast meal prices from May through September 2010 in Lusaka, Chipata, and Kasama are comparable to or slightly lower than the 5-year average real retail breakfast meal prices (May through September) for 2005 through 2009 (Figure 4).

Figure 4. Real Retail Breakfast Meal Prices in Lusaka, Chipata, and Kasama (May-September Averages), 2001-2010



Source: CSO.

Note: 2010 May-Sep. average vs. 2005-2009 mean May-Sep. average: Lusaka (2,355 vs. 2,487), Chipata (2,489 vs. 2,609), Kasama (2,501 vs. 2,513).

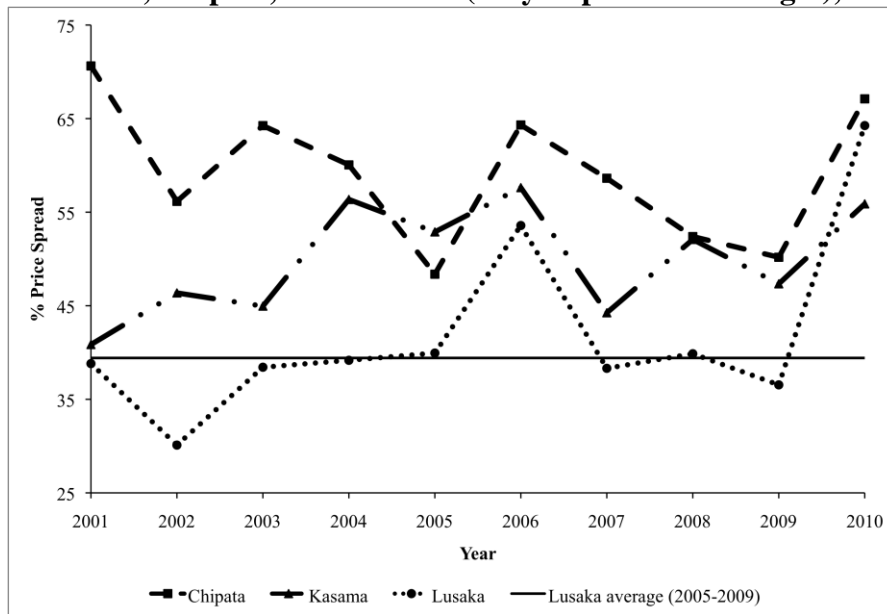
With a record-breaking maize harvest in 2010, real retail breakfast meal prices would probably have been considerably lower in 2010 if the FRA buy price had not been set so high and if the scale of FRA purchases had not been so large.

The dynamic effect of the 2010 maize marketing policies may also be negative on smallholder net-buyers and urban consumers, if large-scale farmers and surplus smallholders produce less maize in 2011 given the assessment of market conditions presented above. If these groups plant less maize, grain and meal prices may be higher in the upcoming marketing year. In this case, the dynamic effect of the 2010 maize marketing policies will be negative on both the net-maize buying smallholders and the urban consumers.

The immediate and dynamic effects of the current maize marketing policy on millers are unclear. From May through September 2010, the average margin between what millers paid for maize (the into-mill wholesale maize grain price) and the retail breakfast meal price was generally higher than the 5-year average retail-wholesale price margin (May through September) for 2005 through 2009. Figure 5 shows these margins in percentage terms (the retail breakfast meal-wholesale maize grain price spread as a percentage of the retail breakfast meal price) and Figure 6 shows the margins in real terms (the retail-wholesale price spread in real 2010 Kwacha). If millers' inflation-adjusted marketing costs in 2010 are comparable to those in previous years, then the higher margins indicate larger profits per kilogram on the part of millers.¹²

¹² However, if real marketing costs were higher this year, some or all of the margin increase may be due to higher costs (rather than larger profits), yet it is not immediately clear what components of millers' costs would have risen dramatically in real terms in 2010 compared to the previous 5 years.

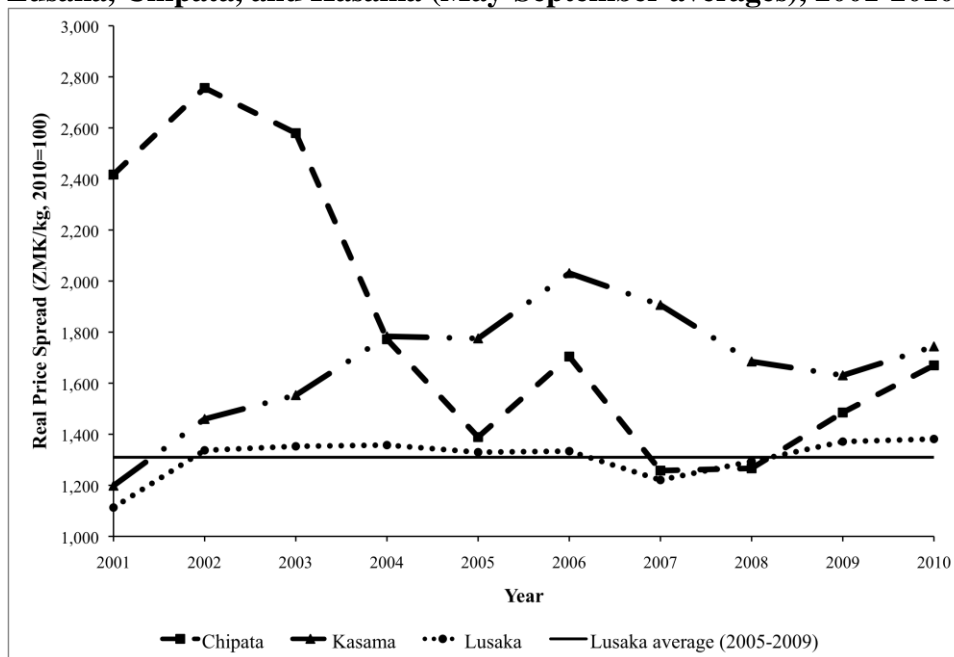
Figure 5. Percentage Retail Breakfast Meal-to-Wholesale Maize Grain Price Margins in Lusaka, Chipata, and Kasama (May-September averages), 2001-2010



Source: CSO and AMIC.

Notes: 2010 May-Sep. average vs. 2005-2009 mean May-Sep. average: Lusaka (64.3% vs. 41.6%), Chipata (67.1% vs. 54.8%), Kasama (55.9% vs. 50.8%).

Figure 6. Real Retail Breakfast Meal-to-Wholesale Maize Grain Price Margins in Lusaka, Chipata, and Kasama (May-September averages), 2001-2010



Source: CSO and AMIC.

Notes: 2010 May-Sep. average vs. 2005-2009 mean May-Sep. average: Lusaka (1,381 vs. 1,310), Chipata (1,670 vs. 1,420), Kasama (1,744 vs. 1,806).

The immediate effects of the 2010 maize marketing policies on traders are potentially negative. Private traders have clearly been crowded out of purchasing maize from smallholders. With the FRA purchasing approximately 83% of smallholders' marketed maize, there is little room left in the market for private traders. Informal interviews with five maize wholesalers in Choma also indicate that private wholesalers in the area bought less from farmers in 2010 than in 2009.¹³ The effects of the FRA's activities on those traders that remained in business this year depend on the volumes they are handling and the profit margins they are earning. Such data are not available so we cannot conclusively say how such traders have been affected. Given the constraints on private sector exports highlighted above, traders may be losing out on potentially profitable export opportunities. And in general, the ad hoc and discretionary nature of GRZ's maize marketing policies and FRA's rapidly evolving target purchase quantities created a great deal of uncertainty for private maize traders in 2010.

In summary, the government's maize marketing policies in 2010 have produced both winners and losers. By raising maize prices beyond what they otherwise would have been in 2010/11, the FRA operations have benefited maize selling farmers. However, these benefits have accrued only to the relatively small proportion of the rural countryside that sells maize. Eventually, rural constituents are likely to appreciate this fact and may call on government to adopt policies with more equitably distributed benefits. In the medium-term, the FRA's operations in 2010 may create political challenges for the government, especially once it becomes more widely apparent that they have imposed upwards of K1.5 trillion on the Treasury.¹⁴ Notwithstanding that the bulk of this money is borrowed, it will be a huge fiscal burden in years to come and will have a major opportunity cost in terms of foregone public investment to support the agricultural sector. Furthermore, there is a high probability that large quantities of the maize purchased by the FRA this year will go to waste, given the lack of adequate storage facilities and the poor prospects for offloading Zambian maize on regional export markets. If large quantities of maize are lost due to spoilage, government will be blamed for mishandling the bumper crop.

¹³ Interviews conducted by Nick Sitko and Bill Burke, both of FSRP, on 5 November 2010.

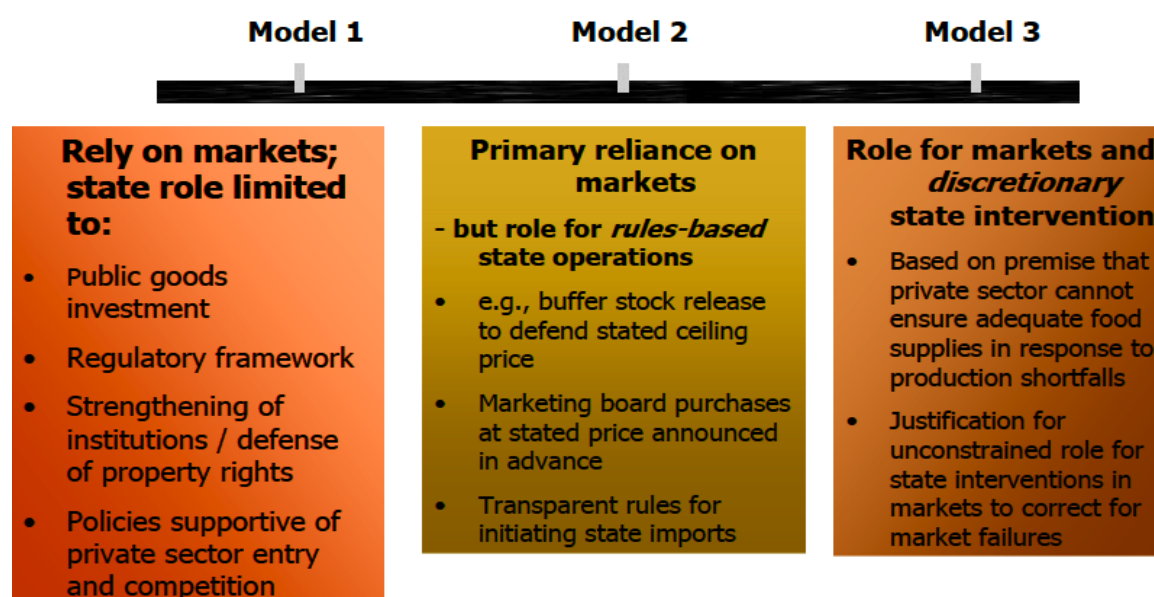
¹⁴ See Appendix 2 for details on the estimated cost of the 2010 FRA maize purchase exercise through November 2010.

3. ALTERNATIVE POLICIES TO MANAGE A MAIZE BUMPER CROP

3.1. Features of the Proposed Policies

As summarized in Figure 7, there are three broad, competing models of the roles of government and the private sector in food markets (Jayne 2010). In Model 1, the role of the state is limited to public goods investments, strengthening institutions and the regulatory framework, and generally creating an enabling environment for private sector participation in food marketing. Under this model, food marketing is mainly the role of the private sector and government does not participate directly in the buying and selling of agricultural commodities. In Model 2, food marketing is still private sector led but there is scope for more direct state involvement in markets under a rules-based system. The goal of Model 2 is to minimize uncertainties that may arise in a system with discretionary (non-rules based) state interventions that discourage private sector participation in food marketing (for example, unpredictable maize pricing and quantities purchased by the FRA). Model 3 has a role for the private sector but food marketing is heavily influenced by discretionary state intervention. Model 1 does not appear to be feasible in Zambia where maize is a highly politicized crop and the cornerstone of the government's *social contract* with the citizenry. Under this social contract, it is viewed as government's role to support smallholder welfare and to keep food prices low for urban consumers (Jayne and Jones 2002; Jayne, Chapoto, and Govereh 2007). Model 3 is similar to the current policy environment in maize markets in Zambia. The current system of government involvement in maize markets generates private sector uncertainties and inaction leading to the need for additional but unplanned government intervention (Abbink, Jayne, and Moller 2010). In this section, we propose alternative policies consistent with Model 2 that policymakers could consider for implementation to address maize marketing challenges in Zambia.

Figure 7. Competing Models of the Roles of Government and the Private Sector in Food Markets



Source: Jayne (2010)

The two main features of the alternative set of policies are: (i) rules-based GRZ/FRA maize marketing operations and the return of the FRA to its core goal of stabilizing national food security and market prices for maize; and (ii) creation of an enabling environment for private sector participation in domestic and export markets. (The proposed alternative policies are summarized in the bottom of Box 1.)

In recent years, and in 2010 in particular, the FRA's operations have been more like those of a maize marketing board than those of a national strategic food reserve. By paying a pan-territorial price well-above market prices and buying the vast majority of smallholders' marketed maize at this price, the FRA's policies this year resemble those of NAMBOARD in the 1980s. If continued in this way, the fiscal burden of FRA's activities will prove too great for GRZ to bear.

We propose that the FRA return to the core of its stated strategic goal, which is “to significantly contribute to the *stabilization of national food security and market prices of designated crops*” (FRA website, emphasis added). We propose that the FRA use a strategic grain reserve and price band system to help cope with food emergencies/supply shortfalls and to stabilize maize prices. Under the proposed alternative, GRZ would establish and announce a maize *price band*, i.e., a maize floor price and a maize ceiling price. These prices should be set with consideration of prevailing market prices in Zambia, import and export parity prices, and expected production and demand based on the Food Balance Sheet, Crop Forecast Survey results, and other relevant information (FAO 1997). FRA maize purchases (sales) on the domestic market would be triggered when market prices in one or more key locations fall below (rise above) the floor (ceiling) price. Additional purchases (sales) on the local market and imports (exports), all in partnership with the private sector, would be used to add to (reduce) FRA stocks to maintain the target level of strategic reserves. The price band system would protect farmers from unreasonably low prices and net-maize buyers (both rural and urban) from astronomical increases in maize grain and mealie meal prices. The strategic grain reserves would enable GRZ to temporarily address supply shortfalls and food emergencies while private traders arrange for imports and/or food aid resources are mobilized (FAO 1997).

Working out the specific details of how the strategic grain reserve and price band system would be implemented is beyond the scope of this paper and the modalities would depend in large part on the specific goals and objectives set by GRZ. However, some important issues to consider include: a) the level and width of the price band; b) the number of locations where the price band would be defended and if the price band would differ across locations; c) the prices at which the FRA would buy and sell maize (e.g., at the floor and ceiling prices, respectively, or at market or other prices); d) how purchases and sales would be made (e.g., directly by the FRA through its own networks or in collaboration with the private sector via contracting agents or a tendering process); and e) the optimal size of the reserve stocks (FAO 1997; Minot 2010). A great deal of research has been done on using price bands to stabilize market prices and much can be learned from this work and from the experiences of other countries that have implemented price band systems.¹⁵

Another element of a rules-based system for maize marketing is consistent government policies with respect to exports during a bumper harvest year. The current environment where policies on exports are not clear makes it difficult for the private sector to participate. Traders

¹⁵ Minot (2010) provides a review of recent experiences with price stabilization policies in eastern and southern Africa. FAO (1997) discusses many issues associated with establishing a strategic grain reserve and using it to pursue price stabilization and to help cope with food emergencies.

who have the capacity to export may be reluctant to engage in international trade due to uncertainty about government actions; some may have tried to export maize in the past but suffered losses due to changes in government policy. To promote transparency and increased private sector participation, an export quota for private sector exports could be announced by government as early as possible. The quota could be increased if deemed appropriate but should not be reduced during the course of the marketing year. Such a system would decrease uncertainty on the part of prospective exporters but also give government some control over the total volume of maize leaving the country while helping it ensure that adequate stocks are available to meet domestic demand. In addition to reducing uncertainty, consistent government policies from year-to-year with respect to exports would give private traders the opportunity to develop relationships with contacts in potential importing countries.

Simulation results in Dorosh, Dradi, and Haggblade (2009) suggest that open borders and using regional trade can significantly reduce maize price and consumption volatility in Zambia. However, open borders may not be politically feasible in Zambia given the highly politicized nature of maize availability and prices (ibid). A quota system might be a politically feasible middle ground between open borders and highly restricted/banned exports or ad hoc government export policies. Under an export quota system, traders would be provided licenses to export up to a specified quantity of maize. In this way, government would be able to regulate the quantity of the marketed maize surplus that is exported under formal trade arrangements.

While clear and consistent policies from government with respect to exports will contribute to a more conducive environment for private exports, additional steps are likely to be necessary for increased private sector participation. For example, given many private traders' unfamiliarity with current export requirements, government could launch educational campaigns to raise awareness of these requirements. There may be scope for public-private partnerships for maize export. Government could also consider revising current export requirements and work to reduce the transactions costs associated with fulfilling these requirements. For example, at present, export permits for maize can only be obtained in Lusaka. Government could consider issuing export permits in more locations throughout the country, particularly in areas from which maize exports are likely to originate. The current process for obtaining phytosanitary certificates for export is also a deterrent for private sector participants and could be streamlined. Even with the proper paperwork, many traders are not convinced that exports would be allowed once maize reaches the border and there are often considerable delays at border crossings. Government has already taken great steps toward facilitating cross-border trade by setting up a one-stop border post at Chirundu. Similar arrangements could be made at other high traffic border points.

3.2. Distributional Effects of the Proposed Alternative Policies on Stakeholders

Table 1 shows the likely effects of the proposed policies for maize marketing in Zambia. Because the alternative policies are designed to stabilize prices within an explicitly stated price band consistent with medium-term average world market prices rather than raise prices substantially above world market prices, the alternative policies would have resulted in somewhat lower maize prices than what has prevailed so far in 2010. For this reason, the alternative policies would not have provided the same income benefits to maize selling farmers as has prevailed in 2010. However, a stable price band system as proposed would positively benefit all farmers through the reduction of price uncertainty. Moreover, facilitation of private sector participation in exports could help move surplus maize out of

Zambia during bumper crop years. This would mitigate downward pressure on producer maize prices as a result of the bumper harvest. Simulations by Dorosh, Dradi, and Haggblade (2009) show that, all else equal, lean season maize prices are 50% lower in a bumper crop year (represented by a maize harvest of 1,229,000 MT) than in an average harvest year (represented by a harvest of 945,000 MT). In contrast, if 200,000 MT (100,000 MT) of maize exports are allowed through an export quota, maize prices during a bumper harvest drop by only 18% (37%).

Smallholders that neither buy nor sell maize would not be affected by the alternative maize marketing policies, as they do not participate in the markets. Net-buying maize smallholders and urban consumers would clearly benefit from lower maize and mealie meal prices. The specified alternate maize marketing policies would have resulted in lower maize prices than those prevailing in 2010, conferring benefits to the millions of urban and rural consumers of maize in Zambia. However, it is possible that the facilitation of export markets under the proposed alternative policies could put upward pressure on prices and hence mitigate some of the price benefits to maize consumers. Nevertheless, an environment of less-constrained trade would contain prices within import and export parity price bands. Therefore, the overall effect of the policies on net-buying smallholders and urban consumers would be positive.

The effect of the specified alternate policies on millers would be relatively neutral compared to the 2010 GRZ marketing policies. Market prices in a bumper crop year are likely to be lower under the proposed alternative system than under the current system of a very high FRA price and FRA purchases of more than 80% of smallholders' marketed maize, but this would not greatly affect millers' margins. Assuming that miller profits are larger in years with relatively low maize prices, millers could be moderately better off under the proposed price band system than the 2010 GRZ maize marketing policies. GRZ facilitation of private sector exports could also potentially open up profitable opportunities for millers to export maize meal to regional markets.

Private traders would be positively affected for several reasons. First, the farmgate and wholesale prices will be lower without a high FRA price, potentially increasing margins for traders. Second, an FRA price comparable to market price levels and lower FRA purchases would also create space for greater market participation by private traders. This in turn could have positive effects for farmers, as investment by the private sector in maize marketing would expand the available market options for farmers, stimulate competition for maize in rural areas, and, thus, push traders further into remote regions to acquire maize. Third, if the environment is conducive for private sector exports, traders who have built their capacity may benefit from opportunities to export to countries with maize deficits.

The government may also benefit from the shift to the alternative policies described above because the fiscal burden will be reduced due to less involvement by the FRA. However, this may initially work to the disadvantage of the government because the decision to participate less directly in the markets might be negatively viewed by some stakeholders. It may give an impression that the government does not care about issues affecting smallholder farmers. But with transparency and predictability in policy, private sector participation would be enhanced and help address maize marketing bottlenecks. What is critical, however, is that there should be better coordination between government and the private sector to ensure maize markets operate efficiently. Moreover, the distributional effects of the alternative set of policies proposed here are generally positive for all stakeholder groups except for government, which may be negatively affected in the short-run. However, in the long run, if most constituents were benefiting from the policies, government would also be better off.

4. CONCLUSIONS AND POLICY IMPLICATIONS

The 2010 maize bumper crop is a significant achievement for Zambia. For maize producing smallholders that harvested more than in past years, household food security is likely to improve. Public markets are currently well-stocked with maize, to the benefit of urban consumers and maize-buying rural households. Smallholders that managed to sell maize to the FRA at its attractive price have clearly benefited. But the policies used by GRZ to handle the 2010 maize bumper crop have produced both winners *and* losers. This paper explored the effects of these policies on different stakeholder groups: large-scale farmers, various categories of smallholder farmers, urban consumers, millers, traders, and government itself. We also discussed alternative policies that the government could consider to manage a bumper crop in future years and how the alternative policies are likely to affect the range of stakeholders in the agricultural sector.

The two major GRZ maize marketing policies used to date in the 2010/11 marketing year are: (1) setting an FRA maize buy price of K65,000 per 50-kg bag, which is well above maize market prices and roughly comparable to the price of South African maize landed in Lusaka (the import parity price); and (2) progressively increasing the FRA's maize purchase targets throughout the course of the Agency's buying campaign and ultimately purchasing 878,570 MT or 83% of expected maize sales by smallholder farmers.

These policies have resulted in the following outcomes. First, the FRA has accumulated massive maize stocks that can only be sold domestically or in regional export markets at a major financial loss. Much of the FRA's maize is at risk of spoilage due to inadequate storage facilities and poor prospects for exports. At the end of the day, the FRA's 2010 operations are estimated to cost the Zambian Treasury nearly K1.5 trillion.

Second, the FRA's activities have put upward pressure on market prices for maize but only a relatively small group of well-capitalized farmers have benefited directly from the high FRA buy price and large volumes purchased and/or indirectly from higher maize market prices. Despite the bumper crop, only 36% of smallholder farmers expected to sell maize during the 2010/11 marketing year and just 4-5% of maize-growing households (approximately 49,000 households) are likely to account for 50% of all maize sold to the FRA and private buyers.

Third, higher maize market prices as a result of the FRA's activities have made maize grain and maize meal more expensive for urban and rural consumers than would have been the case in a bumper crop year without such heavy FRA involvement. Fourth, because the FRA buy price is comparable to or greater than the import parity price once transportation and other marketing costs are added to the FRA price, millers could obtain maize more cheaply from South Africa than from the FRA unless the FRA's sale price is subsidized by the Zambian Treasury. Fifth, the FRA's progressive ratcheting up of maize purchase targets caused private traders to delay their entry into the market, which in turn limited access to maize markets for farmers that were unable to sell their maize to the FRA.

And sixth, maize bought at the FRA price is not competitive in regional export markets and US\$91-177 is being lost on each ton exported. FRA's willingness to export maize at a financial loss and uncertainty over the timing and magnitude of FRA maize purchases and over GRZ export policies have also discouraged private sector participation in formal maize exportation, which could have relieved the national surplus without imposing huge costs on the Zambian Treasury.

By raising maize prices, GRZ's 2010 maize marketing policies positively affect large-scale farmers and net-maize selling smallholders in the short-term but negatively affect most other stakeholder groups. A point that may be underappreciated by government's rural constituents is that a very small percentage of smallholder households are actually benefiting from this year's high FRA price and purchases. FRA's large presence in rural areas this year may give the impression that most rural households are benefiting. Households that were not able to sell to the FRA might assume that the majority of other smallholders did get to sell to the Agency and that FRA's policies are 'good' for most rural households. But this perception is not consistent with the empirical evidence. Only 36% of smallholder households expected to sell maize in 2010/11 and just 4-5% of maize-growing households are likely to have accounted for 50% of the maize sold to FRA during its 2010 buying campaign. Less than 10% of smallholder households sold any maize at all to the FRA during the 2007 and 2009 maize purchase exercises. This percentage is unlikely to be much higher in 2010. Thus, while FRA's policies are ostensibly to 'help' smallholder farmers, they actually benefit very few households. And most of the smallholders that benefit from the high FRA price are relatively well off, with greater holdings of land and non-land assets (Kuteya et al. 2010). In fact, by raising market prices above where they would have been in a bumper harvest year without such heavy government involvement, current FRA/GRZ policies *hurt* the approximately 36% of smallholders that are net-maize buyers.

On the other hand, alternative maize marketing policies characterized by more rules-based state operations are likely to have positive effects on nearly all stakeholder groups. Key elements of the alternative policies are: (i) FRA maize purchases and sales triggered when market prices fall below and above pre-established floor and ceiling prices, respectively; (ii) consistent government policies with respect to private sector exports (e.g., by setting and respecting an export quota); and (iii) other strategies to create a more enabling environment and build capacity for private sector participation in exports. Although a transition to this alternative set of policies might initially cost the government some political capital, in the long-run, with better outcomes for more constituent groups, government can take credit for improving smallholder and urban consumer welfare in Zambia. This loss of political capital could also be mitigated by an effective outreach campaign aimed at educating the public about the benefits of this new policy approach.

Beyond the alternative policies outlined in the paper to help government better manage a bumper crop in future years, there are other complementary policies and investments that could help government to avoid having more maize than it can find markets for and to improve the profitability of maize production for farmers and keep food prices low for urban consumers. Raising productivity on-farm and throughout the maize value chain is one such strategy. Promoting crop diversification and a more demand-driven mentality on the part of large-scale farmers and commercially-oriented smallholders (producing *for* the market, not *to* market) could help avoid unmanageable maize surpluses in the future. Finally, there may be opportunities for profitable investments in maize processing and value-addition in Zambia, which could provide other uses for *Zambian* maize.

Ultimately, *Zambian* farmers should be congratulated for their accomplishments this year. There are alternative strategies that government could use to ensure that *Zambians* reap the full benefits of bumper crops in the future.

APPENDICES

APPENDIX 1

Table A1.1 Timeline of the 2010 Zambia Maize Marketing Experience

October 2009	<ul style="list-style-type: none"> • 9 October: Government announces K100 billion allocation to FRA for 2010
May 2010	<ul style="list-style-type: none"> • 1 May: Government announces 2010/11 FRA buy price of K65,000 per 50-kg bag (maintains 2009/10 FRA buy price) and purchase target of 300,000 MT. Officially opens 2010/11 marketing season. • Some stakeholders respond negatively to K65,000 FRA price; argue that price should have been at least K70-75,000 per bag to cover high costs of production. Agriculture and Cooperatives Minister Peter Daka says Zambian maize would not be able to “compete favorably on the international market” if the price were increased to US\$300 per MT (~K75,000 MT per bag). National Association of Peasant and Small-Scale Farmers of Zambia (NAPSFZ) President Rogers Phiri supports K65,000 FRA price. • Minister Daka calls for millers to reduce maize meal prices in light of bumper harvest • 21 May: 2009/10 Crop Forecast Survey results and 2010/11 National Food Balance Sheet announced. Maize carryover stocks of approximately 300,000 MT plus 2009/10 production of 2.8 million MT against total requirement of approximately 2 million MT indicates surplus of roughly 1.1 million MT. Largest maize harvest in 22 years and largest surplus in 15 years. Expected maize sales are 1.35 million MT (of which 1.07 million MT are from small- and medium-scale households) (Crop Forecast Survey, 2009/10 agricultural season). • Reported 24 May: Zambia National Farmers Union (ZNFU) President Jervis Zimba calls on government to secure adequate funding to buy all 1 million MT of surplus maize and subsidize its export • 28 May: In a speech read for him by Vice President George Kunda at the opening of the Copperbelt Mining, Agricultural, and Commercial Show (CMACS) in Kitwe, President Rupiah Banda announces that Government will ensure that all maize from the 2010 bumper harvest is purchased. Reported as “Vice-President George Kunda has assured farmers that Government will purchase all maize from this season’s bumper harvest” in a May 29 Times on Zambia article.

June 2010	<ul style="list-style-type: none"> • FRA purchases slow to start due to limited funding and high moisture content of maize (must be 12.5% of less) • Informal maize exports to DRC. Informal maize imports from Mozambique, attracted by relatively high price on Zambia side (K32,500 per 25 kg bag, compared to K20,000 per 25 kg bag on Mozambique side) • National Milling Corporation (NMC) reduces breakfast meal prices from K57,700 to K55,000 and roller meal prices from K33,000 to K27,500 per 25-kg bag, and begins buying maize from smallholders. • Maize grain market prices of K40,000-50,000 and K25,000-35,000 reported • ZNFU President Zimba urges farmers to hold maize until they can sell to FRA • Zimba calls for reintroduction of NAMBOARD-like body; NAPSfZ opposes revival of NAMBOARD • 10 June: Government announces it will allow farmers and traders to export 1.1 million MT of maize. (No official export ban had been in place prior to this but exports may have been restricted through limited issuance of export permits.) • FRA negotiates with Zimbabwe over possible maize exports. Also, receive inquiries from DRC, Namibia, Kenya, Sudan, and Egypt. • Editor of The Post and ZNFU President Zimba call for maize export subsidies • Crop marketing expert Graham Rae encourages government to quickly sign bilateral trade agreements with DRC, Angola, and Zimbabwe for export of maize before Malawi, South Africa take these export markets • Reported 21 June: FRA Public Relations Office Mwamba Siame reiterates that FRA only plans to buy 300,000 MT. Siame quoted as saying “The law of demand and supply will take care of the rest of the maize which will not be bought by FRA... There are millers, grain traders and stock-feed producers who can and will take care of the surplus maize which the market currently has.” • Reported 24 June: Millers Association of Zambia (MAZ) signs agreement with NAPSfZ to buy 70% of smallholders’ maize. MAZ chair and NMC managing director Peter Cottan says maize meal prices remain high because millers are still using maize from previous year’s harvest purchased from FRA at K70,000 per 50-kg bag. • Reported 30 June: Minister Daka reveals that FRA has obtained loan for additional K700 billion to buy maize (in addition to FRA government budget allocation of K100 billion). Encourages traders and millers to “offer a good price to farmers in order to encourage them to continue producing”.
July 2010	<ul style="list-style-type: none"> • FRA Executive Director Anthony Mwanaumo announces that with the loan of K700 billion, FRA hopes to purchase more than the original target of 300,000 MT and will source more funding for additional purchases if other market players fail to buy up the surplus maize. Encourages farmers to sell to non-FRA buyers when they are able to negotiate higher prices. • Reported 23 July: FRA puts out invitation for bids for sale of maize for export. Goal is to export 160,569 MT (carryover stock from 2009/10 marketing year). • Government continues efforts to secure export markets for maize
August 2010	<ul style="list-style-type: none"> • 2 August: FRA maize purchases to date – 75,000 MT. • NMC announces plans to purchase 100,000 MT of maize from small-scale farmers and that it is working with government to obtain export permit to export maize meal to Zimbabwe. • Reported 7 August: Zambia Consumers Association (ZACA) supports ‘commitment’ made by Vice President George Kunda in May in speech at CMACS that Government would buy all of farmers’ maize • Continued pressure from ZNFU for government to subsidize maize exports • 13 August: FRA maize purchases to date – 145,000 MT • Reported 19 August: FRA selects seven companies to export the 160,569 MT of maize. Reported 22 August: Winning bids were US\$150-180 per MT. The maize is to be exported to DRC, Zimbabwe, and Namibia. • 20 August: FRA maize purchases to date – 318,129 MT

September 2010	<ul style="list-style-type: none"> • Few formal exports because constrained by Zambia’s uncompetitive maize prices in regional market but significant informal maize trade (informal exports to DRC and informal imports from Mozambique and Tanzania) • Average private sector maize price reported at K45,000 per 50-kg bag • Complaints from farmers over delayed payments by FRA • 15 September: Minister Daka encourages private sector to help ‘mop up’ surplus maize but at a price not lower than K65,000. Also encourages private sector to export maize. • 16 September: Minister Daka reveals that K700 billion loan is from African Development Bank (ADB) • 18 September: FRA purchases to date – 643,000 MT. FRA Executive Director Mwanaumo announces that FRA plans to have purchased 700,000 MT by the end of September and approximately 1 million MT by the end of October. FRA announces call for bids for storage space rental as FRA only has storage capacity for approximately 780,000 MT. Also, call for bids for 27,000 rolls of black polythene sheets. • 24 September: FRA purchases to date – 697,000 MT, of which 172,000 MT is from Eastern Province, 154,000 MT is from Southern, and 100,000 MT is from Northern. K225 billion paid to farmers and outstanding balance owed is K681 billion. • 27 September: FRA to pay out K130 billion per week until all farmers paid • 28 September: President Banda shuffles ministers. Eurstarkio Kazonga replaces Peter Daka as Minister of Agriculture and Cooperatives. Part of rationale for changes is “to make the issues of maize payments and movements more efficient”. • 30 September: FRA buying period extended to 31 October.
October 2010	<ul style="list-style-type: none"> • 3 October: President Banda appeals to Zambians to give his government another term to finish the development projects they have begun and ensures the public that government would obtain additional funds to ensure that all of farmers’ maize is purchased. FRA announces it has exported 82,000 MT to Zimbabwe. May increase total exports to 600,000 MT pending decision of the Stocks Committee. FRA distributes tarpaulins to areas with no storage facilities. • Reported 8 October: Government secures loan for additional K632 billion from a consortium of commercial banks. Together with K100 billion government budget allocation and K700 billion loan from ADB, total FRA resources stand at K1.432 trillion. President Banda says government needs K1.5 trillion to purchase all the surplus maize in the country; encourages private sector to complement government efforts in buying up surplus maize at reasonable prices. Agriculture and Cooperative Minister Kazonga urges farmers to negotiate fair prices and emphasizes that FRA price is a not a national price. • 15 October: FRA purchases to date – 756,011 MT. Farmers have been paid for approximately 523,000 MT (K679.9 billion). To date, FRA does not have adequate capacity to store all maize. FRA has received inquiries from Zimbabwe, DRC, and Namibia regarding exports. • 21 October: President Banda announces that Government is seeking ways to bring down maize meal prices • 23 October: President Banda announces plans to set up more one-stop border posts like the one at Chirundu on the Zimbabwe border to facilitate cross-border trade • 26 October: FRA purchases to date – 767,000 MT. Farmers have been paid for approximately 579,230 MT (K753 billion). FRA exports to date – 82,000 MT to Zimbabwe and DRC. FRA goal is to export at least 500,000 MT total and is in negotiations with Namibia and Angola. • 27 October: The Zambia Agricultural Commodity Exchange (ZAMACE) announces that the FRA has become a broking-member of the Exchange and will offer some maize for sale on ZAMACE using the “offer volume only” (OVO) facility. According to ZAMACE, “an OVO is an auction mechanism which allows a seller to get bids from the market. The seller then selects the bid(s) which they are satisfied with”. • 28 October: FRA purchases to date – 767,859 MT • 31 October: Last day of FRA 2010 crop purchase exercise

November 2010	<ul style="list-style-type: none"> • 3 November: FRA sells 2,950 MT of maize on ZAMACE at US\$200/MT for export to Zimbabwe. • Reported 7 November: Mwanaumo reports that 105,000 MT of FRA maize is being transported to Harare. The FRA has 1.2 million MT of storage space but 40% is leased to the private sector, leaving FRA with storage capacity of 720,000 MT. • 13 November: FRA offers 10,000 MT of maize for sale on ZAMACE for local markets, and 7,050 MT for export markets. • Reported 14 November: Millers buying maize at K980/kg to K1,000/kg. Reports that FRA maize in Monze and Kalomo spoiled after being soaked by rains; some households' stocks also spoiling. • Reported 16 November: FRA purchased 873,779 MT of maize during the 2010 maize purchase exercise. This is approximately 82% of expected maize sales by smallholders according to the Crop Forecast Survey. At K1.3 million per MT, the FRA will pay out a total of K1.136 trillion to farmers. In areas with no FRA sheds, FRA is storing maize on concrete slabs or logs covered with tarpaulins. 2,700 tarpaulins have been procured. The maize is also being fumigated. • 16 November: New FRA Board of Directors appointed after one year without a Board. MACO Minister Kazonga urges FRA Board to begin preparations for next marketing season, re-examine the FRA business model, and address challenges such as timely and complete payment to farmers, crop storage, and enhancing export opportunities. In addition to its own storage facilities, FRA has rented storage space for 98,00 MT. The Agency is paying K63 billion to transporters to move maize from satellite to main holding depots. FRA has advertised 328,000 MT of maize for export.
December 2010	<ul style="list-style-type: none"> • 1 December: FRA contacts indicate that total FRA purchases were 878,570 MT or 83% of expected maize sales by smallholders. • Reported 3 December: GRZ has spent US\$11 million to construct storage sheds and is in talks with cooperating partners to obtain an additional US\$50 million for shed construction.

APPENDIX 2
Estimated Cost of the 2010 FRA Maize Purchase Exercise and Estimated Revenue from FRA Domestic Sales & Exports, May to November 2010

Table A2.1 Estimated One-Time Costs for FRA 2010 Maize Purchase Exercise

Description	Cost (million ZMK)	Source
(1) Purchase of 878,570 MT at K1.3 million/MT	1,142,141	FRA
(2) Transportation costs from satellite depots to holding depots	63,000	Zambia Daily Mail, "State releases K100bn to FRA for farmers", 17 Nov. 2010
(3) Bagging and rebagging costs (estimated at 48,200/MT)	42,347	Brian Tembo (ZAMACE)
(4) Other logistics costs (estimated at K30,000/MT)	26,357	Based on Brian Tembo (ZAMACE) estimate of K100,000/MT for transportation + other logistics costs
(A) TOTAL ONE-TIME COSTS	K1,273,845 million	

Table A2.2. Estimated Quantities (MT) Stored by FRA and Estimated Storage and Finance Costs, May to November 2010

Description	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.
<i>Monthly total purchases, domestic sales, & exports (MT of maize)</i>							
(1) FRA carryover stocks from 2009 (MT)	160,059	--	--	--	--	--	--
(2) Estimated FRA 2010 purchases (MT)	0	0	75,000	243,129	378,871	181,570	0
(3) Domestic sales and exports (MT)	0	0	0	0	0	82,000 ^c	2,950
(4) Planned domestic sales and exports (MT)	0	0	0	0	0	0	17,050
(5) Monthly total (MT) = (1) + (2) - (3) - (4)	0	0	75,000	243,129	378,871	99,570	-20,000
(6) Cumulative FRA stocks (MT)	160,059	160,059	235,059	478,188	857,059	956,629	936,629
<i>Monthly costs:</i>							
(7) Finance costs, million ZMK (estimated at K14,460/MT=US\$3/MT*4,820 ZMK/US\$) ^a	2,314	2,314	3,399	6,915	12,393	13,833	13,544
(8) Storage costs, million ZMK (estimated at K24,100/MT=US\$5/MT*4,820 ZMK/US\$) ^a	3,857	3,857	5,665	11,524	20,655	23,055	22,573
(9) Rental of storage facilities for 98,000 MT, million ZMK (estimated at K2,250/MT) ^b	0	0	0	0	0	0	221
(10) Total monthly recurring costs, million ZMK = (7) + (8) + (9)	6,172	6,172	9,064	18,439	33,048	36,888	36,337
(B) TOTAL STORAGE & FINANCE COSTS, MAY THROUGH NOVEMBER 2010							K146,119 million

Notes: ^aEstimated finance and storage costs per month from Brian Tembo (ZAMACE). ^bFRA advertisement for the Agency to rent storage facilities at K2,500/MT/month in urban areas and K2,000/MT/month in rural areas. Used average monthly rental rate (2,250 MT). In November Daily Mail article, Minister of Agriculture and Co-operatives Dr. Eustarckio Kazonga announced that the FRA was renting storage space for 98,000 for maize. ^c82,000 MT exported came from 2009 carryover stocks.

BOX A2.1: ESTIMATED COST^a OF 2010 MAIZE PURCHASE EXERCISE AS AT END NOVEMBER 2010:

- (i) Including storage of 2009 carryover stocks during May to November 2010 = (A) + (B) = **K1.420 trillion total**
 (ii) Excluding storage of 2009 carryover stocks^b during May to November 2010 = (A) + (B) – K0.037 trillion = **K1.383 trillion total**
 or **K1.574 million/MT^c** (approximately **US\$327/MT**, assuming exchange rate of K4,820/US\$)

^aInterest on loans, losses due to spoilage, personnel and other overhead costs, and revenue from exports/sales not included. ^bAlso excludes export of 82,000 MT of 2009 carryover stocks in October 2010. ^cPer MT figure calculated as K1.383 trillion divided by 878,570 MT of maize bought by FRA during the 2010 maize purchase exercise.

Box A2.2 Estimates of Cost of 2010 FRA Maize Purchase Exercise in the News

- President Banda states that the Food Reserve Agency (FRA) will need approximately K1.5 trillion for the maize purchase exercise (*Source*: “Bumper harvest to cost K1.5tn”, Daily Mail, 8 October 2010, by Angela Chishimba)
- According to the Business Times, Government spent K1.3 trillion beyond the 2010 FRA budget allocation of K100 billion on the FRA maize purchase exercise. This implies that the total cost of the FRA purchase exercise was approximately K1.31 trillion (*Source*: “Refined crop marketing beckons in 2011”, Business Times, 12 January 2011, by Chishimba Chishimba)

Table A2.3 FRA budget allocation and commercial loans

Description	Amount (billion Kwacha)
(1) 2010 budget allocation to FRA	100
(2) Commercial loan #1	700
(3) Commercial loan #2	632
(4) TOTAL FUNDING FOR FRA = (1) + (2) + (3)	1,432
(5) Estimated interest on commercial loans (assuming 12.0%/year)	172
(6) Estimated interest on commercial loans (assuming 18.9%/year)	271

Notes: The lending rate and treasury bill rate in Zambia in 2007 were 18.9% and 12.0% per year, respectively. 2007 is the most recent year for which data are available on IMF International Financial Statistics.

Table A2.4 Estimated FRA Revenue from Domestic Sales and Regional Exports, May to November, 2010

Domestic sale or export quantity and price	Revenue (million ZMK)
82,000 MT of 2009 carryover stocks exported in Oct. at ~US\$230/MT (K1,108,600/MT)	90,905
2,950 MT exported through ZAMACE in Nov. at US\$200/MT (K964,000/MT)	2,844
17,050 MT sold on ZAMACE in Nov. at approx. US\$200/MT (K964,000/MT)	16,436
(C) TOTAL REVENUE FROM DOMESTIC SALES & EXPORTS	K110,185 million

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