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MAIZE PRICE PROJECTIONS FOR ZAMBIA'S 2006/07 MARKETING SEASON

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Main policy messages for the 2006/07 marketing season:

- Zambia's forthcoming maize harvest will be a good one, with the crop forecast projected at 1.4 million tons.
- Historically, prices vary as much as 50% between good years and bad. But how much are they likely to fall this coming season – with an export ban and without?
- To help policy makers and private actors answer this question, a small spreadsheet model can be used to explore likely price changes, using simple measures of consumer price responsiveness.
- These projections suggest that retaining the current export ban could result in prices falling between 20% and 40% below their historic norms. In the most likely scenario, the price would fall by roughly 30%, leading to a July low in the range of $85 to $110 per ton.
- Removing the current export ban would result in price falling less, given significant regional market demand. Under an assumed 100,000 tons of exports, average annual maize price would fall roughly 20% below long-term norms, and if 200,000 tons were exported, the price fall would be closer to 10% below historical levels.

Objective:

The coming 2005/06 maize harvest promises to be a good one, certainly better than last season. Market prices have begun falling, and the question now is how far they are likely to fall. Government currently has a maize export ban in place. This short note aims to assess the likely price levels this coming season, with and without an export ban.

Historical Perspective on Production and Prices:

Production. Given that Zambian smallholders depend primarily on rainfed production, Zambia's maize output fluctuates significantly from year to year, largely as a result of changes in rainfall patterns. Output varies by up to 100% from bad years to good (Table 1).

Average annual prices. Price levels likewise fluctuate, though not as much as production. Historically, average annual prices vary by about 50% from bad years to good (Table 1).

Seasonal price patterns. Seasonal price movement remains highly pronounced. In Lusaka wholesale markets, into-mill prices typically peak in February. Following the new harvest, prices fall to their

lowest levels around July (Figure 1). The question now is how low prices are likely to fall in the coming season.

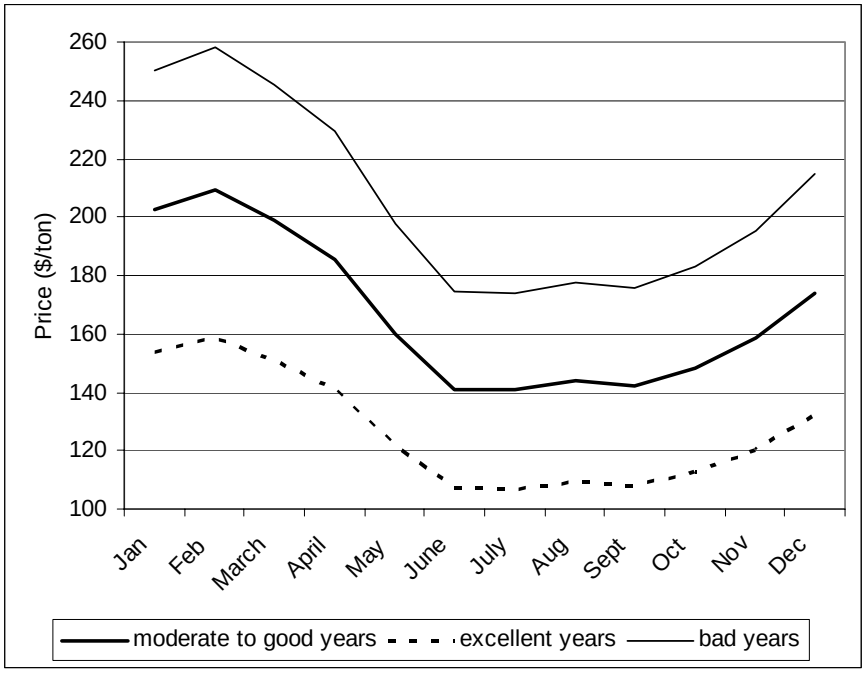
Table 1. Historical Maize Production and Price Movements in Zambia

Year	Harvest	Production tons	Price* $/ton	Price* % change
1994	good	1,020,749	$150	
1995	moderate	737,835	$208	
1996	excellent	1,409,485	$127	
1997	moderate	960,188	$173	
1998	bad	638,134	$183	
1999	moderate	822,056	$135	
2000	moderate	881,555	$116	
2001	bad	601,606	$192	
2002	bad	602,000	$244	
2003	good	1,161,000	$169	
2004	good	1,113,916	$150	
2005	moderate	866,187	$236	
Averages, 1994 to 2005				
	excellent	1,409,485	$127	-27%
	good	1,098,555	$156	-10%
	moderate	853,564	$174	0%
	bad	613,913	$206	19%
baseline	good to moderate	945,436	$167	

* Lusaka into-mill price for the marketing year, May - April.

Source: MACO, FAOSTAT, AMIC.

Figure 1. Maize Price Seasonality in Lusaka, 1994-2005



Source: AMIC.

Projections for the 2006/07 marketing season:

Baseline. The following projections take as their baseline historical norms for good to moderate production years. As defined in Table 1, these amount to eight of the past twelve production seasons, when national output averaged 945,000 tons and average annual into-mill price in Lusaka averaged $167 per ton. Given standard, observed seasonal price movements, the monthly price typically ranges from a low of $141 per ton in July to a high of $209 per ton in February.

2005/06 production. The Crop Forecast Survey for the current season projects a harvest of 1.4 million tons of maize. Various trade groups have suggested alternate figures, with estimates ranging from 1.5 to 1.2 million tons. As a starting point, the following projections compare the baseline historic norm of 945,000 tons to a year when production increases to 1.2 million tons.

Projection method. These projections rely on historical data coupled with a small spreadsheet model of the Zambian maize market[i]. The simple model underlying these projections uses standard measures of consumer price responsiveness[ii] together with an ordinary supply and demand framework to estimate a plausible range of market prices under various export scenarios.

2006/07 prices under an export ban. Under an export ban, and given a possible 30% production increase this season over the "normal" baseline harvest of 945,000 tons, the model projects that average maize prices would fall between 20% and 40% below their historic norms. This would lead to average annual prices between $100 and $130 per ton, with a July low in the range of $85 to $110 per ton in Lusaka.

2006/07 prices if exports are allowed. If exports were allowed, this would relieve downward price pressure in the domestic market and moderate the price decline. From a market perspective, it doesn't matter who does the exporting. The price impact will depend on the volume of maize taken off the domestic market. Under 100,000 tons of exports, the average annual maize price would fall roughly 20% below long-term norms, and if 200,000 tons were exported, the price fall would be closer to 10% below historical levels. As a rough rule of thumb, each 100,000 tons of exports will increase market price by about $10 to $15 per ton.

Table 2. Projections of the Lusaka Into-Mill Maize Price

	Harvest	Exports	Average annual Lusaka into-mill price	Seasonal low price (July)	Area planted next season
Baseline*	945,436	18,421	$167	$141	
Projections					
a) export ban	1,200,000	0	$100 to $130	$85 to $110	-9%
b) small exports	1,200,000	100,000	$120 to $142	$101 to $120	-6%
c) large exports	1,200,000	200,000	$140 to $154	$118 to $130	-4%

* Baseline is historical averages from 1994 to 2005. See Table 1 for details.

Source: projections base on Zambia multi-market model (Dorosh and Haggblade, 2006)

Production impact next season:

Lower prices this season may discourage market-oriented smallholder and commercial farmers from planting maize next season. If the price responsiveness of Zambian producers lies in the normal range observed elsewhere in Africa[iii], then area planted to maize next season would fall by roughly 9% under an export ban and by as little as 4% under 200,000 tons of exports.

Rainfall this season has been good. But if weather patterns revert to normal, or worse, then Zambia faces a potentially compounded risk of a production shortfall next year. If farmers were to reduce area planted by 9% next season, and if yields were to revert to the normal 1.5 tons/ha (compared to an estimated 1.8 tons this season), then production would fall from the most recent Crop Forecast Survey estimate of 1.4 million tons this season to 1.1 million tons next year -- a 300,000 ton fall. Should rainfall prove erratic, as in 2004/5, and yields fall closer to 1 ton/ha, then production would fall to 740,000 tons, over 600,000 tons below this year's estimate. Prices would shoot up correspondingly, improving farmer incentives for the ensuing season but penalizing consumers and leading Zambia into a boom and bust cycle of overproduction followed by underproduction.

Regional trade as a tool for moderating domestic price volatility

Regional trade in maize – becoming a reliable exporter in surplus years and an importer in deficit years – helps to moderate these potentially wide swings in national prices and production. Exporting during surplus years lifts low farm prices and encourages production for the coming year. It also enables Zambian farmers to target external markets in chronically deficit neighbors without fear of trade retaliation and border closing by other countries. Allowing imports in deficit years dampens high prices and discourages over-expansion of maize production in the coming year. By cushioning price swings in both good years and bad, regional maize trade enables farmers to plan better, at the same time moderating both price and production volatility.

Refusal to export maize during surplus years could invite neighboring countries to do the same, to refuse to allow exports to Zambia in years when Zambia faces deficits. So in order for regional trade to become a reliable tool for helping government reduce price variation for Zambian farmers and consumers, neighboring countries will need to be able to rely on Zambia to keep markets open and support regional trade agreements favoring maize without borders.

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[i] The model is described in a paper by Paul Dorosh and Steven Haggblade, 2006. "Incorporating Market Responses in Emergency Needs Assessments: A Prototype Spreadsheet Model for Zambia." Paper presented to the WFP SENAC Conference in Cairo, March 2006.

[ii] The price elasticity of demand measures consumer responsiveness to price changes. An elasticity of -0.5 indicates that a 10% *increase* in maize price will result in a 5% *reduction* (10*-0.5) in maize consumption.

[iii] These projections use a supply elasticity of 0.3, meaning that a 10% fall in price will result in a 3% decline in area planted next season.