
POLICY SYNTHESIS

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Africa Bureau,
Office of Sustainable
Development

Number 67

May 2003

USAID/Zambia

USAID/Mozambique

REGIONAL TRADE IN MAIZE IN SOUTHERN AFRICA: Examining the Experience of Northern Mozambique and Malawi

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INTRODUCTION: Southern African countries have dramatically reformed their agricultural economies over the past decade. Because maize was the key focus of the previous controlled systems, it has also been at the center of these reforms. Despite periodic policy reversals, maize in every country of the region is today more freely traded within national borders than it was ten years ago. Trade outside national borders has seen much less reform, and substantial controls on such trade continue in Zambia, Zimbabwe, and Malawi. Mozambique has pursued one of the most aggressive reform agendas, establishing an explicit open border policy, allowing regular unhindered private sector exports of maize from the north and imports to the south.¹

OBJECTIVES: This paper evaluates the impacts of maize exports from northern Mozambique to Malawi on producer and consumer maize prices in selected markets of Mozambique. Readers interested in more detail should see MADER/MSU (1999) and Tschirley and Santos (1999). Discomfort with such trade among policy makers throughout southern Africa is expressed at both the household and geographical levels through

the related concerns that farm households will sell “too much” of their crop and that localities or the country as a whole will be unable to ensure the food security of the populace. We thus also briefly assess farmer food security strategies in Mozambique and their opinions regarding what the appropriate stance of government should be with respect to trade, especially during years of high prices. See MADER/MSU (2002) for more detail on this issue.

BACKGROUND: Mozambique’s geography makes the issue of trade liberalization especially pertinent. First, the country has a long seacoast, with three excellent natural ports spread along its length, and railroads linking these ports with its own interior and with neighboring countries.² Second, the most productive area of the country is in the north, but this region is separated from the key domestic consumption centers (Beira in the center and Maputo in the south) by long distances, an underdeveloped system of feeder roads, poor north-south road links, and a high-cost coastal shipping industry. These characteristics result in very high costs of supplying the center and south of the country and, consequently, very low prices to producers when such trade does occur.

Description of retail markets: Principal consumer markets in the country are Maputo in the south, Beira in the center, and Nampula in the north. **Maputo** is the largest city in the country. The city is fed by maize grain from the center of Mozambique, and grain and

¹ A trade distortion whose effects are currently being researched is the application of the value-added tax to maize imports (it is not applied to any other commodity) in such a way that most formal importers can obtain reimbursement while informal traders cannot. Since consumers typically rely on the informal sector for maize grain and whole meals, this policy may have contributed to the recent disappearance of whole meal from maize markets.

² Inefficiencies in the ports and rails have substantially increased the cost of importing and exporting, but are being addressed through major investment and moves toward privatization of port management.



meal imported from South Africa. **Beira** is located on the coast at the end of the Beira Corridor linking the city with Zimbabwe. This city is typically fed by surpluses from the central provinces of Sofala and, especially, Manica, but is strongly affected by fluctuations in regional production. **Nampula City** is the largest urban center in the north and is supplied primarily by production from its own province, sometimes receiving grain from northern Zambêzia.

Description of producer markets: **Manica** market near Zimbabwe at the end of the Beira Corridor is a surplus production area with some of the highest maize yields in the country. This market is well integrated with the south of Mozambique (Donovan 1996), supplying Beira, Maputo, and consumption centers in-between in addition to meeting its own needs during most years. **Mocuba** is located in the central-northern province of Zambêzia, with good agro-climatic conditions for maize production. Mocuba is an important transit point for maize, cassava, pigeon pea, and butter beans to others districts and to Malawi. Only during food deficit years is it economical for Mocuba to sell maize in the southern areas of the country. In recent years, with the opening of trade to Malawi, the importance of the Mocuba market has increased as a wholesale distribution point for traders.

Ribaué is characterized by generally good agro-climatic conditions very similar to the north of Malawi. Ribaué supplies deficit areas within the province, including Nampula City and some areas of the neighboring province of Cabo Delgado. There is weak linkage between this production area and the center and south, since this zone is very far from Beira and Maputo and the road links are poor. With the opening of trade with Malawi, this area became a major assembly point for traders exporting to southern Malawi.

Recent developments in the maize trade: Formal and informal trade between Mozambique and Malawi have been ongoing for several years (Macamo 1998; Tickner 1997; Bowen 1998; Whiteside 1998). However, this trade was relatively small scale and the effects of exports were felt primarily along the border until the 1997/98 marketing season. Production in Malawi in 1997 fell by 34%, and ADMARC and private traders suddenly looked to Mozambique to cover the deficit.

In response, Mozambican formal sector wholesalers entered the maize trade, many for the first time, along

with the *Instituto de Cereais de Moçambique*. Officially registered exports to Malawi surged during the third quarter of 1997, and remained at high levels through that and the following marketing year (1998/99), almost entirely replacing exports to other countries. Exports and producer prices then collapsed over the next two marketing seasons, only to pick-up again in the 2001/02 and 2002/03 seasons. Both boom periods had profound effects on prices in central and northern Mozambique; in the next section we present the results of econometric modeling work to quantify these effects during the first boom.

MODEL AND RESULTS: To test the effect of the opening of trade with Malawi on price levels in Mozambique, an econometric model was developed and estimated.³ The general model is:

$$\text{PRICE}_{m,y} = f(\text{PRODREG}_y, \text{PRODMOZ}_y, \text{FAMOZ}_y, \text{TRADE}, S_m)$$

Where $\text{PRICE}_{m,y}$ is the white maize price during month m of year y , in real meticaís, PRODREG_y is total white maize production during year y in South Africa, Swaziland, Lesotho, Zimbabwe, Zambia, and Malawi, PRODMOZ_y is domestic production of white maize during year y , FAMOZ_y is domestic maize food aid arrivals during year y (white and yellow), TRADE is a dichotomous variable representing trade with Malawi, equal to zero through July 1997, equal to 1 from August 1997 forward, and S_m is a vector of 11 monthly dichotomous variables, to control for seasonal effects.

Table 1 presents the results of this model, expressed as the percent increase in prices due to trade with Malawi. In general, both producer and consumer prices in the north of the country were substantially affected by trade, while neither was affected in the center and south of the country.

³ A Seemingly Unrelated Regression (SURE) approach was used in which the equations for each of the six markets were estimated jointly. Autocorrelated errors were corrected using lagged values of the dependent variables, based on the results of a Durbin-h test. See Tschirley and Santos (1999) for more detail on methods.



Table 1. Percentage Impact of Maize Trade with Malawi on Selected Producer and Retail Prices in Mozambique

Markets	% Increase in Price from Trade with Malawi
Producer	
Manica	not statistically significant
Mocuba	21%
Ribaué	15%
Retail	
Nampula	13%
Beira	not statistically significant
Maputo	not statistically significant

DISCUSSION: Since most producers live in the north, while most consumers live in the center and south, these results indicate that the maize exports of 1997 through 1999 benefitted most rural households while having no negative effect on most urban consumers.

The impact of trade with Malawi during the period under analysis was extremely important to producers. In 1996, Nampula and Zambêzia provinces contained 37% of all maize producers in the country, and accounted for 40% of all maize sales (1996 National Agricultural Survey). Available data suggest that the percentage of net buyers of maize in rural areas is low: during the 1994/95 marketing year, between 12% and 25% of all households in surveyed areas of Nampula and southern Cabo Delgado province were net maize buyers. With large increases in maize production since then, it is likely that these figures have not increased significantly, meaning that large majorities of rural households benefitted from these price increases.

Table 2 presents the increase in value of production and cash earnings from sales due to trade with Malawi during the 1998/99 marketing year. In Nampula the increase in earnings from maize sales was US\$677,000 and in Zambêzia was US\$827,000, a total of US\$1.5 million in increased cash income in the two provinces due to the price increases. Increases during the 1997/98 marketing year would have been similar, though household level data are not available to estimate them precisely. These increased earnings have an impact on the broader rural economy through consumption multipliers and through the self-financing of rural micro enterprise activities. Haggblade, Hazall, and Brown (1989) estimate average growth multipliers in rural

Africa of 1.5. In this case, such a multiplier implies nearly US\$750,000 in *additional* income through responding during each of the two years that this trade took place.

The producer level price impacts of trade with Malawi have potentially important implications for the intensification of maize production in Mozambique. Howard et al. (2000) calculate break-even prices at mean yields for high external input technology (HEIT) maize in the better agroecological zones of US\$50-69/metric ton. During the two years of exports to Malawi that were analyzed in this study (marketing years 1997/98 and 1998/99), 88% of all monthly producer prices in the four markets have exceeded US\$69/ton; 94% have exceeded US\$50/ton. These prices have obtained despite very good production in Mozambique and no serious shortages in the region. By increasing the probability of remunerative prices even during years of regional surplus, the development of regional markets will reduce the risk of adopting these technologies.

Table 2. Increases in Value of Maize Production and Cash Earnings from Maize Sales Due to Trade with Malawi, 1998/99 Marketing Season¹

Province	Increase in Total Value of Maize Production (US\$)	Increase in Cash Earnings from Maize Sales (US\$)
Nampula	1,961,000	677,000
Zambêzia	3,061,000	827,000
Manica	0	0

Source: MSU/USAID Focus Area Income Survey

¹ Price increase due to trade is taken as the estimated regression parameter from the opening of trade regressions: 205 Mts/kg in Nampula, 332 Mts/kg in Zambêzia (Mocuba market), and 0 in Manica (coefficient on TRADE was insignificant).

Even if the long-run trend in Malawi is toward a structural deficit in maize, Mozambique cannot necessarily rely on that market every year. Malawian production in 1999 increased to 1996 levels, helped in part by the Starter Pack Initiative that provided limited amounts of improved seed and fertilizer to every farm household in the country. Large-scale exports to Malawi ceased for two years, and prices collapsed, only



to surge again during the 2001/02 and 2002/03 marketing seasons when Malawi again experienced deficits.

As production in Mozambique continues to increase (especially if HEIT technologies become more widely adopted), the Malawi market may not be large enough to absorb all of Mozambique's exportable surplus. Therefore, Mozambique needs to look beyond Malawi to other areas in the region that will periodically require imports, such as Zimbabwe, eastern Zambia, Kenya, and Tanzania. More generally, it needs to develop regional markets on a broad scale.

Despite these seemingly strong arguments in favor of unhindered regional maize trade for Mozambique, local officials often attempt to hinder this trade on the basis of food security concerns. This issue received a great deal of attention after the 2001 harvest, when poor production combined with exports to Malawi caused dramatic price rises in the north of the country. A new maize mill in Nampula, owned by the country's largest mill in Maputo, requested that government close the borders to exports, and used food security concerns as a key element in their own argument.

To examine what farmers actually do – and what they believe government should do – during years of high prices, the country's agricultural national market information system (SIMA) surveyed 167 randomly selected farmers in late 2001 in the more trade-reliant areas of Zambêzia, Nampula, and Niassa provinces. Respondents were asked to compare their food security situation during the current year (a poor production year in most areas) with the previous year (a normal or good production year and much lower prices). They were also asked what strategies they use to ensure their food security during years of high prices, and their opinions about what if anything government should do to limit trade during such years.

Results in Table 3 suggest that farmers overwhelmingly rely on management of their own stocks as their principal strategy, typically relying more on manioc than maize when harvests were poor. Most interestingly, when asked what government should do during high price years, farmers in Zambêzia were most in favor (76%) of a completely unrestricted trade policy. Of all the surveyed areas, Zambêzia has been the most affected for the longest time by border trade.

CONCLUSIONS AND POLICY IMPLICATIONS: Three policy implications specific to Mozambique emerge from these findings.

First, the country's open trade policy is clearly in its national interest. Government therefore should design policies and programs that reduce the cost of trade. Three specific steps should be taken: 1) push for rapid liberalization of maize trade in the region under the SADC Trade Protocol; 2) provide timely and improved regional outlook information and regional policy monitoring; and 3) simplify and facilitate the export process.

Table 3. Households Strategies and Opinions of What Government Should Do During Years of Low Production or High Prices, Mozambique, 2001

Strategy		Zambêzia Nampula Niassa		
		% of HH Responding "Yes"		
What principal strategy does the HH use in years of low production or high prices?	Resort to other crops	8	10	14
	Never sell all production	84	74	75
	Buy food	1	0	5
	Other actions	6	11	7
What should government do in years of low production or high prices?	Prohibit exports	18	18	27
	Permit exports but only by domestic traders	4	18	40
	Permit exports both by domestic and foreign traders	76	47	29
	Other actions	2	3	0

Second, Mozambique needs to look beyond Malawi in developing its market for maize. Zambia and Zimbabwe may provide demand for Mozambican maize in years when Malawi does not (as in 1999 and 2000).

Third, regional trade will be key to Mozambique's efforts to intensify maize production. Studies to date make it clear that producer prices will be too low to sustain maize intensification in the absence of regional trade. By substantially increasing the probability of remunerative prices for northern Mozambican producers even during years of overall regional surplus, this trade creates the possibility of successful intensification. Efforts to deal with the institutional and technical



challenges of intensification must be pursued in the context of developing these regional markets.

Finally, these findings may have implications for policy in Malawi. In the medium- to long-run, regular imports from northern Mozambique may be the most effective way for Malawi to ensure its food security. Making this happen will require investment to increase farm level productivity on the Mozambican side, and in marketing infrastructure on both sides. A key challenge for Malawi is how to design rural income growth strategies that do not undercut incentives for such investments.

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Work for this summary was conducted under the Food Security II Cooperative Agreement between USAID/Bureau for Economic Growth, Agriculture and Trade, Office of Agriculture and Food Security, and the Department of Agricultural Economics at Michigan State University. Supplemental funding for this research was also provided to the FS II Cooperative Agreement by USAID/Mozambique. The views expressed in this document are exclusively those of the authors.

The authors are associated with the Policy Analysis Support Project in Mozambique and the Department of Agricultural Economics at Michigan State University.