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POLICY SYNTHESIS

FOOD SECURITY RESEARCH PROJECT – ZAMBIA

No. 5 *(Downloadable at: http://www.aec.msu.edu/agecon/fs2/zambia/index.htm)* *October 2002*

THE ROLE OF MUGAIWA IN PROMOTING HOUSEHOLD FOOD SECURITY: WHY IT MATTERS WHO GETS ACCESS TO GOVERNMENT MAIZE IMPORTS

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The challenge: How to improve rural and urban food security to meet the impending maize shortfall?

In recent years, national maize production has fallen short of typical consumption requirements. Once again, in the 2002/03 marketing season maize will need to be imported to ensure households' access to food. Particularly vulnerable households will require food relief, but the achievement of national food security will also require that maize meal is accessible at affordable prices to consumers through the market. To the extent that markets can provide affordable food to consumers, the burden and cost of food relief programs can be reduced.

The purpose of this Policy Synthesis is to examine the role of mugaiwa[1], and the small-scale trading and milling sector that provides it, in ensuring poor consumers' access to food in the context of this marketing season's maize deficit. We then identify opportunities for Government and the private sector to increase access to affordable food among consumers.

Many rural households purchase maize grain or mealie meal, even during the current crisis.

Maize shortfalls are typically met by (1) imports for commercial sale, and (2) imports for free distribution among vulnerable households. The large urban markets in the Copperbelt and Lusaka are met almost exclusively through commercial markets. Food relief distribution takes place mainly in rural areas. Even in drought years, the majority of rural households' residual maize requirements (after exhausting own production) are met through markets. Analysis[2] presented in Table 1 suggest that 38%, 45% and 75% of rural households in Eastern, Southern and Western provinces are estimated to meet their consumption requirements through the market during the current season (some households even remain maize surplus).

Table 1. Food Deficit and Surplus Households in Eastern, Southern and Western Provinces (maize and mealie meal, expressed in maize equivalent), 2002/03 Season

Province	Maize deficit, hhs cannot pay for shortfall		Maize deficit, hhs able to pay for shortfall		Maize surplus, hhs able to sell		(7)
	(1) Households	(2) Estimated qty. of food relief required (MT)	(3) Households	(4) Maize volume to be purchased (MT)	(5) Households	(6) Maize volume for sale (MT)	Net maize market position (MT) (4+6)
Eastern	118,300 (61.9%)	-60,700	55,700 (29.2%)	-27,000	17,000 (8.9%)	19,700	-7,300
Southern	58,700 (54.7%)	-105,000	36,800 (34.4%)	-51,400	11,700 (10.9%)	14,400	-37,000
Western	35,000 (34.5%)	-16,300	50,000 (49.4%)	-21,200	16,300 (16.1%)	1,300	-19,900

[1] Mugaiwa, also known as "straight-run" maize meal, is produced by milling maize grain through a hammer mill, using a sieve setting that produces no by-product.

[2] FSRP, 2002 (forthcoming). The analysis uses a cost minimization mathematical programming model at the provincial level where nutrient requirements are wholly or partly met by crops grown in the province, using known crop values, household income, and crop production estimates. Data source: CSO/MACO/FSRP 1999/2000 Post Harvest Survey, 1999/2000 Supplemental Post Harvest Survey, 2001/2002 Crop Forecasting Survey.

The high proportion of households who are unable to pay for their maize deficit confirms the serious nature of the current food crisis in southern parts of Zambia. In the three provinces, some 210,000 households may require food relief of varying degree. On the other hand, in the three provinces some 140,000 rural maize deficit households are estimated to have the purchasing power to buy their maize requirements. Part of that requirement may come from those households who are estimated to have a net maize surplus. In order to reduce the burden of drought relief programs, markets will need to function well so that households with adequate purchasing power can purchase their residual maize requirements at affordable prices.

The hammer mill sector is likely to have the capacity to process as much maize as industrial mills and is important to urban and rural food security.

Hammer mills are found throughout the country and produce mugaiwa. Until public market supplies reduce towards the end of the marketing season, hammer mills probably process as much maize as the industrial mills. They can also produce other products such as roller and breakfast meal by first de-hulling the maize and using finer sieve settings. All hammer mills provide service milling for customers who bring relatively small maize quantities to be milled. Some hammer mills have also started commercial milling and sell their product to the public.

Hammer millers' fees for grinding maize grain into mugaiwa are substantially less than large-scale commercial millers' costs of milling maize into roller and breakfast meal plus the packaging and retailing costs incurred on these kinds of maize meal. Because of this, consumers buying maize grain and milling it into mugaiwa at a local hammer mill pay only about 60 to 80 percent of the cost of purchasing breakfast or roller meal in retail stores.

Hammer mills are important to many urban and rural consumers' food security. About 80 percent of rural households' total maize and maize meal purchases is in the form of maize milled into mugaiwa; the remaining purchases are in the form of packaged industrial meal. This implies that most rural consumers prefer to satisfy their remaining maize needs by purchasing maize grain and having this grain hammer milled into mugaiwa rather than purchase relatively expensive roller or breakfast meal. Urban consumption of mugaiwa is also known to be important, particularly for low-income consumers. However, during times when the availability of maize grain through the small-scale public market distribution channels is constrained, i.e. when local maize shortages occur, industrial mills have traditionally been able to import maize, or have preferential access to government-imported maize, resulting in a temporary increase of the market share for industrial mealie meal versus hammer meal. These periods usually reflect consumers' temporary inability to procure maize grain due to shortages in local markets. This occurred in 2001/02, following the importation of some 150,000 MT of maize facilitated by Government, channeled exclusively through industrial mills. Low-income consumers were forced to pay a higher price for their maize meal than would have been the case if some imported grain were made available to small traders and consumers.

There is the possibility that this situation could repeat itself in 2002/03. If consumers or small traders cannot source maize grain to have it milled into mugaiwa, they will be forced to incur higher prices for their staple food needs. This could especially jeopardize poor urban and rural consumers' food security.

The nutritional value of mugaiwa is superior to industrial meal.

Table 2 shows the nutritional composition of mugaiwa, roller meal, and breakfast meal. Mugaiwa is substantially more nutritious than the industrially milled mealie-meal because all of the germ is retained in the meal. Moreover, because it is less expensive, the nutritive advantages of mugaiwa is even more pronounced when expressed in monetary terms.

Arranging maize imports in such a way that consumers' access to mugaiwa is protected during years of national shortfalls will result in big cost savings among low-income households.

Table 2. Nutritional Differences: Breakfast, Roller Meal and Mugaiwa

Nutrient	Breakfast (65 % extr.)	Roller (85 % extr.)	Mugaiwa (99 % extr.)
Energy (kcal)	334	341	343
Protein (g)	8.0	9.3	10.0
Fat (g)	0.5	3.5	4.0
Calcium (mg)	6.0	7.0	12.0
Iron (mg)	1.1	2.0	2.5
Thiam (mg)	0.14	0.3	0.35
Riboflavin (mg)	0.05	0.08	0.13
Niacin (mg)	1.0	1.8	2.0
Vit C (mg)	0	3.0	3.0

Source: Food Composition Table, Technical Centre for Agriculture and Rural Cooperation, Wageningen Agricultural University, The Netherlands, 1987.

As noted above, due to lower marketing and processing costs, mugaiwa prices[3] are normally well below industrially produced roller and breakfast meal prices (Figure 1). However, the computed mugaiwa prices exceed mealie meal prices toward the end of each season.

This is due to high public market maize grain retail prices, caused by the scarcity of maize grain in the small/medium-scale trading and public market distribution channels at the end of each marketing season. During such times, due to the scarcity of maize grain at public markets, poor households have no choice but to purchase industrially produced meal. This situation occurs each year, but is amplified in maize deficit seasons when maize imports are necessary, such as the current season.

To estimate the effect of more affordable maize meal on household income, a scenario is presented in Table 3 of a low-income household in Lusaka (earning roughly 68,000 kwacha per month)[4] that needs to purchase 42 kgs of maize meal each month, and then shows the cost difference of purchasing maize and taking it to a hammer mill to obtain mugaiwa, rather than purchasing the same volume of breakfast or roller meal. Compared to purchasing breakfast meal, the cost saving of the mugaiwa option is 20% of the household's monthly income. The household's remaining income after purchasing breakfast meal would have been around ZK 18,000, whereas the remaining income after purchasing mugaiwa would be ZK 32,000.

Table 3. Comparison Between Savings Derived from Mugaiwa Consumption and Industrially Milled Mealie Meal

	Breakfast	Roller	Mugaiwa
Price per kg (ZK, 2001/2002 avg.)	1,184.74	975.64	855.07
Average household's consumption (kg)	42	42	42
Monthly expenditure on mealie meal (ZK)	49,759	40,977	35,913
Difference in expenditure between mugaiwa and other types of meal	13,846	5,064	-
Real income of Lusaka low-income household	68,182	68,182	68,182
Cost saving by consuming mugaiwa instead of breakfast or roller meal as % of household income	20.31%	7.43%	-
Remaining household income after purchasing mealie meal requirement	18,423	27,205	32,269

Notes:
1. Assumed household size is 6 persons
2. Estimated mealie meal consumption is 7 kg per person per month
3. Lusaka income based on CSO Living Conditions Monitoring Survey, 1998
4. Lusaka mugaiwa prices are estimated by adding milling charges to the maize grain retail price (source: AMIC), adjusted for inflation (source: CSO)

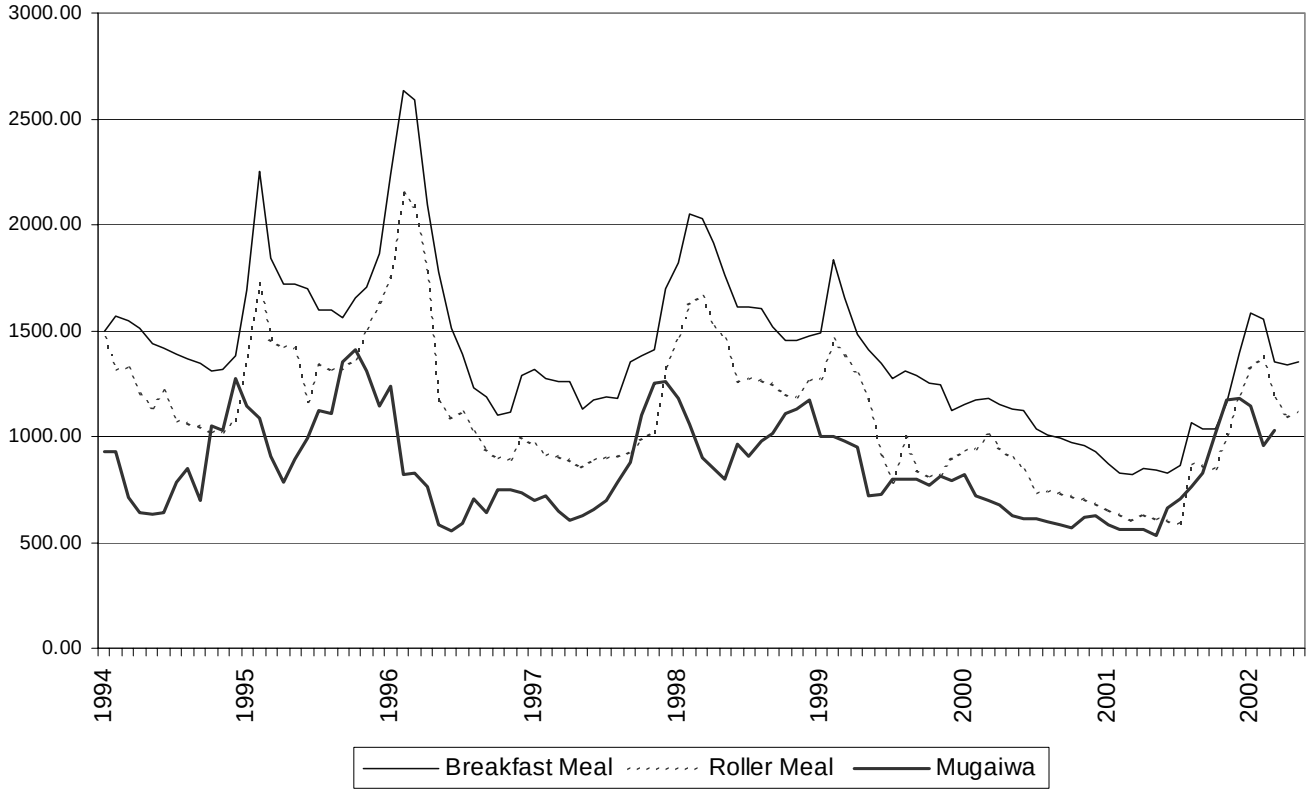
Recommendations:

If mugaiwa consumption through the availability of maize grain is to be facilitated, policy interventions

[3] Mugaiwa prices were computed using maize grain public market retail prices, added by hammer milling fees (Source: AMIC and CSO). It was assumed that the mugaiwa extraction rate is 100%.

[4] About 25% of urban households are estimated to have less than this monthly income and 75% are estimated to have more, according to LCMS estimates, reflated to 2002 price levels.

Figure 1. Breakfast, roller meal and mugaiwa prices in Lusaka (real Kwacha/kg, May 2002=100)



should aim at supplying maize grain through the small and medium scale trading, milling and public market distribution channels during those months of the season when local small-scale supplies normally "dry up". These efforts should not be restricted to large urban centers, and should include the rural maize trade and hammer milling sector. The proposed Crop Marketing Authority may be able to play a useful role in this respect.

For the current season, Government can increase poor households' real incomes by channeling part of its intended maize imports through small and medium scale traders and small-scale commercial mills, and/or sell maize directly to consumers.

The Food Reserve Agency has performed a retail function several years ago, as has the Grain Marketing Board (GMB) in Zimbabwe. The latter set up small sales offices at their depots, following which an active market developed for GMB grain to be milled by small traders and millers who would sell it in urban and small town markets in the form of mugaiwa. Other millers stacked the maize that they bought from GMB depots outside their mills, and allowed consumers to buy the grain and then custom mill it for a fee. Similar marketing practices have been witnessed at Soweto market in Lusaka.

The underlying reason for this is consumer demand. Low-income consumers in particular often rely on the informal trade in grain and mugaiwa in both rural and urban areas, given the cost advantages of hammer milling over commercial roller mills. Allowing these channels to thrive in periods when maize must be imported will help to ensure consumers' access to food during the coming months of the 2002/03 season.

The Food Security Research Project is a collaboration between the Agricultural Consultative Forum, the Ministry of Agriculture and Cooperatives, Michigan State University's Department of Agricultural Economics, and the United States Agency for International Development in Lusaka. The Zambia FSRP field team is comprised of J. Govereh, B. Mwiinga, J.J. Nijhoff, G. Tembo, and B. Zulu. MSU-based researchers in the FSRP are C. Donovan, T.S. Jayne, D. Tschirley, M. Weber, E. Knepper, and A. Chapoto.

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