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ZIMBABWE'S FOOD INSECURITY PARADOX:
IMPLICATIONS FOR GRAIN MARKET REFORM
IN SOUTHERN AFRICA

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Working Paper AEE 1/91

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ZIMBABWE'S FOOD INSECURITY PARADOX: IMPLICATIONS FOR GRAIN MARKET REFORM IN SOUTHERN AFRICA¹

T.S. Jayne and Munhamo Chisvo²

Abstract: The structure of Zimbabwe's grain market, while stimulating production and incomes in high-potential smallholder areas since independence, has actually contributed to food insecurity among grain-deficit households in semi-arid areas. Results of an econometric model indicate that over 100,000 tonnes of expensive commercial maize meal flow annually into rural areas while grain flows out through the official marketing channel. This circuitous movement of grain, a symptom of poorly functioning informal rural grain markets, has effectively reduced incomes among poor rural consumers by as much as 30 percent. The promotion of informal rural trade will require the removal of government restrictions and attention to other critical barriers to private investment in grain trading.

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Zimbabwe has a food insecurity paradox: the threefold expansion of marketed grain output among smallholders since 1980 and overflowing state grain silos existing concomitantly with widespread chronic malnutrition.³ While malnutrition has many causes, inadequate access to food is clearly one of the most important in Zimbabwe (NSC, 1991). Inadequate purchasing power among the poor is often cited as the reason why food insecurity can persist amidst food abundance. This explanation masks the underlying structural determinants of income distribution that give rise to poverty and hunger.

This paper argues that the structure of grain markets in Zimbabwe has eroded real incomes and food security among grain-deficit, relatively poor rural households while simultaneously stimulating the well-publicized growth in aggregate grain sales and incomes documented elsewhere (Stanning, 1989; Jackson and Collier, 1987). Underdeveloped informal grain markets, constrained by government restrictions and other barriers to investment, have failed to provide viable outlets for surplus grain production, causing supplies to be effectively siphoned out of semi-arid rural areas through the formal marketing channels.⁴ This creates localized shortages later in the season as deficit households deplete their own grain stocks. As a result, large

³ A graphic illustration of this paradox occurred on 14 June 1990, when separate accounts of huge food surpluses and widespread starvation were reported on opposite pages of Zimbabwe's major newspaper (The Herald, p.3 and p.4). The Ministry of Health estimates that 30% of Zimbabwean children under five are chronically malnourished; this figure is as high as 36% in the drier provinces of the country (Central Statistics Office, 1989, p. 94).

⁴ The "formal" marketing channel is comprised of farmers selling produce to the Grain Marketing Board (GMB) or any of its licensed agents, urban commercial millers who procure grain directly from the GMB, and retail shops that sell the commercial meal. By contrast, "informal" markets involve households and traders selling grain to buyers other than the GMB or its agents. This channel also includes millers (mostly located in communal areas) that process grain moving through informal channels. The distinction between legal and illegal informal trade is covered below.

volumes of expensive commercial maize meal flow into these areas to satisfy consumer demand at the same time that grain flows out through the formal channels. Therefore, grain "surpluses" delivered from various communal areas to GMB depots, while giving the illusion of self-sufficiency, may mask and even contribute to considerable food insecurity in these areas.

This circuitous movement of grain, a symptom of poorly functioning informal rural grain markets, inflates rural grain prices and has effectively reduced cash incomes among poor rural consumers by as much as 30 percent. At the same time, relatively wealthy grain surplus smallholders have benefitted from the system, as the government's investment in formal marketing infrastructure in communal areas since 1980 has provided reliable outlets for their surplus production. Consequently, the organization and performance of the marketing system has contributed to the highly skewed distribution of income among the rural population observed by other researchers (Stanning, 1989; Rohrbach, 1989).

The case of Zimbabwe may be relevant to other countries in Southern Africa experiencing persistent food insecurity amidst food abundance. Contrary to views that government subsidies are necessary to improve food consumption among the poor, we argue that selective restructuring of the grain market may simultaneously reduce food insecurity and government budget costs. Such a strategy must be based on the development of competitive intra-rural markets that provide more direct channels between grain surplus and deficit households in the communal areas. The development of intra-rural markets -- designed to operate alongside rather than replace the formal marketing channel -- may reduce superfluous grain movements through the formal sector and thus reduce transport costs, shift maize milling to the informal sector where milling margins are about one-half that of the formal commercial mills, and reduce the volume of maize handled at significant loss by the GMB in semi-arid areas of the country. These changes could greatly reduce the cost of maize meal for consumers in rural areas.

The promotion of informal rural trade will not require the government to relinquish

control of maize pricing and distribution tasks that it currently performs. Rather, it will require (1) the removal of several government marketing restrictions that currently make informal grain trading unprofitable and risky, and (2) active government support for private and cooperative investment and new entry into rural grain trading, storage, transport and milling. These changes would facilitate grain access for rural consumers where the single-channel GMB system has not been able to reach, while still allowing the GMB to carry out important tasks related to urban food security, buffer stock management, and price stability.

This report is based on preliminary results of surveys of 648 households, 124 grain and/or grain meal traders, 52 informal millers, 5 GMB depot managers and 2 GMB inspectors operating in 7 communal areas situated in Natural Regions III, IV and V.⁵ These communal areas were Gokwe, Buhera, Mberengwa, Shurugwi, Runde, Nkayi, and Kana. The period of study was between the harvest of April 1989, which was relatively poor in terms of rainfall, and April 1990.

GOVERNMENT OBJECTIVES AND THE GRAIN MARKETING SYSTEM: A MEANS-ENDS INCONSISTENCY?

Rural income growth has been a prime objective of the Government of Zimbabwe since independence in 1980 (Government of Zimbabwe, 1983). Primary instruments of this rural income objective have been grain pricing and marketing policies, in particular (a) producer prices consistently above export parity, especially for small grains; (b) an expansion of GMB buying points in communal lands to stimulate marketed output by smallholders, and (c) a massive infusion of government credit recouped from crop sales to the GMB. These policies were part of a set of factors that induced the dramatic rise in GMB grain intake from the smallholder sector (Rohrbach, 1989).

⁵ Zimbabwe is divided into five agro-climatic natural regions (NRs) ranked I, II, III, IV and V. NRs I and II receive the highest rainfall and are suitable for intensive crop production. NRs IV and V receive under 650 mm of average annual rainfall, and are prone to frequent drought. Sixty percent of Zimbabwe's communal population lives in NRs IV and V.

The emphasis on policies that raise the returns from smallholder grain sales as a means to raise rural incomes implicitly assumes an image of surplus rural producers. This image is contradicted somewhat by a set of recent household surveys in Zimbabwe's semi-arid communal areas. First, it appears that most smallholders in the drier communal lands sell little or no grain. Throughout all Nrs smallholder grain sales are highly concentrated among well-endowed farmers, primarily in the most productive agricultural areas. Ten percent of the households in a given area typically account for over half of the total grain sales (Table 1).

Second, between 50 and 100 percent of smallholder families in Nrs IV and V are typically net purchasers of grain. The exact proportion of grain-deficit farm households depends on the particular geographical area and the quality of the harvest. The government's incomes policy has largely bypassed these households. Their incomes are substantially more sensitive to the consumer price of commercial maize meal than the GMB producer price. These farmers appear unable to respond significantly to production incentives because of limited assets such as land, draft animals, farm equipment, non-farm income to finance investments in improved technology, poor rural transport infrastructure, poor soil and erratic rainfall.

Third, smallholders selling the most grain tended to have higher incomes and grain consumption. Household surveys in two semi-arid communal areas indicated that, at the .01 level of significance, smallholder grain sales were positively correlated with per capita income, grain availability per household member and crop sales from oilseeds and cotton (Chigume and Jayne, forthcoming). The poorest households tended to have relatively few productive assets and were generally purchasers of grain.

Fourth, there are distinct grain surplus and deficit areas within particular communal areas, and among communal areas in close proximity. If the increased surpluses of grain sellers were directly accessible to deficit households, this would reduce informal grain prices and benefit consumers. However, these potential gains have been hampered due to the structure of the grain marketing system.

Table 1: Grain marketing profile of households in selected semi-arid communal areas.

COMMUNAL AREA	NATURAL REGION	QUALITY OF RAINFALL DURING SURVEY PERIOD	AVERAGE NET HOUSEHOLD GRAIN SALES (KGS)	% OF TOTAL GRAIN SALES FROM THE LARGEST 10% OF GRAIN SELLING HOUSEHOLDS	% OF HOUSEHOLDS THAT ARE NET GRAIN PURCHASERS
Gokwe (south) ^a	III	average	2,592	51	12
Gokwe (north) ^a	IV	average	159	59	59
Buhera (north) ^a	III	average	496	50	26
Buhera (south) ^a	IV, V	average	87	72	57
Runde ^a	III, IV	average	3	74	61
Mberengwa ^a	IV, V	average	-248	60	85
Nata ^b	IV	below average	-275	57	94
Ramakwebana ^b	V	below average	-353	68	96
Semukwe ^b	V	below average	-344	62	98

Source: ^aUZ/MSU/ICRISAT Grain Marketing Surveys, 1990; ^bHedden-Dunkhorst, Bettina, 'The role of small grains in semi-arid smallholder farming systems in Zimbabwe: preliminary findings', draft mimeo, SADCC/ICRISAT, Matopos.
 Note: na=less than five households in this category.

THE STRUCTURE OF GRAIN MARKETS

There are two channels by which staple maize⁶ is redistributed from grain sellers to consumers in Zimbabwe: the formal system, in which prices and distribution are highly controlled by the government, and the informal system, which is unregulated within communal areas but is nevertheless circumscribed by GMB activities and regulations (Figure 1).

The Formal System: Maize may be sold through the formal system to one of three procurement arms of the GMB: (1) GMB depots, normally located in town centers; (b) GMB collection points located in rural communal areas; and (c) approved buyers (ABs), licensed private traders that buy at mandated prices on behalf of the GMB. GMB prices are pan-seasonal and pan-territorial.⁷ The expansion of GMB buying points in communal areas since independence has induced surplus farmers to sell a larger proportion of grain through formal channels. These surpluses are not readily accessible to rural consumers. Once grain is sold to rural collection points or ABs, it cannot be purchased directly by rural consumers. Instead, the grain must be forwarded directly to GMB depots, often a considerable distance from grain deficit rural areas. This effectively siphons supplies out of rural areas, tightens supply-demand conditions, and exerts upward pressure on informal market prices. While helping to meet the marketing needs of surplus households, the collection point/AB system and associated resale restrictions may actually make staple grain more expensive for food insecure households.

Once delivered to the depots in town centres, grain may be repurchased for distribution back to communal areas. In theory, GMB depots could play an important role in selling maize grain to rural consumers. Yet the volume of grain purchased from the GMB by rural consumers largely depends on the proximity of a particular grain deficit area to the nearest depot. For example, GMB grain sales

⁶ Maize accounts for 45 percent of the caloric intake in the average Zimbabwean diet (USDA, 1988).

COMMUNAL AREA

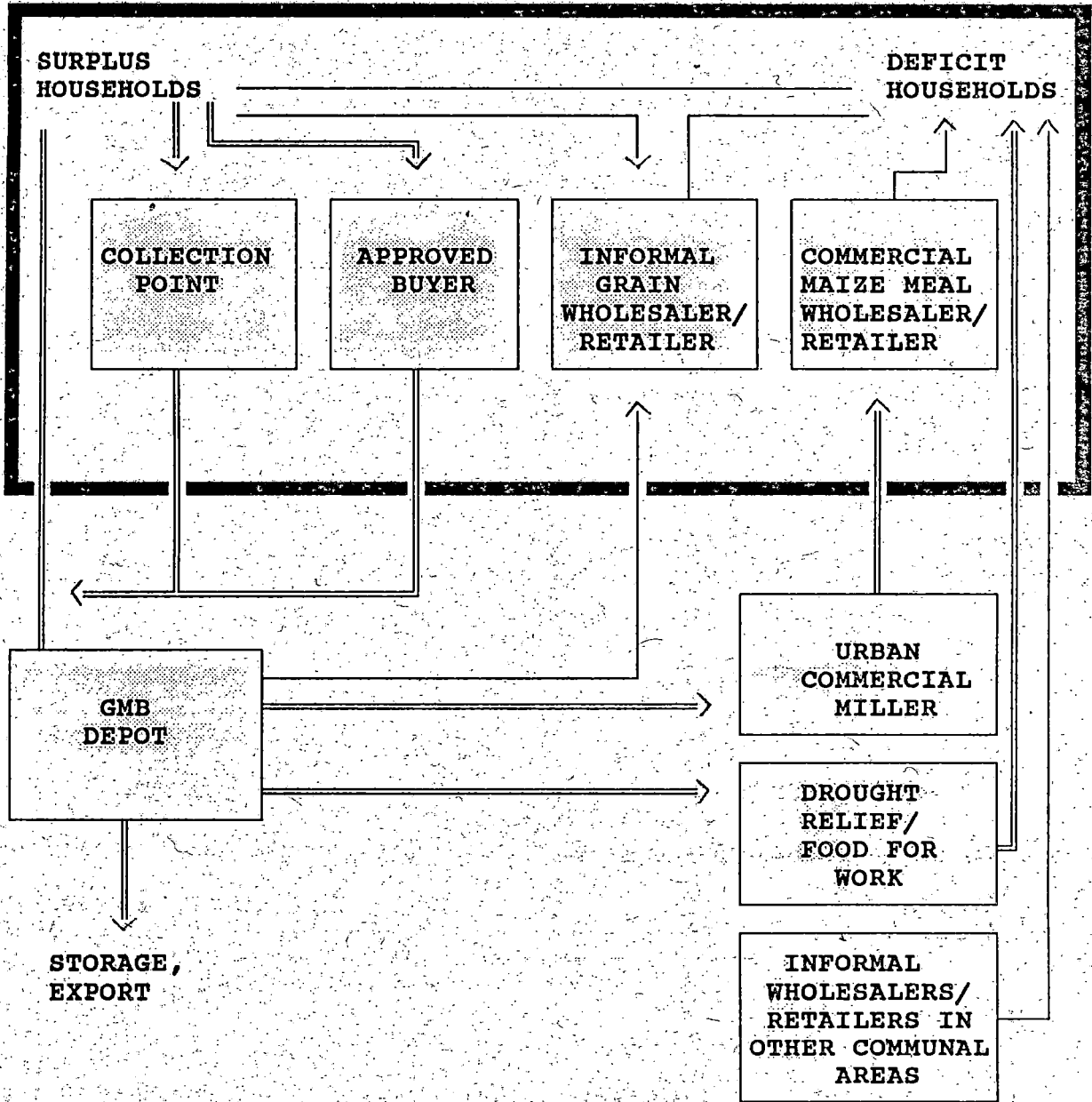


Figure 1: Formal and informal grain distribution channels linking sellers and consumers in Zimbabwe's communal areas

Note: Formal channels are represented by double lines, informal channels by single lines.

in Mberengwa Communal Area were substantial during 1990 because a depot is located in the middle of this drought-affected area (Table 2). However, direct purchases from the GMB dropped markedly in the areas of Mberengwa more than 40 kilometres from the depot. Most households relied on ox-drawn carts for transport. No household surveyed in any communal area located more than 60 kilometres from the nearest depot bought any grain from the GMB. Therefore, the availability of large grain stocks at GMB depots in town centres throughout the country does not necessarily assure access for consumers in distant rural areas.

Moreover, while the GMB provides free transport services for commercial buyers in urban areas, informal buyers must incur all costs of transporting grain back to rural areas. Most importantly, while GMB depots appear to offer grain for sale in small amounts to rural consumers, many will not sell larger amounts to informal traders intending to resell the grain in communal areas. Four of five GMB depot managers interviewed by UZ/MSU Food Security Project staff stated that this practice was illegal, even though the GMB Marketing Act condones it. It is not surprising, therefore, that only 2 percent of GMB's total maize intake since 1980 has been resold to informal buyers. Commercial millers, stockfeeders and brewers have accounted for 77, 8 and 6 percent of GMB sales. Seven percent of GMB intake has been redistributed to rural areas through government food aid programmes.

The formal system appears to perform well in redistributing supplies from areas of geographically concentrated surpluses in the north to urban consumption centers in the south. The government rail links between these regions have resulted in low unit transport costs, which have effectively precluded the development of long-distance informal trade in grain.

The major shortcoming of the current system is its inability to make grain available to numerous, geographically dispersed consuming units in the semi-arid communal areas where 60 percent of the communal population lives. There may be large stocks of grain available at stable prices at GMB depots at town centres throughout the country, but this does not necessarily assure access for consumers in distant rural

Table 2: Importance of alternative grain marketing channels used by households in selected semi-arid communal areas.

COMMUNAL AREA	NATURAL REGION	% OF TOTAL HOUSEHOLD GRAIN SALES TO			% OF TOTAL HOUSEHOLD GRAIN AND MEAL PURCHASES FROM			
		GMB OR APPROVED BUYERS	NEIGHBORING HOUSEHOLDS	INFORMAL TRADERS	GMB	NEIGHBORING HOUSEHOLDS	INFORMAL TRADERS	SHOPKEEPERS
					----- grain -----			----- commercial meal -----
Gokwe (south) ^b	III	86	8	6	7	80	13	0
Gokwe (north) ^b	IV	5	95	0	10	44	36	10
Buhera (north) ^b	III	69	16	15	16	70	1	13
Buhera (south) ^b	IV, V	68	31	1	0	36	11	53
Runde ^b	III, IV	30	70	0	0	23	37	40
Mberengwa ^b	IV, V	43	57	0	26	15	17	42
Nata ^c	IV	0	100	0	0		7 ^a	92
Ramakwebana ^c	V	0	100	0	0		13 ^a	87
Semukwe ^c	V	0	100	0	0		21 ^a	79

Note: ^aThe distinction between purchases from households and informal traders was not made in this study.

Source: ^bUZ/MSU/ICRISAT Grain Marketing Surveys, 1990; ^cHedden-Dunkhorst, Bettina, 'The role of small grains in semi-arid smallholder farming systems in Zimbabwe: preliminary findings', draft mimeo, SADCC/ICRISAT, Matopos.

areas. The GMB's single-channel, one-directional distribution system from rural to urban centers, assumes rural self-sufficiency in grain (Blackie, 1984). The Grain Marketing Act, which specifies the functions and duties of the GMB, contains no mandate to deliver and sell grain beyond its own depots. This is probably justified considering the daunting logistical and financial burden that the GMB would incur in distributing grain to numerous, geographically dispersed areas with poor roads and trading facilities. However, the underlying problem still remains.

The Informal System: Competitive grain markets, in the sense of many buyers and sellers interacting in open fora, are conspicuously absent in Zimbabwe's communal areas. Most informal grain trade is between surplus and deficit households in close proximity, exchanging small quantities (Table 2). This system is unable to achieve economies of scale in bulking and distribution, and cannot efficiently redistribute supplies over long distances and into communal areas suffering from severe food shortages.

The reliance on sporadic household-to-household trade is a manifestation of the underdeveloped and unspecialized nature of informal grain marketing systems. Table 2 indicates that households' purchases of grain from informal traders were quite low except in northern Gokwe and Runde, two deficit areas contiguous to nearby surplus areas. In several grain-deficit wards, no household surveyed was able to identify an informal buyer operating in the area (Table 3).

The survey of rural shopowners and grain traders revealed that, during the 1989/90 marketing year, only 43 percent stored grain for more than one month; only seven percent stored for more than three months. All of the grain bought by informal traders in this sample was resold before October 1989 -- more than six months before the next harvest. This suggests that, apart from storage by farm households, the important function of reallocating grain across time through temporal arbitrage is performed almost entirely by the state.

Table 3. Number of grain buyers and sellers in operation during some portion of 1989/90 marketing year.

COMMUNAL AREA/WARD	ESTIMATED POPULATION 1990	----- GRAIN BUYERS (number) -----				----- GRAIN SELLERS (number) -----			
		approved buyer	shopkeeper	household that trades	TOTAL	approved buyer	shopkeeper	household that trades	TOTAL
RUNDE	1	-	3	9	12	1	1	-	2
	2	-	-	-	0	-	-	2	2
	3	-	-	-	0	-	3	7	10
	4	-	1	3	4	-	9	25	34
MBERENGWA	1	1	4	1	6	1	-	3	4
	2	1	5	-	6	-	2	6	8
	3	-	-	-	0	-	3	2	5
	4	-	-	-	0	-	3	2	5
	5	-	-	-	0	1	3	6	10
SHURUGWE	1	-	1	2	3	-	-	2	2
	2	1	1	2	4	-	-	8	8
	3	-	-	4	4	-	-	9	9
BUHERA (north)	1	15	6	-	21	3	2	4	9
	2	2	3	-	5	1	-	-	1
	3	1	2	-	3	-	-	-	0
BUHERA (south)	1	1	3	-	4	-	3	-	0
	2	-	-	-	0	-	3	6	10
GOKWE (north)	1	4	4	1	9	2	3	3	8
	2	-	4	2	6	-	3	3	6
GOKWE (south)	1	2	7	2	11	-	2	5	7
	2	3	7	4	14	-	3	8	11
KANA	1	13	11	-	24	-	1	-	1

Source: UZ/MSU/SADCC/ICRISAT Grain Marketing Surveys (1990); Central Statistics Office (1989).

This is clear evidence of a problem considering that a substantial marketable grain surplus is often produced in relatively high-potential locations within communal areas that are grain-deficit in the aggregate. There appears to be substantial micro-variation in productive potential between various locations within a given communal area, especially the larger ones. In the case of northern Gokwe, Buhera, and Runde, the grain surpluses generated in some survey areas were sufficient to satisfy the residual grain and maize meal demanded by the remaining survey households in other parts of the communal area. Yet this type of exchange, involving the movement of grain up to 100 kilometres, was depressed because very few informal traders were available or utilized to link these surplus and deficit areas together. The GMB and neighboring households apparently provided more profitable or convenient market outlets (Table 2). Smallholders in the survey who sold grain to GMB or neighboring households were asked why they did not sell to informal traders instead. Their responses were: no informal buyers were operating nearby at time of sale (48%), other buyers gave higher prices (42%), and grain sacks could not be obtained by informal traders (10%).

Ironically, the survey of traders identified grain trading, milling and transport as the second, third, and fourth most profitable activities in which to invest in Zimbabwe's rural areas (opening a restaurant/bottle store was first). However, only 32 percent of the respondents who identified these grain marketing activities expressed an actual intention to expand investment in any of them. These traders stressed that major barriers to further investment in informal grain trading were unavailability of credit to expand operations (73%), unavailability of vehicles and spares to buy (38%), and confusion over the legality of certain trading activities (19%). Moreover, the scope for private trading is further restricted by government regulation of the movement and resale of grain. For example:

1. Grain is prohibited from crossing Zone A areas (commercial farming and urban areas) into Zone B (communal areas). Furthermore, grain may not legally pass from surplus communal areas into deficit communal areas if it requires passing through a Zone A area. While some illicit trade has been detected the surveys, it is undoubtedly of lower volume and higher cost than if government were to remove such restrictions and actively encourage such

trade.

2. Grain delivered by smallholders to rural collection points or ABs cannot be resold directly to consumers. Instead, the grain must be forwarded to the nearest GMB depot, often at considerable expense to farmers and the GMB. These resale restrictions essentially bar the use of these known local sources of grain for procurement and redistribution through informal channels while still in the rural areas.

As a result, after the GMB buying campaign in which supplies are ferried from rural areas to GMB depots in town centres, grain is often not available in sufficient quantities through informal channels to satisfy requirements in semi-arid rural areas.

Consequently, commercial urban-based millers have been able to develop a market by distributing their maize meal from urban centres to rural areas. Seventy-four percent of households randomly interviewed in four semi-arid communal areas in 1990 stated that they bought commercial meal simply because grain was not available to buy locally.⁷ For example, in four communal areas in NRs IV and V from December 1988 to November 1989, households' purchases of commercial maize meal accounted for up to 92 percent of total grain purchases (Table 4). With the exception of Mazvihwa, an areas that received over 170 kgs of maize grain per household through food for work programmes, commercial meal purchases dwarfed coarse grain purchases of all type, and constituted 24 to 37 percent of households' total grain consumption.

Unfortunately, the refined commercial meal is less nutritious and less preferred than the maize meal obtained from informal channels (see below). Most importantly, it is more costly. Even during the pre-harvest months of 1990, commercial maize meal was from 10 to 80 percent more expensive per kilogram than the maize obtained and milled through informal markets.⁸ Ironically, the government subsidizes the GMB's

⁷ Ironically, the commercial millers fill this rural demand by buying grain from the GMB, which to some extent procures the grain from surplus households in the same areas where the commercial meal is sold.

⁸ Price monitoring surveys were conducted bi-weekly within the seven communal area in the sample during 1990.

Table 4

Importance of Commercial Maize Meal Purchases in Households' Residual Grain Requirements
in Four Communal Areas: Natural Regions IV and V, 1988-89*

	HOUSEHOLD GRAIN CONSUMPTION**	HOUSEHOLD GRAIN PRODUCTION	GRAIN CONSUMPTION NOT FROM OWN PRODUCTION	HOUSEHOLD GRAIN PURCHASES	HOUSEHOLD MAIZE MEAL PURCHASES	MAIZE MEAL PURCHASES AS % OF:	
	(1)	(2)	(3)=(2)-(1)	(4)	(5)	TOTAL GRAIN PURCHASES (6)=(5)/(4+5)	TOTAL GRAIN CONSUMPTION (7)=(5)/(2)
COMMUNAL AREA	----- kgs -----					----- % -----	
RAMAKWEBANA	1073	608	465	58	394	87	37
MAZVIHWA	1128	684	444	166	19	10	2
NATA	1275	908	367	25	300	92	24
SEMUKWE	1089	500	589	93	353	79	32

* Consumption is not equal to grain production plus grain and mealie meal purchases because of food aid, food for work, gifts, and carryover stocks.

** Refers to human food and beer consumption; does not include grain fed to animals.

operating margin; if current pressure to reduce these subsidies are implemented, the gap between formal and informal maize meal prices would likely widen further.

The magnitude of this circuitous movement of grain from rural areas to GMB depots, onward to urban mills, and then back to rural areas for consumption has not been accurately quantified and is the subject of some dispute. The following section develops a framework for estimating the grain backflow into rural areas and empirically estimates its volume in both normal and drought years.

COMMERCIAL MAIZE MEAL BACKFLOW INTO RURAL AREAS

Survey data on household market behavior is used to develop a monthly econometric model to estimate the rural backflow of commercial maize meal. Immediately after harvest, most farm households are consuming grain from their own production. At this time, demand for commercial meal is confined mainly to urban and rural non-farm households. Consumption among these groups, who produce no grain, is assumed to be roughly constant throughout the year. However, as a growing proportion of rural households deplete their stocks as the year progresses (Figure 2), demand for commercial meal rises, reaching a peak during the pre-harvest months, after which demand drops off considerably, and is again confined to urban and rural non-farm consumers. Therefore, any rise in demand later in the season may be attributable largely to rural households running out of own grain stocks.

Interviews with general managers of several commercial milling firms indicate that (a) there is a 1 to 2 week time lag between the purchase of maize from the GMB and the time at which it is milled and bagged for distribution, (b) once bagged, the maize meal is rapidly distributed out to distribution points and retail outlets, and (c) aside from working stocks, these millers do not store maize because of the pan-seasonal selling price of the GMB, which effectively performs free storage services for the millers.

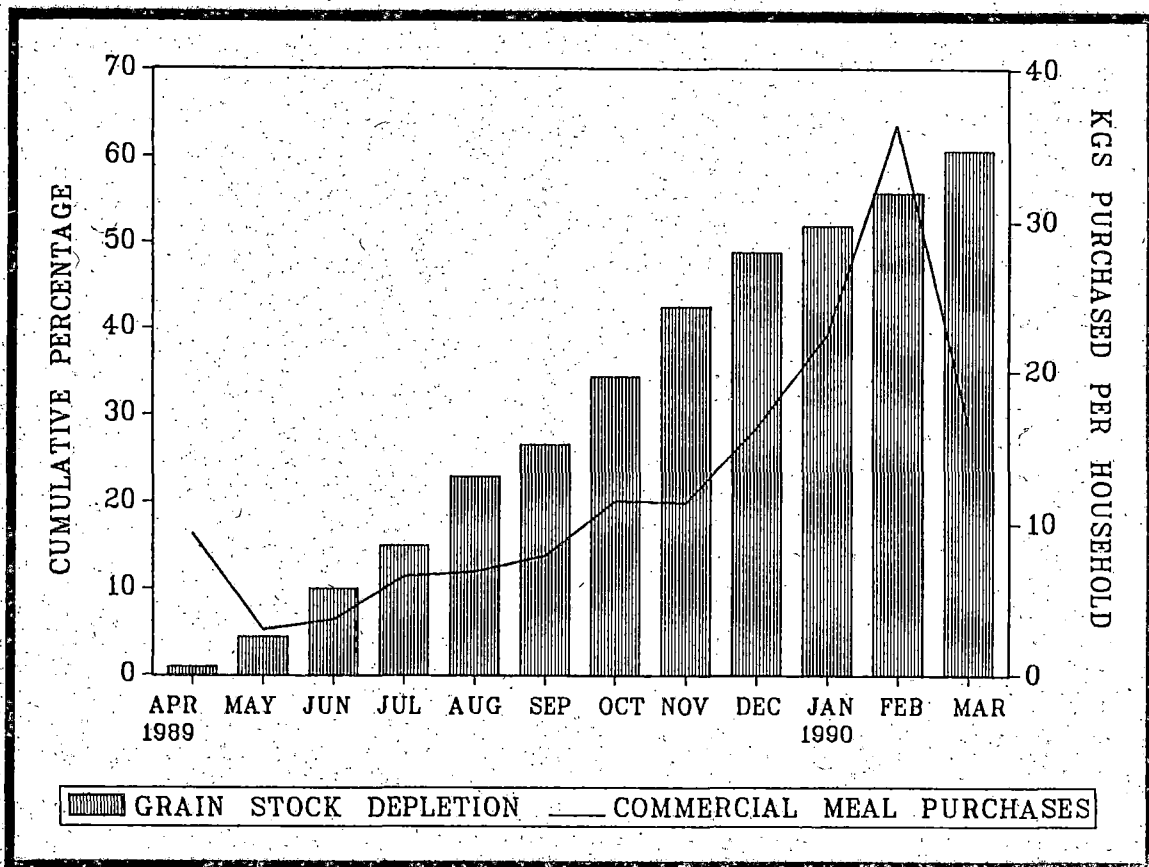


Figure 2: Seasonal pattern of commercial maize meal purchases and the cumulative proportion of households depleting grain stocks: Mberengwa and Runde communal areas, 1989-90 Marketing Year

Note: Harvest in Runde (Natural Regions III and IV) and Mberengwa (NRs IV and V) normally occurs in April or May. However, households may begin eating "green maize" from the new harvest as early as February or March.

Source: UZ/MSU/ICRISAT Grain Marketing Surveys, 1990.

These points indicate that the demand for maize by commercial millers is basically a derived demand for maize meal by consumers, with a 2 to 3 week time lag. Therefore, the seasonal pattern of maize purchases by urban millers, lagged several weeks, provides a close proxy for commercial maize meal consumption.

The seasonality of rural demand for commercial meal may be examined statistically by contrasting the following models:

$$(1) \quad \text{DEMAND}_t = B_0 + B_1 \cdot (\text{PMEAL})_t + B_2 \cdot (\text{PBREAD})_t + B_3 \cdot (\text{RETENTIONS})_t + e_t$$

and

$$(2) \quad \text{DEMAND}_t = B_0 + B_1 \cdot (\text{PMEAL})_t + B_2 \cdot (\text{PBREAD})_t + B_3 \cdot (\text{RETENTIONS})_t + B_4 \cdot (\text{JAN}) + B_5 \cdot (\text{FEB}) + \dots + B_{14} \cdot (\text{NOV}) + e_t$$

where DEMAND represents maize demanded by commercial mills (a derived demand for meal by consumers), PMEAL and PBREAD are the deflated retail prices of commercial roller meal and wheat bread,⁹ and RETENTIONS are annual communal maize production minus deliveries to the GMB.¹⁰ JAN, FEB, MAR, etc., are monthly dummy variables. The hypothesis of no significant rise in rural demand later in the season is represented by $B_4 = B_5 = \dots = B_{14} = 0$.

Equations (1) and (2) were estimated by OLS using monthly data from the GMB and the Ministry of Trade and Industry from April, 1985 to September, 1989. An F-test rejected the null hypothesis of no seasonality at the .01 level of significance.

⁹ Bread is now the second most important source of purchased staple food grain in both rural and urban areas of Zimbabwe. Demand for sorghum and millet may be more important than bread in certain parts of the country when including demand through informal channels, yet no data on volumes and prices are available to examine this further.

¹⁰ Past research has noted the important inverse relationship between demand for commercial meal and the quality of the harvest (Blackie, 1984). During drought years, for example, annual demand for commercial meal rises substantially. The less grain produced and retained in communal areas, the greater the need for commercial meal to be transported into these areas. The demand model should also include a measure of national income, yet this data was not available on a monthly basis.

Results for equation (2) are as follows (t-statistics in parentheses):¹¹

$$\begin{aligned} \text{DEMAND}_t = & 88\,834 - 2\,572.0 \cdot (\text{PMEAL})_t + 39\,778 \cdot (\text{PBREAD})_t - 0.03 \cdot (\text{RETENTIONS})_t + 4\,347.3 \cdot (\text{JUL}) \\ & (2.90) \quad (-2.98) \quad (0.76) \quad (-6.55) \quad (0.83) \\ & + 8\,414.5 \cdot (\text{AUG}) + 13\,922.0 \cdot (\text{SEP}) + 14\,725.6 \cdot (\text{OCT}) + 17\,919.6 \cdot (\text{NOV}) + 21\,295 \cdot (\text{DEC}) \\ & (1.58) \quad (2.62) \quad (2.63) \quad (3.18) \quad (3.84) \\ & + 28\,414.2 \cdot (\text{JAN}) + 25\,526.1 \cdot (\text{FEB}) + 18\,260.4 \cdot (\text{MAR}) + 1\,657.9 \cdot (\text{APR}) + 8\,525.6 \cdot (\text{MAY}) \\ & (4.94) \quad (4.51) \quad (3.23) \quad (0.32) \quad (1.64) \end{aligned}$$

$$R^2 = .72 \quad DW = 1.72 \quad F = 7.25$$

Own price elasticity of demand for maize: - 1.23

Wheat bread cross price elasticity of demand for maize: + 0.44

The results indicate that June is the month of lowest demand (about 35 000 tons purchased per month, given mean levels for PMEAL, PBREAD, and RETENTIONS over the estimation period). This is also the period just after harvest, when most of the rural farm population eats grain from their own production. Considering the extraction rate from maize to maize meal, the results suggest that about 31 300 tonnes of meal are consumed during June. This may be assumed to be the quantity of commercial meal consumed by the year-round consumers mentioned above. This suggests that approximately 375 000 tons of maize are consumed by the year-round consumers in a typical year over the estimation period (Figure 3).

Notice that the demand for commercial meal rises progressively and substantially later in the marketing year. This seasonal pattern corresponds very closely with the pattern of grain stock depletion and commercial meal purchases in Figure 2. It must be assumed that the steady rise in demand later in the season, which peaks just before the harvest, is attributable largely to rural households running out of own grain stocks and not being able to procure grain locally.

The coefficient on RETENTIONS indicates a strong negative relationship between the annual amount of grain produced and retained in communal areas and the

¹¹ Since June was the month of lowest demand, the model was standardized in terms of this month. Elasticities and consumption estimates are calculated at the price and retention means over the estimation period.

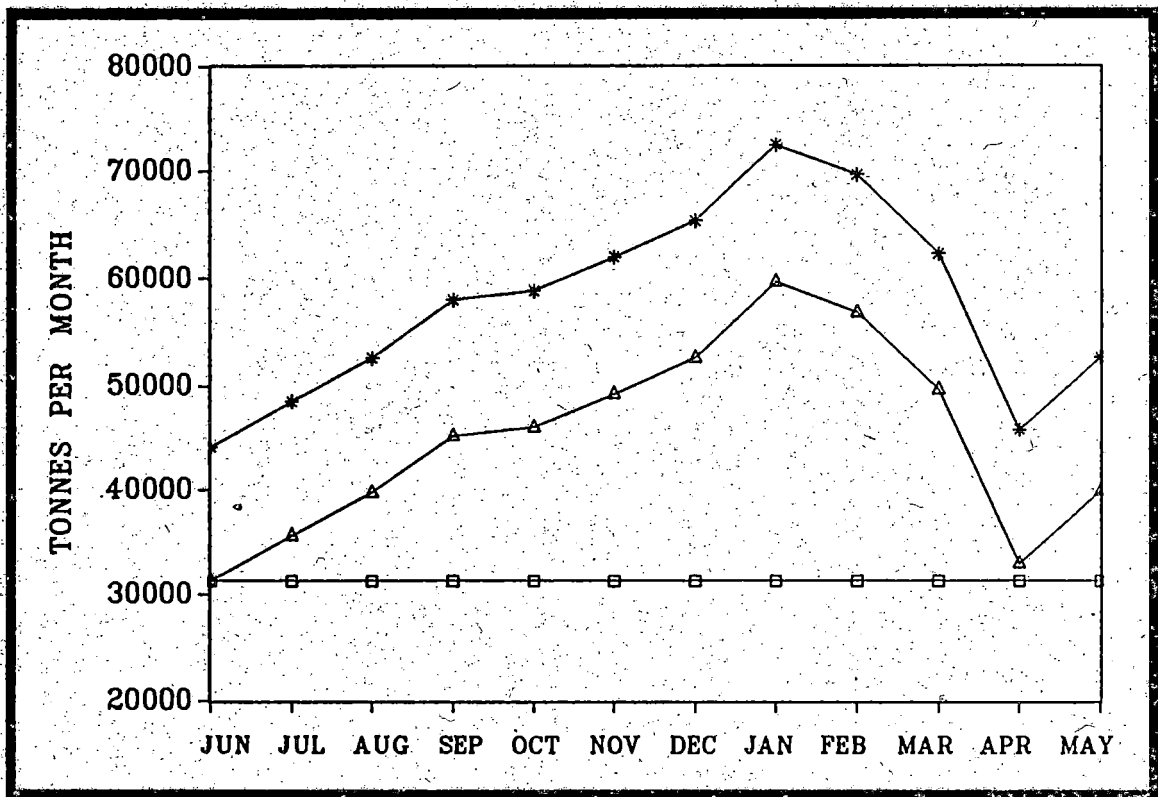


Figure 3: Estimated seasonal variation in commercial maize meal consumption and the distribution of consumption between urban and rural areas

Estimated consumption from urban and year-round rural consumers

Estimated total consumption, normal rainfall year

Estimated total consumption, 1987/88 marketing year

Source: computed from results of Equation (2).

demand for maize by millers. The model indicates that for every additional ton of maize retained in the communal areas, demand for grain by commercial millers declines by 0.32 tons.¹²

The econometric results indicate that the volume of urban-milled meal consumed in rural areas over the past five years has averaged about 130 000 tons during a normal rainfall year, but may rise to 275 000 tons or more during a drought year, as in 1987/88. This represents about 22 and 36 percent of total commercial maize meal sales during a normal and drought year, respectively. This rural consumption is probably concentrated in the low rainfall communal areas and among households working on commercial farms that were allocated plots of land too small to meet the households' annual grain needs.

A hypothetical but not unlikely scenario may be constructed in which 50 percent of the communal area population and 50 percent of the commercial area population accounted for the seasonal rise in demand during the 1987 drought year. Under these assumptions, the average per capita consumption of commercial meal in the rural areas would have been 64 kilograms per year, or approximately 30 percent of per capita grain consumption requirements in Zimbabwe.

EFFECTS OF MARKET STRUCTURE ON HOUSEHOLD INCOMES AND FOOD SECURITY

An estimate of the effect on real household income of filling residual grain needs by purchasing commercial roller meal rather than grain through the informal market is presented in Table 5. Dietary patterns among food secure households show that daily grain consumption is about 0.5 kilograms per adult equivalent. Household surveys in Natural Regions IV and V indicate that average family size is about 8.0 in terms of adult equivalents (Stack and Chopak, 1991). This indicates that about 1,460 kilograms of grain is required by an average household per year. Data

¹² Grain consumption requirement of 230 kilograms per person per year is from SADCC (1990).

Table 5. Estimates of household cash income loss resulting from meeting residual grain requirements with commercial roller meal as opposed to grain from informal channel.

	Household runs out of own grain stocks in:	
	SEPTEMBER	JANUARY
1) Annual household grain requirements (kgs)	1,460	1,460
2) Number of days between household stockout and green maize availability	165	45
3) Residual grain requirement to be met from purchases (kgs)	$165/365 * 1460 = 660$	$45/365 * 1460 = 180$
4) Cost of residual grain requirement from roller meal (Z\$ per household) ^a	$660 \text{ kgs} * \$0.48/\text{kg} = \317	$180 \text{ kgs} * \$0.48/\text{kg} = \86
5) Cost of residual grain requirement from grain purchase on informal market and milling charge (Z\$ per household) ^b	$660 \text{ kgs} * \$0.39/\text{kg} = \257	$180 \text{ Kgs} * \$0.39/\text{kg} = \70
6) Difference in residual procurement costs between roller meal and grain from informal market (Z\$ per household)	\$60	\$16
7) Mean household cash income, lowest income quartile, Mutoko and Buhera (1988-89 marketing year) (Z\$ per household)	\$184	\$184
8) Mean household cash income, 2nd lowest income quartile, Mutoko and Buhera (1988-89 marketing year) (Z\$ per household)	\$452	\$452
9) (6) as proportion of (7)	33%	9%
10) (6) as proportion of (8)	13%	2%

Notes: ^aThe official roller meal price of \$23.50 per 50 kg bag was chosen as a low-end estimate. Actual roller meal prices in many remote rural areas during 1990 were somewhat higher than this. ^bThe informal maize market price of Z\$32 per 95kg bag was chosen as a high-end estimate; informal maize prices observed in the UZ/MSU/SADCC/ICRISAT study never exceeded this price in 25 of 27 wards surveyed during the pre-harvest months of 1990. These wards are all in Natural Regions III, IV and V, most of which were affected by moderate drought during the harvest. The \$5.00 milling charge is 20% higher than the average charge observed in a related survey of informal millers during 1990. Source: data from UZ/MSU/ICRISAT Grain Marketing Surveys, 1990.

presented in Figure 2 indicate that in 1989 (a moderate but not unusual drought year), 25 percent of households surveyed in Runde and Mberengwa (Natural Regions IV and IV/V) ran out of own grain supplies by September (about 165 days before green maize is available from the next harvest); 50 percent ran out by January 1990 (about 45 days before the green maize). Under these two scenarios, Table 5 illustrates the reduction in real household income from purchasing commercial roller meal at prescribed prices instead of maize in the market, assuming an informal price of \$32 per 95kg bag plus a \$5 per bag milling charge. Reference incomes are the mean cash incomes recorded in Buhera and Mutoko communal areas (Natural Regions IV and V), for households in the lowest income quartile (Row 7), and for those in the second lowest income quartile (Row 8; Stack and Chopak, 1991).

This simulation suggests that households in the lowest income quartile that ran out of grain in September and had to buy roller meal instead of grain at \$32 per bag would have incurred a 33 percent loss in real annual household income. Since this is a non-marginal change in income, it is more likely that such households would reduce their intake of grain, with potentially adverse effects on food security. Even for households in the second income quartile, 13 percent of annual cash income would be absorbed in the higher acquisition price of commercial meal. Nine and two percent, respectively, of annual cash income would be lost if the household depleted its grain reserves by January.

In addition to the direct effect on real incomes and food consumption of deficit rural households, the current system suffers from the following:

1. Refined urban-milled meal is less nutritious than straight-run maize meal ground through small hammer mills commonly operating in communal areas. Specifically, the refined commercial meal contains less protein, less fiber, and less oil than straight-run meal.
2. Most rural people prefer the taste of locally-processed meal to more refined commercial meal. In the survey of 648 households in seven communal areas, 71 percent said they would prefer a bag of locally-milled meal over an equal-sized bag of any type of commercial meal. Based on taste alone, 88 percent said that they preferred sadza (the staple dish) made with locally-milled meal.

The slight difference between taste preferences and overall preferences is mostly because locally-milled meal takes longer to cook.

3. The movement of grain out of deficit communal areas and into the GMB/urban milling system reduces demand for and investment in rural grain storage and milling. The potential employment and multiplier effects of rural grain processing, stockfeed manufacturing, and other agro-industries are thus lost to rural communities and captured in the urban areas.
4. Substantial amounts of scarce transport are tied up in GMB freight contracts between collection points, depots, and urban silos (Jayne et al., 1989). The portion of this haulage that is moved circuitously back to rural areas adds to GMB's storage and transport costs, and contributes unnecessarily to the transport bottlenecks currently plaguing Zimbabwe's economy.
5. High-priced grain for rural consumers in the form of commercial maize meal depresses the quantity of GMB maize demanded by urban mills, thus inflating the size and costs of government stockpiling.¹³ The econometric results indicate that national demand for grain by millers, a derived demand for maize meal, is quite elastic. The ability to reduce acquisition costs of grain in rural areas through the development of viable informal trade could greatly relieve the government's maize oversupply problem and the costs associated with it. The shortage of maize grain to buy in many communal lands later in the season is particularly ironic considering the mountains of maize currently held by the government, significant amounts of which were purchased in the deficit areas. This irony is at least a partial side effect of the current organization of the market.

CONSTRAINTS TO INFORMAL GRAIN TRADING

What accounts for the fact that grain is not being adequately redistributed through informal trade, either spatially from surplus areas to deficit locations in the same or another communal area, or temporally from post-harvest periods of abundance to pre-harvest periods of scarcity?

Traders were asked questions about various types of trading activities to clarify the constraints to investment in grain trading specifically. In addition, rural businessmen

¹³ Government maize stocks have constituted over 1.5 years of demand on average over the past five years.

who were not involved in grain trading were also interviewed. These shopowners were chosen to identify factors limiting new entry into grain marketing activities.

Some analysts have suggested that the underdevelopment of informal grain markets may be due to a general lack of profit in this activity (Amin, 1990). This contention does not appear to be supported by the responses of rural traders and shopowners. Grain trading, milling, and transport were identified as the second, third, and fourth most profitable activities in which to invest in Zimbabwe's rural areas (opening a restaurant/bottle store was first).

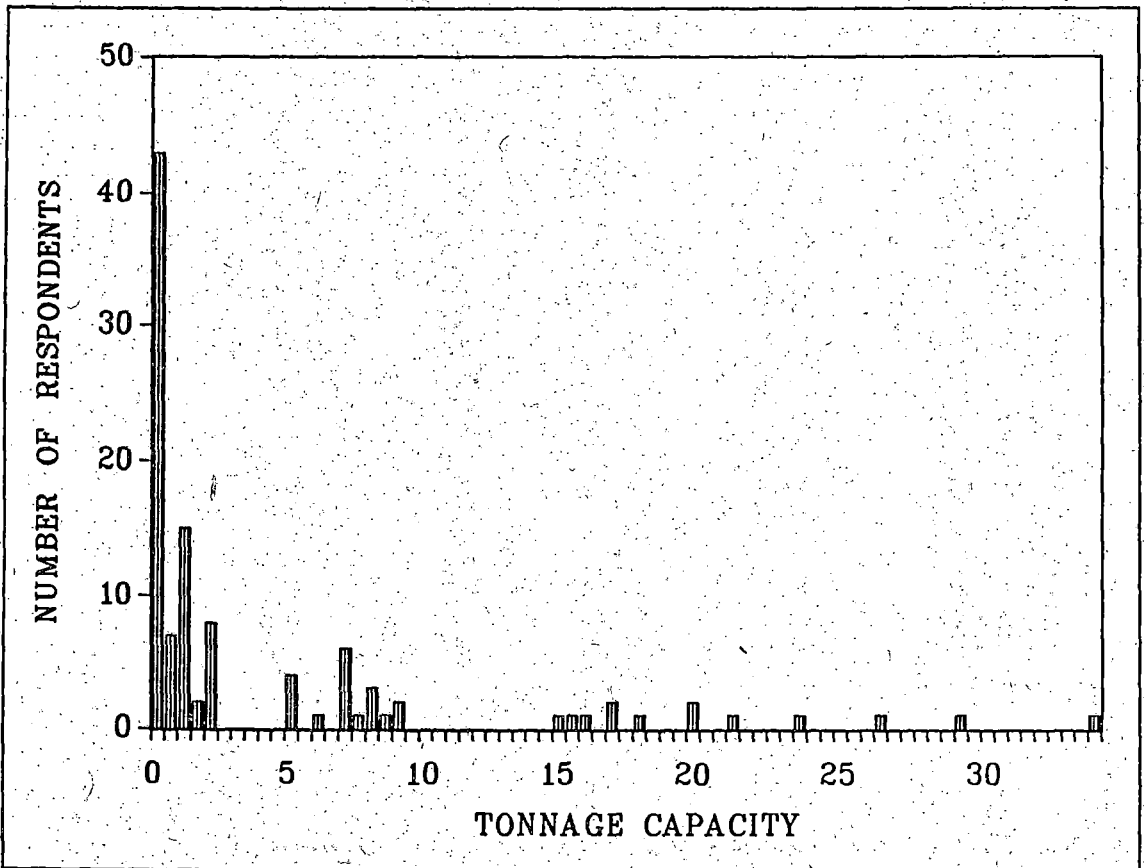
However, only 32 percent of the respondents who identified these grain marketing activities expressed an actual intention to undertake or expand investment in any of them. The major barriers to investment and new entry can be grouped into three broad categories: limited resources necessary to engage in trading, ambiguity of state regulations governing informal grain trade, and government policy restrictions on the movement and resale of grain.

Limited Resources

Working Capital: The viability of grain trading depends on exploiting economies of scale in transactions. Buying enough maize from the GMB to fill a 5-tonne truck requires almost twice the annual income of the average Zimbabwean. Not surprisingly, the inability to secure loans through either the formal or informal sector represented a major barrier to grain trading. Those actually involved in grain trading almost always used only their own funds as working capital. This creates barriers to entry by restricting potential entrants from capturing scale economies in distribution and thus depresses net returns. Those who can capture such scale economies with own cash are probably the relatively wealthy traders.

Limited transport capacity: Only 60 percent of the rural traders surveyed owned a vehicle (Figure 4). Less than 50 percent owned a vehicle with the capacity to carry more than 20 bags of grain. Shortages of credit also limit investment in this critical

Figure 4. Distribution of Transport Capacity among 106 Traders Surveyed in Seven Communal Areas



Source: UZ/MSU/SADCC/ICRISAT Grain Marketing Surveys

means of trade. The availability of vehicles to purchase is severely restricted in Zimbabwe due to a 60 percent import tax on foreign-purchased vehicles and limited domestic production. An interview with the general manager of a major truck dealer in Harare revealed that, while receiving over 3,500 orders for trucks, the dealership was allocated only 30 vehicles from domestic production. Only 1,000 heavy trucks are produced domestically each year, but these are largely rationed through non-market means. The manager estimated that over 50,000 trucks would be needed to alleviate the critical transport shortages currently facing Zimbabwe's economy.

Access to hired transport in the remote areas is reduced further by the poor quality of roads, particularly in the rainy periods. The period just before harvest is critical since many households will have depleted their grain stocks and need to buy grain.

Shopowners have found commercial maize meal trading to be a convenient substitute for grain trading because (1) most commercial millers or wholesalers deliver their meal to retailers' shops even in rural areas, and (2) the demand for commercial meal is guaranteed by the unavailability of grain locally. It is therefore rational for traders to seek trade in commodities that maximize returns to their limited transport capacity.

Seventy-three percent of respondents who possessed a truck did engage in grain trading, yet it was often a passive form of trading, in which grain would be bought by the trader only if customers brought it to his shop. Very little active procurement of grain in known surplus villages was detected.

Because of the currently unspecialized nature of informal grain trade, buyers in surplus areas must find their own means of disposing of the grain, typically to consumers or GMB. There were no reported cases of resale between traders, indicating a less specialized informal marketing system than those commonly found in other developing countries, in which first handlers, wholesalers, and retailers have developed their own niche in the marketing channel. Lack of specialization inflates information and management requirements as well as transactions costs associated

with grain trade. As a result, many respondents stated that an expansion of grain trading would require investing in a new shop or using a relative's home in a deficit area as a place to sell grain procured in surplus areas. This is because no open markets exist in which to sell grain to wholesalers or retailers with a better knowledge of supply and demand characteristics in other locations.

This process of expanding the number of shops to accommodate grain trading again exacerbates the working capital constraint. It also increases management capacity problems, since only members of the family are trusted to hold responsible positions. Several shopowners stated that they would need a trustworthy employee/salesman or relative with good knowledge of local market conditions, and that such salespersons are hard to come by. Lack of trust in employees not only requires strict supervision and record-keeping but also increases transaction costs. There is, however, potential to overcome this hinderance through advertising which would enable the traders themselves to prescribe days which they would trade and thus concentrate the buying and selling of grain into specified time periods. This would reduce the risk and cost associated with employing a salesman. Yet the advertising of grain to sell and buy -- which in the absence of open markets assumes increased importance -- is currently suppressed, since informal traders often perceive their activities to be illegal.

Confusion over regulations governing grain trade

Informal marketing of grain is circumscribed by the Grain Marketing Act, which divides the whole country into two areas, "A" and "B". Area "A" consists mainly of the large-scale-farming areas, most small-scale commercial farming areas, and urban centres. Area "B" is predominantly the communal lands and game reserves. The Act (CAP 113, 1966) states that:

1. Area "A" is controlled; and Area "B" is uncontrolled;
2. The GMB '...won't be concerned with what goes on in Area "B", and main attention will focus on Area "A";
3. Anyone will be permitted to acquire and sell or resell the controlled... maize

in Area "B"...without reference to the Board provided that the controlled product does not leave Area "B"; if they do leave Area "B" its destination must be the GMB, and the only people who will be in a position to deliver it to the Board will be approved and registered by the Board. These people include direct producers, co-operatives and approved buyers and all of these should be in possession of a GMB card.'

In addition, approved buyers, as opposed to informal buyers, have a contract with the GMB. Approved buyers may not directly resell grain that was purchased from farmers except to the GMB. Since the GMB's prices are pan-seasonal, approved buyers are provided no incentive to store grain. The current organization of the market effectively bars a large group of grain traders from engaging in a socially useful function.

While the rules governing grain trading are clearly stated in GMB publications, they are nevertheless subject to a wide variety of interpretations, both, within the GMB and in rural areas. As mentioned above, four of five GMB depot managers interviewed believed it to be illegal for anyone to purchase grain from the depot in excess of his consumption needs, and particularly if the grain was to be resold. Hence, a private trader who wanted to buy truckloads of grain for resale to deficit households in his area would be subject to prior questioning. And if that trader was to confess that he was buying in order to resell, he would be denied the opportunity to buy from the GMB. The few GMB managers interviewed hinted that private traders were likely to set exploitative grain retail prices in remote deficit areas¹⁴. Apparently, this argument appeared strong and common to all depots visited, thus supporting that, at present, only a few informal traders buy grain from the GMB depots, countrywide. In fact, this survey found out that those traders who bought from the GMB either bought in unsuspecting small quantities, hence failing to achieve economies of scale, or pretended to be transporters who were buying and transporting on behalf of those grain deficit households who had no transport. The

¹⁴ This seems ironical given that commercial maize meal obtained through the GMB-urban milling system is 10 to 80 percent more expensive than maize meal prices observed in informal marketing channels.

de facto restrictions on buying grain for resale in rural areas provides urban commercial millers with a de facto monopoly on grain distribution into deficit areas, to the detriment of informal grain trade.

Second, the majority of informal traders lack sufficient information on rules governing grain trade and hence perceive grain trading as illegal regardless of whether the product is controlled or not in the area in which they trade. An illustration of this was the reluctance of many traders to initially admit to enumerators that they traded grain despite being identified by surveyed households as the ones with which they traded. In fact, about ten percent of the original sample of informal traders refused to be interviewed. The incredible difficulty faced by enumerators in gaining the trust of informal traders highlights the risk they attached to their grain trading activities.

Third, informal traders were asked whether or not trade of red sorghum, mhunga and rapoko was legal outside of communal areas. The government decontrolled these crops in 1989, making it legal for informal traders to sell to commercial buyers in urban areas. Surprisingly, only 27 percent were aware the change in rules. Thirty-one percent were confident that it was illegal to trade these three crops, and 43 percent were not sure. Even more surprising were results from surveys of approved buyers, who, through their day-to-day interaction with the Board, have greater access to information and therefore are expected to have more updated knowledge of rules governing grain trade. However, of those interviewed, only 33 percent were aware of the changes in regulations. Fifty percent still perceived it illegal to trade mhunga, red sorghum, and rapoko outside of their area and 16 percent were not sure.

Lastly, four informal traders reported that approved buyers threatened to report them to the police for trading grain informally -- even within their own communal area, which is legal. While the ambiguity of trading regulations has not precluded the development of informal trade, it is apparently of lower volume and higher costs than if the rules were clear and government actually took steps to actively support

such intra-rural trading activity.

Marketing policy restrictions

Apart from misperceptions concerning grain marketing regulations, rural grain traders are legally constrained by two important government restrictions mentioned earlier:

1. Maize is prohibited from crossing Zone A areas (commercial farming and urban areas) into Zone B (communal areas). Furthermore, grain may not legally pass from surplus communal areas into deficit communal areas if this requires passing through a Zone A area;
2. Grain delivered to rural collection points or Approved Buyers cannot be resold directly to consumers. Instead, the grain must be forwarded to the nearest GMB depot, usually located in town centres.

Both of these rules tend to exacerbate the problem of grain shortages in semi-arid areas later in the season. The rules also contribute to the importance of commercial maize meal in rural areas, despite its higher costs and lower preference compared with locally milled meal.

POLICY IMPLICATIONS

Many analysts have tended to think of grain marketing, price, and storage policy options in terms of finding the optimal trade-offs between price stability, consumption, budgetary costs, and other government objectives -- holding market structure constant. The results of this paper suggest that greater focus on the restructuring of the market itself may considerably reduce the magnitude of these trade-offs. Rural food security and GMB budget outlays may both be positively affected by the development of well-functioning, competitive informal grain markets.

A major policy issue is whether the grain market can be restructured in such a way that the GMB maintains its positive functions such as holding buffer stocks to guard against drought and providing a stable floor price for surplus producers, while

simultaneously promoting the development of intra-rural informal trade. Although certain major changes may provide the greatest benefits over the long run, it is important to understand the skepticism with which private traders are viewed in some government circles. These misgivings, coupled with the facts that the effects of promoting informal grain distribution are untested in Zimbabwe and represent a distinct shift away from the highly controlled and regulated current system, may motivate toward a more gradual approach to reform. This would allow government to test the effects of adjustments, and, if successful, progressively restructure the system in line with its objectives.¹⁵

Toward this end, several policy options should be seriously considered:

1. Publish and widely disseminate information pertaining to the regulations governing grain trade in Zimbabwe, rather than have traders ferry grain at night. Some research may be needed to determine effective methods of transmitting information on market regulations in rural areas.
2. Publish and widely distribute information that the GMB sells grain at depots. Make the conditions under which, and the maximum amount that a trader can buy from the GMB explicit.
3. Abolish restrictions on the movement of grain produced in Zone B areas. The GMB would still procure grain from Zone A and surplus areas of Zone B, which would allow it to meet urban demand and maintain strategic buffer stocks. The GMB would also maintain its role as a residual buyer in all areas, effectively offering a floor price to guard against adverse price

¹⁵ Recent events in Zambia and Tanzania demonstrate the risks of immediate and full market decontrol. Following food riots in 1987, President Kaunda renounced the IMF-sponsored structural adjustment programmes and returned the country to its prior system of administered pricing. Zambia's grain policy has since flip-flopped several times, abolishing its marketing board, NAMBOARD, in the process. This approach to full decontrol followed by reinstatement of controls has probably not mitigated the current disarray in Zambia's grain markets. In Tanzania, the government also restricted the operation of private grain traders in 1989/90 after sweeping decontrol several years earlier. This was apparently because the National Milling Corporation and Cooperative Unions could no longer compete with the private traders (Amani and Kapunda, 1990). It is conceivable that a more gradual process of market reform may have facilitated monitoring and measured responses to the changes that reform was bringing, thus avoiding the backlash that returned Tanzania's grain markets to a heavily administered albeit ineffective system of control.

fluctuations. Decontrol of grain movement from Zone A to Zone B would likely have a number of effects on grain distribution and pricing that need to be identified through future research. The adoption of such reforms may include an evaluation component to monitor the adjustments made after decontrol.

4. Expand the function of rural collection points to include the sale of grain to rural consumers as well as procurement for commercial buyers. The added costs to GMB associated with grading and selling could be reduced by conducting sales only once or twice a week. Such costs would almost surely be less than the social costs of transporting grain onward to main depots, handling and storing the grain by the GMB, and transporting expensive commercial meal or food aid back into these deficit areas. To the extent that the retention of grain in rural areas would reduce the costs of drought relief food aid borne by the Ministry of Social Welfare, this Agency could partially compensate the GMB for the added costs of grading and selling at collection points.

Removal of resale restrictions at these known sources of supplies would also expand the scope for intra-rural trade considerably by reducing the search costs of grain procurement for redistribution by informal traders.

5. Allow approved buyers to become "approved sellers". Under such an arrangement, the GMB would set selling prices at which the approved buyer/seller could sell grain to local consumers. This price would have to be high enough to provide incentives to the trader, and would have to allow for the trader's cumulative storage costs. Over the long run, the need for controlling the selling price may become obsolete if a sufficient number of such "approved sellers" were operating in an area to ensure competition.
6. Develop government support for new entry and investment in rural grain trade. The Zimbabwe Development Bank or SEDCO could play a role by targeting credit for specific private investments such as vehicles, hammer mills, spare parts, storage, and marketplace facilities in rural areas. This could be complemented by government investment in rural road infrastructure, and elimination of import restrictions on vehicles and spare parts. Promotion of new entry in grain trading is necessary to ensure that sufficient numbers of traders are in operation to promote competition.

Greater grain availability in semi-arid rural areas would also promote the development of rural hammer millers, dehullers, brewers, and other agro-based industries requiring adequate and reliable volumes of grain to be available for purchase. Currently, such agro-based industries are highly concentrated, and are located in the major urban areas. A higher proportion of grain traded and processed locally may create rural employment and multiplier effects that are currently

confined to urban areas.

Changes in the grain marketing system may be an important precondition for success in the government's efforts to promote crop diversification into higher valued cash crops (Chigume and Jayne, forthcoming). These crops may be "higher-valued" when their net returns are compared against those from growing maize for sale. However, in grain deficit areas, the true opportunity cost of foregoing maize production is related to the acquisition price of commercial maize meal -- some 110 percent above the GMB maize producer price. Market development that successfully reduces rural consumer grain prices may stimulate cotton and oilseed production and promote income growth in some of the less-favoured rural areas.

CONCLUDING REMARKS

It is therefore not a paradox that rural food insecurity persists despite a 300 percent increase in official grain sales since independence. On the surface, the situation is due to substantial variation among households' productive resources, the ability to produce a marketable grain surplus, and other income earning opportunities. Yet the historical and current orientation of agricultural policy toward surplus producers and the neglect of rural market development for consumers has certainly contributed to these income inequalities and the current level of food insecurity in the country. While great strides have been made since independence to provide formal market outlets for smallholders' surplus production, the income gains have been highly concentrated among relatively well-endowed households, especially those in high-potential areas. By contrast, the structure of the market has effectively taxed rural consumers by restricting the development of informal intra-rural grain trade, thus inflating the acquisition price of grain meal in these areas. These grain-deficit households tend to belong to the lowest income strata in the rural areas. Recognition of the magnitude of grain deficits in many rural areas may lead to a reorientation of agricultural and nutrition policy in which broad based rural income growth is seen to depend on reducing consumer prices in rural areas as well as raising producer returns.

These results may hold important lessons for other countries in Southern Africa also possessing centralized grain distribution systems and large surplus stocks. Grain "surpluses" delivered from rural areas to parastatal depots, while giving the illusion of self-sufficiency, may mask and even contribute to considerable food insecurity in these countries. The reforms suggested in this paper would not require the government to relinquish control of grain pricing and distribution tasks that it currently performs. Such reforms would rather encourage government to facilitate market development -- through selected changes in market regulation and active support for investment and new entry in informal trade -- in rural areas where the GMB has been unable to reach.

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