

Staff Paper

**POSTSCRIPT TO ZIMBABWE'S MAIZE
SUCCESS STORY:
POLICY LESSONS FOR EASTERN AND
SOUTHERN AFRICA**

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Abstract: Since independence, Zimbabwe has received widespread international acclaim for the rapid growth in smallholder maize production. However, there has been a largely unnoticed structural decline in production since 1985, associated with a contraction of public sector support programs that had contributed to the dramatic rise in smallholder production during the early 1980s but involved large treasury deficits. The adverse effects of this production decline on urban food security appear to have been mitigated by recent maize marketing reforms that have reduced distribution and milling costs of staple maize meal available to consumers. The experience of Zimbabwe raises important policy issues for South Africa and other countries in economic transition: (1) how to restructure (rather than abandon under budget pressure) key public sector programs and policies to raise agricultural productivity and meet the needs of a vastly expanded agricultural client base in a sustainable way; (2) how to capture potential gains from market liberalization without exposing producers, consumers and government to the economic, nutritional and political costs of price instability; and (3) how to allow the preferences of lower-income consumers to be better articulated through the food marketing system to promote food security.

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Amid Africa's overall lackluster agricultural performance during the 1980s, Zimbabwe has received widespread acclaim for its agricultural success story (Rukuni and Eicher, forthcoming). The country has been a net exporter of maize, the dominant staple crop, for 11 of the 13 years since independence in 1980 and has doubled food production in the smallholder sector between 1980 and 1985. The elements of this production success have been well documented, and provide important food policy lessons for the region (Rohrbach 1989; Stanning 1989).

A closer look, however, reveals a relatively neglected second chapter of Zimbabwe's maize revolution, which holds equally important policy lessons for governments faced with a massive expansion in its client base and declining budgets for investment in agriculture. The purpose of this article is to identify and document the underlying causes of the agricultural decline in Zimbabwe's smallholder sector since 1986, and to discuss their broader implications for reviving food security and productivity in Eastern and Southern Africa. Concluding remarks are directed to the lessons of Zimbabwe's post-independence experience for policy change in the Republic of South Africa and other countries in the region.

From Success Story to Stagnation

The impressive growth of Zimbabwe's smallholder maize production from 1980 to 1985 was due to six major factors: (1) the ending of the war after independence; (2) an increase in the use of hybrid maize seeds from about 40% in 1979 to 98% in 1985 (Kupfuma 1993); (3) an increase in state crop buying stations serving smallholder areas, from 5 in 1980 to 148 in 1985, thus reducing the costs and risks associated with surplus maize production; (4) guaranteed state-set producer prices that were generally well above export parity prices (but below import parity); (5) a eight-fold increase in crop credit disbursed to smallholders between 1979 and 1986, which led to greater fertilizer use and maize yields; and (6) an associated response by private input suppliers to the increased demand for farm inputs due to the aforementioned (Rohrbach 1989).

However, perceptions have lagged behind reality since the mid-1980s. Smallholder maize area peaked in 1985, and has declined at an average rate of 55,000 hectares per year from 1985 to 1991.¹

¹The drought in 1992 precludes meaningful use of data from this year to discern trends. The data in this paragraph is drawn from AGRITEX (1992) and is analyzed in greater detail in MLAWD (1993). The AGRITEX data indicate that the decline in smallholder maize area has not been counterbalanced by increased cultivation of other crops. While the data should be interpreted cautiously, total cultivation of crops in the smallholder sector appears to have declined since 1985.

Most of the decline in smallholder maize area appears to be in the lower-rainfall areas that are already subject to chronic food deficits. As with the commercial farming sector, smallholder maize yields have shown little improvement since 1985. Since 1985, the growth rate of maize production has been outstripped by population growth. After rising dramatically during the early 1980s, per capita maize production in the smallholder sector during 1989/91 had declined to about the same level as it was at independence (Table 1).

The stagnation of Zimbabwe's smallholder revolution since the mid-1980s is due to 3 major factors. The most conspicuous is drought, which has affected the country three times since 1985. Yet there are also underlying structural causes of the maize decline. First, the improved hybrid seed varieties that stimulated smallholder productivity during 1980-85 are now almost universally adopted. A new set of technological improvements or management practices is necessary to stimulate additional gains in productivity. The national agronomic and crop breeding research institute (DR&SS) receives only 75% of the budget it had in 1980/81 in real terms. The number of on-farm trials and sites by DR&SS has shrunk from 63 in 1987/88 to 31 in 1990/91 (Shumba 1991). The public agricultural research system is having serious staffing and budget problems (Eicher 1994).

The productivity of the public agricultural research system is also indicated by the continued use of hybrid seeds that were developed 15-20 years ago. Byerlee (1993) has documented that specific maize hybrids typically have a life of about 3 years in the USA and parts of Asia before they are replaced by new improved varieties; by contrast, R201 and R215, which were developed over 15 years ago, continue to be the major maize varieties grown by smallholders.

Second, several important features of the 1980-85 production boom (expansion of state marketing infrastructure and credit allocation, producer prices above export parity) involved large and sustained treasury outlays. The maintenance of high maize prices to sustain surplus production also put pressure on government to cushion the impact on consumers by subsidizing the price of maize meal manufactured by large urban millers. Under mounting pressure to cut budget deficits, these public investments in support of agricultural production were progressively cut back after 1985. Grain Marketing Board (GMB) buying stations in smallholder areas have been reduced. Even though 20 additional grain buying depots have been established since 1985, the number of rural collection points has declined from 135 in 1985 to 42 in 1989 to 9 in 1991.² GMB real producer prices have also declined steadily, being only 75% in 1991 of their 1985 level. State credit allocation to smallholders has also declined steadily since 1986. The amount of fertilizer that can be purchased with government credit disbursed to smallholders is 44,000 metric tons in 1992 compared with 148,000 tcn in 1986. Declining input use, along with relatively poor rainfall, may explain why smallholder maize yields, even in the relatively productive Mashonaland provinces, have exceeded their 1985 level only once.

Prior to independence, the controlled marketing system effectively met the needs of its primary agricultural client base: several thousand European commercial farmers. Upon independence, the Zimbabwean government rapidly expanded the same basic support package (state marketing board depots, subsidized credit to individual farmers) into smallholder areas. However, there are

²While part of this decline is due to reduced expected throughput because of frequent drought and lower real producer prices, it is evident that the collection point program was financially in-viable (Herald, 1991).

TABLE 1. Trends in Zimbabwean Maize Production and Associated Policies

YEAR	Maize area smallholder sector (000 hectares)	Average maize yield, smallholder sector (metric tons per hectare)	Maize production, smallholder sector (000 metric tons)	National maize production per capita (kgs)	GMB real maize producer price (Z\$ per metric ton 1992 = 1)	Number of loans disbursed by AFC to smallholder	Number of GMB depots and collection points in smallholder areas
	(a)	(b)	(c)	(d)	(e)	(f)	(g)
1980	931	0.79	738	232	541	18,000	5
1981	1,153	0.91	1,054	384	675	30,150	9
1982	1,146	0.58	665	240	610	38,912	9
1983	1,099	0.28	308	118	496	50,036	9
1984	1,166	0.58	681	170	481	65,793	12
1985	1,228	1.52	1,876	363	570	77,526	148
1986	1,114	1.24	1,388	284	499	77,384	54
1987	1,030	0.52	544	118	444	69,885	39
1988	1,036	1.54	1,600	249	449	57,879	50
1989	979	1.37	1,351	227	434	43,846	54
1990	949	1.27	1,212	194	383	30,190	43
1991	885	0.95	841	136	364	22,568	40
1992	728	0.30	222	50	550	n/a	n/a

(a), (b), (c) AGRITEX Crop Forecasts, AGRITEX, Ministry of Lands, Agriculture and Water Development, Harare
 (d) Central Statistics Office files, Central Statistics Office, Harare
 (e), (g) Grain Marketing Boards files, Harare
 (f) Agricultural Finance Corporation, Annual Reports, Harare

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important distinctions between the two sectors that led to the financial unsustainability of simply "scaling-up" a marketing apparatus for a small number of large farmers to meet the needs of almost a million geographically-dispersed smallholder families (Blackie 1986). The large-scale farming areas were predominantly close to urban centers; volume of sales per farmer were large; and the production units were geographically concentrated and few in number. GMB marketing costs were therefore low. By contrast, the expansion of state buying stations into the smallholder areas forced the GMB to buy relatively small, variable quantities of grain from a large number of geographically-dispersed farmers. Per unit marketing costs rose dramatically in this setting, although government normally chose not to raise GMB's trading margin sufficient to cover these costs. This has been a major impetus for the GMB's call for further contraction unless the government agrees to underwrite its losses (Herald 1991).

The experience with expanding crop credit to individual smallholders farming in environments prone to frequent drought has resulted in high default rates (The Herald 1993). Credit allocation, and the associated demand for farm inputs have failed to expand since the mid-1980s. The experience of Zimbabwe highlights the problems of "scaling-up" public support services to meet the needs of an expanded agricultural base in a sustainable way (Eicher 1994).

Trends in Food Access

Ironically, lower maize producer prices through the 1980s had not resulted in lower consumer prices of maize meal. An increasing proportion of the value of industrially-processed maize meal has been taken up in marketing costs. Higher marketing costs over the past decade, while commonly attributed to GMB, had been also due to substantial increases in margins awarded by government to high-cost industrial millers (which, in a de facto sense, had become vertically integrated with the GMB).

Despite the relative inefficiency of roller mill technology compared with small-scale hammer mills (Bagachwa 1992; Stewart 1976), key regulations entrenched the dominance of the GMB/large urban milling system in the sector by restricting access to maize by lower-cost small-scale millers (Jayne *et al.* 1991). As in Kenya, Malawi, Zambia and South Africa, some of the regulations used to preserve the dominance of the official marketing system and impede private trade in Zimbabwe had included (1) prohibiting private maize movement across district or zonal boundaries, including into urban areas; (2) providing preferential access to grain once in the hands of the state marketing board; (3) setting a narrow margin between the producer and selling price c^f the marketing board, such that private trading is rendered unprofitable in many areas and the marketing board becomes the sole maize buyer by default; and (4) mandating a state monopoly on cross-border trade, the enforcement of which is supported by points (1) and (3).

This system, while consistently generating maize surpluses during the mid-1980s, resulted in higher real food marketing and milling costs, which were partially passed on to consumers and partially absorbed by the treasury. However, the subsidy on industrial maize meal reached 3% of GDP in 1992, and its elimination became an object of external donor pressure.

In recognition of these problems, the GOZ began considering the modalities of grain market reform in the early 1990s in an effort to (a) reduce treasury deficits associated with maize marketing; (b) revive food production incentives; and (c) maintain food prices at tolerable levels. The centerpieces

of the proposed reforms was the partial or total elimination of controls on grain movement across "zone" boundaries, and the elimination of selective discounts on the price of maize offered to large-scale urban millers by the GMB. The following section discusses the major fears of policy makers stemming from these proposed reforms, their actual initial effects up to December 1993, and their implications for policy reform in other countries considering a transition from controlled agricultural systems in the region.

Maize Market Reform: Anticipated Problems and Initial Assessment

There is a unique set of conditions that have led to the historical pattern of highly centralized and controlled grain marketing systems in Eastern and Southern Africa. Their social and political ramifications must be adequately appreciated in order to design and implement viable food market reform strategies in the region. First, the staple crop in the region, white maize, is thinly traded on world markets. Second, most of the population of Eastern and Southern Africa lives in landlocked cities and remote rural areas and face high transport costs to coastal ports. Third, white maize production in the various countries of Southern Africa is positively correlated (Koester 1986). Reliance on regional trade is limited, *inter alia*, because shortfalls in one country tend to coincide with shortfalls in neighboring countries. Fourth, the region is prone to frequent drought and cereal yields are the most unstable in the world.³ These structural features indicate that reliance on private trade alone to offset production fluctuations would involve large price fluctuations between export and import parity levels in the absence of substantial inter-annual stockholding.⁴ The social and economic disruptions caused by instability in staple food prices have given rise to the region's commitment to food price control and associated market regulation. While such policies have imposed heavy costs on their grain sectors, textbook free market prescriptions have been ignored in Zimbabwe and elsewhere in the region because they normally failed to satisfy policy makers' concern with the instability issue.

In addition, efforts to develop more decentralized and competitive maize trading and milling networks in urban areas had been neglected because of the conventional perception, built up by decades of advertising by commercial milling firms, that urban consumers strongly prefer (or should prefer) the refined maize meals produced by industrial roller mills, and are not responsive to price differences between various types of maize meal. In both Zimbabwe and Zambia, a better understanding of actual consumer preferences, which could not be articulated through the market because of policy barriers, may have generated important information that could have led to the earlier implementation of food security-enhancing policy change (Jayne and Rubey 1993; Guyton and Temba 1993).

³Botswana, Swaziland, Lesotho and Zimbabwe have the highest cereal yield variability in Africa over the period 1970-92 (Goldman and Block 1992). Cereal yield variability was defined as the standard deviation of residuals of logged cereal yield from trend. Cereal yield variability of these countries was more than double that of four Asian countries for which data was presented.

⁴Similar problems in landlocked areas of West Africa have been discussed by Delgado (1992). Factors impeding private sector inter-annual grain arbitrage in low-income countries are discussed in Sahn and Delgado (1989).

In 1993, however, specific maize market reforms were linked to the GOZ's receipt of a structural adjustment loan from external funders. Based also on a government study (MLAWD 1993) and results of surveys indicating greater receptiveness to hammer-milled meal in urban areas than previously perceived, the GOZ eliminated the subsidy on commercial roller meal and eliminated most of the controls on private maize movement in the country. The policy reforms allowed maize to be privately moved into urban areas to be milled by substantially less-costly hammer mills (compared to the more costly commercial roller mill technology that had had a virtual monopoly on the urban maize meal market until 1993).

The initial effects have been dramatic. While the price of commercial roller meal doubled between 1992 and 1993, the effect on consumers was buffered by private movement of maize into urban areas, which has allowed households to avoid paying the trading margin of the GMB as well as the higher milling margins of the large-scale industrial roller mills. Since early 1993, the monthly sales of maize by the GMB to the large millers had fallen to 25% of their normal level, indicating a massive shift in maize throughput from the large roller milling firms to the small-scale hammer mills. This conclusion is supported by data from local distributors of hammer mills, indicating a four-fold jump in hammer mill investment in 1993 over previous annual levels (Sithole et al. 1993).

In addition to putting downward pressure on maize milling and distribution costs, the 1993 maize marketing reforms have also (a) increased the nutritional content of the maize meal processed and consumed through hammer mills, since this meal is less refined than roller meal (West et al. 1987); (b) presumably increased employment, due to the greater labor/capital and labor/output ratios of hammer mill technology over large-scale roller mill technology (Bagachwa 1992; Stewart 1977); and (c) increased the aggregate meal/grain extraction rates, thus reducing the amount of raw grain required to meet national demand at a given price level. This would either have beneficial foreign exchange implications and/or free up land for cultivation of substitute crops without putting upward pressure on staple maize prices (Jayne and Rubey 1993).

The major feature of the evolving grain marketing system is the greater emphasis it has put on decentralized private trading and milling networks to distribute food. A major test of the system will come with the next drought: will the system be able to avoid food price hikes and shortages in deficit rural areas as well as urban areas? Under the continued maintenance of pan-territorial and pan-seasonal prices, private storage for short periods will continue to be unattractive, which may also serve to impede inter-annual storage incentives as well. The GMB's ability to moderate price rises depends on securing adequate stocks to release onto the market in response to supply shocks. But because of the new importance of private distribution and trade, the historical patterns of farmer maize sales to GMB and demand for GMB maize are likely to be poor guides for supply-stabilization management in the future.

Policy Lessons for Eastern and Southern Africa

The broader agricultural policy issues highlighted by the case of Zimbabwe concern how to restructure programs and policies during a period of declining public budgets under structural adjustment, to raise agricultural productivity and meet the needs of the much broader constituency in a sustainable way. Several lessons are highlighted:

- (1) When governments become indebted and solicit assistance from international lenders, the

quid pro quo for loans is normally a modification of the policies and practices contributing to that debt. Thus, without a tax base to cross-subsidize agriculture or a sustainable external flow of capital to feasibly maintain recurrent deficits, an agricultural sector whose growth depends on recurrent public transfers is likely to falter in the long run. The rise and fall of agricultural production in Zimbabwe's smallholder sector over the 1980s has mirrored an upsurge and contraction of key public investments and expenditures to agriculture.⁵ However, this does not imply that the correct response is to withdraw the role of the state when, by default, it can no longer sustain the costs under the existing formulation of its agricultural support programs. The key question is how to redesign such programs and policies to fit the needs of a much larger clientele in a cost-effective and sustainable way. Zimbabwe's difficulties in "scaling-up," i.e., managing the transition from a well-organized public research and market infrastructure system that fit the needs of a few thousand commercial farmers under Southern Rhodesia, to a system that meets the needs of over a million smallholder households, has clear implications for South Africa and other countries in the region (Blackie 1986; Eicher 1994).

- (2) While the commitment to food price stabilization and associated controls on food marketing systems have been an understandable outgrowth of the unique conditions of Eastern and Southern Africa, these policies have imposed heavy costs on producers, consumers and/or the treasury. The development of decentralized maize marketing networks in Zimbabwe, facilitated by the policy reforms of 1993, has already measurably reduced food marketing margins and consumer prices and has stimulated private sector investment (Sithole et al. 1993). However, as experience in Zambia, Kenya and Malawi has shown, increased competition from private trading networks makes continued state management of food pricing and stockholding considerably more difficult, especially under the continuation of rigid fixed price policies that prohibit the marketing board from flexibly adjusting its prices to changing market conditions. In some cases, the marketing boards have been left to collapse under financial difficulty rather than redesigned to fulfill important functions in a sustainable way. The pitfall of this approach is that large production fluctuations in the absence of price stabilization policies, given the thinness of the world market for white maize and the landlocked status of many Eastern and Southern African cities, may easily precipitate political upheaval and the reimposition of tightly controlled marketing system.
- (3) Food marketing policies are often designed without adequate knowledge of existing consumer preferences, or how preferences may be changed to permit broader productivity gains throughout the agricultural system. As shown by the case of Zimbabwe, consumer preferences, while typically viewed as exogenous and fixed, were much more flexible and responsive to policy change than conventionally perceived. The ability to alter consumption preferences (or allow existing consumer preferences to be better articulated through the food system) may facilitate (a) relatively costless improvements in access to food and the nutritional content of food consumed; (b) productivity gains in the agricultural system through shifts in crop mix and processing techniques; and (c) growth in employment and income distribution from shifts in the importance of alternative marketing channels and associated technologies utilized by these alternative channels.

⁵This finding, based on results of a restricted dual profit function model, is discussed in greater detail in Jayne et al., 1994.

- (4) The depletion of human capacity at public sector agricultural research and extension organizations poses serious long-term problems for the agricultural sector. Because of the long gestation periods associated with rebuilding scientific capability, agricultural productivity over the next several decades may be compromised by current high staff turnover and financial difficulties facing public sector agricultural research. Kupfuma (1994) recommends that smallholder farmers, normally a politically dispersed and unorganized group, can more effectively influence the performance of public research and extension systems by learning from the techniques by which the Commercial Farmer's Union (the major client of the public agricultural research organizations prior to independence) effectively influenced the level and use of resources allocated to the public agricultural support organizations in Southern Rhodesia. This symbiotic relationship between organized farmer groups and public agricultural support organizations has important lessons for other countries undergoing political and economic transition. Future productivity growth will be undoubtedly influenced by the structure of incentives and power that emerges from this transition.

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