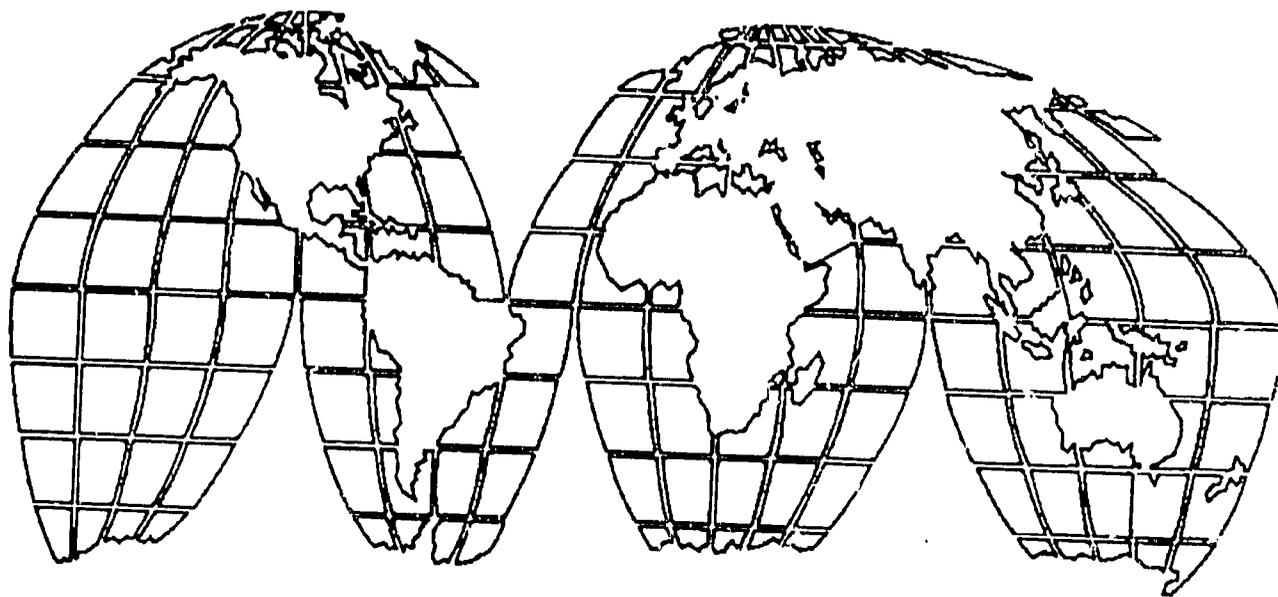

CDIE Working Paper Report No. 143

The Malawi Fertilizer Subsidy Reduction Program The Impact of the African Economic Policy Reform Program



December 1990

Agency for International Development (A.I.D.)

Washington, D.C. 20523

THE MALAWI FERTILIZER SUBSIDY REDUCTION PROGRAM
The Impact of the African Economic Policy Reform Program

A.I.D. WORKING PAPER NO. 143

by

Vimal Atukorala, Economist
(AFR/DP)

Alan Batchelder, Economist and Team Leader
(PPC/FA)

George Gardner, Agricultural Economist
(AFR/TR/ANR/PA)

Theresa Ware, Anthropologist
(S&T/RD/HRD)

U.S. Agency for International Development

December 1990

The views and interpretations expressed in this report are those of the authors and should not be attributed to the Agency for International Development.

TABLE OF CONTENTS

Summary

1. Background
 - 1.1 Introduction
 - 1.2 The Nation
 - 1.3 The Economy, Double Agricultural Dualism
 - 1.4 ADMARC Subsidies and Fertilizer Imports
 - 1.5 Budget Deficits and Inflation
2. The Role of A.I.D.
 - 2.1 The 1985 Economic Policy Reform Program
 - 2.2 Termination for Noncompliance
3. The Impact of the Parts of the Economic Policy Reform Program
 - 3.1 The Size of the Subsidy
 - 3.2 The Impact on Smallholder Farm Families
 - 3.2.1 Fertilizer Prices Relative to Maize Prices
 - 3.2.2 Differential Subsidy Rates
 - 3.2.3 Increased Smallholder Purchases of HAF
 - 3.2.4 The Cropping Pattern
 - 3.2.5 Maize Production and Marketing
 - 3.2.6 The Smallholder Fertilizer Revolving Fund
 - 3.2.7 The Smallholder Agricultural Credit Administration
 - 3.2.8 The Role of the Extension Service
 - 3.3 The Impact on the GDM Budget
 - 3.4 The Impact on Supply of and Demand for Foreign Exchange
 - 3.4.1 The \$13.1 Million in Cash Grants, the Real Resource Transfer
 - 3.4.2 Reductions in Foreign Exchange Costs
 - 3.5 The Impact of the Use of the Local-Currency Counterpart
 - 3.6 The Impact of the Use of the \$1.9 Million in Technical Assistance
4. The Impact of the EPR as a Whole
 - 4.1 Direct Effects on Smallholder Families
 - 4.2 The Larger Policy Environment
5. Lessons Learned
6. Recommendation

TABLE OF CONTENTS (cont.)

ANNEXES

- A. Impact Calculation Methodologies
- B. Project Data Sheet
- C. Statistical Tables
- D. Bibliography
- E. Glossary
- F. Charts and Figures

THE MALAWI ECONOMIC POLICY REFORM PROGRAM

SUMMARY

Malawi is a country of large families on small farms with some 70% of their land planted in maize. Eight to ten percent of this is hybrid maize with high yields if chemically fertilized.

In 1985, the Government of Malawi (GOM) was negotiating its third World Bank (WB) structural adjustment loan (SAL). The first two SALs, of 1981 and 1983, had provided \$100 million to the GOM. SAL III ultimately provided \$30m. Official Development Assistance (ODA) averages over 10% of national output; and gross ODA disbursements totaled \$121m in 1983, \$165m in 1984, and were to rise to \$311m in 1987.

As a Lilliputian in that land of giant assisters, A.I.D. negotiated its 1985 Economic Policy Reform Program (EPRP) with just two reforms and \$15m to be disbursed over three years. Malawi imports all its fertilizer, and the two reforms were to reduce GOM fertilizer subsidies and to change the character of fertilizer imports to cut procurement costs.

The GOM would implement each of the two reforms in three steps that would trigger release of the three tranches of cash grants.

- The GOM would cut its subsidy on the fertilizer its parastatals imported and sold to smallholder farm families. This would make prices a more efficient guide to farmers' decisions and would reduce GOM budget costs. The WB had asked for this, without results, in both SALs. A.I.D. conditioned aid on GOM action and designed and won agreement on an offset. Farm families would lose from subsidy reductions but would gain from the second reform.
- The GOM would begin to substitute high analysis fertilizer (HAF, with over 45% active ingredients) for low analysis fertilizer imports (LAF, under 41% active ingredients). Cutting imports of inert material -- over 70% of fertilizer import weight in 1985 -- would save fertilizer transport costs for farm families and foreign exchange costs for the country. Before 1985, GOM research institutions and its extension service had done little with HAF; but A.I.D. negotiators overcame the resistance to HAF substitution,

first, of technicians, second, of administrators, and finally, of policy makers.

The GOM met the conditions for the first two tranches (cutting GOM expenditures a modest 0.2%) and received \$8 million in cash and \$1.9 million in technical assistance. It took the third step in HAF substitution but refused to cut the subsidy to meet 1987/88 conditionality, and the Mission cancelled the EPRP without releasing the \$5m third tranche.

The GOM decision was based on its political judgment that transportation cost increases (caused by Mozambique's civil war), the infusion of hungry Mozambique refugees, and lagging maize production (the latter now seen to have been largely due to GOM suppression of maize prices) required an increase in subsidy to moderate fertilizer price increases.

Since 1987:

- The subsidy has risen in kwachas but remained flat as a percent, 23-24%, of delivered cost. In early 1990, the International Monetary Fund endorsed GOM policies:
 - maintaining the subsidy at a level offsetting the extra cost of procurement through Durban instead of through Beira
 - but ending the subsidy when procurement is once again through Beira.
- Each year, the GOM parastatal has increased the HAF share of imports and has passed all cost savings to smallholder buyers. Between 1984/85 and 1989/90, smallholders doubled their purchases of fertilizer nutrients. (One caveat, an unknown portion ends up on "estate" farms that are supposed to be buying from private buyers at unsubsidized prices. A growing conviction that this leakage is significant, e.g., perhaps 20%, seems to be the principal reason for the change of heart among most previous opponents of eventual subsidy elimination.)
- Since 1984/85, total maize production has been increasing. Hybrid maize production rose 50% between 1984/85 and 1989/90. In a year of better rainfall, production seems likely to exceed consumption plus storage capacity.

- By 1987/88, savings from HAF substitution reached K8.0m, approaching that crop year's K8.9m fertilizer subsidy. Put different, if the 1987/88 subsidy had been eliminated, HAF substitution savings would almost fully have offset the smallholders' loss of subsidy. As HAF substitution is extended beyond its 1987/88 replacement of one-third of LAF, the savings grow.

Several GOM institutions have changed substantially since the EPRP began:

- Agricultural extension agents have become knowledgeable about HAF uses. The 95% increase in hybrid hectareage and the 75% increase in hybrid production between 1986 and 1990 evidence growing farmer acceptance of and competence in HAF use.
- Most smallholders buy all their fertilizer using credit from the Smallholder Agricultural Credit Administration. In 1989/90, it made loans to some 25% of smallholder families, up from 15% in 1985/86. Two bits of information about its clients: in 1985/86, the average farm size of borrowers was only slightly above the all-Malawi average; in 1989/90, 25% of borrowers were female-headed families. However, this parastatal's persistent decapitalization will close it down before 1995 unless it changes policies or is recapitalized.
- The local currency counterpart of the EPRP's \$8m in cash transfers was given to the parastatal that imports fertilizer for smallholders. The European Economic Community recently gave this parastatal 90,000 tons of fertilizer, and it is now funded adequately to provide timely and adequate imports. Nevertheless, the separate parastatal handling fertilizer distribution appears unable to provide timely distribution everywhere in the country.

The Malawi EPRP was a special case in which one reform action involved almost no losers. Nevertheless, A.I.D. analysis and policy dialogue were required to overcome institutional barriers to that change. The consequent foreign exchange savings are an unqualified success. The effort to reduce subsidies did little to cut GOM expenditures, but the EPRP and subsequent policy dialogue appear to have restrained subsidy increases. GOM commitment to eventually ending the subsidy seems principally

based on the political decision-makers' conviction that too much of its benefits leak to estates.

The Malawi EPRP addressed only two elements in the decision-making environment of farm families. It did not touch the other GOM policies and practices that operated in 1985, and that continued to operate in 1990, in ways that appear to be depressing returns to the land and labor of the country's smallholder majority while increasing returns to the land, capital, and management of estates.

These measures include the legal restriction of burley tobacco cultivation to estates and the requirement, until 1989, that smallholders sell to the GOM parastatal at much below export parity. In contrast, estates, paying the GOM only token rents, sell all cash crops in private markets at export parity. Eight years of structural adjustments endorsed by international institutions and donors did improve macroeconomic policies but did little to reduce the GOM's "estate bias" or the inefficiency, growth inhibitions, and inequities caused by that bias.

The Mission focused the EPRP narrowly on the practical grounds that, after four years of WB effort on one of the two reform components, the GOM appeared willing to implement the two reforms whose combined benefits seemed likely to be substantial. The Mission then had neither the information nor the influence needed to attempt broader intervention. While the direction of the effects of estate bias seem clear, little information was available in 1985, and little more is known in 1990, about the dimensions of those effects or, indeed, about the operation of Malawi's crop and labor markets. A safe generalization is that the effects are broadly injurious to smallholder families and that broad economic policy reform would require substantial reduction in that bias. The Mission and the World Bank are to be commended for their present efforts, first, to analyze rural land, labor, and crop markets and the effects of the policies of estate bias and, second, to identify practical means to encourage and assist the GOM to reduce and eventually eliminate the elements of bias.

1. BACKGROUND

1.1 Introduction

In 1985 the U.S. Agency for International Development (A.I.D.) obligated \$15 million for the Malawi Economic Policy Reform Program (EPRP), intended to reduce budget deficits, save foreign exchange, improve efficiency of resource use in smallholder agriculture, and strengthen associated institutions. The purpose of this evaluation is to assess the effects of the EPRP.

Our four-person evaluation team visited Malawi in March-April 1990 to identify and, so far as possible in three weeks, to quantify and assess the effects of the program. We were helped by a number of excellent previous evaluations and by interviews with and data from officials of the Government of Malawi (GOM).

1.2 The Nation

Malawi is a nation of large families working small farms using their own labor, some fertilizer, and few other resources. During the period of the EPRP, Mozambique's civil war raised the costs of importing fertilizer and thrust 800,000 refugees into Malawi.

Malawi is the same size as, but has four times the population of, Mississippi. But because 65 percent of Malawi is either under lakes or otherwise not arable, there are 550 people per square mile of arable land, compared with 55 in Mississippi. Population growth has cut average farm size to 1.4 hectares with 55% of families on farms under one hectare. Further, stocks of both physical and human capital per capita are tiny. For example, well over 50 percent of the population remains illiterate, and smallholders did not begin to learn use of high analysis fertilizers (HAFs, with over 44% active ingredients, contrasted with low analysis fertilizer, LAF, with active ingredients under 41%) until 1986. The result of this low resource base, was output of \$476 per person in 1987 compared with \$18,500 in the United States.

Over 80 percent of families live and work on farms where maize is planted on 60-70 percent of all land each year. Malawi is self-sufficient in maize in that it rarely imports, and often exports; but total maize output combined with other foods generally totals under 90 percent of the minimal caloric needs of

its people. The combination of hybrid maize seed and fertilizer is, at present, the principal means for raising farm productivity.

All Malawi's fertilizer is imported. Blantyre, Malawi's principal railhead, is 400 miles from Beira, the nearest Indian Ocean port. But since 1982, because of Mozambique's civil war most of Malawi's imports and exports have had to pass through Durban, over 2,300 miles from Blantyre. Since 1985, Mozambique has sent some 800,000 refugees into Malawi where, despite international food aid, they impose policing, social, and land use costs on Malawi.

1.3 The Economy: Double Agricultural Dualism

Malawi's farm land is divided between "estates" and smallholders. The EPRP was targeted at the smallholders who use fertilizer. Overall, GOM agricultural policies discriminate in favor of the estates.

Of Malawi's arable land, twelve percent is "estate land," leased by Government to individuals at a few dollars a hectare. The rest is "customary land," with use rights inherited and administered by village leaders. "Smallholders," the 80 percent of families who live on customary land, were the people affected by the EPRP. The 25 percent of them who now use fertilizer are the people most affected.

The estates grow cash crops, principally burley tobacco (with output constrained and prices raised by an effective African cartel) and tea, sugar, and coffee. But the estates subdivide between those well managed and those under-managed that leave some 80% of their very cheap land unplanted but unavailable for smallholder use. Estates buy and sell at world market prices with little regulation and low taxation.

Smallholders also subdivide with 45 percent on farms of one or more hectares and 55 percent on farms of less than one hectare. Although prohibited from growing burley tobacco, most larger smallholders (one hectare or more) sell some other agricultural output each year, mostly to the Agricultural Development and Marketing Corporation (ADMARC), the GOM parastatal created to sell inputs to, and to buy outputs from, smallholders. Up to one half of the large smallholders use both fertilizer and government credit. Nevertheless, most of even the large smallholder families are very poor in material incomes and exhibit significant deficiencies in health, nutrition, and education.

The smaller smallholders subsist on under one hectare, sell little but their labor for cash, and use little chemical fertilizer or agricultural credit. Nevertheless, most of them do buy maize from ADMARC.

The land constraint is now binding. If more than a small portion of the population is to achieve sustained real income growth, farm families must raise the productivity of their labor and their land. Such increases so far have resulted from the use of hybrid seed on 10 percent of maize land and from applying fertilizer to the hybrid seed, to some other maize, and to nearly all flue-cured tobacco.

During the 1970's, the "pro-estate bias" of GOM laws, policies, and practices produced strong output growth of burley tobacco and tea on estates while discouraging increased production on smallholder farms. Other GOM policies and practices inhibited growth generally. These inhibitions included a rigid structure of price controls, initially efficient but increasingly inefficient public enterprises, high levels of protection, and erratic movements in prices and foreign exchange availability caused by recurring balance of payments and GOM budget deficits. Over the past decade, a series of World Bank (WB) and International Monetary Fund (IMF) arrangements addressed the latter inhibitions while leaving the pro-estate bias untouched.

1.4 ADMARC Subsidies and Fertilizer Imports

ADMARC sells fertilizer to smallholders. Estates buy from the private importer, OPTICHEM, or, since 1988, import directly. ADMARC's unsubsidized fertilizer prices paralleled Optichem's through 1977. Since then, ADMARC has sold fertilizer below cost, and the Finance Ministry has made up the difference. That is the subsidy EPRP targeted for reduction.

Until recently, the law prohibited private trade in farm productions. Smallholders could sell only to ADMARC. ADMARC responded with low crop procurement prices, in effect, taxing farmers. Part of ADMARC's implicit tax on maize has been passed through, in the form of lower retail prices, to smallholders who buy maize from ADMARC and to anyone buying refined maize flour from Malawi's two mills. This consumption subsidy has tended to raise the real income of smallholders who buy maize from ADMARC.

On the other hand, ADMARC's low purchase prices depressed returns to labor across the maize-based smallholder sector. Both these depressed returns to agricultural labor and the low retail price of maize have increased the supply of-- and decreased the nominal wage of-- estate labor. However, no one has attempted to

measure the net effects of these various government practices on farm families.

In 1984, ADMARC's fertilizer imports were 76% inert material. Farm families knew how to use these fertilizer varieties. The EPRP required a shift in imports to high-analysis fertilizers (HAFs) to reduce both transport and ex-factory costs in the expectation the cost savings would be passed through to smallholders.

1.5 Budget Deficits and Inflation

Between 1980-82 and 1985, the GOM cut its budget deficit from 12 to 6 percent of GDP. But the GOM's ability to borrow abroad was reduced by accumulated debt; so domestic borrowing was up and appeared likely to rise further if deficits were not further cut. The money stock had doubled, and the general price level had risen 70 percent between 1980 and 1985. The rate of inflation appeared likely to increase after 1985 unless the GOM deficits and borrowing from banks could be cut further.

The EPRP, by reducing subsidy cost to the GOM, was intended to assist GOM efforts to reduce its budget deficit, the growth of the monetary base and, in turn, the rate of inflation.

2. THE ROLE OF A.I.D.

The preceding sections described the Malawi problems addressed by the EPRP. This section tells how the EPRP was supposed to work.

2.1 The 1985 Economic Policy Reform Program

In 1985, Malawi was negotiating its third Structural Adjustment Loan (SAL III) with the World Bank. With little previous policy dialogue in Malawi, with grave concerns but inhibiting ignorance about smallholders' markets, A.I.D. piggy-backed onto the SAL program. Both previous SALs had called in general terms for an end to fertilizer subsidies. The GOM had ignored the admonitions. The EPRP was more practical. It set a timetable for phased reduction. Then to cut procurement costs to offset the loss of subsidy benefits and to reduce GOM political opposition to the subsidy cut, the EPRP required substitution of high analysis fertilizer for low.

The EPRP was then simple. It had two immediate macroeconomic objectives:

- to cut the fertilizer subsidy's budgetary cost, and
- to cut the foreign exchange cost of fertilizer imports.

In turn, successful achievement of these objectives:

- would reduce upward pressure on the government deficit and on credit levels and
- would save foreign exchange.

As fertilizer prices moved toward border parity, families would make decisions about fertilizer uses based on its true cost to the country. At the same time, that cost would be cut; and GOM budget problems would become a little less.

The EPRP had just two kinds of criteria for each of three annual disbursements projected in the sequence, \$4.0, \$4.0, and \$5.0 million. The conditions precedent were:

| <u>For the year</u> | <u>The subsidy would not exceed this percent of fertilizer's total delivered cost</u> | <u>The planned imports HAF would equal or exceed this percent Crop fertilizer/imports</u> |
|---------------------|---|---|
| 1985/86 | 22.6 | - |
| 1986/87 | 17.0 | 10.0 |
| 1987/88 | 12.0 | 25.0 |
| 1988/89 | - | 40.0 |

When the first numerical criterion in each column was met, the first tranche could be paid. The second tranche depended on satisfaction of the second number in each column. The final tranche depended on satisfaction of the final two numbers.

The criteria for the first tranche were both met in January 1986. The second tranche was delayed after a World Bank team approved a fertilizer price list with LAF subsidy rates double those on HAF. This violated an EPRP covenant requiring the reverse to encourage farm families to switch to HAF. The GOM then promised correction in 1987/88; USAID granted a waiver; and the second tranche was disbursed in February 1986.

2.2 Termination for Noncompliance

In 1987, because of political concerns about rising fertilizer prices, the GOM decided not to meet the 12 percent subsidy-rate condition for 1987/88; and USAID terminated the program. The GOM appears to have decided to end compliance because of the influx of refugees from Mozambique, the 40 percent increase, 1986 to 1987, in overland transportation costs, and the 55 percent decline between 1985/86 and 1986/87 in smallholder maize sales to ADMARC -- the latter having been blamed (unfairly, as section 3.24 below will show) on rising fertilizer prices.

3. THE IMPACT OF THE PARTS OF THE ECONOMIC POLICY REFORM PROGRAM

3.1 The Size of the Subsidy

This section tells what happened, 1984-89 to the subsidy rate. In the two years before the EPRP the subsidy rate fell from 28.9 to 24.6 percent. Figure 1 shows the subsidy rates, i.e., subsidy payments divided by total acquisition and delivery costs. (Annex C's statistical tables provide precision and detail for each of the text's figures). During the two years the EPRP was in force, 1985/86 and 1986/87, the subsidy rate fell to 21.4 then to 17.9 percent.

Anticipating a jump in unit costs that turned out to be over 30 percent, the GOM initially decided to hold 1987/88 fertilizer prices at 1986/87 levels. That would have raised the subsidy rate above 35%. Although the EPRP had been cancelled, USAID continued its newly achieved role in the GOM policy process. The Mission provided estimates of the jump in the GOM budget deficit that would follow from the increase in subsidy costs unchanged fertilizer prices would cause. Perhaps influenced by the Mission's argument and evidence, the GOM finally announced fertilizer price increases of 5-30 percent. Consequently, although far out of compliance with the EPRP goal of a 12 percent subsidy, the 1987/88 subsidy rate was 23.9 percent; and the 1988/89 rate was 23.5 percent.

In early 1990, the GOM made a commitment to the IMF to keep the subsidy's total cost below two percent of GOM expenditures and to eliminate the subsidy completely when the traditional transportation route through Beira reopens. In fact, the recent subsidy level has just offset the extra cost of shipping through Durban; so it follows that simultaneous return to the Beira route and subsidy termination would leave smallholders unaffected.

3.2 The Impact on Smallholder Farm Families

Malawi has experienced 8 years of structural adjustment and several decades of donor approbation. Nevertheless, neither time series nor cross section data exist that would indicate the effect on farm families' decision making caused by EPRP-induced changes in fertilizer prices. We are able to look at changes over 1985-90 in price incentives affecting farm families' decisions about use of hybrid maize and the fertilizer needed to go with it.

3.2.1 Fertilizer Prices Relative to Maize Prices

Smallholders decisions about when, where, and how much fertilizer to use depend mostly on price ratios, particularly on the ratio between the price of fertilizer and the price of maize. Figure 2 shows that ratio, annually, for 1980-89.

The ratio rose in 1985/86 as fertilizer acquisition costs rose and the subsidy rate fell. It stayed up in 1986/87. But it had also gone up during the pre-EPRP years 1981-85. A principal reason for the high fertilizer-to-maize price ratio through much of the 1980s was that ADMARC held maize prices almost unchanged over the five year period, 1981 to 1986 (shown in Table 3, Annex C).

Through most of the 1980s, ADMARC's commodity buying prices have been set in consultation with staff of the World Bank. This impact evaluation team was in no position to evaluate those pricing decisions. A serious evaluation of the effects on smallholder decisions of EPRP-induced changes in fertilizer prices would require statistical analysis that could allow for changes in relative prices of fertilizer, of farm products, of labor, and of other household items.

Figure 2 does show that since 1987, the "real" price of fertilizer in terms of maize has fallen. This has provided an incentive to use more hybrid seed and more fertilizer.

3.2.2 Differential Subsidy Rates

In addition to its two categories of disbursement conditions, the EPRP carried some covenants. As noted in Section 2.1, one covenant provided that, to encourage switching to HAF, remaining subsidies were to be higher on HAF than on LAF. This did not happen in 1986/87 and, as Figure 3 shows, was only moderately implemented in 1988/89. Since fertilizer nutrients are much more

cheaply procured in HAF than in LAF, Malawi ought to be urged, while fertilizer subsidies continue, to concentrate them on HAF as the EPRP proposed.

3.2.3 Increased ADMARC Sales of High Analysis Fertilizers

One thing the EPRP emphatically did not do was to reduce fertilizer use. On the contrary, as Figure 4 shows, after 1985, ADMARC's fertilizer sales increased; and by 1990, the four-year increase had become dramatic. Between 1985/86 and 1989/90, ADMARC sales doubled to 40,000 metric tons of nutrients. This doubling in four growing seasons is an impressive shift by any standards.

While the weight of nutrients was doubling, the total weight of fertilizer material (including inert ingredients) increased by only 55 percent, reflecting the shift to HAF. This shift produced the substantial savings in transport and foreign exchange costs to be discussed in detail in Section 3.42.

Supposedly, only smallholders bought the increased fertilizer imports since ADMARC is legally prohibited from selling to estates. Did smallholders use them? Increased smallholder purchases could be explained by several factors: a) increasing fertilizer applications to smallholder cropland; b) a significant expansion of the smallholder cropland base; c) some "leakage" of subsidized smallholder fertilizer to the estate subsector; or d) some combination of all three factors. Conceivably also, despite the law, some fertilizer may have gone directly from ADMARC to estates.

If smallholders were increasing either the extensive or the intensive use of fertilizer, the increases should be reflected in increasing crop yields. The predominant smallholder crop is maize; and its average aggregate yields per hectare, after falling steadily between 1980 and 1985, rose only five percent between 1985/86 and 1988/89 (Figure 5).

However, smallholder hybrid-maize hectareage more than doubled while groundnut hectareage fell by two-thirds between 1985/86 and 1989/90. (The reduction in groundnut hectareage exceeded the increase in hybrid maize hectareage, see Table 8, Annex C.) Hybrid output rose 250% over the four years (Figure 6).

It is possible that the reports are correct that "leakage" (resale of subsidized smallholder fertilizer to estates) is substantial. Recent studies of the agricultural sector have quoted AgMin estimates of the leakage at 17 up to 35 percent. Conventional wisdom in Malawi is that a large amount of

subsidized fertilizer (and of FiMin cash subsidy), intended for smallholders, finds its way to the estates; but the evaluation team lacked means to estimate the extent of fertilizer leakage.

3.2.4 The Cropping Pattern

One of the stated objectives of the EPRP program was to provide economic incentives for smallholders to diversify into the production of higher-value crops than maize, the traditional food security crop. By making fertilizer a more expensive production input, so the reasoning went in the PAAD, farmers would be forced to allocate their fertilizer to crops which would yield higher net returns. This assumed that smallholders who used fertilizer were behaving irrationally before 1985; no reasons were given for this assumption.

According to AgMin cost-of-production data, groundnuts and tobacco have generally been more profitable alternate crops for smallholders during the period of the subsidy removal program (Figure 7). These data suggest that the profitability of these alternate crops vis-a-vis both local and hybrid maize varieties further improved as the fertilizer subsidy was lowered (and the procurement prices of all of the crops were changed at different rates).

However, the shifts in cropping patterns since 1985 have been the reverse of the EPRP objectives. During the first six years of the decade, there was a steady shift of smallholder land from maize to the alternate crops. In 1986/87, this trend away from maize reversed with a sharp shift back to maize production as the cost of fertilizer in terms of maize prices declined. That return to maize continued after 1987 as ADMARC raised maize prices from 16% to 29% of groundnut prices per kilo (Figure 8).

Consistently, smallholders have shifted to alternate crops when their relative profitability increased significantly, but the question of profitability has been a function of ADMARC procurement prices and other factors--not just fertilizer costs or subsidy levels. Like farmers elsewhere, Malawi's smallholders clearly respond to their market's signals.

3.2.5 Maize Production and Marketing

Among the numbers just cited, the most significant may be these: between 1987 and 1990, smallholders' hybrid-maize hectareage rose 260%; ADMARC sales of fertilizer nutrients rose 100%; and smallholder hybrid-maize production rose 250% (Figure 9). The February 1990 drought cut local maize output

substantially while affecting hybrid output much less. Nevertheless, had rainfall been normal in January-February 1990, hybrid output would have been even larger.

Over the same four years, smallholder hectage in local maize rose 8% and output rose 15%. Hectage rose a little in 1989/90, but the drought cut local maize production by over 20%.

The growth of hybrid hectage was encouraged on both the input and the output side:

- ADMARC's maize/groundnut price ratio rose from .16 to .29.
- Over the three crop years 1985/86-1987/88, the "real" cost of fertilizer held flat at just above 3 kilos of maize per kilo of fertilizer. In 1988/89, the "real" cost fell to below 2.5 kilos of maize per kilo of fertilizer.

ADMARC's maize purchases from smallholders varied considerably during the 1980s, ranging from less than 100,000 tons to more than 300,000 tons. As a percentage of total production, ADMARC's procurement peaked at 21 percent in 1984/85 following large increases in ADMARC's maize purchase prices. The consequent maize surpluses presented the GOM with storage problems that appear to have been highly influential in the decisions to hold maize prices constant for the next four years. Since 1986/87, ADMARC's maize purchases have represented no more than nine percent of annual production. Smallholder maize retained for domestic consumption has grown at approximately the same rate as population increase. It thus appears that in many years ADMARC is the market of last resort for the smallholders. Annual sales to private traders are neither known nor estimated.

3.2.6 Institutions: The Smallholder Farmers' Fertilizer Revolving Fund (SFFRF)

Prior to 1983, all fertilizer for smallholders was procured, imported, and distributed by ADMARC. However, in 1982, a liquidity crisis in ADMARC resulted in delayed and reduced quantities of fertilizer being made available to smallholders. The GOM response was to create the SFFRF, a new parastatal, in July 1983, with its principal responsibilities the timely and adequate importation of fertilizer for subsidized sale to smallholders. (Incidentally, estates and OPTICHEM are free to sell to smallholders, but smallholders will not be interested to the extent that SFFRF fertilizer is available at subsidized prices).

Having assisted in the design of the SFFRF, the Institute for Food and Agricultural Development (IFAD) and the World Bank (WB) immediately provided a US\$24.47 million four-year loan to capitalize the Fund. The three parties simultaneously invited donors to make cash and in-kind gifts to build up the Fund's capital which was to be held in a trust so ADMARC could not draw on it to use for non-fertilizer purposes. The SFFRF is also responsible for analyzing fertilizer transport routes, price proposals, demand estimates, and fertilizer application recommendations as well as for the monitoring and evaluation of the program.

Responsibility for storage and distribution of fertilizer remains with ADMARC. It does the work then bills, and is compensated by the SFFRF.

A.I.D. placed the GOM counterpart funds from both \$4.0 million cash transfers in a Trust Fund of the SFFRF. The first tranche payment of 6.77 million kwacha was transferred in January 1986; and the second tranche of 7.3 million (the kwacha exchange rate had fallen from 1.6925 to 1.775 per dollar) was transferred in February 1987.

The GOM has scrupulously honored USAID's EPRP covenant that it would make foreign exchange available to meet the needs of the SFFRF. Since 1983, it has stayed the course in carrying out its mandate for timely importation of fertilizer into Malawi. Internal distribution has been and remains the thorny issue between ADMARC and the SFFRF. Although the SFFRF pays ADMARC a commission for its storage and distribution capability, the SFFRF has no control over fertilizer distribution.

Having the right fertilizer at the right place at the right time is a serious problem for ADMARC because its aging and inadequate trucking fleet is expected to service the entire country, including isolated, thus unprofitable, routes. The distribution problem is to be addressed in the new Agricultural Sector Assistance Program (ASAC) being discussed with the World Bank. The extent of ADMARC's use of -- or failure to use -- the private trucking industry was not considered by the team.

From the perspective of growth potential, the SFFRF managed to import an increasing amount of fertilizer each year. It has innovated by packaging fertilizer in quantities of less than the standard 50 kg. bags for greater accessibility to smallholders.

As world prices of fertilizer rise and as the kwacha is further devalued, decapitalization will occur in the sense of reduction in the SFFRF purchasing power; for the SFFRF interest earnings are too small to offset inflation and devaluation.

After a series of contributions from donors, the SFFRF ended its 1987/88 fiscal year with net Trust Fund assets of K65 million and it maintained roughly that level through 1988/89. By itself, this was enough to buy and distribute some 83,000 tons of fertilizer during 1988/89 and 71,000 tons during 1989/90.

The European Economic Community is donating fertilizer to initiate an inventory stock (misleadingly called a "buffer stock") that is to total 90,000 tons before October of 1990. The SFFRF manages this stock and may draw it down completely each year on condition that the stock is to be replenished fully before the next crop year begins. This arrangement is to assure the availability of adequate stocks at the beginning of the crop year and is to permit the SFFRF to order replacement supplies at the times of the year when international prices are lowest. Together the buffer stock and the Trust Fund assure the availability of at least 150,000 tons of fertilizer each year for some time to come. Since sales have yet to exceed 100,000 tons, these provisions appear comfortably adequate for some time to come.

3.2.7 The Smallholder Agricultural Credit Administration

The commercial banks, the National Bank of Malawi, and the Commercial Bank of Malawi lend to estate farmers but not to smallholders. There are several reasons for this, including 1) smallholder lack of collateral and 2) financial institutions' recognition of the high transactions costs involved in processing small loans. In addition, procedures for obtaining bank credit are generally too cumbersome for a largely illiterate rural population.

Consequently, following the launching of agricultural development projects in the late 1960s, the National Rural Development Program (NRDP) became the main provider of institutional credit to smallholders. From that time to 1988, various donors financed specific credit operations in particular Agricultural Development Divisions (ADDs, the AgMin's geographic administrative units). Beginning in the 1968/69 agricultural season, the lending volume was K80,000 to 650 smallholders. Ten years later in the 1978/79 season, the volume of credit reached K2.5 million, benefitting approximately 75,000 borrowers. Under this highly fragmented and decentralized credit system, the volume of credit continued to grow in the early 1980s as donor funds continued to flow into the ADDs.

The ADD credit system rested upon joint-liability farmers' clubs whose membership depended entirely on the decisions of those agreeing to join together in each club. With minor exceptions, a club's members could not borrow again until all

principal and all interest from the preceding loan had been repaid by all club members. Consequently, clubs generally minimized risks by excluding the smallest smallholders. Nevertheless, the 8,259 clubs (averaging 25 families each) that borrowed during the 1985/86 crop year had an average farm size of only 1.16 hectares, about the same as the MOA's estimate of all smallholder average farm size of 1.14 hectares.

One of the most critical elements of an increase in the use of high analysis fertilizer is the expansion of access to credit. Yet, the ADD credit system reached only 15 percent of smallholders during 1984-87. In 1988, with \$12.8 million in IDA and IFAD loans, the credit system was restructured as a separate department under the AgMin and named the Smallholder Agricultural Credit Administration (SACA).

As under the ADD credit system, SACA lends only to clubs, providing vouchers, not cash, for purchases from ADMARC and making successor loans only when all previous debt is repaid. During 1989/90, SACA made some K50 million in new loans to 12,000 clubs with some 300,000 members (therefore, borrowing of K4,100 per club, K166 per family). In terms of broad inclusion, it is notable that since 1986, over 25 percent of club members have been households headed by women.

At the beginning of the 1987/88 crop year, 6,602 clubs were K4.26 million in arrears in principal and interest. Since then, the repayment experience has deteriorated. Lending fees of 10 percent (charged annually regardless of how early repayment is made) are not large enough to prevent the consequent decapitalization that has reduced SACA's assets by some K10 million in under two years.

3.2.8 Institutions: The Role of the Extension Service

In anticipation of the arrival of the first high analysis fertilizer in 1986, the EPRP PAAD reported that GOM and USAID had agreed to lay out a plan to set up a series of field demonstrations, commencing in the 1985/86 agricultural season, and continuing thereafter, to teach extension staff and farmers the correct use of, and the precautions necessary with, urea and DAP. For the vast majority of Malawian farmers as well as for most of the extension staff, HAFs such as urea and DAP were totally unknown.

During the course of the 1985/86 demonstrations, farmers were to be brought to observe crop growth and to be shown the financial advantages of concentrated fertilizers. About 15 training days were to be scheduled per month and a total of some

50,000 farmers were to be exposed to those demonstrations over the entire season.

The AgMin estimated that in 1985 there were one million smallholders, of whom 25 percent were to using fertilizer. The target for 1986/87 was HAF use by 25,000 farmers, 10 percent of all smallholders. Thus approximately one farmer in two attending the demonstrations would need to be convinced. USAID/GOM believed this 25,000 target was feasible.

Between December 1985 and May 1986, Technical Assistants, farmers, including local leaders (Party Officials, Councillors, and Traditional Leaders) were to attend field days at the demonstration sites. Extension staff were to pass along the information regarding advantages of urea and DAP in large part by assisting the innovator farmers who purchased urea and DAP.

Approximately 80 demonstrations were conducted at residential training centers in all eight ADDs. Fifty percent of these demonstrations were in maize and the remaining half in tobacco and rice.

According to several GOM officials interviewed, the 1985/86 demonstrations were problematic for the following reasons:

- Neither research nor extension staffs had much prior experience or exposure to HAF use on maize, tobacco, or burley crops.
- Both urea and DAP were applied late in the 1985/86 demonstrations because they arrived late in the country. Consequently, results were variable; for example, in some demonstrations, crops that received DAP were reportedly inferior to those which received 20:20:0 as a first application.
- Lastly, there were variations in quantities of fertilizers applied at various sites. All in all, during the 1985/86 demonstration season, results of urea and DAP application indicated no superior advantage over 20:20:0 and CAN.

As described in detail in Section 3.23 above, HAF sales to smallholders increased in 1986; and the amounts have increased substantially since that time. However, there is little in official USAID and GOM records to indicate what actually has happened regarding the magnitude or character of farmer adoption of HAF. The official record does show that the trials continued through the 1988/89 season.

3.3 The Impact on the GOM Budget

One of the two macroeconomic objectives of the EPRP was to reduce the budget cost of the subsidy. The subsidy was lower in 1985/86, in 1986/87, and in 1987/88 than it would have been in the absence of the EPRP. The question is, "how large would the subsidy have been in the absence of the EPRP?" Of course no one knows this. The team has made what they thought a reasonable assumption, that without the EPRP, the subsidy rate would have been 25 percent. It was in fact 29 percent in 1983/84, and 25 percent in 1984/85.

The actual subsidy rates for the three years, 1985-88, were 21, 18, and 24 percent. Comparing their budgetary costs with those of a continued 25 percent subsidy rate, the total budget savings were a modest K3.29 million during those three years. This was 0.6 percent of the GOM "overall deficit", of K553 million, and 0.14 percent of total GOM expenditures, of K2,264 million, during 1985-88. The savings was only 0.2% of 1985-87 expenditures. More detail is shown in text Table 1. This is clearly a case where original intent came to little.

TABLE 1. EPRP BUDGET SAVINGS AS DIFFERENCE BETWEEN ACTUAL SUBSIDY AND CONTINUATION OF THE 1984/85 SUBSIDY RATE OF 25 PERCENT (In Millions of Kwacha)

| <u>Crop Year</u> | <u>Actual Subsidy</u> | <u>Actual Rate</u> | <u>Assumed Alternative</u> | <u>Ratio of 25 To Actual</u> | <u>Alternative Subsidy</u> | <u>Budget Saving</u> |
|------------------|-----------------------|--------------------|----------------------------|------------------------------|----------------------------|----------------------|
| 85/86 | 6.17 | 21% | 25% | 25/21 | 7.34 | 1.17 |
| 86/87 | 4.51 | 18% | 25% | 25/18 | 6.26 | 1.75 |
| 87/88 | <u>8.89</u> | 24% | 25% | 25/24 | <u>9.26</u> | <u>0.37</u> |
| Total | 19.57 | | | | 22.80 | 3.29 |

3.4 The Impact on the Supply of and Demand for Foreign Exchange

3.4.1 The \$13.1 Million in Cash Grants, The Real Resource Transfer

In January 1986, A.I.D. transferred \$4 million to the GOM. In February 1987, A.I.D. transferred a second \$4.0. This \$8 million was, presumably, sold by the GOM into the foreign exchange market. The \$8 million was added to the flow of foreign exchange from which private importers, parastatals and the GOM

bought dollars and other foreign currencies to buy goods and services from abroad. Assuming no change in Malawi's foreign exchange reserve and no additional capital outflows, the A.I.D. grants added \$8 million worth of goods and services to the total imported and used by Malawians.

3.4.2 Reductions in Foreign Exchange Costs

The second of the two macroeconomic objectives of the EPRP was foreign exchange savings. As described in detail in 3.23 above, the EPRP led to big increases in imports of HAF. The question here is how do the foreign exchange costs of HAF actually imported compare with the foreign exchange costs of what Malawi would have done if no HAF had been imported for smallholder use.

The prior question, of course, is "what additional LAF would Malawi have imported had no HAF been imported?" The Malawi smallholders suggest an answer. The Robert Nathan study discovered that, in practice, smallholders apply just enough HAF so the nutrient quantities are within 5 percent or so of each of the nutrients they would have applied had they used LAF instead.

TEXT TABLE 2. ANNUAL FOREIGN EXCHANGE SAVINGS AND SAVINGS TO SMALLHOLDERS FROM IMPORTING HAF IN LIEU OF LAF (In Millions)

| <u>Crop Year *</u> | <u>Savings in Kwacha</u> | <u>Dollars</u> |
|--------------------|--------------------------|--------------------------|
| 1986/87 | K2,529 | \$1,352 @ K1.87/\$1 |
| 1987/88 | K7,957 | 3,584 @ K2.22/\$1 |
| 1988/89 | K13,068 | 5,065 @ K2.58/\$1 |
| 1989/90 | K21,099 | <u>7,962</u> @ K2.65/\$1 |
| TOTAL | K44,653 | \$17,963 @ K2.65/\$1 |

* HAF Imports in 1985/86 were negligible
Source: Based on Annex A: Worksheets 1 and 2.

Text Table 2 shows the results of a comparison between the foreign exchange costs (purchase, freight, insurance, and commission) of the urea and DAP, the two kinds of HAF, actually imported and the foreign exchange costs if the SFFRF had,

instead, imported the combination of 20:20:0 and CAN that would have provided exactly the same total tonnage of nutrients.

The \$18 million saving is the result of two factors. One, 121,800 tons of urea and DAP were imported. To substitute for them, 199,800 tons of CAN and 20:20:0 would have been imported; therefore, a 100 percent transportation saving on 78,000 tons. Two, costs per nutrient unit are lower for nitrogen and phosphorus in urea and in DAP than in 20:20:0 and in CAN.

These savings have grown each year since 1986. They will continue to grow as HAFs substitute further for LAFs and as total fertilizer use rises. Of course the savings will become smaller-- though will again assume an upward trend--once shipments can be again trusted to Mozambique's rail system.

We get a conservative estimated of the total value of the EPRP's foreign exchange savings by calculating the present value, in 1985, of the first ten years of its effects. Assuming a discount rate of ten percent and continuation of the 1989/90 savings of \$7.962 million for six more years, the 1985 discounted value of the first ten years of savings would be \$37.1 million.

3.5 The Impact of the Use of the Local-Currency Counterpart

The grant of the \$8 million worth of counterpart to the SFFRF and subsequent developments involving the SFFRF were described in Section 3.2.6.

3.6 The Impact of the Use of The \$1.9 Million in Technical Assistance

The \$1.9 million technical assistance and training component made important complementary contributions to policy reform. The impact study provided USAID/Malawi with leverage to encourage the GOM to increase fertilizer prices an average 30 percent and maize prices 35 percent in 1987/88, despite the EPRP cancelation. An upsurge in maize production followed these price increases.

Acting on the recommendations of an EPRP-financed study, the GOM re-established the SFFRF as a trust, independent of ADMARC, and took steps to strengthen its administration. Extensive technical assistance was provided to divest and restructure ADMARC of its non-marketing functions, which has markedly improved its financial viability and helped improve its remaining commercial functions.

4. THE IMPACT OF THE EPRP AS A WHOLE

4.1 Direct Effects on Smallholder Families

Now the question is of the size of the direct effects of the EPRP on smallholders. These were three, the shift to availability of HAF, and the two income effects, the reduction in the subsidy and the import savings in nutrient costs. The shifts to availability and increased purchases of HAF were covered in Section 3.2.3.

The reduction in the subsidy's budgetary cost equaled the reduction in the income transfer to smallholders. In Section 3.3, the budget savings were calculated for 1985-88 based on the difference between actual subsidy rates cut back by the EPRP and the 25 percent 1984/85 rate assumed likely to have continued in the absence of the EPRP. On those assumptions, the subsidy cuts reduced the income transfer to fertilizer-buying smallholders:

- by K1.17 million in 1985/86,
- by K1.75 million in 1986/87, and
- by K0.37 million in 1987/88 for a total of K3.29 million.

This works out, among 250,000 smallholder fertilizer buyers, to average a loss of K13 per family over three years; K4 per family per year. However, if a reader believes the appropriate assumption was an alternative subsidy rate of 29 percent, the work-out would average K32 per family over three years; K11 per year. We have no way of estimating the actual distribution of these losses (or the savings described below) among the families that bought fertilizer in various amounts.

On the other side of this ledger, the foreign exchange savings calculated in Section 3.42 were also the cost-savings passed through to smallholders from the switch from HAF to LAF. Compared with smallholders' loss of subsidy income 1985-88, smallholders' cost savings from HAF substitution have been very large. So far, they have been:

- K2.5 million in 1986/87,
- K8.0 million in 1987/88,
- K13.1 million in 1988/89, and
- 21.1 million in 1989/90, for a four-year total of K44.6 million

This works out, among 250,000 smallholder fertilizer buyers, as an average of K178 per family over four years; K44 per family per year -- and rising from K10 per family per year in 1986/87 to K84 in 1989/90. These savings will continue to grow in the future.

By 1987/88, the savings from substituting HAF for LAF reached K8.0m. This almost matched that crop year's fertilizer subsidy of K8.9m. Put differently, by that year, if the subsidy had been eliminated, the HAF substitution savings would have almost fully offset the loss to smallholders of the subsidy. As HAF substitution has been extended beyond its 1987/88 replacement of just one-third of LAF, the savings have grown.

4.2 The Larger Policy Environment

During 10 years of structural adjustment endorsed by donors and major international financial institutions, much changed for the better as Malawi has passed through a series of budgetary and balance-of-payment problems and is at present showing very healthy budgetary and balance-of-payments trends. There remain, however, policies that depress smallholders' returns to land and labor while increasing returns to the land, capital, and management of estates.

The principal pro-estate policy is the provision that only farms with licenses may legally grow burley tobacco and only estates are eligible for licenses. While an international oligopoly constrains output, this law excludes smallholders from participating in the oligopoly rents flowing from the higher prices output restriction produces. (There are an unknown number of smallholder who violate the law). The licensing provision appears to have been the principal motivation behind the growth of the estate area, the present backlog of applications for estate leases, and the large estate areas not being farmed while waiting for burley licenses.

A second element in estate bias has been the policy of allowing estates to sell all their cash crops at, or at least near, export parities while ADMARC set low prices, and smallholders were forbidden to sell to private traders. This contrast may be alleviated by the recent reform allowing smallholder sales to private traders. But the licensing, time-of-day, and location restrictions on the private traders make the effects problematic.

A final point: during the past six or seven years, ADMARC's pricing decisions have been guided by World Bank criteria specified in SAL agreements. At least in general, the WB staff have approved ADMARC's performance. One would have to understand

those criteria, their application, and their consequences in order to pass judgement on the GOM's overall agricultural policy system. This team did not take action along those lines but welcomes the prospect that the Mission's prospective Agricultural Sector Adjustment Program will do so.

5. LESSONS LEARNED

A.I.D. and policy dialogue can overcome administrators' fear of change that has prevented a reform whose benefits clearly outweigh its costs. As soon as HAF substitution began, farm families began to receive cost savings, and the nation obtained improvements in its terms of trade (in that it obtained greater import value per unit of exports). Some GOM technicians had been clearly aware of these possibilities, but implementation was prevented because of policy makers' fears of the uncertainties of beginning a switch from doing what every one knew how to do to doing something different. The EPRP's conditionality tipped the balance in favor of the reform that benefitted many while injuring few (perhaps some transporters).

The effectiveness of policy dialogue can be increased by devoting much of it to the technicians who advise about, and to the mid-level administrators who must implement, a proposed reform. According to participants in the policy dialogue that led to agreement on the EPRP, success came from identifying, first, the size of potential gains and, second, the means to implement the change and then convincing GOM officials first at the technical and implementation levels and only later at policy-making levels.

Macroeconomic fiscal reform can be used as an argument to obtain price reforms that improve efficiency in resource use. IMF conditionality restricting credit creation is often cited as a means to induce governments to abolish money-losing parastatals and other subsidized activities. In this case, the subsidy's effect on the budget was accepted as a reason for moving toward pricing in accord with international costs.

Serendipitous results can bring benefits much beyond those initially sought in a reform. This EPRP was initially proposed as a means to reduce the budget deficit and to get prices right. As part of the search for sufficient supporting arguments, means were sought to cushion the effect on farm families of losing the subsidy. HAF substitution was picked out as a means to that end; but when implemented, HAF substitution produced cost savings whose importance exceeds that of any other aspect of the program.

Conditioned nonproject assistance requires a lot of A.I.D. staff time and a lot of specialized A.I.D. expertise. Mission

resources were sorely taxed in implementing this reform and in monitoring its impact. Management fell to the Mission Program Officer since there was no staff economist during start-up and implementation. Conventional wisdom in the Agency in the early EPRP years was that quick disbursing non project assistance was less staff intensive than project assistance. The Mission's experience has been just the opposite. Additional staff support from AID/W would have been justified, for example, in design of a monitoring and evaluation system for the Mission.

The PAAD called for a monitoring and evaluation system for the reform program. Although it maintained meticulous documentation of key events in the unfolding of the program, the Mission had no way of determining effects on smallholder farm families. A monitoring and evaluation system might have done this.

Without explicit provision of resources, monitoring the effects of a reform may be beyond the means, the will, or both of the host government. A serious host government problem is the lack of institutional capability to set priorities and focus sustained attention on any given donor policy reform program. There are no formal GOM institutional arrangements for establishing priorities among policy reform elements. The result is that a very thin layer of key technicians in the various Ministries and Departments must try to focus on large number of different initiatives at any given point in time. The end result was that none of the GOM implementing institutions were able to invest the time required to monitor the impact of this initiative.

One reform may lead to the need for another. Although the SFFRF appears to be relatively healthy from a financial point of view, A.I.D. financing for its capitalization has contributed to the institutionalization of an additional parastatal. Regarding donor financing of the revolving fund, Uma Lele makes the point that financing "... served its purpose at the time in Malawi; but it has entrenched a new parastatal as smallholder fertilizer importer." Her point is well taken, but, as long as there is a separate estate fertilizer market and a subsidy on fertilizer going to smallholders, the parastatal has to remain in place.

6. RECOMMENDATION

Perhaps little progress can be made against estate bias until technical studies equip policy dialoguers with facts on the deleterious effects of that bias on smallholders. The Mission and the World Bank are to be commended for their current efforts to understand the character and consequences of the policy inequalities between estates and smallholders.

While the Mission pursues its search for understanding and practical means to assist reform in this area, we recommend that the Mission and A.I.D./Washington should be extremely cautious about putting resources into programs that either leave the present biased system in place or that serve to strengthen it.

ANNEX A
IMPACT CALCULATION METHODOLOGIES

**ANNEX A. WORKSHEET A: TO CALCULATE THE SAVINGS IN
FOREIGN EXCHANGE AND IN DELIVERY COST THAT HAVE FOLLOWED FROM
THE IMPORTATION OF HIGH ANALYSIS FERTILIZER IN LIEU OF
LOW ANALYSIS FERTILIZER
(All figures in Metric Tons)**

| CROP YEAR AND HIGH ANALYSIS VARIETY | QUANTITY IMPORTED | NUTRIENT CONTENT OF QUANTITY IMPORTED | |
|--|----------------------|---|-------|
| | | NITROGEN | PH |
| 1986/86 | | | |
| DAP | 5,271 | 1,949 | 2,530 |
| Urea | <u>7,843</u> | <u>3,608</u> | - |
| TOTAL | 13,114 | 4,557 | |
| 1987/88 | | | |
| DAP | 7,335 | 1,320 | 3,521 |
| Urea | <u>19,499</u> | <u>8,970</u> | - |
| TOTAL | 26,834 | 10,290 | |
| 1988/89 | | | |
| DAP | 8,129 | 1,463 | 3,902 |
| Urea | <u>24,547</u> | <u>11,292</u> | - |
| TOTAL | 32,676 | 12,755 | |
| 1989/90 | | | |
| DAP | 9,200 | 1,656 | 4,416 |
| Urea | <u>40,000</u> | <u>18,400</u> | - |
| TOTAL | 49,200 | 20,056 | |
| GRAND TOTAL | 121,824 | | |

**IMPORTS OF 20:20:0 AND CAN REQUIRED TO PROVIDE
THE NUTRIENTS IN THE HAF ACTUALLY IMPORTED**

| VARIETY | IMPORT QUANTITY | NUTRIENT CONTENT | |
|---------|-----------------|------------------|-------|
| | | NITROGEN | PH |
| 1986/87 | | | |
| 20:20:0 | 12,650 | 2,530 | 2,530 |
| CAN | <u>7,796</u> | <u>2,027</u> | - |
| TOTAL | 20,446 | 4,557 | |
| 1987/88 | | | |
| 20:20:0 | 17,605 | 3,521 | 3,521 |
| CAN | <u>26,035</u> | <u>6,769</u> | - |
| TOTAL | 43,640 | 10,290 | |
| 1988/89 | | | |
| 20:20:0 | 19,510 | 3,902 | 3,902 |
| CAN | <u>34,050</u> | <u>8,853</u> | - |
| TOTAL | | | |

* The fundamental assumption here is that if the particular HAF quantities, e.g. 5,271 tons of DAP and 7,843 tons of urea in 1986/87, had not been imported, then additional quantities of

18

LAF, e.g., 12,650 tons of 20:20:0 and 1986-89 data, 7,796 tons of CAN in 1986/87, would have been imported such that the nutrient tonnages of nitrogen and phosphorus actually imported would have been the same. Actual smallholder substitution from CAN and 20:20:0 to urea and DAP is consistent, within 5% of this assumption (see Robert Nathan, 1987, p. IV.44). The foreign exchange savings on the substitution of 23:21:0+45 for 20:20:0 has been omitted from these calculations in recognition of their relatively small size and somewhat greater complexity involving sulphur.

Source: for 1986-89 data, Sahn, David E. Jehan Arulpragason, and Lemma Merid. 1989. "Policy Reform and Poverty in Malawi: A Survey of a Decade of Experience." Cornell University Foods and Nutrients Program. Washington. Photocopy. Appendix A II, no pagination. For 1989/90 data, Malawi Smallholder Farmers' Fertilizer Revolving Fund. Photocopy.

**ANNEX A WORKSHEET B: SAVINGS IN FOREIGN EXCHANGE
AND IN DELIVERY COSTS FROM IMPORTING HIGH ANALYSIS
FERTILIZER IN LIEU OF LOW ANALYSIS FERTILIZER***

| <u>Crop Year</u> | <u>Tons Actually Imported</u> | | | <u>CIF COST TO BLANNTYRE (Thousands of Kwacha)</u> | |
|------------------|-------------------------------|-------------|------------|--|--------------|
| | <u>DAP</u> | <u>UREA</u> | <u>DAP</u> | <u>UREA</u> | <u>TOTAL</u> |
| 1986/87 | 5,271 | 7,843 | 2,821 | 3,818 | 6,639 |
| 1987/88 | 7,335 | 19,499 | 5,130 | 10,897 | 16,027 |
| 1988/89 | 8,129 | 24,547 | 7,301 | 19,000 | 26,301 |
| 1989/90 | 9,200 | 40,000 | 10,423 | 36,311 | 46,734 |

| <u>TONS OF LAF REQUIRED FOR EQUIVALENCE</u> | | | <u>CIF COST OF EQUIVALENTS (Thousands of Kwacha)</u> | | |
|---|------------|----------------|--|--------------|---------------|
| <u>20:20:0</u> | <u>CAN</u> | <u>20:20:0</u> | <u>CAN</u> | <u>TOTAL</u> | <u>SAVING</u> |
| 12,650 | 7,796 | 6,071 | 3,097 | 9,168 | 2,529 |
| 17,605 | 26,035 | 10,664 | 13,320 | 23,984 | 7,957 |
| 19,510 | 34,050 | 15,269 | 24,100 | 39,369 | 13,068 |
| 22,080 | 60,154 | 20,049 | 47,784 | 67,833 | 21,099 |

* CIF Cost, in Kwacha, per Metric Ton Delivered to Blantyre

| <u>Crop year</u> | <u>DAP</u> | <u>Urea</u> | <u>20:20:0</u> | <u>CAN</u> |
|----------------------|------------|-------------|----------------|------------|
| 1986/87 | 535.12 | 486.86 | 479.90 | 397.28 |
| 1987/88 | 699.33 | 558.86 | 605.77 | 511.64 |
| 1988/89 | 898.22 | 774.03 | 782.62 | 707.78 |
| 1989/90 | 1,133.00 | 907.78 | 908.00 | 794.37 |

Source: The same as for Annex A Worksheet A.

ANNEX B
PROJECT DATA SHEET

13

ANNEX B: PROJECT DATA SHEET

1. Country: Malawi
2. Project Title: Economic Policy Reform Program Malawi
Fertilizer Subsidy Removal Program
3. Project Number: 612-0225
4. Project Implementation:
 - a. Project authorization, 1985
 - b. Final obligation, 1985
 - c. Final input delivery, 1987 under program agreement 1990
under project agreement
5. Project Completion-Final Disbursement: Program 1987;
Project: 1990
6. Project Funding:

A.I.D. Total, \$15,000,000; \$5,100,000 deobligated
7. Mode of Implementation:
 - a. Program Agreement between USAID/Malawi and Government of
Malawi, Ministry of Finance
 - b. Implemented by Ministries of Finance and
of Agriculture
8. Evaluations:
 - a. Annual reviews in 1986 and 1987
 - b. Special evaluation, The Impact of the Fertilizer Subsidy
Removal Program on Smallholder Agriculture in Malawi,
Robert E. Christiansen, Edward Tower, Peter Wyeth, and
Christina Gladwin, R. Nathan Associates, Inc., June 30,
1987.
9. Responsible Mission Officials During Life of Project:
 - a. Mission Director: John Hicks
 - b. Project Officer: Richard Day
10. Host Country Exchange Rates:
 - a. Name of currency: kwacha (K)
 - b. Exchange rate: 170 kwacha = \$1 for the first
disbursement, January 1986; 187 kwacha = \$1 for the
second disbursement, February 1987.

ANNEX C
STATISTICAL TABLES

ANNEX C: STATISTICAL TABLES

- Table 1. Government Subsidy to SFFRF, 1983/84-1989/90
- Table 2. Smallholder Fertilizer Prices, 1980/81-1989/90
- Table 3. Producer Prices Paid by ADMARC, 1980/81-1988/89
- Table 4. Value Ratios, Fertilizer/Maize, 1980/81-1989/90
- Table 5. Fertilizer Subsidies by Categories: HAF, LAF, and Aggregate Subsidies, 1980/81-1988/89
- Table 6. Total Uptake of Fertilizer, 1980/81-1989/90
- Table 7. Smallholder Maize Production, Hectarage, Yield, 1980/81-1988/89
- Table 8. Smallholder Hectarage Trends for Selected Crops, 1982/83-1989/90
- Table 9. Profitability of Major Cash Crops, 1981/82-1986/87
- Table 10. Smallholder Maize Production and Sales to ADMARC, 1980/81-1988/89
- Table 11. Smallholder Maize Production, by Variety, 1984/85-1989/90
- Table 12. Credit Participation and Credit Recovery by Smallholder Farmers, 1977/78-1989-90
- Table 13. Central Government Operations, 1984/85-1988/89
- Table 13. Subsidy Rates by Fertilizer Type

TABLE 1. GOVERNMENT SUBSIDIES TO THE SFFRF*
(Millions of Kwacha)

| | <u>1983/84</u> | <u>1984/85</u> | <u>1985/86</u> | <u>1986/87</u> | <u>1987/88</u> | <u>1988/89</u> |
|--------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Sales | | | | | | |
| Revenue | 15.9 | 22.2 | 25.1 | 27.0 | 37.6 | 53.3 |
| Costs | 22.3 | 29.4 | 32.0 | 32.9 | 49.4 | 69.7 |
| Deficit | 6.4 | 7.2 | 6.9 | 5.9 | 11.8 | 16.4 |
| Net | | | | | | |
| Interest | .1 | .4 | .7 | 1.4 | 2.9 | *** |
| Subsidy | 6.3 | 6.8 | 6.2 | 4.5 | 8.9 | 16.4 |
| Subsidy | | | | | | |
| Rate ** | 28.9 | 24.6 | 21.4 | 17.9 | 23.9 | 23.5 |
| Subsidy to | | | | | | |
| Total GOM | | | | | | |
| Expenditures | | .013 | .0096 | .0056 | .0108 | .0153 |

* In August 1988, the IMF estimated the 1989/90 subsidy would be K12 million, one percent of GOM expenditures. (5 Sept. 1989. "Malawi-Enhanced Structural Adjustment Facility, Second Annual Arrangement." P. 13). This appears to have been an underestimate.

** Deficit divided by costs.

*** Based on a GOM agreement with IFAD and the WB when setting up the SFFRF, it received interest, 1983-88, at 10 percent, on its deposits in the Reserve Bank of Malawi (RBM). In 1988, the GOM and RBM decided they could no longer make that payment. In late 1989 or early 1990, SFFRF transferred its account to the National Bank where it will earn 7 percent interest.

Source: SFFRF Audited Accounts, 1983/84-1988/89.

Sources: Sahn, et. al. (Dec. 1989); and USAID/Malawi files pertaining to FSRP.

Sources: IMF, "Malawi-Recent Economic Developments," SM/89/169 (August 16, 1989); Sahn, et. al. (Ibid); and Malawi Government, Economic Report, 1990. (Budget Document #4) Fertilizer subsidy amounts as

Reported in SFFRF accounts.

Table 2: Smallholder Fertilizer Prices (kwacha per 50 kg bag)

| | 1980/81 | 1981/82 | 1982/83 | 1983/84 | 1984/85 | 1985/86 | 1986/87 | 1987/88 | 1988/89 | 1989/90 |
|------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 20:20:0 | 8.5 | 8.5 | 12.6 | 14.5 | 17.5 | 20.5 | 21 | 27 | 30 | 35 |
| S/A | 6.5 | 9 | 10.5 | 12 | 13.5 | 17.5 | 18 | 23 | 27 | 33 |
| CAN | 10.5 | 10.5 | 13 | 14 | 15.5 | 19 | 19.5 | 24.5 | 27.5 | 34 |
| Urea | | | | | | | 26 | 27 | 30 | 37 |
| DAP | | | | | | | 24 | 31.5 | 34.5 | 41.5 |
| 23:21:0+4s | | | | | | | | | 32.5 | 39.5 |

Source: Nathan report, updated with data from SFRF.

Table 3: Producer Prices Paid by ADMARC (kwacha/kg)

| | 1980/81 | 1981/82 | 1982/83 | 1983/84 | 1984/85 | 1985/86 | 1986/87 | 1987/88 | 1988/89 |
|----------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Maize | 6.6 | 11.1 | 11.1 | 12.2 | 12.2 | 12.2 | 12.2 | 16.7 | 24.0 |
| Rice | 10.0 | 10.0 | 11.5 | 15.0 | 17.0 | 19.0 | 22.0 | 27.0 | 30.0 |
| Groundnuts | 33.0 | 37.0 | 55.0 | 60.0 | 70.0 | 75.0 | 75.0 | 75.0 | 82.0 |
| Tobacco | 59.5 | 59.5 | 102.0 | 112.0 | 145.0 | 145.0 | 145.0 | 160.0 | 240.0 |
| Cotton | 23.0 | 28.5 | 38.0 | 42.0 | 46.0 | 50.0 | 55.0 | 65.0 | 77.0 |
| Ratio, maize/nuts | 0.20 | 0.30 | 0.20 | 0.20 | 0.17 | 0.16 | 0.16 | 0.22 | 0.29 |
| Ratio, maize/tobacco | 0.11 | 0.19 | 0.11 | 0.11 | 0.08 | 0.08 | 0.08 | 0.10 | 0.10 |
| Ratio, maize/cotton | 0.29 | 0.39 | 0.29 | 0.29 | 0.27 | 0.24 | 0.22 | 0.26 | 0.31 |

Source: Derived from Nathan report and updated with MOA estimates.

Table 4: Value Ratios, fertilizer/maize *

| | 1980/81 | 1981/82 | 1982/83 | 1983/84 | 1984/85 | 1985/86 | 1986/87 | 1987/88 | 1988/89 |
|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 20:20:0 | 2.58 | 1.53 | 2.27 | 2.38 | 2.87 | 3.36 | 3.44 | 3.23 | 2.50 |
| S/A | 1.97 | 1.62 | 1.89 | 1.97 | 2.21 | 2.87 | 2.95 | 2.75 | 2.25 |
| CAN | 3.18 | 1.89 | 2.34 | 2.30 | 2.54 | 3.11 | 3.20 | 2.93 | 2.29 |

* Value of 50 kg fert./50 kg maize

Source: Derived from previous price data tables.



Table 5: Fertilizer Subsidies by Categories: HAF, LAF, and Aggregate Subsidies

| | 1985/86 | 1986/87 | 1987/88 | 1988/89 |
|--------------------------|---------|---------|---------|---------|
| High Analysis Fertilizer | 0 | 14.9 | 19.3 | 30.75 |
| Low Analysis Fertilizer | 24.1 | 25.8 | 10.6 | 27.8 |
| Aggregate Subsidy | 23.8 | 20.5 | 19.3 | 29.7 |

Notes: Arithmetic averages of HAF & LAF; weighted average aggregate subsidy.

16

Table 6: Total Uptake of Fertilizer (1,000 metric tons)

| | 1980/81 | 1981/82 | 1982/83 | 1983/84 | 1984/85 | 1985/86 | 1986/87 | 1987/88 | 1988/89 | 1989/90 |
|---------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Total Material | 64 | 57 | 58 | 57 | 69 | 65 | 68 | 76 | 92 | 101 |
| Phosphate | 3 | 2 | 5 | 4 | 5 | 5 | 5 | 7 | 9 | 10 |
| Nitrogen | 13 | 12 | 12 | 14 | 16 | 15 | 18 | 21 | 27 | 30 |
| Total Nutrients (N+P) | 16 | 14 | 17 | 18 | 21 | 20 | 22 | 28 | 36 | 40 |
| Ratio, nutrients/material | 0.25 | 0.25 | 0.29 | 0.32 | 0.30 | 0.31 | 0.32 | 0.37 | 0.39 | 0.40 |

Source: Nathan report, updated with data from SFRE.

Table 7: Smallholder Maize: Production, Hectarage, Yield

| | 1980/81 | 1981/82 | 1982/83 | 1983/84 | 1984/85 | 1985/86 | 1986/87 | 1987/88 | 1988/89 |
|-------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Production (1,000 tons) | 1237 | 1244 | 1369 | 1398 | 1355 | 1295 | 1211 | 1427 | 1520 |
| Hectarage (1,000 ha.) | 969 | 1091 | 1008 | 1183 | 1145 | 1193 | 1182 | 1318 | 1344 |
| Yield (ton/ha.) | 1.28 | 1.14 | 1.36 | 1.18 | 1.18 | 1.09 | 1.02 | 1.08 | 1.13 |

17

Table 8: Smallholder Hectarage Trends for Selected Crops (1,000 ha.)

| | 1982/83 | 1983/84 | 1984/85 | 1985/86 | 1986/87 | 1987/88 | 1988/89 | 1989/90 |
|---------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|
| Maize | 1169 | 1182 | 1144 | 1193 | 1182 | 1215 | 1274 | 1338 |
| local | | 1068 | 1042 | 1104 | 1132 | 1138 | 1163 | 1180 |
| composite | | 26 | 21 | 20 | 14 | 19 | 25 | 23 |
| hybrid | | 89 | 75 | 69 | 37 | 59 | 86 | 135 |
| Groundnuts | 146 | 145 | 136 | 176 | 210 | 176 | 140 | 48 |
| Tobacco | 28 | 45 | 47 | 38 | 40 | 40 | 41 | 30 |
| Cotton | 33 | 51 | 61 | 52 | 35 | 44 | 48 | 46 |
| Pulses | 83 | 91 | 80 | 114 | 144 | 160 | 149 | 168 |
| Ratio, maize/others | 4.03 | 3.56 | 3.53 | 3.14 | 2.76 | 2.89 | 3.37 | 4.58 |
| Maize as % of total for 5 crops | 80 | 78 | 78 | 76 | 73 | 74 | 77 | 82 |

52

Table 9: Profitability of Major Cash Crops (gross margins, k/ha)

| | 1981/82 | 1982/83 | 1983/84 | 1984/85 | 1985/86 | 1986/87 |
|---------------------------|---------|---------|---------|---------|---------|---------|
| Maize, local no fert. | 82 | 80 | 88 | 87 | 84 | 82 |
| Maize, local, fert. | 92 | 81 | 91 | 84 | 68 | 63 |
| Maize, composite | 132 | 120 | 132 | 120 | 104 | 97 |
| Maize, hybrid | 193 | 211 | 193 | 173 | 147 | 136 |
| Groundnuts, chalim. | 76 | 86 | 164 | 236 | 247 | 244 |
| Rice, faya | 86 | 68 | 81 | 153 | 159 | 152 |
| Tobacco, nddf | 88 | 108 | 185 | 269 | 252 | 244 |
| Cotton | 141 | 106 | 151 | 192 | 147 | 143 |
| Ratio, loc. maize/nuts | 1.08 | 0.93 | 0.54 | 0.37 | 0.34 | 0.34 |
| Ratio, loc. maize/tobacco | 0.93 | 0.74 | 0.48 | 0.32 | 0.33 | 0.34 |
| Ratio, loc. maize/cotton | 0.58 | 0.75 | 0.58 | 0.45 | 0.57 | 0.57 |
| Ratio, hybrid/nuts | 2.54 | 2.45 | 1.18 | 0.73 | 0.60 | 0.56 |
| Ratio, hybrid/tobacco | 2.19 | 1.95 | 1.04 | 0.64 | 0.58 | 0.56 |
| Ratio, hybrid/cotton | 1.37 | 1.99 | 1.28 | 0.90 | 1.00 | 0.95 |

Source: Derived from Sahn and updated with MOA estimates.

117

Table 10: Smallholder Maize Production and Sales to ADMARC (1,000 tons)

| Marketing year | 1979/80 | 1980/81 | 1981/82 | 1982/83 | 1983/84 | 1984/85 | 1985/86 | 1986/87 | 1987/88 |
|---|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Maize production | 1198 | 1237 | 1244 | 1369 | 1398 | 1355 | 1295 | 1211 | 1427 |
| ADMARC purchases | 92 | 137 | 246 | 245 | 297 | 272 | 111 | 113 | 135 |
| Percentage of production sold to ADMARC | 7.7 | 11.1 | 19.8 | 17.9 | 21.2 | 20.1 | 8.6 | 9.3 | 9.5 |

Source: Sahn, table 17, page 116.

Table 11: Smallholder Maize Production by Variety (1,000 tons)

| | 1984/85 | 1985/86 | 1986/87 | 1987/88 | 1988/89 | 1989/90 |
|-----------|---------|---------|---------|---------|---------|---------|
| Local | 1084 | 1058 | 1079 | 1236 | 1220 | 956 |
| Composite | 38 | 35 | 23 | 28 | 45 | 35 |
| Hybrid | 233 | 202 | 100 | 156 | 245 | 352 |
| Total | 1355 | 1295 | 1202 | 1420 | 1510 | 1343 |

Source: Office of the President: Department of Economic Planning and Development

5

**TABLE 12. CREDIT PARTICIPATION AND CREDIT RECOVERY
BY SMALLHOLDER FARMERS**
(Average size of club farm in 1985/86: 1.16 hectares)

| <u>NO. OF SEASONUBS</u> | <u>NO. OF PARTI- CIPATING HOUSE- HOLDERS (THOUSANDS)</u> | <u>PERCENT OF SMALL HOLDER FARMERS IN CLUBS</u> | <u>PERCENT OF PARTI- CIPATING HOUSEHOLD HEADS WHO WERE WOMEN</u> | <u>VOLUME OF NEW LOANS** (MILLIONS)</u> | <u>PERCENT RECOVERY TO DATE</u> | |
|-----------------------------|--|---|--|---|---|----|
| 89/90 | 12,000* | 300* | 25.0* | - | 50* | - |
| 88/89 | 10,849 | 285 | 22.2 | 26.2 | K41 | 75 |
| 87/88 | 9,129 | 243 | 17.9 | 29.8 | K27 | 91 |
| 86/87 | 8,045 | 206 | 15.2 | 25.4 | K18 | 93 |
| 85/86 | 8,259 | 208 | 15.3 | 19.4 | K19 | 89 |
| 84/85 | 8,148 | 212 | 15.6 | 16.2 | K16 | 97 |
| 83/84 | 7,191 | 180 | 13.2 | 15.0 | K11 | 98 |
| 82/83 | - | 157 | 11.5 | - | K8 | 97 |
| 81/82 | - | - | - | - | K5 | 98 |
| 80/81 | - | - | - | - | K6 | 98 |
| 79/80 | - | - | - | - | K4 | 97 |
| 78/79 | - | - | - | - | K2 | 98 |
| 77/78 | - | - | - | - | K2 | 98 |

* Estimates.

** Not shown are unrecovered amounts as shown in field reports to SACA. In July 1983, 3,457 clubs were K925,000 in principal and interest arrears. In July 1987, 6,602 clubs were K4,261,400 in principal and interest arrears.

Source: Malawi Smallholder Agricultural Credit Administration

4/6

TABLE 13. CENTRAL GOVERNMENT OPERATIONS
(In Million Kwacha, Current Prices)

| | <u>1984/85</u> | <u>1985/86</u> | <u>1986/87</u> | <u>1987/88</u> | <u>1988/89</u> |
|-----------------------|----------------|----------------|----------------|----------------|----------------|
| Total Revenue | 353.3 | 44.2 | 492.9 | 583.4 | 752.9 |
| Total Expenditure | 503.2 | 643.5 | 797.0 | 823.9 | 1,071.3 |
| Recurrent | 364.8 | 457.3 | 560.5 | 616.5 | 695.2 |
| Development | 138.4 | 150.2 | 189.8 | 207.4 | 341.3 |
| Extra Budgeting | - | 26.0 | 46.7 | - | 34.8 |
| Deficit Before Grants | (149.9) | (201.5) | (304.1) | (240.5) | (318.4) |
| Grants | 40.5 | 44.8 | 79.3 | 69.0 | 209.2 |
| Overall Deficit | (109.4) | (156.7) | (224.8) | (171.5) | (109.2) |
| Financing | 109.4 | 156.7 | 224.8 | 171.5 | 109.2 |
| Foreign (net) | 53.0 | 51.8 | 115.0 | 80.0 | 163.0 |
| Domestic (net) | 56.4 | 104.9 | 109.8 | 91.5 | (53.8) |
| Banking System | 10.0 | 72.4 | 60.9 | 45.5 | (100.9) |
| Other | 46.4 | 32.5 | 48.9 | 46.0 | 47.1 |
| Fertilizer Subsidy | 6.8 | 6.2 | 4.5 | 8.9 | 16.4 |

Ratios (In percent)

| | | | | | |
|-------------------------|-----|-----|-----|-----|-----|
| Subsidy/Total Exp. | 1.4 | 1.1 | 0.7 | 0.8 | N/A |
| Subsidy/Recurrent Exp. | 1.9 | 1.6 | 1.1 | 1.0 | N/A |
| Subsidy/Overall Deficit | 6.6 | 4.6 | 2.6 | 3.8 | N/A |

Memo Items

| | | | | | |
|-----------------------------------|---------|---------|---------|---------|---------|
| Overall Deficit/GDP | 6.2 | 17.8 | 9.6 | 6.2 | 3.1 |
| Growth in M, per annum | - | 7.5 | 8.9 | 45.3 | 23.9 |
| GDP, Cur Mrkt Prices (Mn. Kwacha) | 1,768.2 | 2,010.2 | 2,332.5 | 2,756.5 | 3,552.3 |
| Program Outturn | - | - | 22.2 | 17.0 | 12.0 |
| | | | | 14.7*2 | 22.0*4 |
| | | | | | N/A |

Notes:

- *1 Estimates by David Sahn, et. al., "Policy Reform and Poverty in Malawi: A Survey of Experience," Cornell/USAID (Dec. 1989)
- *2 Ex ante subsidy
- *3 Ex post subsidy
- *4 Revised target proposed by GOM.
- *5 Uses weighted average method used by GOM to calculate subsidy. Donated fertilizer is valued at replacement cost.

ANNEX D
BIBLIOGRAPHY

ANNEX D

BIBLIOGRAPHY

Agricultural Development & Marketing Corporation. 1988. "Annual Accounts & Report for the Year Ended 31st March 1988." ADMARC. Limbe, Malawi.

Ibid. 1989. "Annual Accounts & Report for the Year Ended 31st March 1989." ADMARC. Limbe, Malawi.

A.I.D. 1983. The Private Sector and The Economic Development of Malawi. A.I.D. Evaluation Special Study No. 11. Washington, D.C.: Agency for International Development.

A.I.D. 1985. "Malawi Economic Policy Reform Program (MEPREP)." USAID/Malawi. Photocopy.

African Department and the Exchange and Trade Relations Department. 1988. "Staff Report for the First Review Under the Stand-By Arrangement and Request for Arrangements Under the Enhanced Structural Adjustment Facility." International Monetary Fund/Malawi. Photocopy.

African Department and the Exchange and Trade Relations Department. 1988. "Staff Report for the Midterm Review of the First Annual Arrangement Under the Enhanced Structural Adjustment Facility and for the Second Review Under the Stand-By Arrangement." International Monetary Fund/Malawi. Photocopy.

African Department and the Exchange and Trade Relations Department. "Staff Report for the 1989 Article IV Consultation and Request for the Second Annual Arrangement Under the Enhanced Structural Adjustment Facility." International Monetary Fund/Malawi. Photocopy.

Arulpragasam, Jehan, Lemma Merid, and David E. Sahn. 1989. "Policy Reform and Poverty in Malawi: A Survey of a Decade of Experience." Cornell University/Washington, D.C. Photocopy.

Brek, O.P., P. Brenner, R. Hicks, R. Sharer, and C. Towe. 1989. "Recent Economic Developments." International Monetary Fund/Malawi. Photocopy.

Christiansen, Robert E., and J. G. Kydd. 1987. Malawi's Agricultural Export Strategy and Implications for Income Distribution. Washington, D.C.: United States Department of Agriculture, Economic Research Service, International Economics Division.

- Christiansen, Robert E., Edward Tower, Peter Wyeth, and Christina Gladwin. 1987. "The Impact of the Fertilizer Subsidy Removal Program on Smallholder Agriculture in Malawi." Robert R. Nathan Associates. Photocopy.
- Christiansen, Robert E., and Edward Tower. 1987. "A Model of the Effect of a Fertilizer Subsidy on Income Distribution and Efficiency in Malawi." Duke University. Photocopy.
- Christiansen, Robert E., and V. Roy Southworth. 1988. "Agricultural Pricing and Marketing Policy in Malawi: Implications for a Development Strategy." The World Bank. Photocopy.
- Christiansen, Robert E., and Lee Ann Stackhouse. 1989. "The Privatization of Agricultural Trading in Malawi." World Development_17 (5):729-740.
- Colquhoun, Brian, Hugh O'Donnell and Partners. 1989. Fertilizer Buffer Stock Project Phase I Evaluation. Commission of the European Communities Agreement No. 4064/MAI. Malawi: Government of the Republic of Malawi Ministry of Agriculture.
- Chimango, L.J., and S. Chimwemwe Hara. 1988. "Malawi - Stand-By Arrangement." International Monetary Fund. Photocopy.
- Crown Agents for Overseas Governments and Administrations. 1987. "Malawi Fertilizer Buffer Stock Feasibility Study." Crown Agents. Photocopy.
- Dickerman, Carol W., and Peter C. Bloch. 1989. "Land Tenure and Agricultural Productivity in Malawi." Land Tenure Center/University of Wisconsin-Madison. Photocopy.
- I.M.F. 1988. "Malawi - Three-Year and First Annual Arrangements Under the Enhanced Structural Adjustment Facility." International Monetary Fund. Photocopy.
- I.M.F., and the World Bank. June 1988. "Malawi Policy Framework Paper 1988/8^o-1990/91." International Monetary Fund. Photocopy.
- I.M.F. December 1988. "Malawi - Staff Report for the Midterm Review of the First Annual Arrangement under the Enhanced Structural Adjustment Facility and for the Second Review under the Stand-by Arrangement." International Monetary Fund. Photocopy.
- I.M.F. August 1989. "Malawi - Staff Report for the 1989 Article IV Consultation and Request for the Second Annual Tranche

- under the Enhanced Structural Adjustment Facility." International Monetary Fund. Photocopy.
- I.M.F., and the World Bank. August 1989. "Enhanced Structural Adjustment Facility - Policy Framework Paper 1989/90-1991/92." International Monetary Fund. Photocopy.
- I.M.F. September 1989. "Malawi - Enhanced Structural Adjustment Facility, Second Annual Arrangement." International Monetary Fund. Photocopy.
- I.M.F. December 1989. "Malawi - Recent Economic Developments." International Monetary Fund. Photocopy.
- Ivy, P. No date. "An Assessment of the Agricultural Extension and Credit Services." Symposium on Agricultural Policies for Growth and Development. Photocopy.
- Kadyampakeni, James. 1988. "Pricing Policies in Africa with Special Reference to Agricultural Development in Malawi." World Development 16 (11):1299-1315.
- Kirchner, J., I. Singh, and L. Squire. 1984. "Agricultural Pricing and Marketing Policies in Malawi: A Multi-Market Analysis." The World Bank. Photocopy.
- Lele, Uma. 1989. "Structural Adjustment, Agricultural Development and the Poor-- Lessons from the Malawian Experience." The World Bank.
- Lele, Uma, and Robert E. Christiansen. 1989. "Fertilizer Policy in Africa- Lessons from Development Programs and Adjustment Lending, 1970-87." The World Bank.
- Lele, Uma, and Manmohan Agarwal. 1989. "Smallholder and Large-Scale Agriculture: Are There Tradeoffs in Growth and Equity?." The World Bank. Photocopy.
- Lele, Uma, and Richard Meyers. 1989. "Growth and Structural Change in East Africa: Domestic Policies, Agricultural Performance and World Bank Assistance, 1963-1986 Part I and Part II." Managing Agricultural Development in Africa. Photocopy.
- Lele, Uma, and Vishva Bindlish. 1988. "How Important Are the Relative Effects of Economy-Wide and Sector-Specific Policies in Explaining the Past Performance of Nigerian Agriculture?." The World Bank. Photocopy.
- Lele, Uma. 1988. "Agricultural Growth, Domestic Policies the External Environment and Assistance to Africa: Lessons of a

- Quarter Century." Managing Agricultural Development in Africa. Photocopy.
- Mann, C.K. 1988. "Food Security Policy, Including the Role of ADMARC in Price Stabilization." Agency for International Development/Malawi. Photocopy.
- Mead, Donald C., Bruce R. Bolnick and Robert C. Young. 1989. "Strategies for Small and Medium Enterprises in Malawi." Agency for International Development/Malawi. Photocopy.
- Mhone, Guy C.Z. 1987. "Agricultural and Food Policy in Malawi: A Review." In The State and Agriculture in Africa, edited by T. Mkandawire Codesria, 59- 86.
- Mkandawire, Richard M., and Graham H.R. Chipande. 1988. "Smallholder Agricultural Development in Malawi: The Case for a Targeted Approach, with Special Reference to Cases from Selected Agricultural Development Divisions." Symposium of Agricultural Policies for Growth and Development. Photocopy.
- Peters, Pauline E. and M. Guillermo Herrera. 1989. "Cash Cropping, Food Security and Nutrition: The Effects of Agricultural Commercialization among Smallholders in Malawi." Harvard Institute for International Development for A.I.D., Cambridge. Photocopy.
- Radi, Arnold, and Steven Tsomba. 1989. "Ministry of Agriculture 1989/90 Producer and Input Prices." Agency for International Development/Malawi. Photocopy.
- Sahn, David E., Jehan Arulpragasam, and Lemma Merid. 1989. "Policy Reform and Poverty in Malawi: A Survey of a Decade of Experience." Cornell University Foods & Nutrients Program. Washington. Photocopy.
- Sahn, David E. and Jehan Arulpragasam. 1990. "Land Policy and Poverty in Malawi." Cornell University Food & Nutrients Program. Washington. Photocopy.
- Sebstad, Jennifer, M.A. 1989. "Expanding Off-Farm Income and Employment Opportunities for Women." Agency for International Development/Malawi. Photocopy.
- The World Bank. 1985. Malawi - Economic Recovery: Resource and Policy Needs - An Economic Memorandum. Report No. 5801-MAI. The World Bank.
- The World Bank. 1987. "Malawi - Land Policy Study." Eastern and Southern Africa Region/Southern Agriculture Division/The World Bank. Photocopy.

- The World Bank. 1987. "Staff Appraisal Report - Malawi - Smallholder Agricultural Credit Project (IDA/IFAD Credit)." Southern Africa Department/Agriculture Operations Division/The World Bank. Photocopy.
- The World Bank. 1989. "Malawi - Country Economic Memorandum - Growth Through Poverty Reduction - Volume II." The World Bank. Photocopy.
- The World Bank. 1989. "Malawi - National Rural Development Program (NRDP) - Technical Issues Review." The World Bank. Photocopy.
- The World Bank. November 1989. Malawi, "Food Security Report." The World Bank. Photocopy.
- Vondal, Patricia J. 1988. "Improving Non-Project Assistance Through Better Social and Institutional Analysis, Suggestions from Africa Bureau Experience." Office of Development Planning/Bureau for Africa. Photocopy.
- Weil, Dr. Ray. 1985. "More Efficient Use of Fertilizers by Smallholder Farmers in Malawi: Problems and Prospects (With Special Emphasis on the Use of Urea)." USAID/Lilongwe. Photocopy.

ANNEX E
GLOSSARY

54

GLOSSARY

- ADD - Agricultural Development Divisions (The MOA geographic division of Malawi for administrative purposes.)
- ADMARC - Agricultural Development and Marketing Corporation (Malawi's smallholder agricultural marketing board.)
- ASAP - The Agricultural Sector Assistance Program (A program loan and reform program being discussed with the World Bank)
- CAN - Calcium Ammonium Nitrate (A low analysis fertilizer; nitrogen nutrients 26%.)
- CIF - Cost, Insurance and Freight (The full cost of delivery of merchandise, generally measured at port of entry.)
- DAP - Diammonium Phosphate (A high analysis fertilizer; nutrients, nitrogen 18%, phosphorus 48%.)
- EEC - The European Economic Community
- EPD - Economic Planning and Development Department of the OPC
- EPRP - Economic Policy Reform Program (Malawi's version of AID/AFR's non-project policy reform grant program begun in 1985 and including 18 countries by 1990.)
- FOB - Freight on Board (The cost of material at a port of embarkation.)
- The Fund - The SFFRF
- GNP - Gross National Product (Value at market prices of all goods and services produced by Malawians.)
- GOM - Government of Malawi
- HAF - High Analysis Fertilizer (Nutrients exceed 45% by weight.)
- IBRD - The International Bank for Reconstruction and Development (The "hard" loan agency of the World Bank.)
- IFAD - International Fund for Agricultural Development
- IDA - The International Development Agency (The "soft" loan agency of the World Bank.)
- IMF - International Monetary Fund

- LAF - Low Analysis Fertilizer (Nutrients no more than 45% by weight.)
- MOA - Malawi Ministry of Agriculture
- MOF - Malawi Ministry of Finance
- NRDP - National Rural Development Program (The overreaching smallholder development program begun in 1978.)
- OPC - Office of the President and Cabinet of Malawi
- PAAD - A.I.D. Program Assistance Approval Document (The document used to authorize implementation and financing of particular non-project assistance programs.)
- S/A - Sulphate of Ammonia (A low analysis fertilizer; nutrients, %.)
- SAL - Structural Adjustment Loan (A quick-disbursing loan from the IBRD, or credit from IDA, conditioned on policy reform.)
- SACA - Smallholder Agricultural Credit Administration (Lender to smallholder borrowing clubs of 20-30 families each.)
- SFFRF - Smallholder Farmers' Fertilizer Revolving Fund (Institution created in 1985 to assume adequate and timely fertilizer delivery.)
- SPC - Secretary to the President and Cabinet
- TA - Technical Assistance
- 20:20:0 -
Twenty, Twenty, Oh (A low analysis fertilizer; nutrients, 40%, nitrogen 20%, phosphorus 20%.)
- 23:23:4 -
(A high analysis fertilizer; nutrients, 50%.)
- Urea - (A high analysis fertilizer, 46% nitrogen with no other nutrients.)
- WB - World Bank

ANNEX F
CHARTS AND FIGURES

51

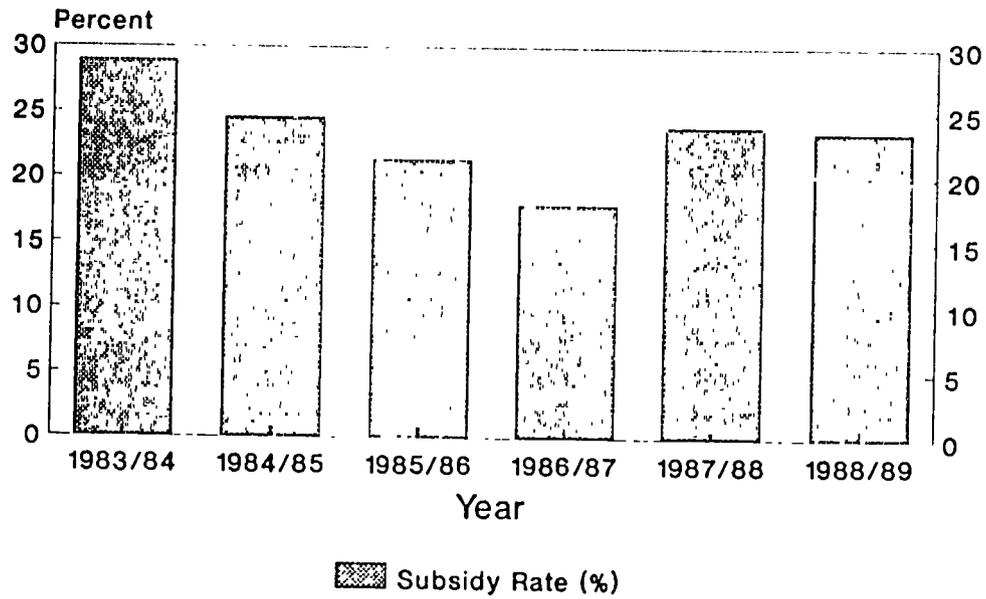
LIST OF FIGURES

(All data used in the figures are shown, usually in more detail, in the tables of Annex C)

- Figure 1. Subsidy Rate To Farmers, 1983/84-1988/89
- Figure 2. Ratio of Fertilizer Cost to Maize Price, 1980/81-1988/89
- Figure 3. Fertilizer Subsidies by Category, 1985/86-1988/89
- Figure 4. Total Uptake of Fertilizer, 1980/81-1989/90
- Figure 5. Smallholder Maize Yield Trend, 1980/81-1988/89
- Figure 6. Smallholder Hybrid Maize Hectarage and Production, 1984/85-1989/90
- Figure 7. Ratios of Hybrid Maize Profitability, 1981/82-1986/87
- Figure 8. Ratios of Maize Producer Price, 1980/81-1988/89
- Figure 9. Smallholder Maize and Alternate Crops, 1982/83-1989/90

10

FIGURE 1: SUBSIDY RATE TO FARMERS

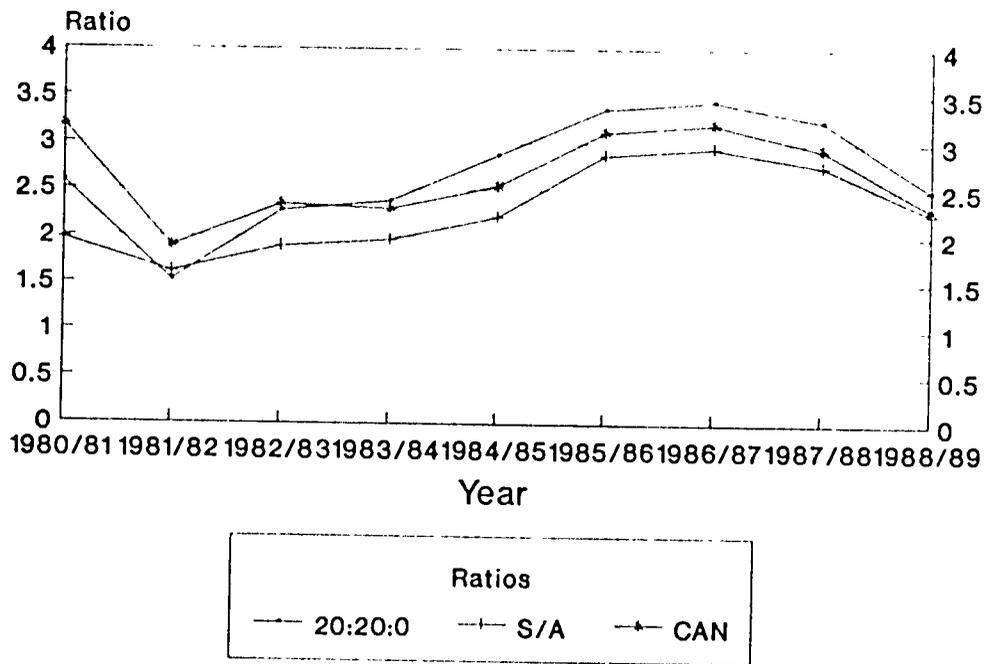


Millions of Kwacha

Source: Table 1, Annex C.

9

FIGURE 2:
RATIO OF FERTILIZER COST TO MAIZE PRICE

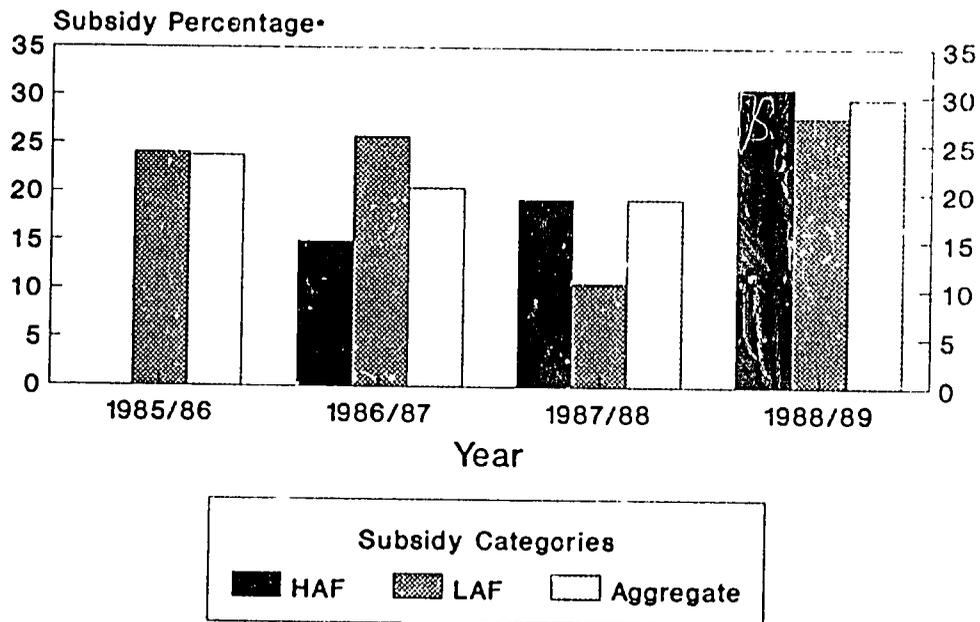


No. Kg Malze Needed to Buy 1Kg Fert.

Source: Table 4, Annex C.

15

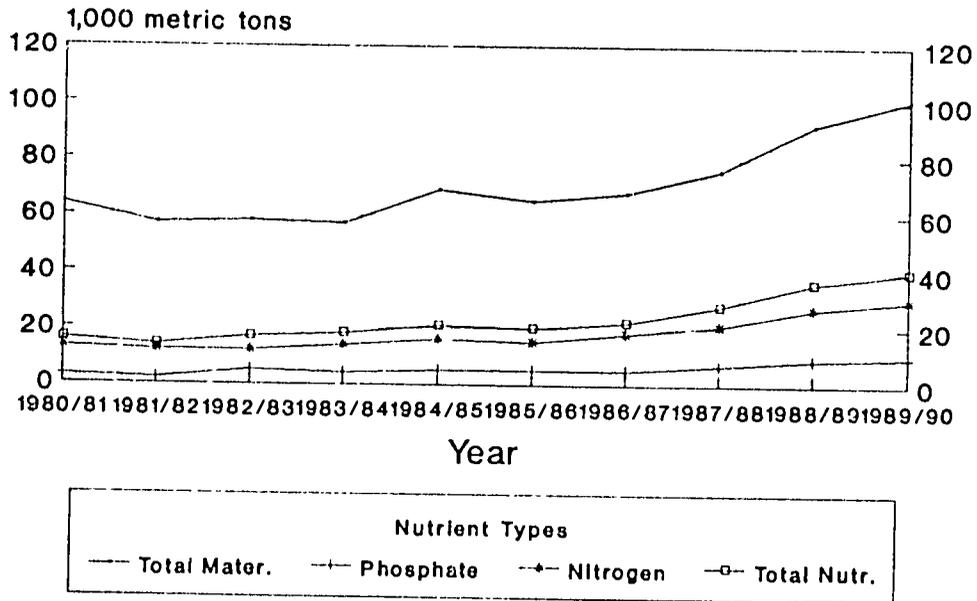
FIGURE 3: FERTILIZER SUBSIDIES BY CATEGORY



•Percentage of cost of delivery

Source: Table 5, Annex C.

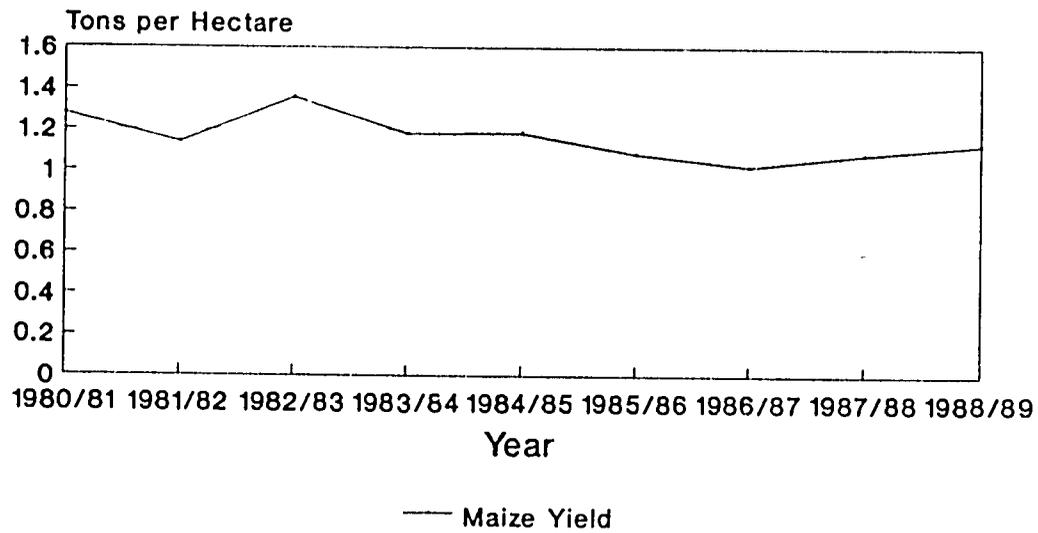
FIGURE 4: TOTAL UPTAKE OF FERTILIZER



Source: Table 6, Annex C.

1/3

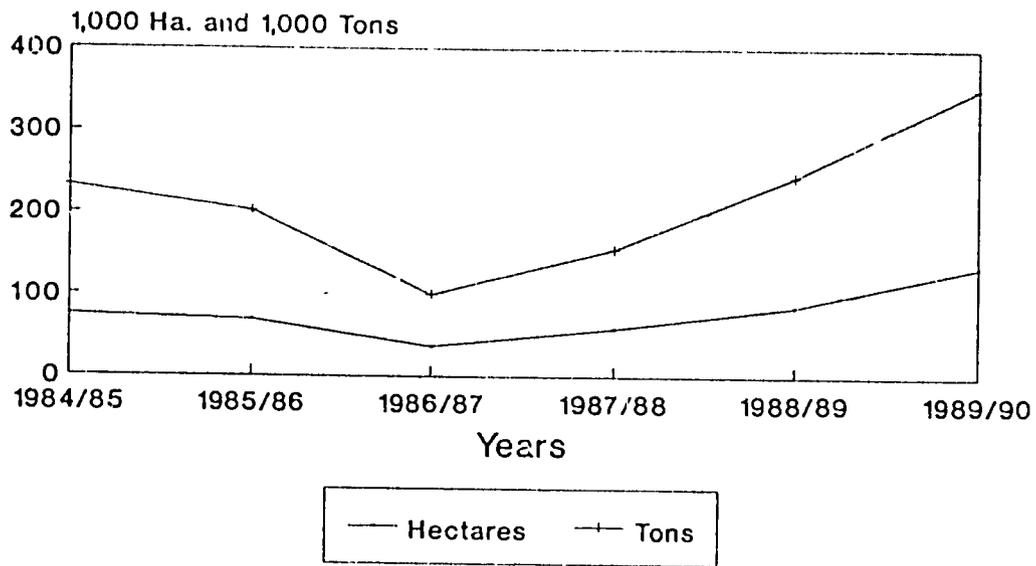
FIGURE 5:
SMALLHOLDER MAIZE YIELD TREND
Tons per Hectare, All Varieties



Source: Table 7, Annex C.

63

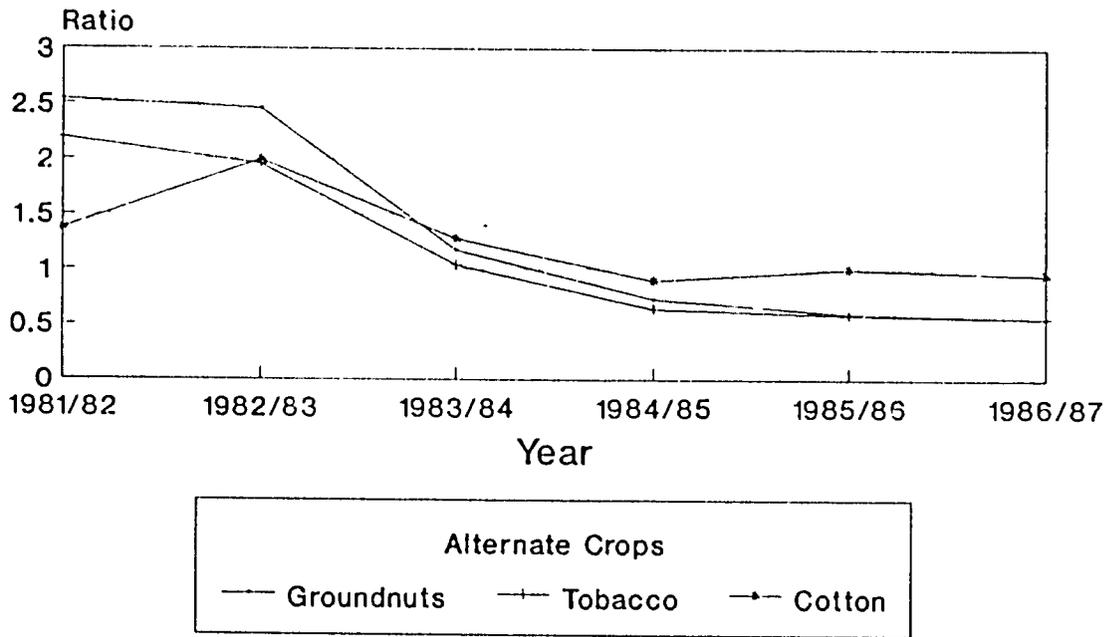
FIGURE 6: SMALLHOLDER HYBRID MAIZE HECTARAGE AND PRODUCTION



Source: Tables 8 and 11, Annex C.

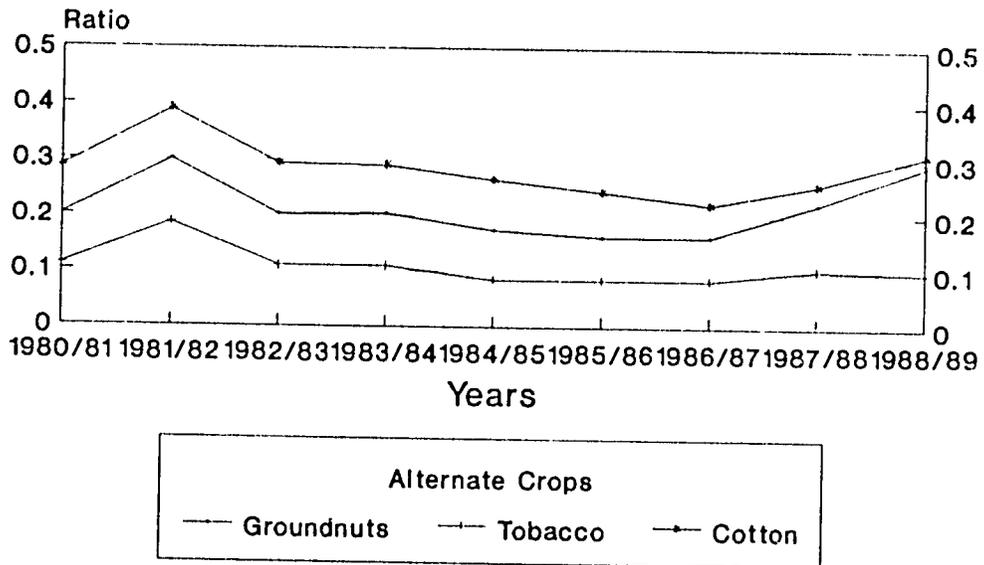
64

FIGURE 7:
RATIOS OF HYBRID MAIZE PROFITABILITY
vs. ALTERNATE CROPS (GROSS RETURNS)



Source: Table 9, Annex C.

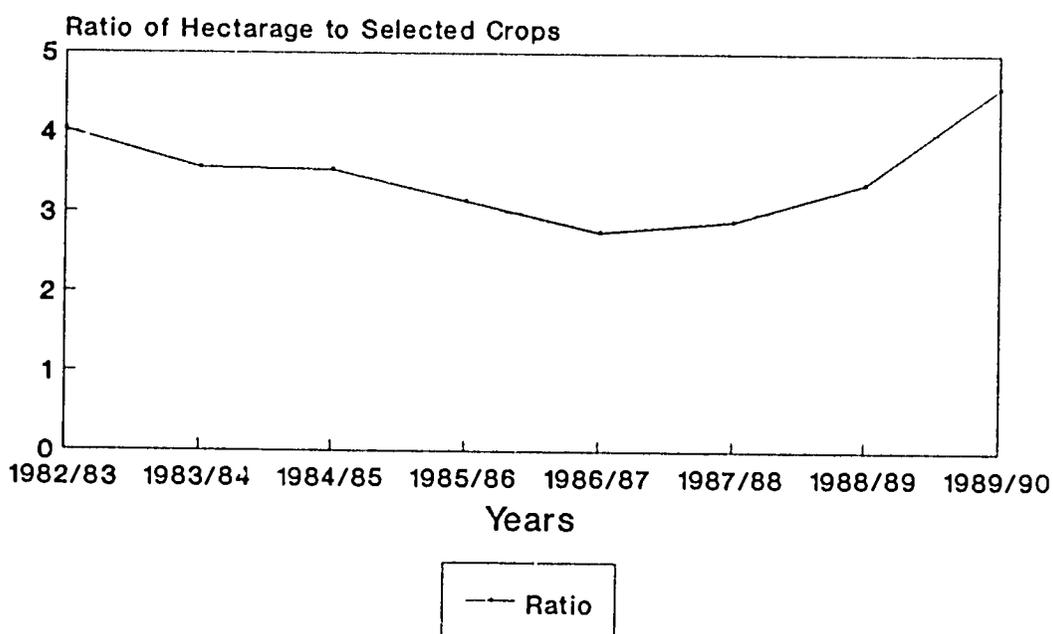
**FIGURE 8:
RATIOS OF MAIZE PRODUCER PRICE
VS. ALTERNATE CROPS (ADMARC prices)**



Source: Table 3, Annex C.

c 66

FIGURE 9: SMALLHOLDER MAIZE AND ALTERNATE CROPS



Source: Table 8, Annex C.