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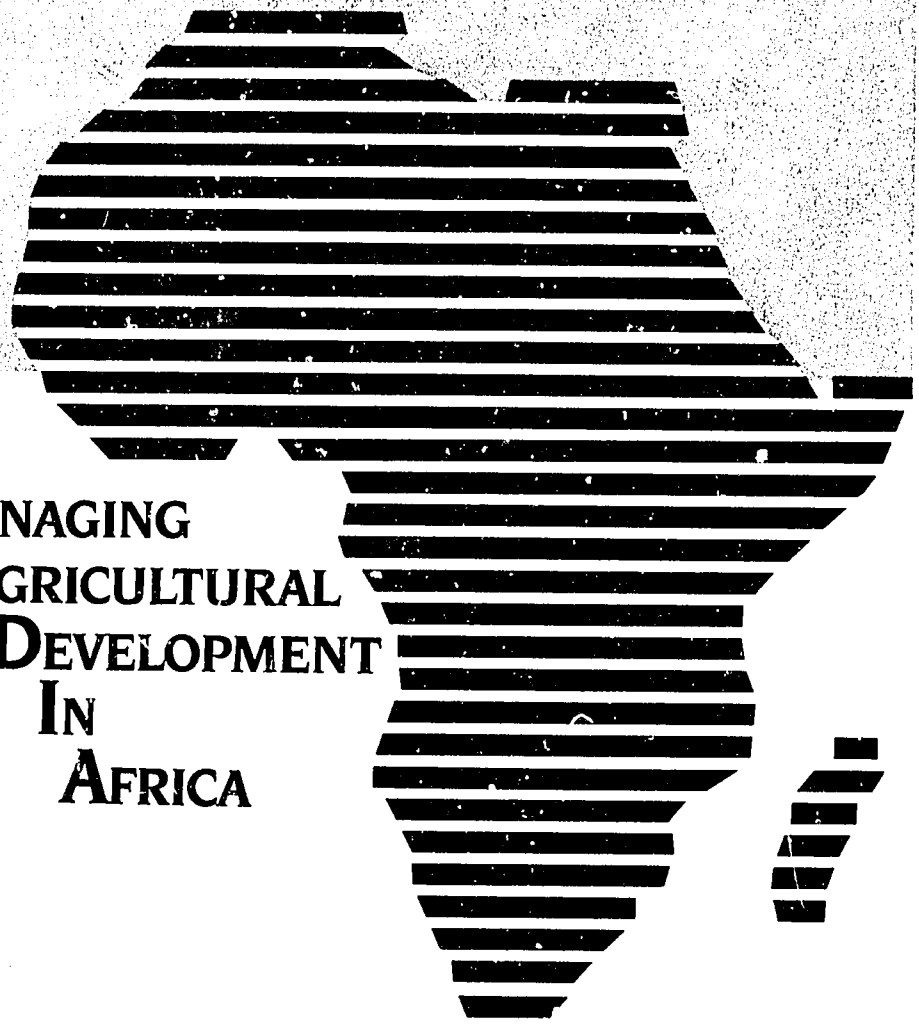
SOURCES OF GROWTH IN EAST AFRICAN AGRICULTURE

UMA LELE



MANAGING AGRICULTURAL DEVELOPMENT IN AFRICA

THE MADIA STUDY

Although many generalizations have been made about the agricultural crisis in Africa, relatively few detailed country and cross-country studies of African agriculture based on systematic data analysis have been conducted. Similarly, although foreign aid has constituted a large part of total government expenditures in Africa for close to fifteen years, there has been little analysis of the role of external assistance in African countries that goes beyond political criticism of official assistance or the alleged self-serving objectives of donors. The impetus for the study "Managing Agricultural Development in Africa" (MADIA) was to begin the process of filling this gap and to explain the nature and sources of the agricultural crisis, particularly the extent to which it originated in resource endowments, historical and contemporary events, external and internal policies, and the economic and political environment.

The MADIA study involved detailed analysis of six African countries—Kenya, Malawi, Tanzania, Cameroon, Nigeria, and Senegal. In addition to the World Bank, seven donors, USAID, UKODA, DANIDA, SIDA, the French and German governments, and the EEC participated in the study. The analysis of country policies and performance during the last 20-25 years was carried out with the benefit of substantial input from the governments and nationals of each of the countries represented. The study had three main areas of focus: (1) the relationship between domestic macroeconomic and agricultural policy and agricultural performance, (2) donors' role in the development of agriculture, and (3) the politics of agricultural policy.

The MADIA study was the result of encouragement and support from many people. Anne Krueger, former Vice President for Economic Research Staff in the World Bank, encouraged the establishment of these studies on aid and development in 1984. Gregory Ingram, former Director of the Development Research Department, provided unstinting support for the study. During the reorganization of the World Bank in 1986, the strong support from Benjamin King, then acting Vice President for Economic Research Staff, proved invaluable. Barber Conable, President of the World Bank, and Mr. Edward V. K. Jaycox, Vice President for the Africa Region, have played a key role by ensuring support for the study's completion, as did Stanley Fischer, the Vice President for Development Economics. Yves Rovani, Director General of the Operations Evaluation Department, was particularly helpful as the MADIA study drew heavily on the works of OED.

A special debt of gratitude is owed to the World Bank's Research Committee, which provided the initial funding for the study, and to the MADIA Steering Committee. In particular the strong support of the chair of the Steering Committee, Stephen O'Brien, has been of critical importance.

Finally, without the active and continued encouragement of many African policymakers and donor officials, including numerous colleagues in the World Bank, this study would not have provided new perspectives. This support has taken the form of numerous reactions to written and oral presentations, and refinement of the analysis to identify the areas of consensus and continuing controversy.

Sources of Growth in East African Agriculture

Uma Lele

A dynamic agricultural sector is critical for alleviating Sub-Saharan Africa's current economic crisis, and for laying the foundations of sustained future growth. In recent years, however, agriculture has performed poorly in many African countries. Efforts to assist its recovery, often through structural adjustment lending, have suffered from inadequate information about country- and region-specific factors, and from an emphasis on macroeconomic policies without complementary interventions at the sector level. The article describes the patterns of agricultural growth in Kenya, Malawi, and Tanzania, and examines price and nonprice aspects of three sets of factors: initial endowments and subsequent exogenous developments, general economic influences, and sectoral issues and policies. It suggests that government action at the sectoral and subsectoral levels in such critical areas as land policy, smallholders' access to inputs, and agricultural research needs to be combined with macroeconomic reforms to achieve sustained and broadbased agricultural growth.

Countries at early stages of development in Africa depend overwhelmingly on agricultural growth for employment, foreign exchange, government revenue, and food. Although African agriculture is generally believed to have performed poorly, there are relatively few detailed studies that document the causes of its poor performance (or, in the exceptional cases, the sources of growth). Some growth theorists (Solow, Kuznets, and others) have tended to emphasize the importance of nonconventional inputs (technological progress and knowledge) relative to that of conventional factors of production (land, labor, and capital) in the process of modernization, and some among them (Schumpeter, Schultz, and Harry Johnson) have focused on particular forms of capital and the complementarity among them in determining the process of knowledge acquisition and technical progress.

In a specifically African context, some analysis has focused on adverse price incentives and excessive government intervention as critical constraints (World bank 1984, 1986), while others have criticized the recent emphasis on "getting prices right" as excessive (Lipton 1987). Some analysts have argued that among the nonprice factors, technological constraints are the most binding (Mellor 1984). Others have stressed the inadequate institutional, human capital, and physical infrastructural environment (Lele 1988b), and still others have decried the large-scale bias of the agricultural strategies pursued by many African governments (Johnston and Kilby 1975). The extent to which prices automatically induce the relaxation of the various nonprice constraints, and the ability of public policy to loosen technological, institutional, and organizational constraints, are also matters of much debate in the literature (Hayami and Ruttan 1985; Mundlak 1988; Lele and Mellor 1988).

This article examines key price and nonprice factors in agricultural growth and distribution in three East African countries, Kenya, Malawi, and Tanzania. Formal modeling of the range of issues and length of time covered here would require comprehensive and reliable data, which are not available. The approach used combines quantitative analysis of some factors with a broader political-economic analysis for other issues as appropriate.

Uma Lele is a division chief in the Country Economics Department, the World Bank. This article is based on work done for a World Bank research project, Managing Agricultural Development in Africa (MADIA), which was conducted with the participation of the governments of Cameroon, Kenya, Malawi, Tanzania, Nigeria, and Senegal and of the U.S. Agency for International Development, the U.K. Overseas Development Administration, the Danish International Development Agency, the Swedish International Development Authority, the governments of France and of the Federal Republic of Germany, and the Commission for the European Communities. The author wishes to thank Harris Mule, M. L. Muwila, J. S. Magombo, Stephen O'Brien, Paul Isenman, Gregory Ingram, Andrew Spurling, Michael Westlake, Kevin Cleaver, and James Adams for helpful comments.

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The issues are introduced in section I, a brief overview of agricultural performance in the three countries. Sections II–IV highlight three sets of factors in agricultural performance: (i) the countries' "luck," that is, their natural endowments (including physical and human capital) at independence and subsequent external developments outside their control; (ii) the general economic environment and strategies; and (iii) sectoral policies. All three sets of factors have price and nonprice aspects. Section V briefly discusses a critical issue—food security policies and prospects—that exemplifies the interplay between the three sets of factors. Section VI offers some conclusions.

I. Overview of Postindependence Agricultural Performance in Kenya, Malawi, and Tanzania

The macroeconomic context for agricultural production has varied substantially among the three countries (as suggested by table 1), creating differential employment and income-earning opportunities within and outside agriculture. In most cases Kenya has the strongest economic indicators and Tanzania the weakest. Per capita annual income in 1965 (when all had achieved independence) was highest in Kenya ($103), followed by Tanzania ($76) and Malawi ($63). Malawi's social indicators were and are the lowest, with the exception of primary school enrollment and access to safe water (levels of which were higher than in Tanzania in 1965).

Table 1. *Macroeconomic Indicators for Kenya, Malawi, and Tanzania, 1967–84*

Indicator	*Kenya*	*Malawi*	*Tanzania*
Growth rates (percent)			
Gross domestic product (GDP) (real)	5.7	5.1	3.8
Population	3.9	3.0	3.3
Per capita GDP	1.8	1.3	0.5
Inflation (consumer price index)	10.9	9.3	14.6
Agriculture (real)	3.9	3.9	2.7
Manufacturing (real)	9.3	2.5	5.4
Mining (real)	3.2	—	−5.6
Exports (real)	1.4	5.6	−1.8
Imports (real)	1.5	3.3	0.3
Shares of GDP			
Investment	23.2	24.4	20.8
Total saving	19.7	13.0	14.0
Net exports	−3.5	−8.7	−8.8
Current account deficit	5.8	6.7	10.0
Fiscal deficit	4.1	7.1	7.5
Central bank claims on government	4.1	6.1	9.8
Export ratios			
Total debt/exports	116.1	207.0	279.3
Debt service/exports	13.7	17.8	8.9

— Negligible.

Note: All growth and inflation rates were calculated using ordinary least squares; all are significant at the 0.05 level.

Source: International Monetary Fund (1985).

This varying economic health is also found in the agricultural sector. Between 1970 and 1985 only Kenya experienced an increase in total output and exports across all its main agricultural commodities (table 2). Equity objectives were also well served in Kenya, with the share of small farmers' production in exports and food output rising substantially mainly due to expansion of the total cropped area and, to a lesser extent, increases in yields. In the case of maize (table 3), the tendency for yields to fall with the movement of population into marginal areas was offset by the increasing use of fertilizer and high-yield varieties.

Table 2. *Average Annual Percentage Growth in Volume of Agricultural Exports and Production, Kenya, Malawi, and Tanzania, 1970–85*

Commodity	Kenya		Malawi		Tanzania	
	Exports	*Production*	*Exports*	*Production*	*Exports*	*Production*
Coffee	3.8				0.8	
Smallholder		6.0				2.3
Estate		1.0*				−4.1
Tea	7.5				1.9	
Smallholder		13.5				13.7
Estate		5.5	5.2	4.5		1.0
Sugar						
Smallholder		16.9				
Estate		5.3	28.1	14.7		0.8*
Dairy						
Smallholder		8.5				
Estate		0.0*				
Rice						
Smallholder		2.8		−2.7*		
Cotton						
Smallholder		4.9	−12.5	1.1*	−2.3	1.6
Tobacco[a]					−4.7[a]	
Smallholder				0.3*		−4.8*
Estate						−7.5
Burley			14.1	15.4		
Flue-cured			9.2	10.4		
Groundnuts						
Smallholder			−13.2	−7.2		
Cloves						
Smallholder and estate					−2.7*	
Sisal						
Estate (mainly)					−5.9	
Cashewnuts						
Smallholder					−6.8	
Horticultural	12.7					

* Statistically insignificant (all other figures significant at the 0.05 level).
a. In Malawi, burley and flue-cured figures refer to estate production; smallholder production includes dark-fired, sun-air cured, and oriental tobacco.
Source: Lele and Meyers (1987).

Table 3. *Food Sources: Average Annual Percentage Growth in Maize Production, Cereal Imports, and Food Aid, 1970–85*

Source	Kenya	Malawi	Tanzania
Maize			
Production	3.9	1.5*	2.1
Official purchases	2.4*	19.1	1.1*
Official sales	9.2	23.7	1.9
Net cereal imports	5.1	−4.1	3.3
Food aid	43.1[a]	28.6	23.5

* Statistically insignificant (all other figures significant at 0.05 level).
a. Started from a low base during 1970 to 1978 and increased dramatically in 1979.
Source: Lele and Meyers (1987).

In Malawi, estate production increased impressively, while per capita smallholder maize output stagnated and output of other smallholder crops either declined or showed no trend. Estate sector tobacco yields increased considerably, with an average differential of four times the smallholder yields (Lele 1987). Malawi also had a larger differential between the land productivity of its tobacco estates and smallholders sectors (4:1) than did Kenya in its tea and coffee production (2:1) (Lele and Meyers 1987). Kenya's smallholder gains have been slow and steady since the late 1950s, whereas Malawi's export crop output expanded very rapidly in the 1970s and peaked at the end of the 1970s

and in the early 1980s. Because Malawi's strong agricultural growth arose primarily in the estate sector, agricultural employment and income have been more narrowly distributed than in Kenya. This has constrained internal demand for food and food imports relative to those in Kenya and allowed greater agricultural exports.

While Kenya and Malawi increased the world market share of their major export crops, Tanzanian agricultural exports from both large and small farms have performed poorly. Coffee and tea exports increased slightly (with the share of smallholders in total output increasing, albeit from a very small base) but exports of all other major crops have declined. As in Malawi, smallholder production shifted away from agricultural exports and into food crops.

All three governments have operated de jure or de facto monopolies on purchases and sales of maize and other major cereals. Officially purchased and sold output showed substantial year-to-year fluctuations, particularly since the late 1970s, reflecting changes in total output and large shifts in the proportion of that output handled by official and informal markets.

Fluctuations in official maize purchases have risen substantially since independence, as the share of small producers in the total has grown. Small farmers (and especially the lowest-income households) tend to sell grain in the harvest season to meet cash requirements and then to buy it back in the postharvest season. This tendency has increased with growing land pressure, as households have less to sell and a greater need to purchase from the market. In a period of crop shortfall, therefore, marketing parastatals are faced with both declining inventories and increasing demand, whereas the reverse tends to be the case in good crop years (Lele and Candler 1981).

Over the 1970–85 period as a whole, Malawi was generally a net maize exporter, while Kenya and Tanzania were net importers (although Kenya was a net exporter during most of the 1970s) (table 3). Food aid dependence has also been greater in Kenya and Tanzania than in Malawi, and has increased over time.

Several factors in the economic environment may have a bearing on Malawi's ability to export cereals, in contrast to that of Kenya and Tanzania. Both Kenya and Tanzania have higher rates of urbanization and population growth than Malawi (table 4). Kenya and Malawi, however, have greater population concentration on arable land. All these could reduce net per capita cereal availability. Malawi's skewed distribution of income and assets, discussed below, however, also affected internal effective demand adversely (Lele 1987).

Country experience with diversification out of agriculture has varied. Table 4 shows that the share of agriculture in GDP had declined by the early 1980s in Kenya and Malawi. In Tanzania, however, agriculture's share in GDP and exports had increased, despite the adoption of industrial promotion measures such as the channeling of public investment, with donor support, into heavy industry and agroprocessing (Lele 1984; Lele and Meyers 1987).

II. The "Luck" Factor: Endowments at Independence, External Shocks, and Aid

Kenya, Malawi, and Tanzania are former British colonies or protectorates with relatively similar ecological conditions and many of the same crops. At independence, agriculture was the most important sector. The three inherited similar agricultural structures, consisting of many small African farms and a modern agricultural sector operated by European settlers. Kenya had the largest European settlement, the most advanced economy, and a relatively more developed physical infrastructure and institutional base. Kenya also had the lowest share of agriculture in GDP, employment, and exports, reflecting its more

advanced state of structural transformation, while Malawi had the highest (table 4).

Tanzania is well-endowed in terms of per capita arable land, although pockets of land pressure exist, whereas land pressure has been substantial in Kenya and Malawi since independence and has been exacerbated by population growth, which has been highest in Kenya (see table 4). Differences in land quality and rainfall make production possibilities more limited in Malawi than in Kenya or Tanzania. While only 26 percent of Kenyan land is arable (relative to 37 and 56 percent in Malawi and Tanzania, respectively), 16 percent of that land is of very high quality, whereas in Malawi and Tanzania medium-potential land dominates. Malawi has only a single rainy season, allowing cultivation once a year, compared to the bimodal rainfall pattern in Kenya and Tanzania.

Table 4. *Economic and Social Development Indicators, Kenya, Malawi, and Tanzania*

Indicator	*Year*	*Kenya*	*Malawi*	*Tanzania*
Sectoral share (percent)				
Agriculture's share in:				
GDP	1967–73	34	44	41
	1982–84	33	40	52
Employment	1965	84	91	88
	1980	78	83	86
Exports	1967–73	75	97	78
	1979–81	57	94	79
Industry's share in GDP	1967–73	12	11	12
	1982–84	16	12	10
Land density				
Population (millions)	1965	9.5	3.9	11.7
	1985	20.2	7.0	22.2
Land area				
Millions of hectares	1985	56.4	9.4	88.4
Arable as percentage of total[a]	1985	26	37	56
Arable land: hectares per capita[a]	1965	1.54	0.89	4.23
	1985	0.73	0.50	2.23
Social indicators				
Population (average annual percentage rate)	1965–73	3.8	2.8	3.2
	1980–85	4.1	3.1	3.5
GNP per capita (current U.S. dollars)	1965	103	63	76
	1986	300	160	250[b]
Life expectancy (years)	1965	45	39	43
	1985	54	45	52
Infant mortality rate (per thousand)	1965	112	199	138
	1985	91	156	110
Population per physician	1965	12,820	46,900	21,700
	1981	10,140	53,000	19,810
School enrollment (percentage of age group)				
Primary	1965	54	44	32
	1984	97	62	87
Secondary	1965	4	2	2
	1984	19	4	3
Safe water access (percentage of population)	1973	15	33	13
	1980	28	41	34
Urbanization (average annual growth rate)	1965–80	9.0	7.8	8.7
Road density (kilometers per 100 square kilometers of land)	1965	7.4	10.8	1.8
	1985	11.3	12.1	9.2

a. Arable defined as cultivable rainfed land.

b. Use of overvalued official exchange rate overstates GNP per capita.

Sources: Sectoral share, land area: Lele and Meyers (1987); population, social indicators: World Bank (1986b, 1987, 1988); *except* GNP per capita for 1965: International Monetary Fund (1987); infant mortality and safe water access: World Bank (1985, 1986a); and road density: Lele (1988a).

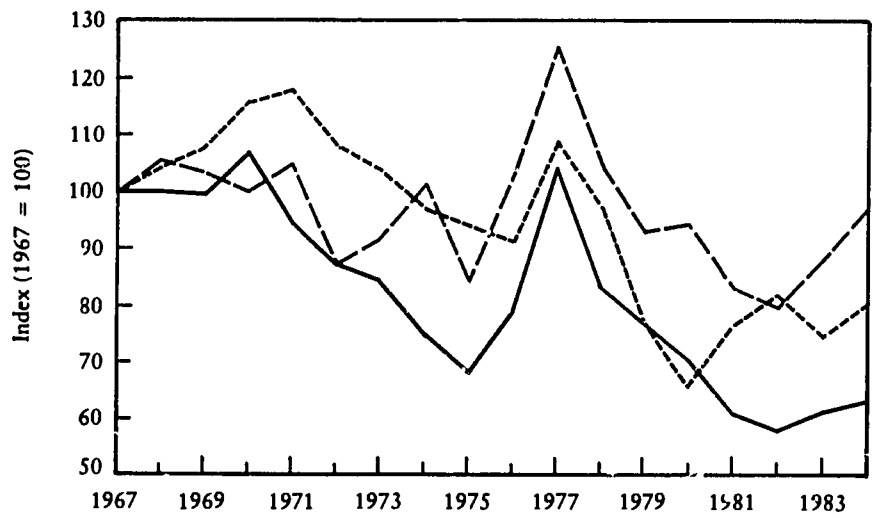
Access to land—and especially differential access on the part of different groups—is a key determinant of patterns of agricultural growth. Land in Malawi, for instance, is divided into three broad classifications. Customary land is held by the state for smallholder cultivation; it accounts for over two-thirds of all land in Malawi. Private land is held under both leasehold and freehold; all estate cultivation is on private land. Public land is mainly composed of forest reserves and game parks.

Since 1964, the quantity of customary land available for cultivation by smallholders in Malawi has declined by more than 700,000 hectares, which is almost 10 percent of total customary area (Mkandawire and Phiri 1987), and the proportion of households with less than one hectare of land has increased sharply, now exceeding 50 percent of all households. Little is known about the recent evolution of smallholder land availability in Kenya, but the average size of smallholder farms fell from a mean of 2.3 hectares in 1974 to 1.7 hectares in 1979. Detailed data on land ownership or access are unavailable for Tanzania, but more than three-quarters of farmers in Tanzania cultivate smallholdings of less than 2 hectares, and government policy has discouraged private ownership and private farming.

Kenya possesses the best transportation network of the three countries, some of which was constructed before independence by European settlers involved in the large-scale production of coffee, tea, maize, and dairying. Kenya has also invested significant resources in transportation. Malawi had higher road density—10.8 kilometers per 100 square kilometers of land in 1965, compared with 7.4 in Kenya and only 1.8 in Tanzania—but it is landlocked, while both Kenya and Tanzania have good ports. Transportation problems have escalated for Malawi since the 1980s as the war in Mozambique has cut off Malawi's major transportation route for exports. Tanzania's transportation needs have been high due both to poor initial conditions and the large size of the country. The growth in road density for Tanzania (table 4) is somewhat deceptive, as most roads in Tanzania are in poor condition.

Economic growth and stability in the three countries have been affected by terms of trade volatility, oil price hikes, worldwide recession, and escalating interest rates on foreign debt. Unfavorable movements in terms of trade have been the main external shocks, with Kenya suffering the greatest loss in barter terms, followed by Malawi and Tanzania (figure 1). Kenya and Malawi in particular have incurred higher interest payments on foreign loans as they

Figure 1. *Index of International Barter Terms of Trade for Kenya, Malawi, and Tanzania, 1967–84*



Key: ——— Kenya ----- Malawi —·—·— Tanzania

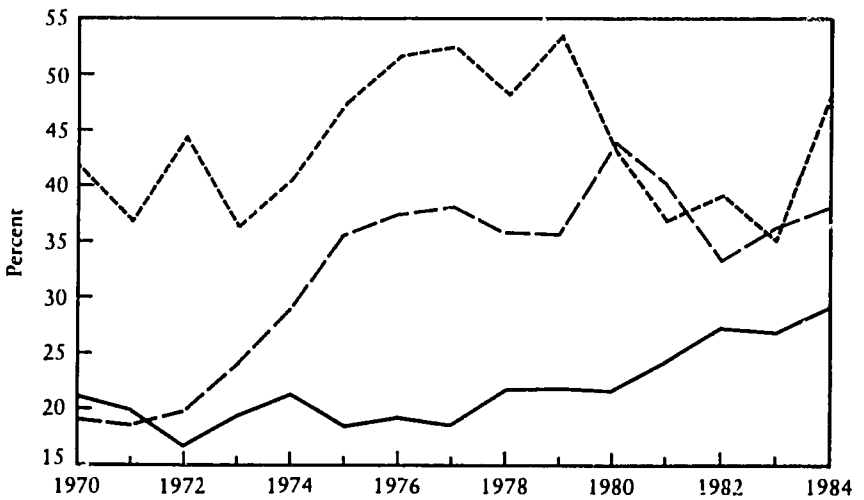
Source: Ansu (1986).

increased the proportions of their debt owed to private sources. Because Tanzania relied more heavily on concessional assistance, it suffered less from interest rate changes. Tanzania's income terms of trade loss was the greatest, however, owing to stagnation in the volume of its exports.

Other external shocks include the effects of droughts, wars, and the movement of refugees, all of which have had substantial effects on one or more of the three countries, but from which Malawi has suffered most. For example, between 1967 and 1977, an estimated 330,000 Malawian migrant workers (or three-quarters of its total population living abroad) returned from Rhodesia (Zimbabwe) and South Africa, mostly to settle on scarce agricultural land in the Southern Region (Christiansen and Kydd 1983). The subsequent closure of Malawi's port outlets in Mozambique in the early 1980s increased the insecurity of transport and its cost. By 1988 the hostilities also drove 700,000 refugees (equivalent to 10 percent of Malawi's population) across Mozambique's borders into Malawi. Other shocks include the breakup of the East African community, affecting Kenya and Tanzania, closure of their common border in February 1977, and Tanzania's involvement in the Ugandan war in 1979.

Levels of external aid represent another factor over which recipient countries may exercise little direct control. Official development assistance (ODA) as a proportion of recipients' government expenditure is summarized in figure 2. The ODA share peaked in the late 1970s and began to decline in Malawi and Tanzania as donors took account of poor project portfolios and the need for macro policy reforms. As recipients began to undertake reforms, however, ODA levels again increased in 1982 and 1983. Although ODA to Tanzania dropped sharply (owing to its reluctance to undertake macroeconomic policy reforms), in 1984 aid was still higher in per capita terms in Tanzania (US$25) than in Kenya (US$21) or Malawi (US$23) (Cancian 1987).

Figure 2. *Official Development Assistance as a Percentage of Government Expenditure in Kenya, Malawi, and Tanzania, 1970–84*



Key: ——— Kenya ----- Malawi —·— Tanzania

Source: Cancian (1987).

III. The Impact of General Economic Policies on Agricultural Growth

Public Expenditure Patterns

It is not currently possible to estimate rates of return to different categories of public expenditure for the three countries under study: the limitations of available methods and the lack of reliable and comprehensive data preclude accurate and compelling analysis. Even if it were possible, such modeling would not provide conclusive evidence on the causes of the differential rates.

Expenditure patterns can be examined however, in terms of their intersectoral balance, their stability and predictability, the shares of recurrent and capital expenditures, and labor versus operating costs in the total, and, to some degree, the extent to which resources were returned to the agriculture sector. Such an analysis was carried out for Tanzania by the World Bank in 1983, and was undertaken for Kenya and Malawi by the MADIA project. The detailed results are published in Lele and Meyers (1987); here I summarize key findings.

Tanzania had a higher overall share of government expenditures in GDP at the end of the 1970s than Kenya and Malawi, despite having a lower share at the beginning of the decade. Over the 1967 to 1984 period, on average, Tanzania had the highest fiscal deficits and central bank claims on the government (as a share of GDP), the highest inflation rates, and the lowest share of investment in GDP (see table 1). Tanzanian programs focused heavily on industrial promotion, while Kenya and Malawi had smaller spending programs and a more even intersectoral balance of expenditures.

Malawi's expenditures on social services were the lowest of the three. Tanzania's gains in the social sector, while impressive on several fronts (especially primary education), remained limited in public health and secondary education.

Despite Kenya's and Malawi's relatively favorable expenditure patterns compared with Tanzania's, the efficiency in the use of public funds, including development projects undertaken with donor assistance, was low. Of the twenty-four agricultural and rural development projects supported by the World Bank in Kenya, Malawi, and Tanzania and completed in the period 1965 to 1985, ten had zero or negative rates of return (Jones 1985). In Malawi, for example, construction of office buildings and housing for field staff has constituted a much larger share of agricultural investments than is standard for other countries in the region according to the World Bank's analysis. These expenditures, while necessary at early stages of development, reduce the funds available for more directly productive uses, such as agricultural research and dissemination—which helps to explain the problems of slow technological adoption by small farmers (discussed below). In both Kenya and Tanzania agroprocessing (excluding tea and coffee in Kenya) and integrated rural development projects in marginal areas (supported by the World Bank and other donors) had very low economic rates of return. Within the agricultural sector, development projects financed in Tanzania experienced greater and more frequent shortfalls in recurrent and operating expenditures than in the other countries, and less stability and predictability.

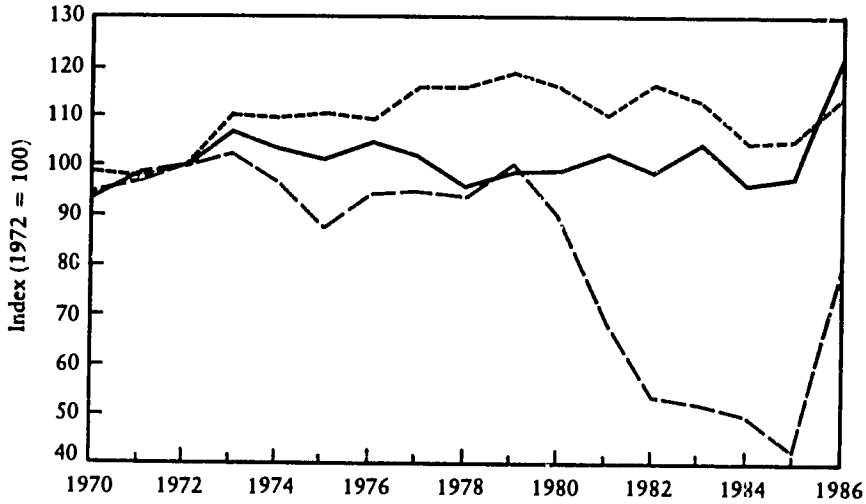
Taxation of Agriculture

Because agriculture constitutes such a large proportion of total exports in these countries, any taxation of exports will fall mainly on the agricultural sector. One measure of the taxation of agriculture is the differential between producer and international prices for export crops. The differential has several components: that due to exchange rate disequilibrium, processing charges, marketing costs (transport, storage, and administration), and the proportion held by marketing agents above those costs.

The extent to which exchange rate overvaluation has taxed agricultural exports is suggested by figure 3, which shows the paths of the exchange rates for the three countries over the 1970–86 period. Tanzania's exchange rate became increasingly overvalued, mainly due to higher levels of inflation (see table 1), while the rates of the other two remained relatively stable or depreciated.

The differentials between producer and international prices for the main export crops of the three countries are shown in table 5. The extent of processing differs between the crops, and the marketing margin, partially due to different unit transportation costs, varies across the three countries, being highest in Malawi.

Figure 3. *Index of Trade-Weighted Exchange Rates at Purchasing-Power Parity, 1970–86*



Key: ——— Kenya ------ Malawi —— Tanzania

Note: Purchasing power parity exchange rates were calculated using geometric weighting:

Real exchange rates = $\text{RER}_i = E_i \frac{P^j}{P_i}$, where $E_i = \pi(e_{ij})^{\alpha_{ij}}$, $P^j = \pi(P_j)^{\alpha_{ij}}$

e_{ij} = bilateral exchange rate between home country i and trading partner j in units of foreign currency per unit of domestic currency.
P_j = inflation rate in j (CPI)
α_{ij} = share of partner j in trade of country i
P_i = domestic inflation (CPI)
j = main trading partners (j = 1 . . . 10)
i = domestic/home country (i = 1, 2, 3)

Source: Ansu (1986).

Table 5. *Ratios of Producer to International Prices, 1970–86*

	Kenya, Smallholder		*Malawi*			*Tanzania, Smallholder*		
				Estate tobacco				
Year	*Coffee*	*Tea*	*Smallholder tobacco*	*Burley*	*Flue-cured*	*Tobacco*	*Cotton*	*Coffee*
1970	0.85	0.56	0.22	0.42	0.56	0.41	0.68	—
1971	0.88	0.66	0.24	0.39	0.66	0.49	0.59	—
1972	0.98	0.63	0.23	0.40	0.63	0.46	0.57	0.57
1973	1.02	0.64	0.24	0.59	0.95	0.45	0.35	0.44
1974	1.01	0.57	0.25	0.68	0.92	0.40	0.31	0.41
1975	1.02	0.64	0.25	0.52	0.73	0.41	0.45	0.32
1976	0.89	0.59	0.23	0.53	0.76	0.37	0.39	0.29
1977	0.94	0.71	0.30	0.70	0.88	0.40	0.43	0.33
1978	0.90	0.61	0.30	0.58	0.86	0.44	0.52	0.37
1979	0.92	0.65	0.29	0.53	0.77	0.37	0.51	0.29
1980	0.98	0.75	0.27	0.54	0.46	0.31	0.47	0.37
1981	0.86	0.64	0.21	0.81	0.62	0.23	0.42	0.36
1982	0.82	0.56	0.28	0.59	0.59	0.16	0.39	0.28
1983	0.94	1.02	0.26	0.31	0.44	0.20	0.35	0.24
1984	0.77	0.64	0.26	0.31	0.40	0.13	0.32	0.23
1985	0.87	0.74	0.22	0.27	0.36	0.15	0.46	0.23
1986	0.96	0.85	0.25	0.50	0.52	0.25	0.88	0.26

— Not available.
Note: Exchange rates estimated at purchasing-power parity.
Source: Lele (1988a).

In Kenya, the producer prices of its two main export crops—coffee and tea—were determined directly by international prices, with only processing and marketing costs being deducted. Kenya also offered the same price incentives to smallholder and estate tea and coffee producers (barring the slightly higher costs involved in the marketing of small farm production).

In Malawi the right to grow burley and flue-cured tobacco has been reserved for estates, which sell their output at open auctions. Smallholders are only allowed to produce dark-fired, sun-cured, and oriental tobacco, and must sell their crops directly to the Agricultural Development and Marketing Corporation (ADMARC), a monopsony marketing parastatal. Small farmers receive on average one-half the price earned by estates and one-quarter of the world price. This has increased the subsistence orientation of the smallholder sector, and the demand for establishment of new estates (see the discussion of land policies below).

Smallholder producer prices for tobacco and coffee in Tanzania were substantially below world prices in the early 1970s, and in the 1980s an overvalued exchange rate further reduced their value to one-quarter of the world price. Although cotton price ratios remained somewhat better, the poor general structure of incentives has dampened export production in Tanzania.

Kenya's pricing policies have favored the production of coffee and tea vis-à-vis maize. The maize producer price was fixed by the government and increased at about 10 percent annually to correct the low prices set in the early 1970s. After reaching parity with world prices, it has subsequently been adjusted annually to remain by and large in line with international prices. The high returns to coffee and tea producers in Kenya also reflect the premium earned on world markets for Kenya's high quality arabica coffee and smallholder tea.

In contrast, official prices for export crops in Tanzania and for the smallholder sector in Malawi have provided incentives for production of food crops (table 6). In 1972, the ratio of producer prices of coffee to maize favored coffee production twice as much in Kenya and Tanzania as it did in Malawi. By 1984, however, Kenyan prices favored coffee over maize at a ratio more than twice that paid in Tanzania and nearly three times that in Malawi. Tobacco-to-maize price ratios in Tanzania were three times the levels found in Malawi in 1971; in the early 1980s the ratios were roughly parallel, and by 1985 the Tanzanian ratio dropped below that of Malawi. Tanzania's informal maize market prices were 100 to 800 percent higher than official prices, depending on year and location, so that export crop production was even more disadvantaged than the price ratios in the table suggest.

Table 6. *Ratios of Official Export Producer Prices to Maize Producer Prices, 1967–85*

	Coffee			*Cotton*		*Tobacco*	
Year	*Kenya*	*Malawi*	*Tanzania*	*Malawi*	*Tanzania*	*Malawi*	*Tanzania*
1967	—	9.79	—	2.67	—	6.09	—
1968	—	10.07	—	3.23	—	4.30	—
1969	—	14.69	—	3.38	—	6.83	—
1970	27.2	11.66	—	3.28	—	7.84	—
1971	19.1	8.03	—	3.37	4.23	7.71	22.31
1972	20.0	9.90	18.75	2.87	4.58	7.32	24.17
1973	23.7	9.49	15.96	3.43	4.35	5.97	21.88
1974	21.7	10.73	13.33	4.34	3.42	4.86	18.91
1975	15.3	11.19	7.00	3.77	2.73	6.05	14.29
1976	32.9	8.75	10.00	2.25	2.50	5.40	9.66
1977	44.7	8.70	18.75	3.52	2.50	6.24	10.90
1978	31.7	11.28	12.81	3.94	2.71	7.80	10.67
1979	36.8	12.54	10.67	4.19	2.82	7.88	10.51
1980	27.6	8.94	11.42	3.25	3.00	6.31	8.95
1981	22.6	7.58	12.36	3.24	3.20	6.53	9.64
1982	25.8	4.50	9.93	2.45	2.47	4.03	7.41
1983	22.7	9.35	8.67	3.39	2.69	7.56	9.96
1984	22.0	8.33	10.40	3.31	2.73	6.61	7.61
1985	21.2	—	6.75	3.56	2.10	8.11	6.30

— Not available.

Source: Lele and Meyers (1987).

Since the introduction of structural adjustment programs in the 1980s, correction of exchange rate and producer price distortions has shifted some resources from food to export crops. But growing food demand, heavy population pressure on land, and stagnant productivity are tending to push food prices upward. Achieving a significant aggregate agricultural supply response will require raising productivity which involves a range of nonprice factors at the sectoral level. It is to these factors that we now turn.

IV. Sectoral Policies and Factors Influencing Growth

Agricultural yields vary significantly among the three countries, with Kenya's coffee, tea, and maize yields being two to three times as high as Tanzania's or Malawi's (Lele 1988a). A substantial part of the differential can be explained by the fact that more than 60 percent of the maize-growing area in Kenya is under hybrid varieties, compared with less than 5 percent in Malawi and 10 percent in Tanzania. A supportive price regime is clearly critical to Kenya's success in this area. Nonetheless, other factors are also of importance: land and labor policies, the access of farmers to inputs and the output of agricultural research, and institutions providing credit, extension, marketing, and information. These and other nonprice factors can critically affect the ability of producers to apply their labor in ways that enhance yields.

Land

The production environment in the three countries has been profoundly affected by the way production units in each country have been legally defined and by the differential rights of these units to cultivate, own, or transfer land and to produce specific crops. Access to markets also varies according to the type of production unit. Some key features of each country's landholding arrangements are summarized below.

In Malawi, customary rights to cultivate and transfer smallholder land are conferred by traditional tribal chiefs, while the expansion of estate agriculture has been determined by explicit government policies. Burley and flue-cured tobacco production has been reserved for estates through a licensing policy that accompanies the establishment of leaseholds on unused customary land. The size of a landholding alone is not a criterion for specification of status in Malawi.

The rapid growth of Malawi's estate agriculture has brought a more unequal distribution of rural land. Between 1970 and the 1980s estate tobacco cultivation grew from 10,000 to 39,000 hectares and estate sugar area from 2,600 to about 15,000 hectares (Ranade 1985, 1986). Although the mean area of tobacco estates has fallen from 34 hectares in 1976 to 11 hectares in 1985, the average estate is still far larger than the average smallholder farm—55 percent of smallholdings are 1 hectare or less. In addition, much of the growth of estates has been in the Central and Southern regions, where population pressure on the land is most severe, and evidence suggests that at least 75 percent of estate land is unutilized (Minster Agriculture Limited and others 1982). There is little new registration of customary land, and no land market exists for holdings operated in customary areas.

In Kenya, land titles and licenses to grow export crops have been far more freely available than in Malawi, as shown by the fact that smallholder tea hectarage has increased almost tenfold between 1970 and 1985, and coffee hectarage has doubled. Land registration drives in smallholder farming have also been more extensive in Kenya than in Malawi or Tanzania. In 1983, well over 80 percent of the land in Western, Nyanza, Central, and Eastern provinces, where 62 percent of the population lives, had been registered. There is also an active land market. While the spread of institutional credit for small

farmers is much greater in Kenya than in the other two countries, significant barriers to land access remain as a result of small farmers' limited access to institutional finance.

In Tanzania the traditional tribal village authority was abolished and replaced with public ownership of land, without the individual right of ownership, sale, or registration. The government nationalized many private estates in the 1970s and prevented the development of further private landownership. In the early 1970s large commercial farms and private corporate estates accounted for more than 90 percent of official wheat sales; by the early 1980s they handled only 5 percent, with public estates making up the rest. Private corporate estates made up 25 percent of official tobacco procurement in the early 1970s; the share had fallen by the early 1980s to 5 percent, with peasant producers (with holdings of less than 10 hectares) producing 90 percent.

The policy of forced "villagization" resulted in the resettlement of more than 9 million people (about 60 percent of the population) into 6,000 villages by mid-1975. A communal cultivation policy was also introduced, whereby husbandry practices and acreage for different crops were dictated by local heads of the (then) Tanzanian African National Unity (TANU) Party. Given the fragile nature of the soils (the original reason for sparse population settlements), increased population density caused by villagization led to rapid soil degradation. The poor siting and large size of the new villages increased walking distances to farms and fuelwood costs and caused deforestation. Because more labor was required to obtain the necessary fuelwood to cure these crops, this had a highly adverse effect on smallholder tobacco and pyrethrum production. The government's response—to promote collective village wood lots—met with little success.

Labor

Labor markets and policies have evolved in different ways in the three countries. As a result, although all three rely heavily on highly labor-intensive handhoe cultivation, intercountry labor costs vary widely, and like the differences in allowable land use, these differences have had an impact on agricultural output.

In Kenya, the de jure minimum wage is not enforced and is higher than that paid in the smallholder sector, where hired labor accounts for as much as 50–60 percent of tea and coffee employment (Lele and Meyers 1986). Despite rapid population growth, employment opportunities have grown commensurately, particularly in areas of high-value crops, and real wages have fallen much less than in Malawi or Tanzania.

In Malawi, a shortage of land in the smallholder sector, discriminatory price and land policies, and the return of migrants from Zimbabwe and South Africa have tended to increase wage employment, part-time employment among women from households with little or no land (Christiansen and Kydd 1983), and tenancy in the estate sector. Agricultural wage employment grew from 38,000 in 1969 to 148,000 in 1978 and to 194,000 in 1983, almost half of total estimated wage employment (Ranade 1986). As macroeconomic difficulties have mounted since the early 1980s, the real rural wage rate in Malawi has declined.

Owing to the preferential treatment of estates in Malawi, gross margins (that is the difference between cash revenue and cash costs, excluding labor costs, as a proportion of the value of sales) for estate producers have been much higher than for smallholder cultivation—two to three times higher for some crops. Tenant farmers receive from the estate owner only a third of the auction price on burley tobacco—their situation has been much worse. While returns per hectare have been slightly higher for burley than maize, the reward for the labor involved is much lower, and where access to land makes it possible,

tenants have moved into maize production (Minster Agriculture Limited and others 1982).

	Gross margins 1981/1982 (kwacha)		
	Burley tobacco	*Flue-cured tobacco*	*Maize*
Per hectare			
Estate	1,228		
Smallholder	398	794	
Tenant	151		138
Per person-day, per hectare	0.47		1.84

In Tanzania, labor shortages have resulted from enforcement of minimum wage laws, restriction of movement of labor across regional boundaries, encouragement of trade unions on estates, and political pressure (before 1986) that discouraged the use of hired labor by small and medium-size farmers. This has created a disincentive for the production of labor-intensive crops such as coffee, tea, sisal, and tobacco. Despite regulation of the money wage, real wages in Tanzania have fallen more sharply since the early 1970s than in the other two countries, reflecting the overall decline in the economy.

Fertilizer

A major factor in efforts to raise crop yields is the availability and application of fertilizer, especially under conditions of heavy population pressure on land and dwindling reserves of uncultivated arable land. The use of fertlilizer is influenced by the ratio of its nutrient price to the output price, and the physical response coefficients of the technology employed. Information and access through extension, credit, and marketing services may also influence adoption of fertilizer.

As table 7 shows, nutrient prices relative to maize prices are higher in Malawi (even after a small subsidy on fertilizers) than in Kenya, partly reflecting Malawi's higher transportation costs and frequent devaluations. More than 60 percent of fertilizer consumption in Malawi is now estimated to be used by small farmers, and more than 80 percent of that is on maize. In Kenya less than 43 percent is used by small farmers, and only 20 percent of that is used on maize, the rest being applied principally to tea, coffee, and sugar. Fertilizer

Table 7. *Ratios of Fertilizer Nutrient Price to Maize Price and Rates of Explicit Fertilizer Subsidy in Kenya, Malawi, and Tanzania, 1972–87*

	Kenya		Malawi		Tananzia	
Year	*Price ratio*	*Subsidy rate (percent)*	*Price ratio*	*Subsidy rate (percent)*	*Price ratio*	*Subsidy rate (percent)*
1972	4.6	0	8.7	—	—	—
1973	6.2	0	8.7	—	—	—
1974	5.9	0	15.6	—	—	75
1975	7.3	0	10.5	—	7.0	66
1976	6.5	0	10.5	—	6.6	—
1977	4.2	0	10.5	—	6.6	—
1978	4.5	0	10.5	—	5.6	50
1979	5.6	0	7.5	—	8.1	—
1980	7.0	0	8.8	—	6.0	—
1981	7.2	0	7.8	—	5.1	60
1982	6.9	0	9.1	—	4.1	60
1983	6.1	0	9.0	25	5.6	60
1984	5.6	0	9.9	29	6.0	60
1985	—	0	12.2	23	5.5	0
1986	3.7	0	12.5	23	5.0	0
1987	3.4	0	10.0	17	5.0	0

— Not available.

Note: The fertilizer prices are transformed to reflect their nutrient contents, and the ratios are computed as: price of 1 kilogram of nutrient per the price 1 kilogram of maize.

Source: Lele, Christiansen, and Kadiresan (1988).

use on coffee and tea is more profitable than on maize in Kenya as international tea and coffee prices are passed on to Kenyan farmers. The timely distribution of fertilizer to tea and coffee producers by the Kenya Tea Development Authority and by the coffee cooperatives has also supported its use. In the period 1974 to 1985, fertilizer nutrient consumption grew more rapidly in Malawi and Kenya; Tanzania experienced a decrease in usage.

Increasing fertilizer use is a major issue in Kenya and Malawi owing to growing population pressure on land. In the 1980s, Malawi subsidized fertilizer. Kenya has had difficulties in expanding fertilizer use due to import restrictions reflecting shortages of foreign exchange for imports and problems in the distribution of the appropriate products and amounts at the right times. Almost all of Tanzania's fertilizer is financed by aid donors, but internal distribution is a problem far worse than in Kenya or Malawi. Not only is transport infrastructure poor, but in 1983 all fertilizer had to be distributed through only thirteen retail outlets. Elsewhere I have argued that given the growing land pressure, limited purchasing power of rural households, and rising food and fertilizer prices, a subsidy on fertilizer for the benefit of resource-poor farmers is critical to ensure their food security (Lele, 1987; Lele, Christiansen, and Kadiresan, 1988).

Research

Increasing the application of fertilizer depends critically on the ability of national agricultural research systems to develop profitable technological packages adapted to the conditions of each agricultural region. Both Kenya and Malawi have had excellent agricultural research systems for their major export crops financed through levies on these crops. Foodcrop research presents a mixed picture. While very weak on adaptive on-farm research, Kenya's hybrid maize program has been quite successful in developing an improved seed distribution program and in ensuring its rapid adoption. These successes are reflected in the high percentage of Kenya's total maize area under improved maize—but much of this gain was achieved in the 1960s, and relatively little subsequent progress has taken place. Malawi's hybrid maize research program faces the question whether research should focus on flint or hybrid dent maizes. Hybrids are more sensitive to growing conditions and thus their yields are more variable, though higher on average than traditional varieties. Low current adoption of hybrid dent varieties reflects the small farmers' inability to bear the risk of variable output, as well as strong consumer preference for flint maize, its better storability, and inadequate access to credit and extension.

Tanzania's research system collapsed in the 1970s in part because of the breakup of the East African Community, upon which Tanzania had depended for research, especially in tea and coffee. Cotton research suffered from the sudden withdrawal of the British Cotton Research Corporation (CRC) in 1975, while tobacco research was plagued by shortages of qualified personnel, lack of continuing and reliable funds for recurrent expenditures and foreign exchange for critical supplies, and the breakdown of the transport system. The recent decision of many external lenders and aid agencies to invest in agricultural research is long overdue but seems to be overloading the country's capacity to manage such research effectively. Similar problems with financing for research have surfaced in Malawi and Kenya. Another common defect of these efforts has been excessive emphasis on the provision of physical capital and external technical assistance; the substance of research and the optimal use of available human capital have begun to receive attention only recently, but much progress is needed on this front for research to have any impact.

V. Food Security: Country Policies and Donor Response

The role of government in food price stabilization has tended to acquire increasing importance with the increased dependence of rural households on the market for food. For example, in Malawi's Southern Region and the semi-arid marginal areas in Kenya more than 80 percent of the rural households regularly have a food deficit. With their low purchasing power, even an efficient market could not meet the consumption needs of low-income households, especially those in remote rural areas. If the burden of adjustment is not to fall most heavily on these households, especially given the frequency of droughts and shortages referred to earlier, government assistance is required. Despite major differences in ideology and approach, the governments of Kenya, Malawi, and Tanzania have each pursued the objectives of food security.

Objectives and Means

Government policy has aimed to provide protection for producers, consumers, and the government itself. (As usual, of course, not all the objectives are fully consistent.) Specifically, governments have tried to:

- Increase total food output, including production in more remote areas
- Stabilize prices and supplies by providing a guaranteed market for food-crop production and a fixed official pan-territorial producer price[1]
- Ensure adequate supply of white maize to the politically sensitive urban areas at fixed consumer prices, to maintain political support and limit inflation and pressure for increased wages
- Control external food trade and thus the internal food situation
- Reduce the commercial activities of Asians and other ethnic minorities.

Means to achieve these goals generally have been similar in the three countries. National buffer stocks of maize have been created in all three, funded by donors or with borrowed capital. Marketing agencies in each country have increasingly attempted to replace private traders as purchasing agents and greatly expanded their purchasing centers during the 1970s—by the early 1980s Kenya had 600 centers and Malawi had 1,000. Likewise, the three discouraged the commercial activities of Asians (and in Kenya's case, of other African ethnic groups), and Malawi prohibited Asians from living in all but the four major cities. Kenya and Tanzania both established restrictions on the movement of stocks by private agents regardless of ethnic origin—restrictions more strictly implemented during periods of shortage to facilitate government purchases. Agencies in both countries located sales points mainly in a few major urban centers, and both have been criticized for purchasing rural grain surpluses without making active efforts to sell them in rural areas. Malawi, through its bush markets, however, has had a more active rural sales policy for food and fertilizers.

In periods of shortages, increased sales by government agencies in urban areas can indirectly alleviate pressure on rural food supplies by discouraging private agents from buying rural supplies at high prices (the Malawian government's inability to protect rural food supplies after the liberalization of the grain market and rising urban prices in 1987 reflects this point).

These objectives, and the methods used to achieve them, have often been at odds with some of the conditions specified in donor-supported structural adjustment programs. Adjustment programs have attempted to increase (1) the private sector's role in grain marketing, (2) reliance on external trade in addi-

1. Cleaver and Westlake (1987) have argued that inelastic aggregate demand and large year-on-year supply shifts would be likely to produce substantial price variation under a free market. Our study of Nigeria, where public intervention in most traditional foodcrops is absent, supports this observation (Lele, Oyejide, Bumb, and Bindlish 1988).

tion to domestic production, (3) the efficiency of the public-sector marketing boards, and more recently, (4) the food security of the population. The liberalization of domestic and foreign trade implied in these programs has faced considerable resistance in Kenya and Tanzania and has also produced misgivings in Malawi.

The role of donor advice and conditionality in the policy reforms of the 1980s has been extensively examined in the World Bank's research project Managing Agricultural Development in Africa, and a range of material has been produced on this issue. The following section merely touches on some of the findings of these documents as they relate to the critical issue of food security. The interested reader is referred to the comprehensive volumes (Lele and Meyers 1987, Lele and others 1989) or to the original sources on which they are based for further information.

Outcomes

Judgments about the effects of these policies are controversial, partly owing to differences in interpretation, but also because of a continued lack of consensus on the real purpose of the policies. For example, disagreements over the desirability of price stability or domestic self-sufficiency continue to arise.

The budgetary effects are probably the least contentious issue. All three governments have subsidized maize operations, although maize producer prices have been brought into line with international prices, and official consumer prices have increased substantially. In Tanzania, the National Marketing Corporation's overdrafts were about 2.8 billion shillings (around US$250 million; billion is 1,000 million) in 1983, while a recent European Economic Community study of the National Cereals and Produce Board in Kenya estimates accumulated losses to be nearly 5 billion shillings (about US$300 million). These compare with total central government expenditure on agriculture of K Sh131 million in Kenya for 1986 and T Sh545.1 million for Tanzania in 1983. Employment in foodcrop parastatals has also grown significantly, even as their operations have declined (Lele and Christiansen 1988).

While the costs involved are significant, and the need for improved parastatal efficiency is universally accepted, mitigating factors have been noted. For instance, year-to-year price stabilization and other government objectives are loss-making but may be regarded as legitimate functions and are not undertaken by the private sector (Cleaver and Westlake 1987). In addition, donors have tended to attribute parastatal losses to managerial and administrative inefficiency, while the boards have often had very little latitude in the tasks with which they have been charged. For instance, governments want to set consumer prices low to maintain urban political support and low wages, but the consequent low producer prices preclude sufficient procurement of grain to meet urban demand, which is already encouraged by the low prices. While high producer prices increase the supplies marketing parastatals can command, raising producer prices narrows or eliminates the marketing margin needed to cover the operating costs of parastatals. Governments have been unwilling to allow prices to vary to reflect transport and storage costs, even though studies show that allowing greater price variability will reduce the cost of supply stabilization operations (Pinckney 1986).

The costs of borrowing capital to cover operating losses have made up a large percentage of total costs, yet parastatal capitalization has received little donor attention. Some critics, while noting that lack of funds to pay for grain purchases has contributed to the poor performance of parastatals, have called for retrenchments rather than improvements in financing. Adjustment programs have imposed limits on the growth of credit, which have induced foodcrop parastatals to issue script for purchases or to cut their procurement. The shortage of working capital has undermined the stability and predictability of

food prices and supplies. This has had an adverse effect on small farmers' willingness to diversify their meager resources out of foodcrops into export crop production (Lele 1988b and forthcoming). There is, however, little recognition in donor circles of the fundamental importance of a stable and predictable food policy on household food security, and in turn on the allocative decisions of rural households which affect the production of export crops. To help with promoting exports, donors have shown greater willingness to relax credit ceilings for the purchase of export crops, but this, while necessary, is not sufficient to increase production.

Some donors have criticized the boards for building larger than needed grain stocks and relying less on external trade. Increasing dependence on trade, however, brings some problems. Kenya and Tanzania's growing food imports, referred to earlier, have amounted to between 10 and 20 percent of their annual export earnings. Given the instability of and the stagnant or declining dollar-denominated value of their export earnings, policymakers cannot be certain that foreign exchange will be available to meet the increased food import bill. Moreover, sharply fluctuating food surpluses and deficits internally and in neighboring countries, poor early warning systems, and the demonstrated unreliability of food imports and aid have made governments nervous about increasing their reliance on trade. The volatility of the food situation is illustrated by Malawi's rapid change from a regular food exporter to food importer, due to the influx of refugees. High domestic transport costs from ports to consuming areas, and physical limits on transportation capacity caused by poor infrastructure, further raise the costs and risks of increased trade dependence. Finally, there is the matter of consumer preference; imported yellow maize is not a perfect substitute for white maize, and this affects the political popularity of governments.

Reducing spatial and temporal price variability has been a major aim of government policy. Enthusiasm for a government role in this area may depend on one's belief about the strength of the markets in question—how stable prices would have been in the absence of government intervention is not known in East Africa. However, the West African MADIA countries (Cameroon, Nigeria, and Senegal), which have few restrictions on internal trade or prices, have experienced more volatile and higher food prices because private markets are not as well integrated in these countries as is believed by many (Lele and Candler 1981, Lele 1987).

Kenya has a relatively strong private sector, while Tanzania suffers from poor internal transportation and an inadequate flow of timely and reliable market information. Malawi lacks adequate credit for traders, who also face increased costs and shortages of vehicles and fuels. These problems were exacerbated by an import compression policy dictated by external transport bottlenecks at the same time that reform programs were reducing the number of government buying centers (Lele and Candler 1981; Lele and others 1989).

The adjustment process in all three countries has tended to cut the role of the public sector. To be successful, however, such measures require alleviation of the constraints on the operation of the private sector and the establishment of a regulatory and facilitating role for government; efforts to do this have just begun but are too slow in relation to the speed of the attempted reduction of the public sector's role. Meanwhile, government restrictions on Asian traders have exacerbated the weak commercial system; due to the weak indigenous trading sector this policy has reduced private trading activity in the short run and in some eyes has increased the need for government involvement (Lele and Meyers 1986).

The extent to which inadequate markets for foodcrops limit the adoption of new technology and the importance of price support are additional important issues which are no longer given the importance assigned to them in donor

advice in the 1960s and 1970s.

Finally, despite their long-term merits, programs for liberalization of grain markets have faced a dilemma in practice. Economic crises and external shocks are more likely to induce government adoption of reform programs than are calmer periods, but the crises have resulted in inadequate preparation as liberalization programs are adopted. Bad luck has also played a part: in Kenya, for instance, a donor's call for liberalization in 1983 was followed by the worst drought of the century and in Malawi in 1987 by an increased flow of refugees. The mixed outcomes from liberalization have tended to reinforce the faith of governments in the importance of public intervention Receptivity to the principle of liberalization is greater now in Africa than ever before, however, and many adjustment programs have been in the right general direction if not at the right speed.

VI. Summary and Conclusions

The common and contrasting experiences of Kenya, Malawi, and Tanzania in the postindependence period indicate the complexity of the task African policymakers have faced in spurring agricultural growth. The extent, direction, and distribution of growth is the product of the interaction of the policies adopted toward the economy and the agricultural sector, and of factors beyond a government's control—initial resource endowments and external events.

Evidence from the MADIA project has shown that Kenya was the luckiest of the three countries and made good use of its inheritances to achieve healthy growth. Kenya now faces major problems, however, as opportunities for raising output through area expansion dwindle away. In particular, the issue of land distribution and the need for policies and institutions that will increase the productivity of resources need to be addressed. While the increasing levels of food aid and imports could suggest to some a need to diversify out of their (very successful) export crops and into food crops, available evidence shows that some countries that have diversified too quickly out of their existing exports have done poorly.

Of the three countries, Malawi has operated against the heaviest odds, has produced commendable rates of economic growth in the agricultural sector, and has responded positively to external shocks and donor advice. The estate orientation may have been seen to be necessary given the desire to stimulate rapid growth and the limited resources available to achieve this (Lele and Agarwal 1988). Malawi's poorer record on equity, however, suggests that government policies must support, rather than discriminate against, the smallholder sector if growth is to be broadbased and sustained—the quick resumption of overall growth in Malawi may now be constrained by the extreme poverty of most of its populace.

Although Tanzania had good initial endowments and has enjoyed substantial donor support, it lost ground relative to Kenya and Malawi in the growth of its agricultural sector. Some of Tanzania's social achievements appear to have been bought at a considerable cost in terms of agricultural output and could not be sustained.

Finally, the findings of the MADIA project excerpted here highlight the intricacy of the relations among the wide range of factors that shape development and economic performance. In particular, the example of food security policies and problems illustrates the need for a better understanding of the interplay between macroeconomic and sectoral policies and constraints (and between donor and recipient perceptions of policy priorities) to improve the prospects for long-term, sustainable, and equitable growth.

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