Number 2

Agricultural Growth and Assistance to Africa

Lessons of a Quarter Century

Uma Lele

International Center for Economic Growth

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PREFACE

This is the second work in our Sector Studies series, which focuses on specific policy areas, either in individual countries or in comparative assessment of multiple countries. This work by Uma Lele is based on a multiyear study, conducted primarily by the World Bank, that analyzes agricultural development in Africa and the effect of external aid on its progress.

The importance of understanding the impact of donor aid on recipient countries cannot be overestimated. The development strategies of most African countries have been critically influenced by levels of donor assistance. There is also the question of whether aid achieves the goals donors set for it. Can it be targeted more effectively or more efficiently, and what information must donors and recipients have in order to formulate the best assistance strategies and programs?

There is considerable consensus that many donor problems are associated with a lack of country-specific knowledge, including historical and situation-specific constraints. This Sector Study provides the information most urgently needed to make solid, productive decisions about agricultural development and how donor assistance can be best appropriated. Lele examines six African recipient countries in close detail—the pre-independence conditions, developmental progress and history, political stability, and other issues. The focus on discovering the origins of agricultural growth and weighing the impact of external factors (especially donor aid) is extremely important to anyone involved with aid or agricultural development and their effects on economic growth.

We are pleased to present this valuable publication and hope that it will be of great assistance to both scholars and policy makers.

Nicolás Ardito-Barletta
General Director
International Center for Economic Growth

Panama City, Panama
January 1990

ABOUT THE AUTHOR

Since 1971 Uma Lele has worked at the World Bank. While there, she has conducted analysis and research and has held both operational and managerial responsibilities. She has held senior economist positions with responsibility for country programming and economic work in the bank's East Asia Programs and Eastern Africa Projects Departments, where she was also deputy division chief since 1978. In 1983 Uma Lele was promoted to chief of the development strategy division and, since 1987, has been chief of the Special Studies Division. She has also been an assistant professor and a senior research fellow at Cornell University. She has published books and papers in academic journals and lectured widely at professional meetings on topics related to economic and agricultural development and foreign aid.

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Introduction

Africa's economic crisis is increasingly coming to be recognized as a result of the critical state of agriculture in most African economies. Nonetheless, and despite agriculture's overwhelming importance to all major dimensions of those economies—as a source of food, exports, employment, savings, government revenues, and raw materials for industrialization, and as a market for goods and services produced in the nonagricultural sectors—there has been little systematic analysis of Africa's agricultural problems. Little information, based on country-specific and cross-country analyses, exists to guide either government policy makers or donor agencies.

Substantial proportions of African countries' gross domestic product (GDP) and government expenditures are supported by a diverse range of external donors. Aid coordination arrangements notwithstanding, this assistance is often based on a relatively short-term assessment of country performance, based on one-year to (at most) five-year time frames. The understanding of an individual recipient's resource endowments, historical, political, and institutional inheritances, and their long-term developmental record is typically not brought to bear on the level or composition of external assistance; nor are these factors incorporated into the policy dialogue with governments. Rather, a particular donor's development philosophy and trade/diplomatic interests tend to determine its long-term aid patterns. In the short run, competition between donors to finance currently fashionable types of assistance has played a part in the composition of aid flows—a tendency that has been augmented by recipient

governments' often weak national policy planning and implementation capabilities, and by their inclination to maximize financial flows of aid rather than focus on the quality of assistance they receive.

In response to these concerns, the World Bank, working actively with seven other donors and six African governments, has had under way since 1984 a long-term, cross-country comparative study called Managing Agricultural Development in Africa (MADIA).[1] The purpose of the study has been to determine where and why growth has occurred in the agricultural sectors of selected African countries since their independence in the mid-1960s, and, in addition, to assess the extent to which domestic policies and the external economic environment (especially changes in world market prospects and the level, form, and composition of aid) have contributed to the process of growth. This monograph gives an overview of the study's methodology and key findings to date.

The Country Sample and Collaborating Donors

The countries selected for analysis (Kenya, Tanzania, and Malawi in East Africa; Nigeria, Cameroon, and Senegal in West Africa) have 40 percent of the population of sub-Saharan Africa and 50 percent of its GNP. These six countries cover almost all the ecological zones in Africa, ranging from the Sahelian and the Guinea Savanna Zones in the north to the equatorial rain forest in the south, and the volcanic, humid, and semihumid highlands of East and West Africa. Taken together, they grow almost all the major crops of Africa, including tea, coffee, cocoa, tobacco, cotton, groundnuts, cashews, sisal, sugar, maize, sorghum, millet, and rice. They include two oil-exporting and four oil-importing countries, two land-surplus and four land-short countries.

Despite their diverse physical characteristics, and although they have followed different policy paths and achieved different outcomes, these six countries have enough features in common to permit a fruitful comparison of the interaction of national policies with resource endowments and other factors in explaining country-specific performance variations.[2] With the exception of Nigeria, all have enjoyed a high degree of political stability. Since political stability has by no means ensured stability of institutions, however, it is possible to examine both the factors influencing stability of institutions and the effects of instability on the processes of development.

The donor participants in the MADIA study (the World Bank, United States Agency for International Development [USAID], United Kingdom

Overseas Development Assistance (UKODA), Danish International Development Agency (DANIDA), Swedish International Development Authority (SIDA), the European Economic Community (EEC), France, and West Germany) have provided nearly 60 percent of aid flows to Africa. Different combinations of these eight donors have been particularly important in providing policy advice and financial flows to each of the six selected recipients.

A Conceptual Approach to the Study

Many analysts of long-term economic growth processes who have emphasized the role of agriculture in overall economic development (Kuznets, Okhawa, Ishikawa, Johnston, Mellor, and Lele) have also pointed out why successful mobilization of smallholder agriculture (as distinct from narrowly based growth of large-scale farming) is crucial for sustained overall advance. They have demonstrated the relationship of the structure of agricultural production to the structure of consumption, savings, and investment; they have illuminated the pattern of demand that such broad-based development generates, and thus the types of growth linkages that are generated internally between agricultural and nonagricultural sectors and internationally between domestic and external markets. These linkages critically affect both the pace and the robustness of growth.

While early approaches to growth theory stressed the relationship of capital accumulation to the economic growth process, economists have subsequently come to highlight the special contribution to the growth process of "nonconventional" inputs (technological progress and knowledge) relative to the influence of conventional factors of production (land, labor, and capital). Others, such as Harrod Domar, W. Arthur Lewis, Theodore Schultz, Schumpeter, and Harry Johnson have elaborated on the different kinds of capital needed for growth, pointing out the complementarity among human, organizational, institutional, and physical capital. (See, for example, Bruce Johnston's elaboration of Harry Johnson's notion of capital.) Indeed, the literature on growth theory has shifted its emphasis away from the importance of traditional capital and toward an understanding of the role different forms of capital can play in determining knowledge acquisition and technical progress.

The development strategies of most African countries (but not all of them, as Nigeria demonstrates) have been critically influenced by levels of foreign aid. Moreover, aid has not only meant increased access to

financial resources, but also increased advice on development policy. Meanwhile, the literature on development financing, starting from the premise of fungibility of financial capital, has concluded that the benefits of donor financial assistance stem less from the specific projects supported by this assistance than from the marginal investments that donor assistance has enabled governments to undertake. While this is true at the project level, the literature has generally not focused on the effects of the size of aid flows, in relation to the size of recipient economies, on the totality of recipient government expenditures. In particular, the literature has not sufficiently recognized the balance between government developmental expenditures (and the effect donors have, or could have, on such expenditures) and nondevelopmental expenditures.

Finally, it is our hypothesis that the limited capacity of recipients to formulate and implement development policy means that external perceptions of development programming priorities—notably the activities donors consider desirable to finance and the policy issues they have been willing to pursue—have had an important influence on the deployment of different forms of capital, and especially on judgments about the appropriate balance between them for achieving key developmental objectives.

The MADIA study therefore focuses not only on the sources of growth in agriculture during the past two decades (based largely on conventional inputs of land and labor), but also on the implications of each country's initial endowments and subsequently accumulated balances of different forms of capital that represent sources of future growth. Our definition of capital includes not only human and institutional resources, but also political capital, including the strength and stability of government commitment to development—factors not usually incorporated by economists.

No single formal methodology is available for undertaking the kind of wide-ranging analysis of long-term agricultural growth and distribution trends, and the factors underlying them, that the MADIA study exemplifies. We have therefore used rigorous quantitative analysis of those features of the overall inquiry that lend themselves to such a method, and a broader political economy and institutional approach has been used on those factors less easily quantified.

For each of the MADIA countries, the analysis begins with an assessment of national resource endowments, including initial post-independence conditions as determined by colonial inheritances and political and economic structures. Agricultural performance is then analyzed over a period of more than two decades—from 1960 to 1988, depending on data availability. The growth of food crop production, agricultural

imports and exports, the nature of large and small farmer production, and regional patterns of growth within each country are examined, as are the availability of institutional and policy supports for farmers, the workings of official crop marketing entities (including government monopolies), and unofficial agricultural markets.

To the extent that the data permit—and data resources vary significantly between MADIA countries, reflecting differences in the quantity and quality of organizational and informational capital available for decision making—production growth is then decomposed according to whether it derives from area expansion, yield increases, or shifts in cropping patterns between high and low value crops.[3] They are further valuated in terms of locational shifts of production between resource-rich and resource-poor regions within each country.

The causes of differences in countries' agricultural performance are then examined. The analytical framework used in the study divides the causal variables into three categories called (a) "luck" factors, (b) macroeconomic factors, and (c) sectoral factors; the latter two categories cover the policy responses of governments to the circumstances arising out of factors in the first category. The distinction between these sets of factors is an important one: there has been relatively little focus in prior analysis on the genesis of country policies, the interactions between the resource endowments (broadly defined) at the disposal of governments, and the policy responses they have devised to adapt their endowments to developmental challenges and goals.

By "luck" factors we mean the initial conditions in each of our sample countries at the time of independence, along with any subsequent changes in those conditions caused by major domestic or external developments outside the countries' control. In the initial conditions that they inherited, we include the quality and quantity of land (including population pressure on land),[4] human capital (including variables that affect the quality of human resources in terms of such social indicators as health, education, access to water, etc.), institutions (i.e., governmental systems, links with world markets, and domestic commercial and grassroots institutions that represent producer interests), and transportation and communication infrastructure availability. By subsequent changes in the external or internal environment we mean the nature, frequency, and magnitude of external shocks[5] and internal political dislocations.

The analysis of policies first focuses on evaluation of the general macroeconomic environment—in particular, the extent of implicit or explicit taxation of the agricultural sector through overvaluation of the

exchange rate or through the net effects of officially determined prices and subsidies. Resources mobilized through net taxes on agriculture may also be returned to the sector through the provision of public goods in the form of productive and social services for farmers, for example, agricultural research, extension, transportation, market information, and support for human resource development, which may offset the disincentive effects of pricing policies. The MADIA study therefore examines public expenditure policies and patterns, their changes over time, and, where available, the inter- and intra-sectoral levels and shares of public expenditure going to agriculture and other sectors that support agricultural development, compared to support for other competing sectors of the economy.

Neither absolute nor relative expenditure levels can, in the absence of analysis of the *quality* of these expenditures, convey much information about the utility of public investment programs. We have determined expenditure quality by evaluating the investment choices made in the agricultural and rural sector, the balance between recurrent and capital expenditures, the stability and predictability of expenditure levels and patterns, and the role of central, (or in the case of Nigeria, federal) regional, and local governments in planning and implementing expenditures. Based on quantitative and qualitative information on each country, we have formed a subjective comparative judgment of country performance with regard to expenditure quality.

Given the importance of trade in the GDP of the MADIA countries (see table 1), public expenditures are greatly influenced by international (barter and income) terms of trade, as well as by foreign aid levels. Agricultural terms of trade have fluctuated widely but around a generally declining trend for most MADIA countries, creating a need for foreign borrowing over and above concessional inflows of foreign aid (see figure 1). The magnitude of the external shocks experienced by each of the MADIA country economies is therefore evaluated in order to determine the circumstances which got them into these positions, along with official policy responses and their subsequent effects on agriculture and the rural sector as a whole.

In addition to examining these specific macro factors, the analysis also takes into account how the macroeconomic environment as a whole creates differential opportunities for employment and returns in the agricultural and nonagricultural sectors (leading to competition for labor use in the various sectors), how it influences the level of internal demand for goods produced in the agricultural sector, and how it affects the relative incentives for domestic and external production. Therefore, the nature of demand for factors of production, and expected and actual external and

TABLE 1 Share of Trade in Gross Domestic Product of MADIA Countries, 1967–1984 (percent of current value)

	Kenya	Malawi	Tanzania	Cameroon	Nigeria	Senegal
1967–73	58.5	51.2	53.8	50.4	34.0	58.8
1974–78	67.5	56.9	48.5	53.5	49.4	84.0
1979–81	62.4	64.3	41.1	58.0	53.0	76.9
1982–84	55.8	47.5	33.6	55.0	37.3	71.1
1967–84	61.2	54.8	48.6	53.2	42.3	70.9

SOURCES: World Bank Database (BESD) and Pierre Seka, "Macroeconomic Shocks, Policies, and Performances: The Case of Three West African Countries—Cameroon, Nigeria, and Senegal," MADIA Working Paper (Washington, D.C.: World Bank, forthcoming).

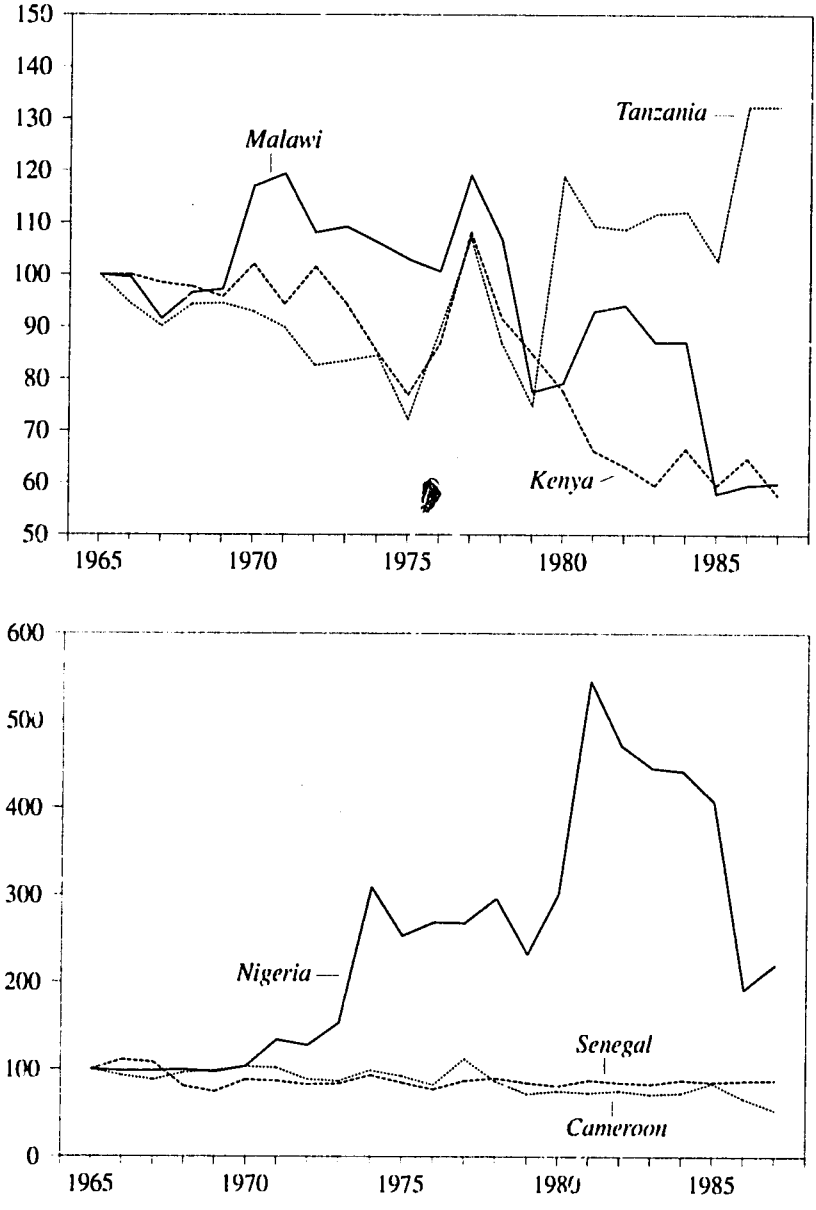
domestic demand for agricultural output are examined. Because expectations about the nature of external demand have influenced macroeconomic and sector policies, the flows of labor and capital within agriculture, and the balance between food and export crops (or smallholder and large-scale agriculture), as well as the balance between agriculture and the rest of the economy, are analyzed. Also analyzed are the effects of international market prospects on the evolution of the agricultural development policies and objectives of governments and donors.

Finally, the effects of sector specific policies on output growth are considered. Special attention is paid to input and output pricing, subsidy policies, and land policies (where the combination of land pressure, income distribution profiles, and the economic and political importance of achieving rapid agricultural growth have led to highly differential access to land, which can in turn differentiate the ability of small and large farmers to mobilize labor, capital, and technology, along with the possibilities for intensification). Policies toward agricultural research, extension, credit, and marketing are also examined, with special reference to differences between countries in terms of the relative roles of private, public (interministerial, central, and regional governmental), cooperative, and grassroots institutions.

General Conclusions

The MADIA study stresses the absence of growth in agricultural productivity in Africa. Its findings show that agricultural production has generally

FIGURE 1 Barter Terms-of-Trade Indexes for MADIA Countries, 1965–1987 (base year = 1965)



SOURCE: Pierre Seka, "Macroeconomic Shocks, Policies, and Performances: The Case of Three West African Countries—Cameroon, Nigeria, and Senegal," MADIA Working Paper (Washington, D.C.: World Bank, forthcoming).

grown as a result of expansion of cropped area, and, to a lesser extent, changes in cropping patterns—both processes, in turn, spurred by rapid population growth.[6] Countries that have maintained their comparative advantage in export crops, and have pursued a balanced strategy regarding the production of food and export crops, have done better than those attempting quick diversification out of agriculture into industry, or out of export crops into food crops. Tea and coffee in Kenya, for instance, exemplify this conclusion, whereas the costly and complex diversification strategies attempted by Tanzania and Senegal demonstrate its negative side. Efficient producers can maintain and expand their market shares, but because Africa's options to diversify exports out of traditional agriculture remain limited in the short and medium run, their efforts need to be supported by both appropriate domestic policies and donor assistance.

The study reveals that donors have made a surprisingly small contribution to agricultural development in Africa. Countries receiving the most aid have performed the least well, as external finance has substituted for a sound diagnosis of development problems. Even in countries that have done well, donor interventions explain only a small part of their achievements. The few success stories are accounted for by the efforts of the former "colonial" donors (showing the importance of detailed knowledge based on grassroots experience as a source of well-planned and executed development programs). There have been some excellent examples of U.S. bilateral efforts in human capital development. The World Bank's assistance to Nigeria, similarly, is a good example of a donor helping to stabilize agricultural policies in the smallholder sector in circumstances of great internal turmoil. Overall, however, there are few instances of donors helping to augment recipients' planning and implementing capabilities or providing a stable policy environment over the long term. Donors have lacked the long-term perspective needed to develop a strategy that achieves a balance between food and export crops, poverty and growth, public sector roles and private sector initiatives, and short-term gains and longer-term capacity building.

Given the numerous constraints to obtaining growth in African economies, there has been a lack of consensus among donors regarding both the diagnosis of the problem, as well as the direction of aid policy. They have sought universal explanations for Africa's poor performance, such as poor domestic macroeconomic and sectoral policies, neglect of price incentives, and a lack of support for private initiatives. In reality, however, there appears to be no simple explanation—there is not a single Africa-wide crisis, but rather a range of national, regional, or subregional crises, each

with its blend of causal factors, including climatic, soil, ethnic, politico-historical, and human/physical capacity endowments. In view of the early stage of development of African economies, this diversity of domestic constraints has resulted in poor agricultural, and overall economic, performance despite substantial inflows of external assistance and, in some cases, despite favorable external shocks. In the unstable economic climate of the 1970s, for instance, many of these trade-dependent countries suffered large terms-of-trade losses. Yet, even those countries that capitalized on the oil bonanza (e.g., Nigeria) or other favorable trade movements (such as the case of phosphates in Senegal) could not achieve and sustain a pattern of broad-based income growth. In the 1980s, this range of micro-level constraints and other factors in Africa has defied donor efforts to apply generalized blueprints for "reform" that gloss over the need for case-specific responses to individual crop production and country realities. Hence, MADIA research demonstrates the urgent need for a comprehensive and location-specific diagnosis of constraints to productivity in order to develop tailor-made, long-run solutions.

A coherent, consistent policy framework built on a consensus between African governments and donors is important because most African countries suffer from severe shortages of human capital resources. Despite much growth in trained manpower, the very low initial base, combined with inadequate use of such human capital as has been developed and the attrition of expertise of colonial donors, has left many African governments with little capacity to frame development plans or deal with the proliferation of external factors or even to articulate effectively their need for stronger bases of human and institutional capacity in Africa.

Aid Flows to MADIA Recipients

The 1973–1974 drought was a watershed point in the levels and patterns of development assistance to Africa. The rise in world market prices of cereals, caused in part by the drought and the simultaneous depletion of world food stocks by U.S. wheat sales to the Soviet Union, heightened concern about the increasing vulnerability of the least developed countries to international fluctuations in food supplies, and intensified interest in expanding the continent's food production capacity. The drought also came on the heels of a growing awareness that, following the Green Revolution in Asia, "trickle-down" effects alone could not be expected to solve (or even swiftly and substantially reduce) poverty in the developing world.

These concerns coincided with a wider intellectual consensus about the unpromising future for developing countries' primary commodity export prospects, especially regarding their volatility and perceived declining secular trends.[7] African governments simultaneously noted the rapidly rising internal prices of food crops relative to export crops, and resolved to achieve domestic food self-sufficiency.[8] These developments produced a series of diverse international articulations of the need to make a direct "Assault on Poverty."[9] While Robert S. McNamara's Nairobi speech in 1973 and subsequent World Bank publications provided the most respected expression of these concerns and their implications for donor policies, different manifestations of the same thinking were under way in other donor agencies—for example, the congressional mandate in the United States and various White Papers in Britain.[10]

The new focus on assistance for poverty alleviation and domestic food production in recipient countries generally, and in Africa in particular, resulted in five of the six MADIA countries experiencing substantial real growth in capital transfers for nearly a decade, much of which was justified in terms of the need to give priority in donor assistance to agriculture and rural development, and especially to achieve food security.[11] Aid levels rose on a per capita basis and as a proportion of both GDP and government expenditures. The share of resources allocated by development agencies to agriculture and rural development also rose sharply. The World Bank adopted an informal guideline recommending that 25 percent of its lending go to agriculture and rural development, and as a result, this category of its assistance more than doubled. Development financing rose strongly in real terms in the late 1970s and early 1980s, but fell in the following years (though the flow size varied considerably by country) before rising again in 1986.

By the late 1970s, the combination of a series of developments—including the two oil price shocks, the decline in Africa's terms of trade (due to the recession in Organization for Economic Cooperation and Development [OECD] countries), and the internal expansionary policies pursued by some governments—had begun to produce major macroeconomic difficulties in many African economies. Implementation of the large portfolio of rural development projects had become a financial and administrative impossibility leading to a shift in the focus of development assistance toward support for policy reform.[12] With the benefit of hindsight it is now evident that the conjunction of an imperfect understanding of the evolution of the international economic environment and an inadequate grasp of the diverse mix of variables affecting the internal growth processes of individual developing countries adversely affected the content of donor policy advice and development assistance. In retrospect, this explains *both* the overcommitment to the antipoverty crusade of the 1970s *and* the similarly zealous faith in "getting prices right" during the early 1980s.

The effect of concerns about poverty alleviation, as reflected in integrated rural development projects, was to shift the policy attention of donors and governments (a) away from export crops (which the "colonial" donors had tended to emphasize) and toward support for food crops, and (b) away from the high potential areas where export crops were typically produced and toward low-income regions. This change in investment policy, which favored resource-poor regions with few known technologies, actually slowed agricultural growth. It did, however, support important sociopolitical objectives of governments, including national

integration, while laying the foundation of human resource building services in areas previously barely touched by infrastructural and agricultural investment.[13] Moreover, donor assistance contributed substantially to public sector expansion in the MADIA countries.

However, the subsequent shift of development philosophy in the early 1980s—away from integrated rural development and toward macro and sectoral adjustment lending and private sector initiatives—has been similarly flawed by its inadequate recognition of the variety of causal factors underlying past growth or decline. Nor did it realize the likely effects of price-based policy reforms on aggregate supply responses or the complementary, nonprice microeconomic actions needed to ensure that the policy reform process was sustainable beyond the short term and harmonized with underlying developmental realities and long-term goals.

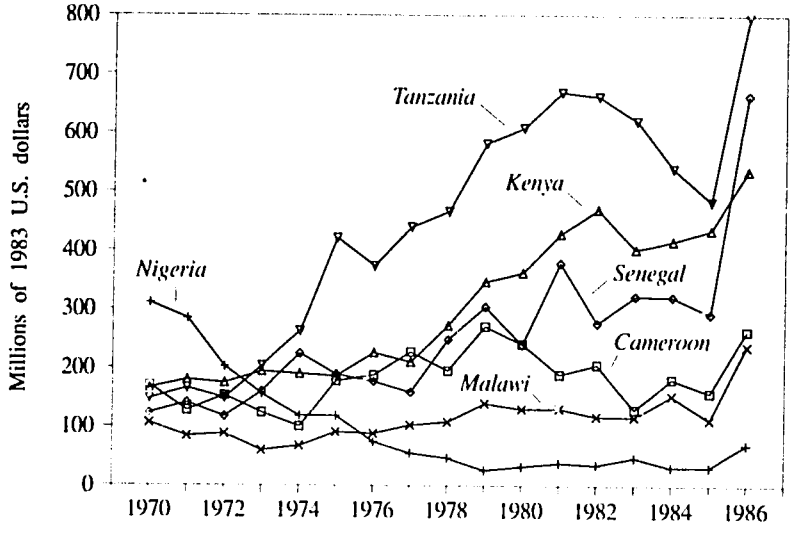
Before addressing the evolution of aid to agriculture in MADIA countries, however, it is necessary to put them in context by outlining the nature, scale, and sources of the relevant development assistance flows over the past two decades.

Trends in Aid Receipts of MADIA Countries, 1970–1984

At the country level, Tanzania, which by the late 1970s turned out to be the poorest economic performer among the MADIA countries, received the highest levels of Official Development Assistance (ODA) in constant 1983 dollars ($669 million in 1981). Tanzania was followed by Kenya (a peak of $470 million in 1981), Senegal (a peak of $378 million in 1980), Cameroon (a peak of $271 million in 1978), Malawi (a peak of $140 million in 1979), and Nigeria (which received relatively little ODA in the 1970s) (see figures 2 and 3).[14] The next poorest performing country among the MADIA group was Senegal, which received the highest per capita ODA over the 1970–1984 period, averaging $41 per capita in 1983 terms, followed by Tanzania ($24), Cameroon ($22), Kenya ($19), and Malawi ($19).

ODA peaked in 1981 in both Senegal and Tanzania, as donors began to take account of poor project portfolios and the need for macro policy reforms. Nevertheless, aid levels per capita remained higher in these two countries in 1984 ($45 and $25 respectively) than in Kenya ($21) or Malawi ($23). Kenya's ODA showed a significant rise from 1977 to 1982, but declined thereafter. Cameroon, like Nigeria, received very little ODA and the level declined after its oil revenues increased in late 1970.

FIGURE 2 Total Official Development Assistance (ODA) Received by MADIA Countries, 1970–1986 (millions of constant 1983 U.S. dollars)

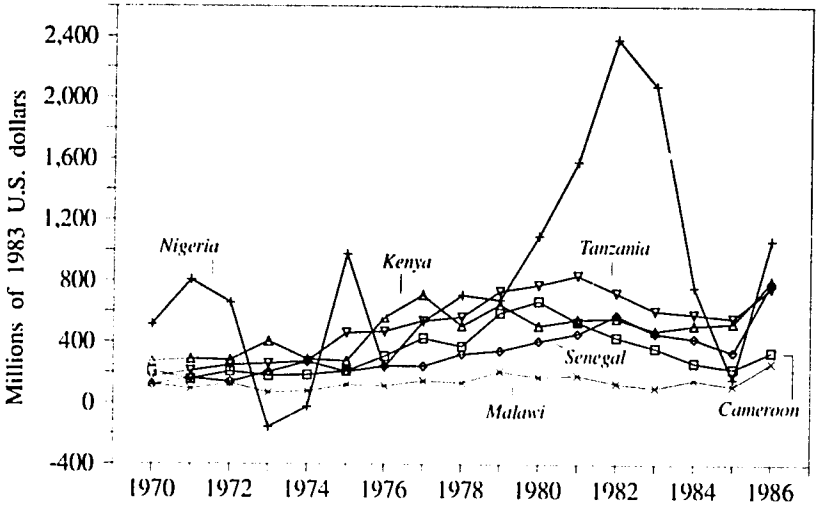


SOURCE: Maria Cancian, Aid Allocation to Cameroon, Kenya, Malawi, Nigeria, Senegal, and Tanzania: A Review of the OECD Databases," MADIA Working Paper (Washington, D.C.: World Bank, October 1987).

The ranking of countries is similar when total receipts net (TRN) are considered rather than ODA.[15] Senegal averaged $56 per capita of TRN (at constant 1983 U.S. dollars) over the 1970–1984 period, followed by Cameroon, Kenya, Tanzania, and Malawi at $42, $32, $29, and $23 respectively. Nigeria averaged $10 per capita TRN.

The *concessionality* of the terms under which aid is supplied influences the extent of a recipient's debt burden (i.e., the real cost of aid) and can be summarized in terms of the share of ODA (which is concessional by definition) in TRN. Among the MADIA countries, Tanzania and Malawi received the highest shares of resource transfers on concessional (i.e., ODA) terms, 84 percent and 81 percent respectively (see figure 4). Senegal also received a large share of capital transfers in the form of ODA (73.5 percent over the 1970–1984 period), though the percentage declined over time, leading to an increased debt burden. In Kenya, the percentage of TRN qualifying as ODA averaged 61.7 percent. Cameroon has had a much lower ODA share (52.4 percent) since the increase in its oil revenues, which resulted in reduced donor leverage.

FIGURE 3 Total Receipts Net (TRN) Received by MADIA Countries, 1970–1986 (millions of constant 1983 U.S. dollars)

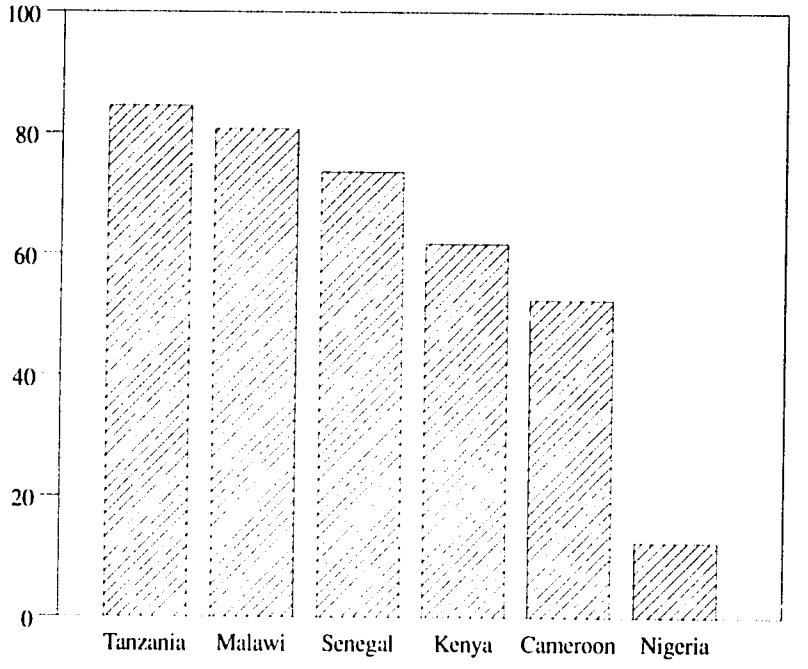


SOURCE: Maria Cancian, "Aid Allocation to Cameroon, Kenya, Malawi, Nigeria, Senegal, and Tanzania: A Review of the OECD Databases," MADIA Working Paper (Washington, D.C.: World Bank, October 1987).

A major feature of the donor-recipient relationship that distinguishes the MADIA sample, and African countries in general, from their larger Asian counterparts is the *multiplicity* of donors supporting the MADIA group—each with different motives for, ideas about, and forms of development assistance. When such bewildering variety is combined with recipients' typically poor absorptive capacity, it becomes easy to appreciate the extent to which aid flows have tended to tax, rather than assist, the development process. In Tanzania, for example, thirty-two donors contributed $6,310 million in ODA (in 1983 dollars) over the 1970–1984 period. Kenya and Malawi received $4,225 million and $1,585 million in ODA respectively, from a total of thirty-one different donors. Senegal received $3,382 million from thirty donors. Cameroon and Nigeria received $2,683 million and $1,580 million from twenty-seven and twenty-five donors respectively.

Data on the *share of aid in government expenditures* provide some indication of both the extent of a recipient's direct dependence on external

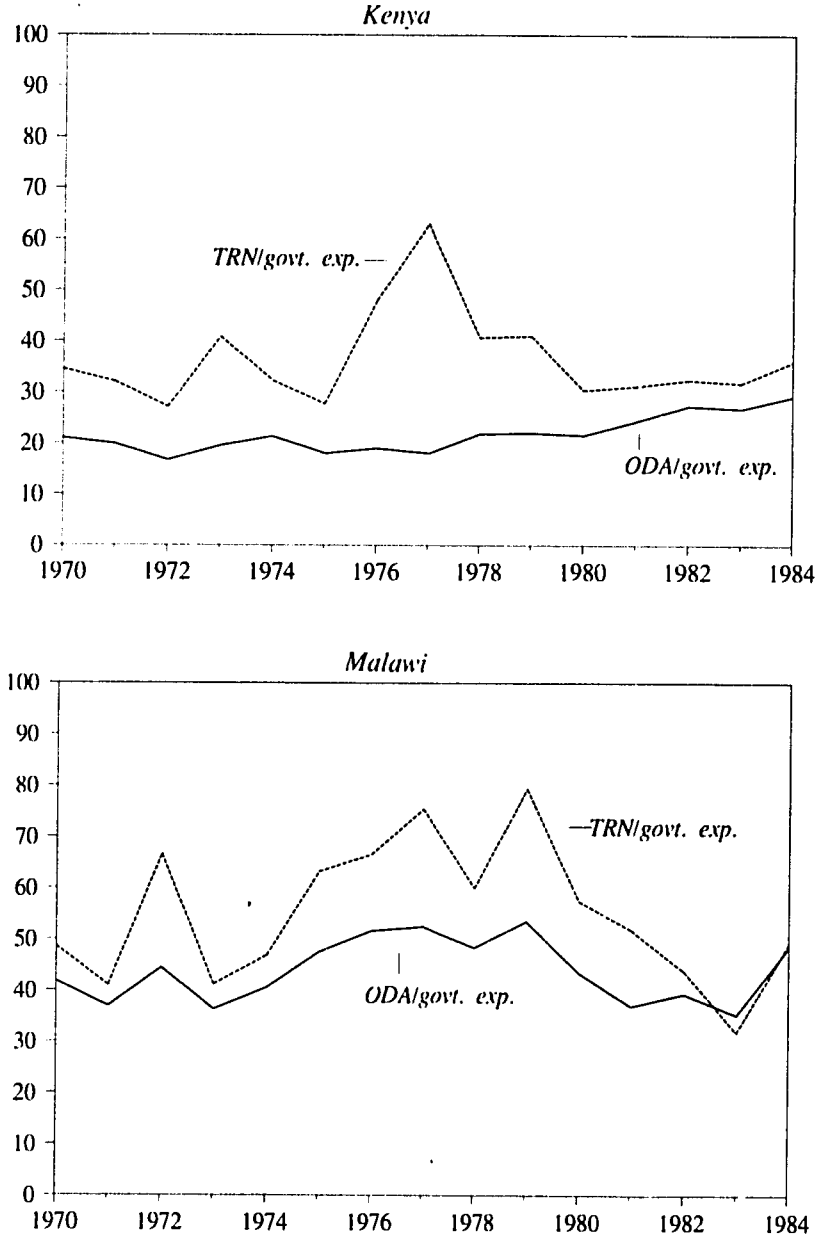
FIGURE 4 Total ODA as Percentage of TRN for MADIA Countries, 1970–1984



SOURCE: Maria Cancian, "Aid Allocation to Cameroon, Kenya, Malawi, Nigeria, Senegal, and Tanzania: A Review of the OECD Databases," MADIA Working Paper (Washington, D.C.: World Bank, October 1987).

resources and the degree to which donors can exert a less tangible, but nevertheless real, influence over the recipient's development strategy—at least in facilitating, if not actively encouraging, the investment choices made. Examination of the scale of aid shares in government expenditures also prompts questions about the effectiveness with which high levels of aid flows can be used by recipient governments at early stages of development, and especially about the relationship of the effectiveness of aid to the pattern of its allocation among sectors. Once again, Senegal leads the MADIA group with 63 percent of government expenditures funded by ODA in 1982, compared to 1983 lows of 9 percent in Cameroon and less than 1 percent in Nigeria (see figure 5). If the entire 1970–1984 period is considered, ODA has been a large percentage of government expenditure in all MADIA countries except Nigeria; however, it has been substantially larger on this basis in Malawi and Senegal (averaging 44 percent and 42

FIGURE 5 ODA and TRN as Percentage of Government Expenditures in MADIA Countries, 1970–1984



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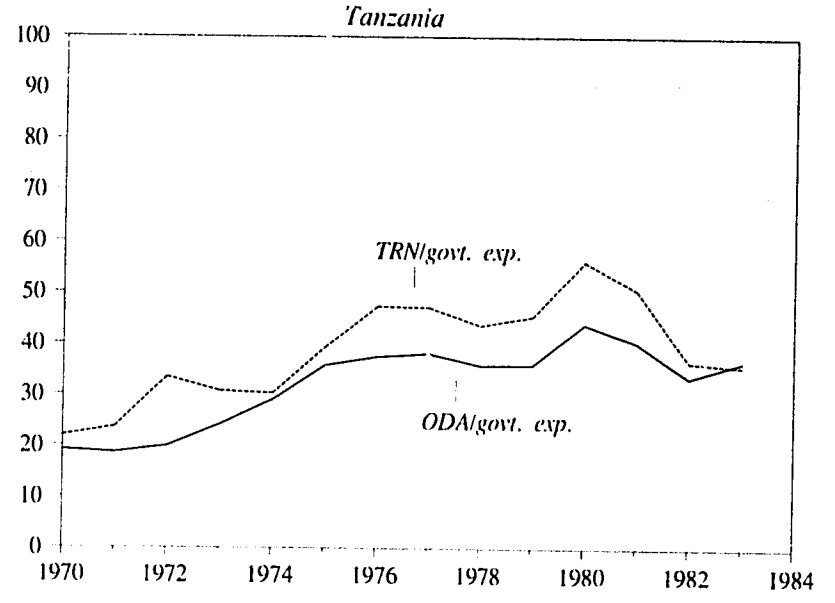

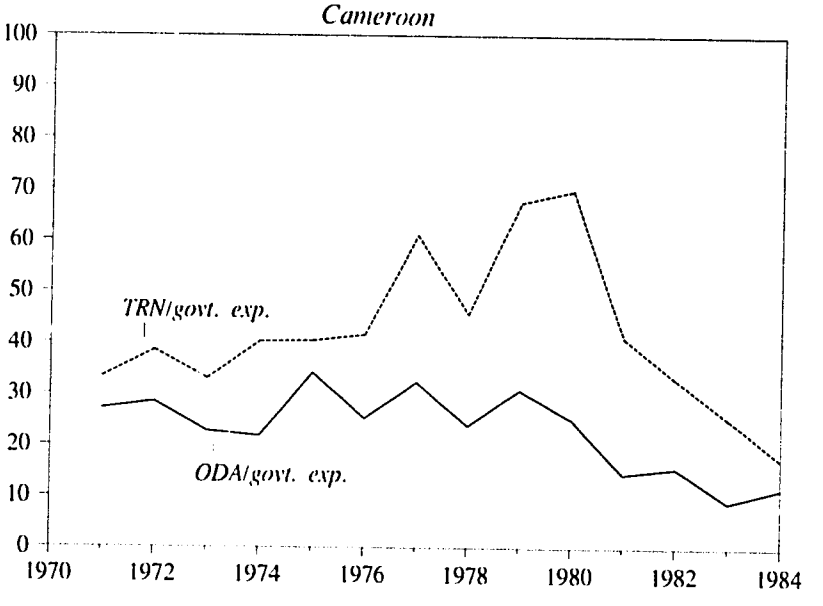

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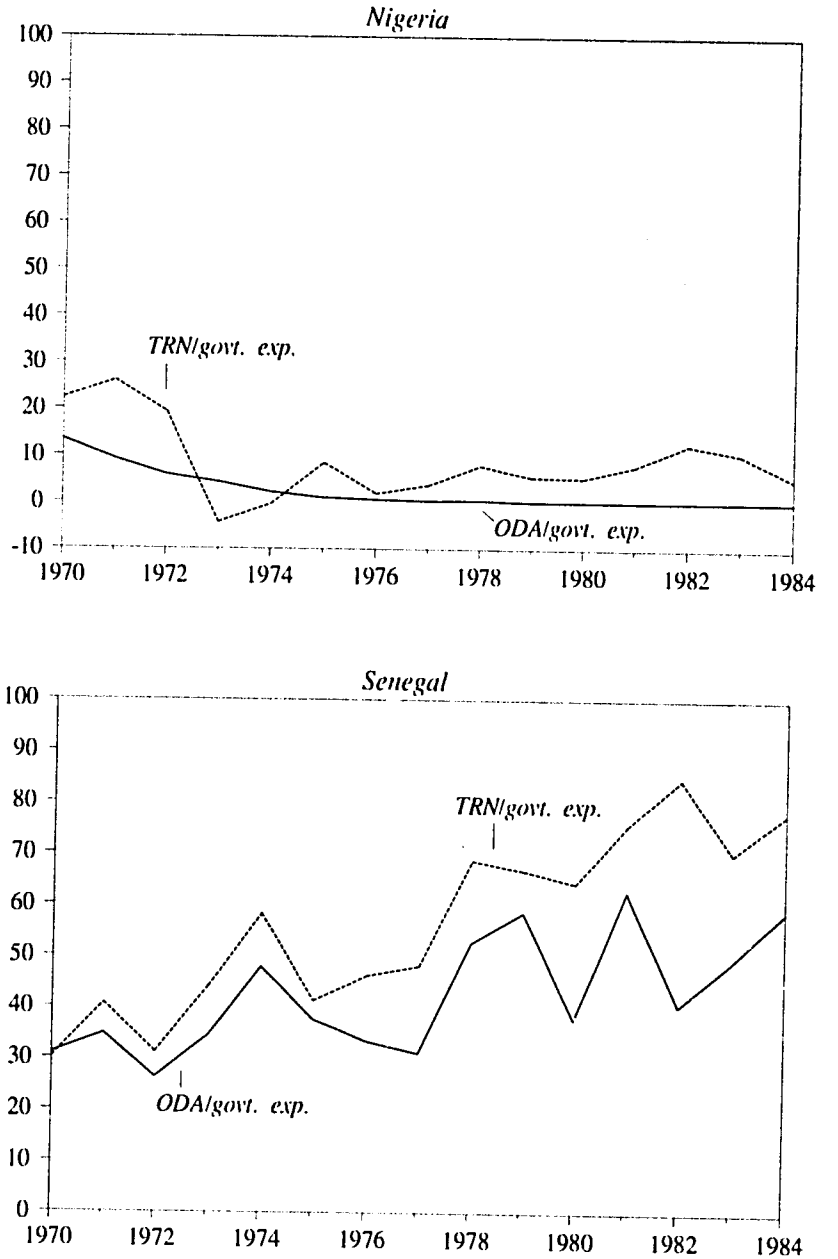

SOURCE: Maria Cancian, "Aid Allocation to Cameroon, Kenya, Malawi, Nigeria, Senegal, and Tanzania: A Review of the OECD Databases," MADIA Working Paper (Washington, D.C.: World Bank, October 1987).

percent respectively) than in Tanzania, Cameroon, and Kenya (which average 32 percent, 23 percent, and 22 percent respectively).

Some important features of donors' influence on country policy choices will be examined in detail later, but in the present context of broad estimates of aid shares in recipient government spending, it is important to note that *changes in aid levels* can create difficulties for governments with high aid: expenditure ratios. In Senegal, for example, fluctuations in aid flows relative to government expenditures have been marked; year-to-year swings have exceeded 20 percentage points, with major adverse consequences for the planning of development programs, and, most critically, for the recurrent budgetary support that is typically needed to keep projects operating in recipient countries. The MADIA study of U.S. assistance stresses the adverse effect of U.S. policy-based fluctuations in U.S. aid levels to Africa.[16]

Nonproject lending, which became important in the early 1980s, also altered country-by-country patterns of aid receipts. Until June 1988, the MADIA countries had received just over $1,700 million altogether in World Bank nonproject lending. Nigeria was the largest recipient, accounting for 32 percent of the total $532 million. Senegal accounted for a 14 percent share ($242 million); and Cameroon received no nonproject lending during the period. In East Africa, Kenya's share of the total was 23 percent ($388 million), while Malawi and Tanzania each accounted for a 15 percent share (approximately $259 million) of the total.

Donors' Record: Aid Flows and Policy Influence

Among the bilateral donors, Denmark, Sweden, and the United States have had very high percentages of TRN qualifying as ODA; they are followed by Germany. Table 2 examines ODA as a percentage of TRN flows from MADIA donors to MADIA recipients.[17] Interestingly, France and the United Kingdom had the lowest percentages of TRN qualifying as ODA (ranging from 31 to 63 percent from France to all MADIA countries except Nigeria, and from 39 to 66 percent of U.K. TRN to the East African MADIA countries). France's share of grants in total TRN to Senegal has been declining over time.

Among the multilaterals, 74 to 100 percent of TRN from the European Economic Community (EEC) to MADIA countries (except Nigeria) qualified as ODA, while the International Development Association (IDA) flows to MADIA countries were 100 percent ODA. Nigeria received over

TABLE 2 ODA as Percentage of TRN Transferred from Donors to MADIA Countries, 1970–1984 (totals in millions of 1983 U.S. dollars)

	Cameroon			Nigeria			Senegal			Kenya			Malawi			Tanzania		
Donors	Total ODA	Total TRN	ODA as % of TRN	Total ODA	Total TRN	ODA as % of TRN	Total ODA	Total TRN	ODA as % of TRN	Total ODA	Total TRN	ODA as % of TRN	Total ODA	Total TRN	ODA as % of TRN	Total ODA	Total TRN	ODA as % of TRN
Bilateral																		
Denmark	22.5	41.8	54.0	7.8	250.2	3.1	30.6	32.0	95.6	205.0	207.5	98.8	56.0	56.1	99.8	433.3	448.1	96.7
France	908.4	2439.6	37.2	20.8	2108.5	1.0	1159.9	1854.4	62.5	59.2	186.4	31.8	10.9	17.2	63.4	31.6	102.2	30.9
Germany	298.6	336.7	88.7	188.0	2066.7	9.1	142.5	165.3	86.2	444.9	614.5	72.4	177.5	198.6	89.4	590.5	632.0	93.4
Sweden	0.0	32.2	0.0	4.1	−13.6	−29.7	0.2	2.7	7.3	293.3	312.2	93.9	0.1	3.4	2.9	936.3	971.2	96.4
United Kingdom	48.4	159.5	30.4	192.4	3944.0	4.9	9.7	43.1	22.4	643.3	1646.3	39.1	424.5	647.3	65.6	361.7	608.0	59.5
United States	136.3	220.9	61.7	341.6	482.2	70.8	329.6	336.0	98.1	429.5	454.8	94.4	80.8	83.7	96.5	382.0	393.6	97.1
Multilateral																		
EEC	304.5	343.8	88.6	16.6	41.6	39.8	570.3	596.5	95.6	169.5	228.7	74.1	91.9	103.8	88.5	242.5	243.2	99.7
IBRD	20.6	300.1	6.9	0.0	1098.2	0.0	19.0	98.6	19.2	13.2	940.8	1.4	17.6	72.3	24.3	41.8	305.7	13.7
IDA	262.1	262.1	100.0	34.6	34.6	100.0	230.6	222.2	103.8	389.0	389.0	100.0	327.9	327.9	100.0	563.2	563.2	100.0
Total	2683.5	5125.5	52.4	1580.4	12794.8	12.4	3381.7	4598.3	73.5	4225.5	6852.9	61.7	1585.7	1968.4	80.6	6310.8	7477.5	84.4

NOTE: Totals do not equal the sum of each column because they also include an "other donors" component not shown in this table.

SOURCE: Maria Cancian, "Aid Allocation to Cameroon, Kenya, Malawi, Nigeria, Senegal, and Tanzania: A Review of the OECD Databases," MADIA Working Paper (Washington, D.C.: World Bank, October 1987).

90 percent of its transfers from the World Bank (from the International Bank for Reconstruction and Development [IBRD] and IDA together) on nonconcessional terms, while the figure for Cameroon was about 50 percent. Terms have hardened for both countries since their emergence as oil producers; indeed, both Nigeria and Cameroon have pleaded for increased concessionality, especially in the case of investments with long gestation lags, e.g., agricultural research. As falling oil prices and devaluation (by 400 percent) have reduced Nigeria's per capita gross national product (GNP), its case for concessional assistance has become stronger.

Colonial connections, commercial interests, and recipients' political and ideological attractiveness have produced major differences in the relative importance of individual donors in concessional flows to each of the MADIA countries. Not surprisingly, in Kenya the United Kingdom (15 percent), the United States (10 percent), Germany (10 percent), and the World Bank (9 percent) have been the major players (see figure 6). These donors have also been predominant in Malawi. In the case of Tanzania, Sweden (15 percent), the Netherlands, (9 percent), and Denmark (7 percent) have been attracted by its socialist ideology, but the views of these donors—who have been described by Tanzania as "friendly donors"—were, on the whole, slow to change on the need for adjustment.[18] Their infrastructural support, together with the levels of framework aid by all donors, enabled Tanzania to postpone reform measures promoted by the International Monetary Fund (IMF) and the World Bank until well into the 1980s. In contrast to these new donors, Tanzania's traditional donors, the United Kingdom and West Germany, to whom it had a long colonial connection, actually terminated their aid in the 1970s because of foreign policy differences over southern Africa. In West Africa, again reflecting colonial ties, France has been the primary donor in Senegal (34 percent) and Cameroon (34 percent), while the United Kingdom has been the leader in the more commercial (TRN) transfers in Nigeria (31 percent), followed by France and Germany, both with 16 percent. Recipients both reflect and prompt changes in their relative influence, and especially in the impact of their policy advice. In Kenya, for example, perhaps the most striking changes are the declining role of the United Kingdom in percentage terms and the diversification in the sources of assistance from countries other than Kenya's original top six donors. On the other hand, many of Kenya's successes in smallholder agriculture (e.g., tea, coffee, dairying, etc.) are explained by the inheritances of British institutions, policies, and manpower.[19] By the same token, the depletion of cotton research capability in much of anglophone

FIGURE 6 Top Six Donors of ODA to MADIA Countries, 1970–1984 (percentage)

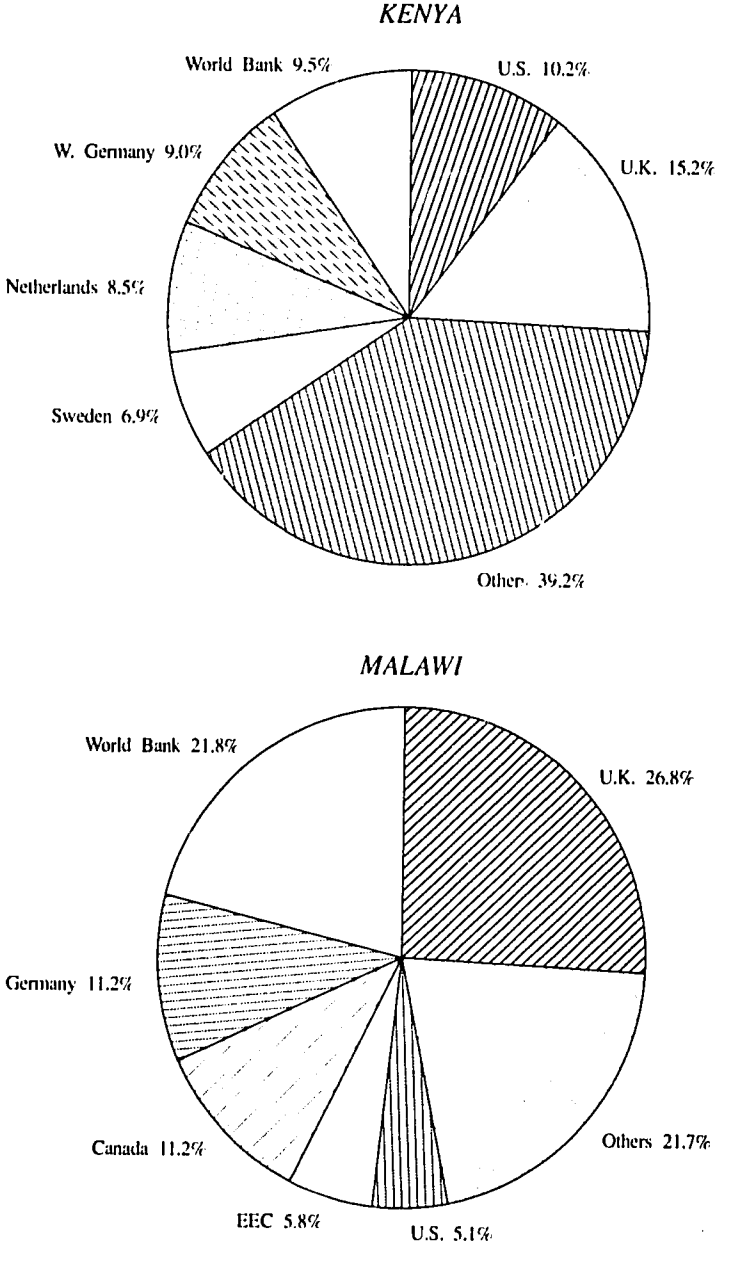

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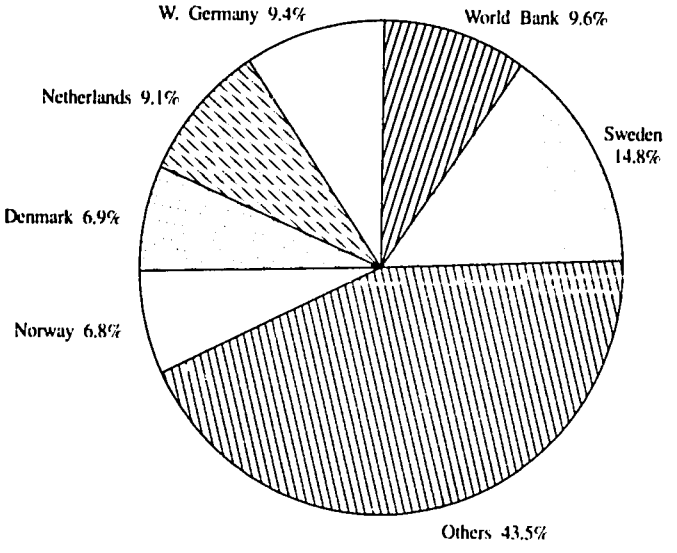
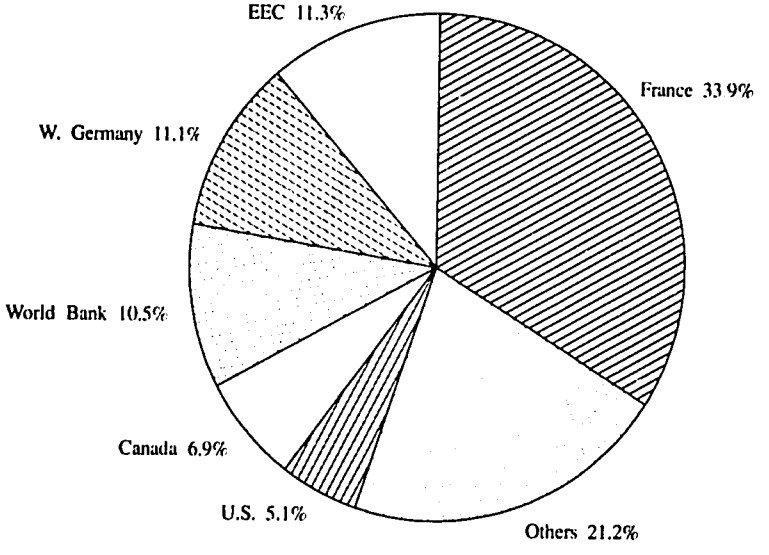
FIGURE 6 (continued)

TANZANIA



CAMEROON



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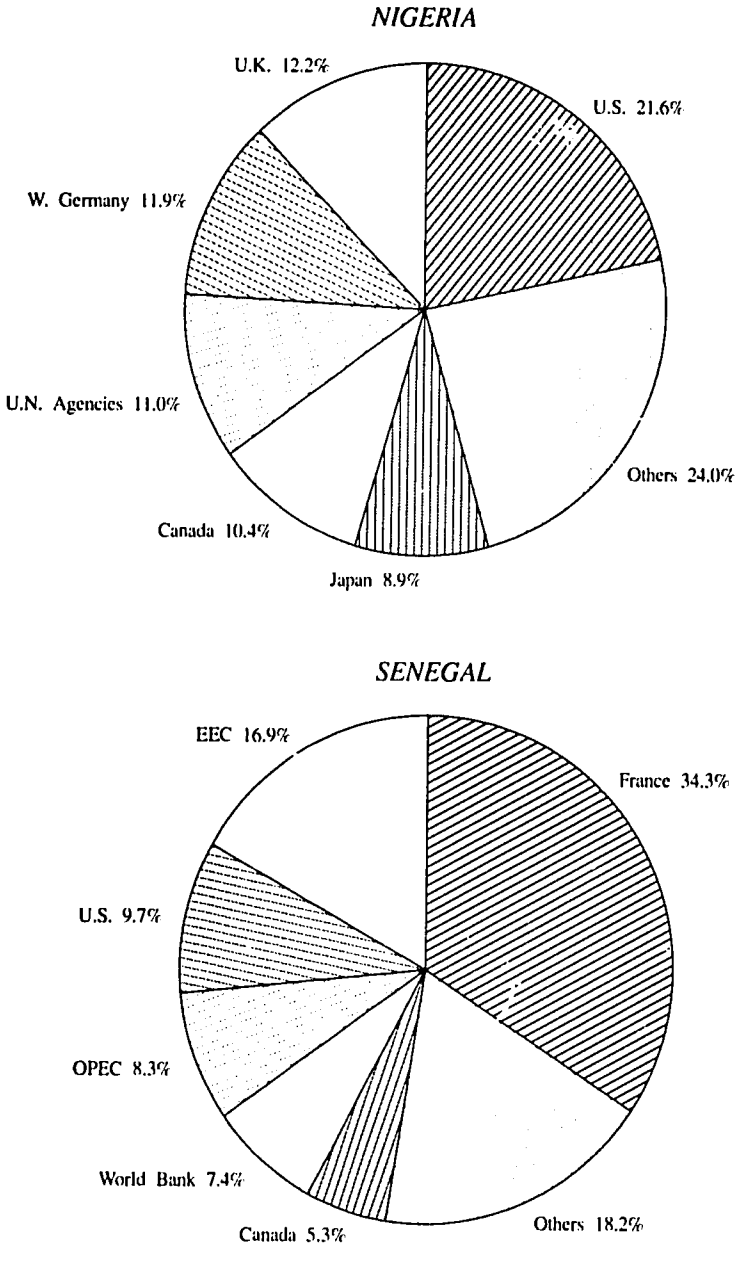


SOURCE: Maria Cancian, "Aid Allocation to Cameroon, Kenya, Malawi, Nigeria, Senegal, and Tanzania: A Review of the OECD Databases," MADIA Working Paper (Washington, D.C.: World Bank, October 1987).

Africa reflects the withdrawal of the U.K. from the cotton industry well before indigenous capacity was established. It also represents a major change in the character of its technical assistance, from a long-term supportive presence in the colonial period to a much shorter-term and smaller-scale assistance in more recent years.[20]

Declining U.K. aid is also evident in Malawi, where the EEC has emerged as a major donor and where the World Bank's role has increased after a dip in flows during the mid-1970s. In Tanzania, Sweden contributed twice as much ODA as any other donor in the early 1970s (20 percent); Sweden had little presence in agriculture, however, as its assistance concentrated on social services and industry.[21] Indeed, the larger share of donor resources allocated to industry and social services in Tanzania, compared to other countries, explains how Tanzania was able to maintain its pro-industrialization and equity-oriented policies as well as it did. The importance of Tanzania's original top six donors has also declined, with the contributions of others rising from 32 percent to 48 percent for TRN, and from 30 percent to 46 percent for ODA. While a larger number of donors now each contribute smaller amounts of assistance, Tanzania's friendly donors, which have been generally supportive of its policies, have begun to appreciate more fully the importance of the macroeconomic environment for development and have supported the need for reform measures promoted by IMF and World Bank conditionality.

In West Africa, France has sustained, and in Senegal even increased, its leading role (with 33 percent and 40 percent of total ODA and TRN respectively) in contrast to the United Kingdom in East Africa.[22] At the same time, the EEC, which France joined in the early 1960s, has picked up more of the ODA share in Senegal—rising from 10 percent to 24 percent of ODA. In the case of Cameroon, however, EEC flows have shrunk from 17 percent to 3 percent of TRN, and from 22 percent to 5 percent of ODA.

In 1974, after Nigeria joined OPEC and the United States departed, the World Bank became an important contributor of capital, especially in agriculture. Nigeria's higher per capita income after the oil boom reduced its eligibility for concessional assistance and, while France and Germany are emerging as sources of nonconcessional flows, the Bank's role in Nigeria's agricultural sector remains strong.[23]

The Bank's share of ODA flows to a country can be taken as an indicator of its influence in two quite opposite ways. We have already noted the implications of contributing large shares of total assistance, but in the specific case of the World Bank, a relatively *small* share might mean lower direct financial influence but greater need for aid coordination—

and hence a different, but potentially important, opportunity for the Bank to influence policy.

In the 1970s, aid coordination based on policy packages was less significant than it is today, and much of the World Bank's influence came from the generally accepted authoritativeness of its country economic work and reports, its role as the organizer of aid consortia and consultative groups, and its emergence as coordinator of arrangements for co-financing of projects. As the scale of lending in support of policy reform has increased since the early 1980s, along with balance-of-payments support operations in which the Bank plays an important role, the Bank's influence on the size and form of total donor resources going to countries—and on the associated policy reform packages—has risen considerably.[24] Over the 1970–1984 period, however, the Bank played a relatively minor role in the volume of direct financing channeled to MADIA. IDA accounted for a small 9.5 percent of the ODA received by Kenya and Cameroon during 1970–1984, compared to 20.7 percent in Malawi, but only 8.9 percent in Tanzania and 6.8 percent in Senegal.[25] The share of total Bank lending (i.e., IDA and IBRD) in TRN was only 9 percent in Nigeria during 1970–1984; in East Africa, the shares were 19 percent in Kenya, 20 percent in Malawi, but only 12 percent in Tanzania.

The Bank's influence in promoting important development ideas has been distinctly greater than that suggested by its ODA contributions, especially since the 1973 McNamara speech and the subsequent growth of the Bank's share in capital transfers to developing countries. Among the MADIA countries, this expanding influence emerged earlier in the anglophone countries as the Bank moved into the vacuum left by the declining U.K. role. Bank influence on integrated agricultural development also increased in francophone MADIA countries, but it was not substantial until the late 1970s and early 1980s as the need for macroeconomic adjustment grew in these countries.

Several factors help to explain this development. First, the Bank's breadth of experience and professionalism, relative to that of bilateral and even other multilateral aid agencies, is generally acknowledged, as is its international (and hence nonpartisan) status. This has tended to give its presence and policy stance more weight. The personal commitment of McNamara on poverty and Clausen on adjustment lending also played an important part. This is far from implying, however, that there have been no criticisms of the Bank. Indeed, it has attracted vociferous critics on a variety of issues—helping socialistic countries, encouraging public sector growth, promoting welfare states in the McNamara years, and, finally, its

excessive private sector orientation and movement away from its earlier poverty alleviation stance during the Clausen and Barber B. Conable, Jr., periods.[26]

It should also be remembered that support in the donor community for policy reform and adjustment lending has been variable. The United States has been the most overt and active supporter of adjustment assistance and the use of conditionality. The United Kingdom and West Germany have followed suit, although they have been less active in devising conditions for lending. Because of the need for burden sharing, France has had to go along with adjustment lending, although in several cases adjustment programs are dismantling the very institutions France has established.[27]

Knowledgeable technocrats are concerned about whether new lending patterns take adequate account of the variety of technical, organizational, and other constraints on smallholder development; the successes and failures of past donor efforts to address these issues; the respective roles of adjustment and project lending; and the need for balance between assistance based on conditionality and policy reform, and assistance that emphasizes long-term capacity building to address the many complex development issues facing African agriculture.

Agricultural Performance in MADIA Countries

Discussion of country performance must be viewed against the background of several ongoing debates regarding the appropriate balance between (1) food and export crop production, (2) growth and equity objectives, and (3) price and nonprice factors in enhancing (and explaining) agricultural performance. Development debates and government and donor policies have tended to emphasize the conflict between food and export crop production, rather than promoting policies that support balanced development of the agricultural sector as a whole. This approach has resulted in swings in aid flows and activities supported by donors, with a major shift of focus from export crop expansion in the 1960s (reflecting the priorities of the colonial era) to support for food crop expansion in the mid-1970s (in response to the deteriorating food situation in world markets and on the African continent). This was followed by a new emphasis on the need for export orientation in the early 1980s, associated with the World Bank's report on Sub-Saharan Africa (the so-called Berg Report) and was exemplified by the structural adjustment programs initiated in Africa and elsewhere. In the latest swing of the pendulum, this priority has been succeeded by a revival of concern about food security, as reflected in recent policy statements of major donors.[28]

The attainment of food security is of fundamental importance in the farming decisions of small rural households. Assured food crop production releases land and labor for diversification into other higher–value

production for domestic use or export. Export crop production, however, helps raise and stabilize household and national income, thereby increasing food security. Because of the labor intensity required, export crops tend to generate greater employment than food cropping. Moreover, the production of most export crops tends to be scale–neutral and therefore can be undertaken by farmers with holdings of any size. Indeed, where marginal productivity in export crop production is high and the returns ensured—as in the cases of tea and coffee in Kenya, or cotton in Cameroon—farming households have relied on the market fo food out of choice—unlike their poorer rural counterparts who have depended on the markt out of necessity. Despite these features, export crops were neglected by both governments and donors in the 1970s.

In later sections, this issue is addressed by contrasting the experience of Kenya—which has pursued an agriculturally led development strategy and achieved growth in both food and export crop production—with the very different policy stances and performance records of several other countries in the MADIA sample, where unbalanced positions either favoring or discriminating against the export crop sector have had adverse consequences for both growth and equity objectives.

Development economics literature in the 1970s tended to emphasize the extent of complementarity (rather than competition) between growth and equity objectives without paying adequate attention to its key determinants—in particular, the profile of asset distribution in a given economy and the substantial public sector planning and implementing capacity needed for the provision of public goods in support of smallholder production. These two factors critically determine the time horizon within which growth and equity objectives can be reconciled. Evidence from Kenya, Tanzania, and Malawi is used to illustrate the extent of the tradeoffs between growth and equity that have in fact occurred during the short and medium run under specific country conditions. The comparative experience of these countries also illustrates the complex interactions between initial conditions, resource endowments, external shocks, and policy responses that have determined short- and long- run growth and equity outcomes.

The primacy given by donors to "getting prices right" since the publication of the Berg Report on Sub-Saharan Africa has come under criticism from several analysts.[29] Examples are used from the three West African MADIA countries to show that price incentives are a necessary, but by no means sufficient, condition for broadly based and sustained agricultural growth. A variety of nonprice factors—including the availability of

effective agricultural research, extension, input supply, and output marketing arrangements—have played important roles in determining overall supply responses, as distinct from relative cropping shifts. We shall also demonstrate the part that country-specific political and other unquantifiable factors have played in providing nonprice preconditions of growth.

The analysis shows how structural adjustment lending must be complemented by other forms of project and nonproject assistance in order to reconcile the short-term nature of structural and sectoral adjustment programs and the time required to alleviate many of the nonprice constraints on growth. This is not to imply that Africa is not getting other forms of assistance; rather that the glamour attached to the relatively short-term structural adjustment lending now needs to be attached to the broader and longer-term developmental concerns that received attention in the 1950s and 1960s.

The Roles of Resource-Poor and Resource-Rich Regions in Agricultural Development

One of the development debates that has *not* yet formally occurred—but that took place mainly by default in the 1970s as a result of the perceived failure of the "trickle down" policy following the Green Revolution in Asia—relates to the appropriateness of diverting scarce government and donor resources and policy attention to the alleviation of poverty and food security concerns in resource-poor regions, as opposed to focusing on the development of other areas with better natural endowments or known technological potential. The contrasting approaches of Tanzania and Kenya are used to illustrate their different growth performance and how, despite Tanzania's worthy efforts to open up areas of high potential, its policy of quick, universal coverage of services to all rural areas made it financially impossible, despite substantial external assistance, to maintain many of its worthwhile long-term developmental efforts in the productive and social sectors.

An Overview of Country Performance

The primary focus of this study is on the period from 1970 to 1985. The year 1970 was selected as the base because it was a relatively normal year in terms of the international market environment as well as the climate and

TABLE 3 Major Agricultural Exports, Estate and Smallholder Production, and Food Imports of MADIA Countries, 1970–1985 (average annual percentage growth in volume)

	Major agricultural exports						Production										Food				
							Smallholder						Estates				Maize				
	Coffee	Tea	Ctn.	Tobac.	G'nut	Hort.	Coffee	Tea	Tobac.	Ctn	G'nut	Sugar	Coffee	Tea	Tobac.	Ctn.	Sugar	Prod.	Official purch.	Official sales	Imports	Food aid
East Africa																						
Kenya	3.8	7.5				12.7	6.0	13.5		4.9		16.9	1.0	5.5				3.9	2.4	9.2	6.4	43.1
Malawi		5.2	–12.5	11.7	–13.2				3.0	1.1	–7.4				12.9		14.7	1.5	19.1	23.7	3.1	28.6
Tanzania	0.8	1.9	–2.3	–4.7			2.3	13.7	–4.8	1.6			–4.1	1.0	–7.5		0.8	2.1	1.1	1.9	3.0	23.5

	Major agricultural exports						Production								Food							
							Smallholders			Estates		General						Imports				
	Coffee	Cocoa	Ctn	G'nut	Rubber	Palm oil	Coffee	Cocoa	Ctn	Rubber	Palm oil	Ctn	G'nut	Cocoa	Rice	Maize	Millet/ Sorghum	Rice	Wheat	Sugar	Genrl	Food aid
West Africa																						
Cameroon	1.9	0.4	4.6		–5.9	6.6	1.0	2.0	8.3	2.7	4.2				16.5	4.1	1.3				6.1	4.1
Nigeria													–3.2	–4.9	10.5	6.1	0.2	46.7	15.2	20.0		
Senegal				–9.5								6.8	–0.4		1.2	5.6	0.2	7.3	0.5	–6.8		

NOTES: Blank cell = not available.
Growth rate averaged for certain crops, for example burley and flue-cured tobaccos.
Growth rates for Nigeria production are calculated using Food and Agricultural Organization data.
SOURCE: World Bank Database (BESD).

institutional environment in most of these countries (with the exception of Nigeria, where a civil war had recently ended). The 1985 cutoff was selected for similar reasons. This period also permitted comprehensive coverage of production performance in all six countries. To understand developments during the 1970 to 1985 period, "initial" conditions prior to the 1970s are examined, including those emanating from the colonial experience. Finally, production performance in the years of structural adjustment since the early 1980s is reviewed in order to explore the extent to which policy reforms have addressed the crucial constraints on production identified in our long-term analysis. It must be stressed that data on export crop performance is far more reliable than on food crops, and for food crops, there are differences among MADIA countries in data consistency. Judgments on country perfomance are not based on statistical measurements alone, but also on other information such as the nature and extent of technical change, growth of input use, effectiveness of services, etc.

Growth rates for major food and export crop production for the six countries are presented in table 3. Kenya has been the best performer in the agricultural sector. Not only did its production of virtually all major export and food crops increase, but the share of small farmers in the production of all crops increased substantially relative to that of large farms and estates.[30] Moreover, higher smallholder production did not come at the cost of the large farm/estate sector; rather, the former increased mainly through area expansion (with yield growth in maize and coffee only) while large farm/estate output expanded mainly through increased yield per hectare. Because small farm yields increased little, despite policies which favored intensification in the smallholder sector, yield differences (in the case of tea and coffee) between small farms and estates remained in the order of 100 percent.

In Malawi, estate production of major crops increased impressively, especially for tobacco (13 percent per year) and sugar (15 percent per year). Smallholder maize production, however, stagnated and fell in per capita terms; but since output of all other smallholder crops fell to a greater extent (in per capita terms), the profile for all smallholder crops shows a net shift towards maize and away from export crops until about 1985. Smallholder productivity showed no increase, but estate sector tobacco yields increased considerably, with an average differential of four times relative yields in the smallholder sector (compared to Kenya's differential of two times). Malawi's much higher estate/smallholder land productivity differential reflects the fact that its development strategy strongly favored estate agriculture in order to take advantage of the export

opportunities that had opened up in the mid-1970s.[31] Productivity differences based on farm size have profound implications in the short and the long run for foreign exchange earnings, government revenues and expenditures, output growth, land distribution, and the robustness of the growth process generally.[32]

Kenya and Malawi are the only countries in the MADIA sample that expanded world market shares for major export crops; all others lost shares (see table 4).

Both large and small farm export agriculture performed poorly in Tanzania (see table 3). Coffee and tea exports stagnated, and exports of all other major crops declined. Within the smallholder sector, there was a major shift in agricultural production away from export to food crops until about 1986.

Informal food markets were active in all three countries. Whereas the government's share of purchases and sales of maize increased in Kenya and Malawi, in Tanzania, informal (including parallel or black) markets had become more active by the end of the 1970s—both internally and across national borders. Maize was offered in exchange for consumer goods that had become more scarce in Tanzania (relative to Kenya or Malawi) due to a poor macroeconomic environment.

Despite its lackluster performance in maize production, Malawi was a consistent net exporter of maize except between 1980 and 1981 and in 1986. In spite of increases in maize production, however, Kenya, Tanzania, and Malawi increased food imports and food aid—Kenya being the most dependent of the three on these sources. Malawi's food exports may have been due to a lack of effective demand at home, owing to its skewed land (and consequent agricultural income) distribution. The growth in food imports in Kenya may reflect exactly the contrary—a more dynamic internal demand for maize, stemming from a more broad-based income growth. The growth of Tanzania's food imports and food aid receipts, in spite of its land abundance and high levels of financial assistance, emphasizes its poor policy environment.

In West Africa, Cameroon's performance was the best of the three MADIA countries, but it was unimpressive relative to that of Kenya and Malawi. Production and exports of palm oil and cotton expanded, while other export crops stagnated. Poor data make food crop performance harder to gauge, but rice production, for which relatively reliable statistics are available owing to its enclave status, increased sharply at 16 percent per year (although from a small base). Root crops, sorghum, and millet, the prime food sources, kept pace with population growth. An important development in Cameroon has been the growth of maize production, and

TABLE 4 Export Volumes, Shares, and Growth Rates of Primary Crops Grown by MADIA Countries and Their Major Competitors, 1961–1986 (average values for indicated periods, volume in thousand metric tons)

	1961–63		1971–73		1983–85		1961–86
Crop	Volume	Share (%)	Volume	Share (%)	Volume	Share (%)	Growth rate (%)
Cocoa Beans							
World	1043.2	100.0	1185.1	100.0	1319.5	100.0	0.74
Ghana	417.0	40.0	366.8	31.0	158.2	12.0	–4.05
Ivory Coast	96.4	9.2	149.8	12.6	384.9	29.0	6.44
Brazil	76.1	7.3	101.4	8.5	144.1	11.0	2.65
Ecuador	33.2	3.2	42.9	3.6	40.5	3.0	–1.73
Malaysia	0.3	0.0	4.3	0.4	68.3	5.2	27.72
Cameroon	70.5	6.8	81.9	6.9	86.2	6.5	0.59
Nigeria	187.3	18.0	237.7	20.1	143.2	11.1	–2.75
Coffee							
World	2910.3	100.0	3559.9	100.0	4220.6	100.0	1.54
Brazil	1057.2	36.3	1051.9	29.6	1001.7	23.7	–1.39
Colombia	366.9	12.6	396.4	11.2	574.5	13.6	2.52
Ivory Coast	160.6	5.5	195.5	5.5	216.3	5.1	1.71
Angola	140.1	4.8	192.4	5.4	22.7	0.5	–8.39
Mexico	85.1	2.9	111.5	3.1	196.6	4.7	3.71
Indonesia	64.5	2.2	94.0	2.6	273.7	6.5	6.54
Cameroon	39.2	1.3	70.6	2.0	90.8	2.2	3.49
Kenya	34.3	1.2	65.0	1.8	97.3	2.3	5.03
Tanzania	25.9	0.9	50.2	1.4	49.8	1.2	2.28
Cotton							
World	3647.9	100.0	4299.2	100.0	4294.9	100.0	0.82
United States	1103.8	30.1	961.2	22.2	1265.1	29.4	1.20
Mexico	366.8	10.1	182.9	4.3	85.7	2.0	–6.35
USSR	349.2	9.6	642.4	14.9	691.6	16.1	3.55
Egypt	278.5	7.6	304.4	7.1	175.7	4.1	–3.31
Brazil	214.5	5.9	264.6	6.2	99.7	2.3	–10.76
Pakistan	121.6	3.3	216.3	5.1	203.6	4.7	1.79
China	n.a.	n.a.	22.0	0.5	203.3	4.7	14.91
Nigeria	37.8	1.0	10.7	0.3	n.a.	n.a.	–8.85
Tanzania	37.3	1.0	60.0	1.4	33.1	0.8	–1.75
Groundnuts							
World	1385.0	100.0	917.4	100.0	785.5	100.0	–2.95
Sudan	105.5	7.6	120.9	13.2	17.1	2.2	–6.60
Niger	76.0	5.5	76.3	8.4	n.a.	n.a.	–29.65
S. Africa	65.8	4.8	56.8	6.2	10.8	1.4	–4.96
Gambia	50.4	3.7	34.0	3.7	31.0	4.0	–2.38
United States	14.8	1.1	163.4	17.7	266.8	33.9	12.54

(continues)

TABLE 4 (continued)

Crop	1961–63 Volume	1961–63 Share (%)	1971–73 Volume	1971–73 Share (%)	1983–85 Volume	1983–85 Share (%)	1961–86 Growth rate (%)
Groundnuts (continued)							
China	2.6	0.2	32.1	3.5	154.0	19.6	13.50
Argentina	n.a.	n.a.	1.2	0.1	93.4	11.9	46.37
Cameroon	11.9	0.9	9.4	1.0	0.3	0.0	–20.62
Malawi	20.7	1.5	30.8	3.4	4.9	0.6	–4.78
Nigeria	554.7	40.0	147.1	16.0	n.a.	n.a.	–33.25
Senegal	249.9	18.1	17.2	1.9	13.7	1.8	–19.54
Groundnut cake							
World	1426.6	102.6	1630.8	100.0	591.1	100.0	–4.07
India	615.2	43.8	845.0	51.9	248.1	43.1	–4.07
Burma	152.3	11.0	51.3	3.1	4.2	0.7	–14.85
Argentina	127.3	9.2	73.5	4.6	30.6	5.5	–5.33
Brazil	101.5	7.4	150.5	9.2	28.9	5.4	–5.37
Gambia	2.9	0.2	16.0	1.0	13.6	2.6	4.03
United States	n.a.	n.a.	n.a.	n.a.	16.5	3.1	1.80
Malawi	1.0	0.1	1.8	0.1	1.5	0.3	0.85
Nigeria	84.0	6.1	112.6	7.0	n.a.	n.a.	–25.41
Senegal	163.3	11.9	201.9	12.2	115.1	18.2	–2.70
Groundnut oil							
World	354.9	100.0	466.2	100.0	383.8	100.0	0.02
Argentina	55.2	15.2	53.0	11.5	35.6	9.3	1.95
India	37.7	9.8	0.1	0.0	n.a.	n.a.	–14.16
China	6.2	1.8	19.3	4.2	53.0	13.8	6.44
Brazil	5.6	1.5	59.8	13.1	54.3	14.7	6.19
Nigeria	60.1	16.9	64.5	13.7	n.a.	n.a.	–14.76
Senegal	116.0	33.7	126.4	26.2	109.1	26.7	–2.24
Palm oil							
World	601.7	100.0	1378.2	100.0	4513.7	100.0	10.73
Zaire	149.3	24.8	87.0	6.5	8.9	0.2	–14.48
Indonesia	109.1	18.1	236.0	17.1	435.2	9.5	6.64
Malaysia	106.4	17.7	689.4	49.8	3029.1	67.6	17.36
Singapore	32.5	5.4	210.5	15.3	685.3	14.9	14.52
Cameroon	8.9	1.5	3.4	0.3	5.7	0.1	–0.29
Nigeria	138.5	22.9	7.4	0.6	n.a.	n.a.	–21.91
Tea							
World	611.4	100.0	778.0	100.0	1049.2	100.0	2.46
India	213.5	34.9	196.9	25.3	216.1	20.6	0.16
Sri Lanka	201.6	33.0	203.2	26.1	186.8	17.7	–0.47

(continues)

TABLE 4 (continued)

Crop	1961–63 Volume	1961–63 Share (%)	1971–73 Volume	1971–73 Share (%)	1983–85 Volume	1983–85 Share (%)	1961–86 Growth rate (%)
Tea (continued)							
China	30.2	5.0	43.7	5.6	135.7	12.9	7.26
Indonesia	29.6	4.9	40.0	5.1	81.5	7.7	4.74
Kenya	16.2	2.6	50.3	6.5	111.9	10.7	8.96
Malawi	12.0	2.0	20.4	2.6	36.8	3.5	5.47
Tanzania	3.8	0.6	9.0	1.2	13.4	1.3	5.73
Tobacco							
World	879.0	100.0	1161.5	100.0	1375.0	100.0	2.17
United States	223.1	25.4	260.1	22.3	247.1	18.0	0.49
Zimbabwe	76.9	8.7	60.0	5.1	90.7	6.6	2.21
Turkey	74.6	8.5	105.8	9.1	80.7	5.9	0.76
Bulgaria	68.7	7.8	64.6	5.6	61.7	4.5	-0.57
India	59.9	6.8	72.7	6.2	76.2	5.6	1.99
Greece	58.4	6.6	59.8	5.2	84.3	6.1	0.59
Brazil	45.0	5.1	63.5	5.5	187.6	13.6	7.12
Italy	15.6	1.8	22.8	1.9	87.3	6.3	12.63
Malawi	13.0	1.5	27.5	2.4	57.8	4.2	6.83

NOTES: n.a. = not available.
In cases where data for certain years were not available, interpolations based on averages were made to allow calculation of growth rates.
SOURCE: World Bank Database (BESD).

even though this comes from a small base, it shows much potential for growth in the long run as a food and feed crop.

Cameroon was the least dependent of the three West African MADIA countries on food imports, with the exception of rice, imports of which increased rapidly with the rising growth in internal demand from urbanization and income growth.

In Nigeria production of most export crops fell sharply. Nigeria not only lost its shares in world markets (see table 4), but became a major importer of edible oils and cotton. Production of other (nontraded) food and root crops probably kept pace with rural population growth, but not with the increased demand resulting from rapid urbanization and income growth.[33] As in Cameroon, the production of rice and maize appear to have done well. Nevertheless, there was accelerated demand for the traded food crops (rice and wheat), with increased imports of wheat, rice, and maize until 1986, when a ban was imposed on food imports.

Senegal's agriculture stagnated, even with substantial year-to-year fluctuations (see table 3). The production increases that occurred were due

to area expansion. Technical change in the form of drought-resistant groundnut varieties arrested a production decline that would have occurred from increased frequency of droughts in the early 1970s. Senegal has had the lowest self-sufficiency ratio of the MADIA countries, with food imports accounting for nearly 35 percent of aggregate calorie availability (compared to 10 percent or less for the rest of the MADIA sample). Stagnant domestic production and expanding internal demand pushed up rice imports sharply until they peaked in 1984–1985 at over 370,000 metric tons. As in the other two West African MADIA countries, maize production did well in Senegal but also from a small base.

Factors Explaining Performance

This section contains an assessment of agricultural performance in terms of the three categories described in the introduction: luck, macroeconomic policies, and sectoral policies. For analytical purposes, the three explanatory categories are further subdivided into a total of twenty-three variables. *Luck* has twelve variables—eight cover the initial conditions at independence, and four are related to subsequent political or economic (internal and external) shocks; *macroeconomic* policies/environment has four variables covering implicit and/or explicit taxation and public expenditures; and *sectoral* (mostly nonprice) policies/environment has seven variables related to the land, labor, credit, and technological and institutional factors needed to support agricultural growth.

Table 5 presents the findings. Each of the six countries is rated for each variable on the basis of a simple 0–1 rating, where 0 = unsatisfactory, and 1 = satisfactory. Our judgment is based not only on how effective past policies have been, but also on how well the countries have used their first quarter century of independence to lay a foundation for long-term growth, based on performance in these various categories. In reality, of course, the story of initial conditions and subsequent policy responses contains more nuances than the table suggests; therefore, a more fully articulated picture of the genesis and evolution of the relevant policies is provided.

TABLE 5 MADIA Country Endowments at Independence and Subsequent Policy Responses in Support of Smallholder Agriculture

Endowments

	Initial conditions								Subsequent internal & external shocks			
	Resources		Physical and human capital									
	Land quant.	Land qual.	Infrastruct	Health svcs.	Life expect	Education	Safe water	Inst. endow	Civil strife	Int'l terms of trade	Int. rates	Foreign demand
East Africa												
Kenya	0	1	1	1	1	1	0	1	1	0	0	1
Tanzania	1	1	0	1	1	0	0	0	1	0	1	0
Malawi	0	1	0	0	0	0	1	0	1	0	0	0
West Africa												
Nigeria	0	1	1	0	0	0	0	1	0	1	0	1
Cameroon	1	1	0	0	1	1	1	0	1	1	0	1
Senegal	1	0	0	1	0	0	1	1	1	0	0	0

Policy responses

	Macroeconomic environment				Sectoral environment							
	Taxation		Govt. expenditure							Institutional policy		
	Implicit (exch)	Explicit	Intersectoral balance	Level & quality	Land policy	Labor policy	Credit policy	Tech. policy R	Tech. policy I	Govt.	Commrc	Grass-roots
East Africa												
Kenya	1	1	1	1	1	1	1	1	1	1	1	1
Tanzania	0	0	0	0	0	0	0	0	0	0	0	0
Malawi	1	0	1	1	0	1	1	1	1	1	0	0
West Africa												
Nigeria	0	1	0	0	1	0	0	0	1	0	1	0
Cameroon	1	0	1	1	1	1	1	0	1	1	0	0
Senegal	1	0	0	0	1	1	0	0	0	0	0	0

(continues)

TABLE 5 (continued)

NOTES: 1 = favorable; 0 = unfavorable.

Binary rating system elaborated in accompanying text. Brief notes on criteria as follows:
Land quantity rated favorably above 1.5 hectares per capita arable land (cultivable/rain-fed).

Land quality rated favorably based on agroclimatic conditions (soils, rainfall, length of growing season).

Infrastructure rated favorably above 30,000 km total classified roads (also according to road densities with respect to population, total and arable land areas, see table 8).
Health services rated favorably below 25,000 persons per physician and below 3,000 persons per nurse.

Life expectancy rated favorably above 43 years average.

Education rated favorably above 50 percent enrollment in primary school of total age group.

Access to safe water rated favorably above 25 percent of total population.
Institutional endowment rated favorably in presence of developed marketing, legal, and judicial bodies.

Civil strife rated unfavorably in presence of overt ethnic rivalries or civil war.
International terms of trade, interest rates, and foreign demand rated favorably based on calculations in table 10 ("External Shocks and Policies," 1967–1984).
Implicit taxation rated favorably based on real effective exchange rate calculations (see figure 7);

Explicit taxation rated favorably based on trends in ratios of producer prices to international prices at nominal and real effective exchange rates (see tables 12a and 12b).
Intersectoral balance of government expenditure rated favorably based on behavior of recurrent and capital expenditures.

Quality of government expenditure rated favorably on normative criteria for contribution to smallholder agricultural production.
Land policy rated favorably based on access to land, land distribution, and land inventory data.

Labor policy rated favorably based on changes in economic and agrarian structure affecting labor markets.

Credit policy rated favorably based on access to and supply of credit in rural areas.
Technology policy rated favorably based on "R" research strategy/program centers; and "I" use of modern inputs, rate of fertilizer adoption.

Government, commercial, and grassroots institutional policy rated favorably using normative criteria promoting supply and marketing channels for smallholder agriculture.

The Luck Factor

Initial conditions reflecting luck are divided into the quality and quantity of natural, human capital, and institutional resources at the time of independence. Following Balassa and others, external shocks are then decomposed into changes in overall international terms of trade, interest payments on foreign borrowings, and changes in foreign demand for countries' exports, that is, the extent to which shares were maintained in world markets. Finally, internal or external political strife that affected the countries' performances is also considered.

Initial conditions at independence. Tables 6, 7, and 8 give data on per capita arable land, road densities, and basic economic and social indicators in MADIA countries at independence and subsequently. In East Africa, per capita income was highest (and the general level of development was the greatest) in Kenya, followed by Tanzania and Malawi. In West Africa, Senegal's per capita income was the highest, followed by Cameroon and Nigeria. Unlike East Africa, per capita income levels in West Africa do not necessarily reflect the development of the countries' rural sectors, as the following detailed discussion of land resources, infrastructure, and social indicators will make clear. Even in East Africa, judgments on these matters are more complex than basic aggregates might suggest; for example, per capita land availability needs to be considered jointly with land quality as an indicator of a country's natural resource endowments.

Similarly, the population factor is something of a two-edged sword. On the one hand, high population densities make intensification of agricultural production possible by increasing the supply of labor and reducing wage rates. They therefore facilitate the production of export crops and the adoption of new food crop technologies, which tend to use large quantities of labor.[34] In countries at relatively early stages of development, however, high and growing densities also increase land pressure, which in turn leads to environmental degradation through reduced bush fallow and increased cropping intensity. More generally, the relative effects on agricultural growth of autonomous increases in population densities and policies that counter their adverse effects remain largely unexplored.[35] Here we need only note that in terms of per capita arable land, Tanzania and Cameroon have been the two land-surplus countries—although they have pockets of land pressure (see table 6). In terms of simple per capita arable land availability, Malawi, Nigeria, and Kenya (in that order) had the most land pressure at independence, followed by

Senegal. However, given that Kenya had a higher population growth and a lower urbanization rate than Nigeria, the actual pressure of population on Kenyan land has increased significantly over time.

Malawi inherited the least favorable position of the three East African countries when consideration of per capita arable land is combined with land quality.[36] Within the West African group, Senegal was clearly the worst off. Cameroon and Nigeria enjoy a much greater range of production possibilities because they not only include semi-arid lands in the north (similar to, but better watered than, Senegal's),[37] but also the Sudano-Sahelian areas in the middle belt and humid southern rainforest zones.[38]

Table 7 shows road densities in the MADIA countries at independence and in the 1980s. Kenya, Nigeria, and Malawi were clearly better endowed with transportation networks than Tanzania, Cameroon, or Senegal. Kenya's superior transportation infrastructure reflects the fact that it had the largest European settlement in Africa and a railway connecting the White Highlands to the port of Mombasa.

Nigeria's road network supported a thriving smallholder export agriculture. While Nigeria ranks high in terms of kilometers of road per unit of area of arable land, its per capita road mileage was similar to Malawi's. The latter's road network, while relatively favorable in terms of its ratio to arable land, has not offset the extremely high international transportation costs that result from being landlocked. These costs have more than doubled since the closure of its traditional shipping outlets in Mozambique in the early 1980s. The groundnut basin in Senegal benefited from investment in an effective road and railway network made by French colonialists to facilitate the exchange of smallholder groundnut production and Indo-Chinese rice.[39] Cameroon and Tanzania had relatively little physical infrastructure, although they enjoyed good ports.

Economic literature has shown that investment in human capital is critical for increasing agricultural productivity. The MADIA study did not undertake a detailed analysis of policies and investments in the social sectors (except to the extent that such investments were included in integrated rural development projects financed in the 1970s). Data on social indicators presented here need to be considered with caution (especially when cross-country comparisons are made, as they are based mainly on secondary sources). Nevertheless, existing evidence suggests that Kenya had generally more favorable initial conditions in terms of life expectancy, infant mortality, population per physician, and primary school enrollment (see table 8). Consistent with its lowest per capita income of the six MADIA countries, in 1965 Malawi had the

TABLE 6 Arable Land in MADIA Countries, 1965–2000 (hectares per person)

	1965	1985		2000	
	Total pop.	Rural pop.	Total pop.	Rural pop.	Total pop.
East Africa					
Kenya	1.34	0.86	0.73	0.60	0.42
Malawi	0.86	0.81	0.73	0.60	0.45
Tanzania	3.99	2.59	2.30	1.68	1.44
West Africa					
Cameroon	5.99	5.23	3.34	4.76	2.09
Nigeria	1.22	1.01	0.71	0.88	0.48
Senegal	2.67	2.38	1.62	1.80	1.04

NOTES: 1. Arable land: Estimates and methodologies vary; for Kenya, which conducted a detailed agroclimatic analysis in conjunction with the German Agency for Technical Cooperation (GTZ), the estimate is 26 percent. Other countries, such as Cameroon and Nigeria, where extensive soil analysis is lacking, the estimates reach 75 percent of total land area.

2. Population: Figures projected from most recent census in country to year 1985 and 2000. Rural population calculated from government estimates of urban population, and percent urbanized in year 2000.

SOURCES: Jaetzold and Schmidt, *Farm Management Handbook of Kenya: Natural Conditions and Farm Management Information* (Government of Kenya, Ministry of Agriculture and German Agricultural Team of the German Agency for Technical Cooperation, 1982); Richard Mkandawiri and Chimimba Phiri, "Assessment of Land Transfer from Smallholders to Estates," Paper written for World Bank; United Republic of Tanzania, Statistical Abstract (1973–79), Bureau of Statistics, Ministry of Planning and Economic Affairs, 1983; Lele et al., "Nigeria's Economic Development"; Republique du Cameroon, Bilan Diagnotisque du Secteur Agricole au Cameroun, Ministere de l'Agriculture, 1980; Republique du Senegal, "Situation Economique du Senegal," Ministere du Developpement Rural/Direction Statistique, 1982; and "Sixieme Plan Quadriennal du Developpment Economique et Social, 1981–85," Ministere du Plan et de la Cooperation, 1982; Uma Lele and Steven Stone, "Population Pressure, the Environment, and Agricultural Intensification: Variations on the Boserup Hypothesis," MADIA Working Paper (Washington, D.C.: World Bank, forthcoming).

lowest life expectancy, the highest child mortality, and the highest population per physician. Tanzania had poorer indicators than Kenya in terms of its primary school enrollment percentage and access to safe water. It made major strides in the 1970s, particularly in access to primary education and safe water, but also in child mortality, life expectancy, transportation, etc. However, an excessive emphasis on the pursuit

of equity in the absence of growth-oriented policies made it difficult to sustain these gains.

In West Africa, Nigeria's social indicators at independence in terms of life expectancy, child mortality, access to physicians, school enrollment, and safe water were not particularly impressive relative to other MADIA countries, but they clearly improved after the oil boom. Being the center of the French West African colonial empire, Senegal had the highest level of secondary school attendees. Senegal also had, along with Malawi, the highest proportion of population with access to safe water. Both Senegal and Malawi retained their leading positions in this respect. But the improvement in Senegal's social indicators has been much less impressive than that in the other countries. Malawi's social indicators have remained the least favorable, despite considerable strides over the base period.

Subsequent External Shocks and Domestic Policy Developments

Developments in the external environment, such as terms of trade volatility (in particular, oil price hikes), worldwide recessions, escalating interest rates on foreign debt, and exchange rate fluctuations have affected economic growth and financial stability in all MADIA countries. At the same time, countries' own policies, such as excessively expansionary fiscal regimes, failure to adjust relative prices, and restrictions on trade, etc., have also affected growth and payments in these countries. In order to understand their magnitude and relative effects, we have evaluated external shocks and domestic policy developments in MADIA countries between 1967 and 1984. Table 9 illustrates the results on the basis of a ranking assigned to each country with "1" meaning that the country suffered the least (or benefited the most) and "6" meaning that the country suffered the most (or benefited the least) from external shocks and domestic policy developments.[40]

Comparing the six MADIA countries in terms of the total effect of external shocks as a percent of current GDP, the three West African countries *benefited* from shocks due to their mineral resources, while their East African counterparts, which are dependent mainly on agricultural exports, *suffered* substantially from external shocks.[41] In terms of rank order, Nigeria and Cameroon benefited the most, with Senegal a distant third. The recent decline in oil prices, however, has had an adverse impact on both Nigeria and Cameroon. In Senegal, while world prices of phosphates played a positive role, other external shocks relating to agriculture

TABLE 7 Roads in MADIA Countries at Independence and at Present

Independence	Kenya[a]	Malawi[b]	Tanzania[c]	Cameroon[d]	Nigeria[e]	Senegal[f]
Paved (km)	2,013	431	1,300	1,231	11,053	1,658
Gravel/earth roads	39,934	9,697	14,292	13,122	60,818	6,851
Total classified	41,947	10,128	15,592	14,353	71,871	8,509
Population (thousands)[i]	9,404	3,854	11,586	5,332	54,278	3,839
Density (meters/person)	4.5	2.6	1.3	2.7	1.3	2.2
Total land (thousand sq km)[g]	569.25	94.08	886.04	469.44	910.77	192.0
Arable land (%)[h]	26.0	37.0	56.0	75.0	75.0	53.0
Density to total land (km/100 sq km)	7.4	10.8	1.8	3.1	7.9	4.4
Density to arable land (km/100 sq km)	28.3	29.1	3.1	4.1	10.5	8.4
Present	Kenya[j]	Malawi[k]	Tanzania[l]	Cameroon[m]	Nigeria[n]	Senegal[o]
Paved (km)	7,944	2,176	3,194	2,922	24,900	3,688
Gravel/earth roads	56,640	9,253	78,701	46,599	103,274	10,280
Total classified	64,584	11,429	81,895	49,521	128,174	13,968
Population (thousands)[i]	18,791	7,044	21,497	10,555	93,402	6,036
Density(meters/person)	3.4	1.6	3.8	4.7	1.2	2.3
Total land (thousand sq km)[g]	569.25	94.08	886.04	469.44	910.77	192.00
Arable land (%)[h]	26.0	37.0	56.0	75.0	75.0	53.0
Density to total land (km/100 sq km)	11.3	12.1	9.2	10.5	14.1	7.3
Density to arable land (km/100 sq km)	43.6	32.8	16.5	14.1	18.7	13.7

(continues)

TABLE 7 (continued)

NOTES: a. Data for 1965. International Road Federation, World Road Statistics, 1965–69.
b. Data for 1964. Inventory of Designated Roads in Malawi, 1984, Government Printing Office.
c. Data for 1965. Same as a.
d. Data for 1960. Cooperation Nord-Sud Echecs et Succes: Les Cas des Infrastructures de Transport au Cameroon Louis Mvele, Geneve, 1984.
e. Data for 1962. Fourth National Development Plan, Lagos, 1981.
f. Data for 1964. Appraisal of a Feeder Road Project, Senegal, World Bank, 1976.
g. Food and Agriculture Organization.
h. Lele and Stone, "Population Pressure, the Environment, and Agricultural Intensification," 1989.
i. Data from UN Social Indicators, BESD, for same year as road length statistic.
j. Data for 1983. International Road Federation, World Road Statistics, 1985.
k. Data for 1985. Inventory of Designated Roads in Malawi, 1985, Government Printing Office.
l. Data for 1984. Same as j.
m. Data for 1986. Information de Base sur le Reseau Routier Camerounais, Julliet, 1984. Min. of Equip., and Etude d'un Plan d'actions pour le Developpement des Routes de Collectes, BCEOM, July 1987.
n. Data for 1983. National Transport Survey and Projections, Interim Report, vol. 1, 1983.
o. Data for 1982. Same as j.
SOURCES: International Road Federation, "World Road Statistics" (Washington, D.C.: International Road Federation, 1969, 1985); Government of Malawi, "Inventory of Designated Roads in Malawi," 1984, 1985; Uma Lele, Vishva Bindlish, and Juan Gaviria, "Rural Roads and Agricultural Development in Nigeria," MADIA Working Paper (Washington, D.C.: World Bank, 1989); Uma Lele and Steve Stone, "Population Pressure, the Environment, and Agricultural Intensification: Variations on the Boserup Hypothesis," MADIA Working Paper (Washington, D.C.: World Bank, 1989); World Bank Database (BESD); Louis Mvele, "Cooperation Nord-Sud Echecs et Succes: Les Cas des Infrastructures de Transport au Cameroon" (Geneve: Institut Universaire de Hautes Etudes Internationales, 1984).

TABLE 8 Basic Social Indicators for MADIA Countries, Selected Years, 1965–1987

	Population (millions)		Population growth rate (%)		GNP per capita (U.S. dollars)		Life expectancy (years)		Infant mortality rate (per thousand)		Population per physician	
	1965	1986	1965–80	1980–86	1965	1987	1965	1986	1965	1986	1965	1981
East Africa												
Kenya	9.5	21	3.6	4.1	103	340	45	57	112	83	12,820	10,140
Malawi	3.9	7	2.9	3.2	63	160	39	45	199	164	46,900	53,000
Tanzania	11.7	23	3.3	3.5	76	220[a]	43	53	138	98	21,700	19,810
West Africa												
Cameroon	6.1[b]	11	2.7	3.2	168	960	46	56	143	85	26,680	13,990
Nigeria	48.7	103	2.5	3.3	49	370[c]	42	51	177	105	44,230	12,000
Senegal	3.4	7	2.5	2.9	241	510	41	47	171	124	21,100	14,200

	Percentage of age group enrolled in primary school		Percentage of age group enrolled in secondary school		Percentage of population with access to safe water		Average annual growth rate of urbanization (%)	
	1965	1985	1965	1985	1973	1980	1965–80	1980–85
East Africa								
Kenya	54	94	4	20	15	26	9.0	6.3
Malawi	44	62	2	4	33	41	7.8	n.a.
Tanzania	32	72	2	3	13	34	8.7	8.3
West Africa								
Cameroon	94	107	94	107	26	53	8.1	7.0
Nigeria	32	92	5	29	15	36	4.8	5.2
Senegal	40	55	7	13	37	42	4.1	4.0

NOTES: n.a. = not available.

a. Use of overvalued official exchange rate in the case of Tanzania overstates its achievements in per capita income growth relative to other countries.

b. 1968. c. As a result of the recent devaluation, per capita GNP in Nigeria was approximately four times lower than amount shown above.

SOURCES: World Bank, *World Development Report*, 1985, 1986, 1987, 1988; World Bank, *Social Indicators of Development*, 1986; per capita GNP for 1965 was calculated from IMF, *International Financial Yearbook* 1987; Republique du Cameroun, "Enquete Nationale Sur la Nutrition" (Washington, D.C.: Agency for International Development, 1978).

turned out to be unfavorable. In East Africa, over the entire period, Kenya suffered the greatest loss from unfavorable shocks, followed by Tanzania and Malawi; however, the ranking between Malawi and Tanzania changes if the period since 1970 is considered.

Detailed analysis of the shocks shows three major conclusions. (1) Whereas Nigeria was dominated by the effect of favorable movements in oil's terms of trade, Cameroon was dominated by the effect of increased foreign demand. Senegal, on the other hand, suffered a terms-of-trade loss, primarily due to a trade imbalance between import and export volumes; however, a strong gain from increased foreign demand for rock phosphate more than outweighed the negative terms-of-trade effect, leading to a minor positive net effect of external shocks. (2) The negative effects of shocks in Kenya, Tanzania, and Malawi are dominated by the unfavorable movements in their agricultural terms of trade, with Kenya suffering the greatest loss, followed by Tanzania and Malawi. (3) Higher interest payments, associated with higher interest rates on foreign loans, had adverse effects on all MADIA countries except Tanzania. While the five countries increased the proportions of their debts owed to private sources and subject to fluctuating interest rates, Tanzania relied more on debt from public sources (concessional loans) and did not alter its debt profile significantly, even in the era of structural adjustment. Cameroon suffered the greatest loss, followed by Senegal, Malawi, Kenya, and Nigeria.

Kenya, Nigeria, and Senegal, in that order, are net losers of factor incomes, while Tanzania and Malawi are net gainers. This positive effect of factor income in Tanzania and Malawi is due primarily to remittances from their natives working in the mines of South Africa. The net factor income effect is neutral in Cameroon.

Effects of Domestic Policies on Current Account Variation

Item 3 in table 9 presents the effects of internal policies on export promotion (as reflected in changes in world market shares), income growth effect (i.e., import income elasticity), import compression effect (i.e., induced by changes in aggregate demand), and increased borrowings. Item 6 presents the total of these various effects, less income growth effect. The distinction between total and implicit income effects on imports is also important given that by increasing imports, growth can be seen to have a "bad" effect on policy and on variations in the current account. For East

TABLE 9 External Shocks and Policies in MADIA Countries, 1967–1984 (percentage of gross domestic product at current prices)

	West Africa						East Africa					
	Cameroon		Nigeria		Senegal		Kenya		Malawi		Tanzania	
	Effect	Rank	Effect	Rank	Effect	Rank	Effect	Rank	Effect	Rank	Effect	Rank
Current account variations	–2.4	2	0.0	1	–7.8	5	–4.4	3	–8.0	6	–5.9	4
Shocks	5.6	2	9.0	1	0.2	3	–4.5	6	–1.0	4	–1.5	5
Terms of trade	0.1	2	6.6	1	–1.3	3	–6.5	6	–3.9	4	–4.8	5
Foreign demand	6.0	1	4.1	2	2.9	5	4.1	2	3.0	4	2.6	6
Interest rate on debt	–0.6	6	–0.2	2	–0.4	4	–0.3	3	–0.4	4	0.3	1
Net factor income-capital income	0.0	3	–1.7	5	–1.1	4	–1.9	6	0.2	2	0.5	1
Policy	–3.5	2	–1.7	1	–12.9	6	–3.8	3	–6.8	4	–8.6	5
Export promotion	0.0	2	5.4	1	–1.9	3	–1.9	3	–2.3	5	–5.9	6
Income growth effect (–)	1.8	1	2.1	2	13.3	6	3.7	3	8.3	5	7.7	4
Imports compression (–)	1.1	1	4.9	6	–3.4	3	–2.6	4	–5.1	2	–5.8	1
Increased borrowing	–0.6	5	–0.2	1	–0.9	5	–0.8	4	–1.2	6	–0.7	3
Other	–4.0	5	–7.4	6	4.9	1	4.5	2	0.8	4	3.9	3
Yearly fluctuation in exports	–3.6	5	–5.1	6	1.3	3	3.1	1	1.5	2	0.5	4
Yearly fluctuation in imports	0.0	4	–0.1	1	–0.1	1	0.4	6	0.1	5	–0.1	1
Transfer payments	0.1	4	–0.3	6	2.4	1	–0.1	5	0.3	3	1.6	2
Net nonfactor services	–0.6	4	–2.0	6	1.1	3	1.6	2	–0.9	5	1.7	1
Residual	–0.6	4	0.3	1	0.0	3	–0.6	4	–1.1	6	0.3	1
Policy-controllable factors excluding the effect of GDP growth: Pure policy	–1.7	6	0.4	2	0.4	2	–0.1	4	1.5	1	–0.9	5
Imbalanced total effect	–3.4	3	–21.5	6	–6.7	5	–1.0	1	–1.9	2	–4.30	4
Pure total effect	3.5	3	28.1	1	5.3	2	–5.5	6	–2.0	5	–0.5	4

NOTES: The rank is from most positive (1) to least positive (6). For 1967–1973, interest payments are included in net factor income from abroad. But for 1974–1984, it has been possible to separate out interest payments from it. Imports enter the current account with a negative sign. Hence, when summing the various factors to obtain their total impact on the current account, the sign of the imports item is reversed.

SOURCES: International Monetary Fund, *International Financial Statistics Yearbook;* World Bank, Country Economic Memoranda, 1987 for Cameroon and 1985 for Nigeria.

Africa, item 6 clearly shows policies to have played a positive (contracyclical) role in Malawi, as in Kenya. Tanzania's loss of market shares was the greatest, followed by Malawi and Kenya. On the other hand, the growth effect on imports was most important in Malawi. All the MADIA countries were forced to contract imports in order to survive the external disequilibria. Import compression was the greatest in Malawi, Senegal, Tanzania, and Kenya, in that order. It continued in Cameroon up to 1985, whereas in Nigeria import levels actually increased (albeit at a declining rate since 1978).

The ability to increase shares in world markets had to do with the fundamental importance of the commodities exported, as well as country policies toward them. The relatively better performance of Nigeria is explained by the substantial growth in export market shares in oil, which more than offset negative effects of import expansion and other policies of traditional exports. The net policy effect (item 6) is primarily due to import expansion and increased borrowing in the context of change in the market shares of exports. Senegal's smaller role relative to the three East African countries is once again due to the role of phosphates. Only Nigeria increased its market share, followed by Cameroon (whose share stayed fairly constant). The remaining four lost market shares, the loss being the greatest in Tanzania, followed by Malawi, Kenya, and Senegal.

Other Factors

Factors that cannot be classified as external shocks or domestic policies are classified under the heading "other." They comprise yearly fluctuations in exports and imports, transfer payments, and nonfactor services (freight and insurance).

Due to the volatility of the oil market, Nigeria and Cameroon have suffered the greatest export income loss (see table 9). The agriculturally dominated countries, on the other hand, *benefited* from market fluctuations, with the greatest benefit accruing to Kenya, followed by Senegal, Malawi, and Tanzania. The cyclical effect of imports is generally very small.

Transfer payments (grants) mainly benefited Senegal, Tanzania, and Malawi, while Nigeria and Kenya were net losers. Cameroon recorded a very small beneficial effect. Tanzania and Kenya benefited substantially from nonfactor services, followed by Senegal. Nigeria benefited the least, followed by Malawi and Cameroon.

Other shocks that were considered important by policy makers, but were not amenable to systematic measurement because of their random nature, should also be noted. For example, Kenya and Tanzania dissolved the East African Community and closed their common borders in 1977. Although informal trade in agricultural goods continued between the two countries, Tanzania's agricultural export trade (which had relied on sales through Kenyan-based traders and export markets) and agricultural research (which had relied heavily on the East African Community) suffered. Tanzania also paid a heavy price for its war with Uganda in 1979.[42]

While all countries suffered from droughts, Senegal's climate (along with poor trading arrangements for its major crop, the groundnut) had a particularly severe adverse effect on its agriculture. Malawi, meanwhile, suffered the most from adverse external political and logistical constraints. The closure of Mozambique's ports raised not only the costs and the insecurity of transport; but political problems in Mozambique also increased the number of refugees entering Malawi, numbering well over 500,000—or close to 6 percent—of its population by mid-1988.[43]

Nigeria had by far the most serious internal political difficulties. Their civil war in the late 1960s was followed by six military coups, numerous changes of governments, and partitions of states—all of which created an unpredictable political and administrative environment, leading to numerous changes in policy initiatives.[44]

Macroeconomic and Sectoral Policy Responses

Examining the nature and scale of initial resource endowments and subsequent exogenous events only tells us about the general availability of resources for development. It is therefore necessary to analyze the ways in which the six MADIA countries' policy makers and their donor supporters have managed those resources and events, and the returns they have earned between 1970 and 1984.

Whatever one's judgments about the relative resource positions of the six MADIA countries at independence, it is clear that all six have been faced with absolute shortages of critical physical, institutional, and human capital assets. It is also clear then that governments and donors need to deploy scarce resources optimally to obtain the best developmental returns. In reviewing the evidence on relative returns to resource use in agriculture vis-à-vis other sectors, it is important to recognize that returns

in agriculture are a function of output and input prices, as well as the productivity of the resources deployed. Furthermore, in determining the policies pursued, expectations about future world and domestic market prospects have been as important as, or more important than, actual subsequent events in the marketplace.

Input and output prices (as determined by exchange rates, taxes, and subsidies) have been the primary focus of recent economic analysis, but the role of nonprice factors has attracted less analytical attention. In our view, an item in this latter category—that is, public (including donor) investment—has formed a significant, but usually overlooked, part of the picture. Public investment has substantially influenced the levels of taxes and government subsidies on production and consumption in order to maintain and implement activities initiated earlier. Similarly, by influencing the technological frontier, public expenditure has influenced the relative returns to factors of production. Finally, the actual allocation of land, labor, and capital to activities in agriculture has also been determined by the ability of small farmers to mobilize and use resources efficiently—a factor that has itself been affected by market and nonmarket forces alike.

Meanwhile, the competition for these public investment resources in the MADIA countries has been affected by agricultural diversification of three kinds: (1) out of agriculture and into industry and construction; (2) within agriculture, especially in favor of import-substituting food crops; and (3) by small producers into opportunities outside traditionally defined and often controlled, economic activities.

Overall Development Strategies and Diversification of Agriculture

Of the six MADIA countries, only Kenya and Malawi have followed moderate diversification strategies, and both have performed better than the other four in terms of growth of agricultural exports. Table 10 shows the change in the share of agriculture in each country's GDP, employment, and exports. Table 11 charts the various macroeconomic indicators. The countries whose agricultural sectors have grown the fastest have also been the best performers in terms of GDP growth. Cameroon, Kenya, and Malawi, in that order, have achieved the highest growth rates of GDP, per capita GNP, and agricultural output between 1960–1987. Clearly, favorable luck factors such as endowments or external shocks do not necessarily coincide with better economic growth. The macroeconomic and sectoral

policies of the MADIA countries have been critically important in explaining their performance.

The most extreme example of attempted diversification out of agriculture was in Tanzania, where the government's primary policy response to export pessimism was a capital intensive, import substituting industrialization effort. This program, implemented through a "Basic Industrialization Strategy," involved the establishment of large-scale public sector industries such as fertilizer, pulp and paper, as well as the development of agroprocessing, to increase domestic value-added in export agriculture. Both strands of Tanzania's industrial program were supported by donor assistance to a greater extent than in any other MADIA country.[45] In contrast, Kenya successfully developed labor-intensive, small-scale industry, and further broadened employment opportunities.

Agriculture's share in GDP, employment, and exports was smaller, and urbanization was greater, in West Africa than in East Africa, even in the early post-independence years. In Nigeria, as in Tanzania, further diversification out of the export crop sector involved a substantial expansion of the industrial and construction sectors. In Senegal, again as in Tanzania, diversification included agroprocessing and the development of the fertilizer and fisheries sectors. Cameroon's industrialization efforts were more moderate than Nigeria's. It maintained an emphasis on its plantation agriculture longer than most other countries, but nevertheless expanded investments in physical infrastructure and industry.[46]

Following a Kuznetsian pattern of growth, agriculture's share in GDP and exports should be expected to decline with overall development. This happened in Kenya and Malawi by the end of the 1970s; in Tanzania, however, where industrialization had been given primary emphasis, agriculture's share in GDP and exports paradoxically increased.[47]

Agriculture's share of GDP, employment, and exports fell further in all three West African countries, with the sharpest decline in Cameroon. The growth of agricultural output in Cameroon, Kenya, and Malawi was accompanied by a higher growth in the manufacturing sector (with the exception of Nigeria). The countries that relied on their comparative advantage and moved least rapidly to diversify their economies performed better and achieved rapid diversification.

Wage rates of unskilled workers were higher and increased more sharply in the West African countries with industrialization, with the increase being the sharpest in Nigeria.[48] Real wages did not increase commensurately because of rising inflation, as food prices rose rapidly.

TABLE 10a Share of Agriculture in Exports, Employment, and Gross Domestic Product (GDP) in MADIA Countries, Selected Years, 1965–1985 (percentage)

	East Africa			West Africa		
	Kenya	Malawi	Tanzania	Camer-oon	Nigeria	Senegal
Exports						
1967–73	75	97	78	81	38	71
1985	57	94	79	65	4	46
Employment						
1965	84	91	88	86	67	82
1985	78	83	86	70	68	81
Gross domestic product						
1967–73	34	44	41	31	41	24
1985	31	38	58	21	36	19

SOURCE: World Bank Data File, 1989.

TABLE 10b Comparative Macroeconomic Structure of MADIA Countries, 1960–1987 (percentage of GDP)

	East Africa			West Africa		
	Kenya	Malawi	Tanzania	Camer-oon	Nigeria	Senegal
Agriculture	34.9	42.6	47.3	29.2	41.5	23.6
Mining	0.3	n.a.	1.4	6.1	12.3	1.5
Manufacturing	11.7	10.1	9.1	10.1	7.0	15.7
Infrastructure	7.2	5.8	4.5	8.8	4.2	6.3
Other services	45.9	41.5	37.7	45.8	35.0	52.9
Savings	19.6	9.1	13.5	18.0	15.0	11.3
Investment	21.7	20.0	19.2	18.8	15.1	15.7
Exports	29.1	24.3	19.1	24.4	15.2	32.5
Imports	31.2	35.2	24.9	25.1	15.3	36.9
Public consumption	17.4	16.4	19.9	9.9	9.0	18.3

SOURCE: World Bank Data File, 1989.

TABLE 11 Comparative Macroeconomic Performance of MADIA Countries, 1960–1987

	Kenya	Tanzania	Malawi	Cameroon	Nigeria	Senegal
	Average Growth Rates, 1960–1987					
GDP	5.8	3.3	4.4	5.9	3.1	2.2
Per capita GNP	2.1	0.2	1.5	2.8	–0.2	–0.9
Agriculture	4.0	1.4	2.8	4.4	0.6	1.2
Manufacturing	8.1	2.7	4.3	8.7	10.6	3.9
Mining	3.8	–4.0	n.a.	29.8	8.4	n.a.
Savings	10.5	–1.5	12.8	17.9	2.3	–1.7
Investment	4.5	5.4	5.0	10.0	6.5	1.9
Exports	3.4	1.2	4.9	6.9	3.1	2.7
Imports	1.1	6.2	1.9	5.1	7.8	2.8
Public consumption	7.3	14.9	4.9	5.7	8.5	2.8
Inflation	8.3	12.0	8.1	7.7	11.6	7.4
Population	3.7	3.1	2.9	3.1	3.3	3.1
			1967–1973			
Growth rate of real GDP	8.5	5.2	5.2	2.4	4.9	2.2
Growth rate of population	3.5	2.7	2.5	2.4	2.5	2.4
Growth rate of GDP per capita	5.0	2.5	2.7	0.0	2.3	–0.1
Ratio of investment to GDP	22.3	20.8	20.0	15.3	12.7	13.8
Ratio of savings to GDP	20.8	18.2	8.2	13.0	11.5	9.7
Ratio of net exports to GDP	–1.5	–2.6	–11.8	–2.2	–1.2	–4.1
Ratio of current account deficit to GDP	–3.0	–2.9	–11.7	–7.5	–4.1	–1.4
Ratio of debt to exports	61.4	120.6	148.7	61.1	29.0	39.0
Ratio of debt service to exports	4.7	5.6	7.1	4.8	2.8	3.8
Ratio of fiscal deficit to GDP	–3.4	–5.0	–2.4	n.a.	–2.1	–0.9
Rate of inflation (CPI)	4.2	8.5	12.5	3.8	5.2	3.6
Rate of inflation (GDP deflator)	3.3	6.2	5.8	7.6	7.7	2.7
Growth rate of real output in agriculture	5.4	2.3	2.8	4.6	1.9	5.8
Growth rate of real output in manufacturing	14.2	7.8	5.5	6.5	13.9	6.9
Growth rate of real output in mining	12.8	–6.2	n.a.	29.4	28.9	2.5
Growth rate of exports	3.1	3.6	5.9	3.8	16.6	2.2
Growth rate of imports	4.0	3.6	1.4	4.0	12.5	1.2
Central bank borrowing as percent of GDP	1.0	3.6	1.4	0.5	3.3	0.0
Rural population as percent of total population	89.7	92.8	93.6	78.7	83.6	74.7
			1974–1978			
Growth rate of real GDP	4.7	2.5	6.6	7.5	2.9	2.3
Growth rate of population	3.6	3.4	3.0	3.0	2.5	2.6
Growth rate of GDP per capita	1.1	–0.9	3.6	4.5	0.4	–0.3
Ratio of investment to GDP	23.5	20.6	29.6	19.8	23.0	18.3
Ratio of savings to GDP	20.0	11.0	18.3	17.4	25.4	10.5
Ratio of net exports to GDP	–3.5	–9.6	–11.3	–2.4	2.5	–7.8
Ratio of current account deficit to GDP	–6.2	–9.7	–8.9	–9.8	–0.3	–5.5
Ratio of debt to exports	74.6	187.1	181.7	72.1	11.7	54.3
Ratio of debt service to exports	6.4	6.6	12.5	5.9	1.7	7.7

(continues)

TABLE 11 (continued)

	Kenya	Tanzania	Malawi	Cameroon	Nigeria	Senegal
			1974–1978 (continued)			
Ratio of fiscal deficit to GDP	–3.6	–7.9	–0.9	–1 2	0.6	–1.1
Rate of inflation (CPI)	16.0	15.1	8.5	13.6	21.9	12.7
Rate of inflation (GDP deflator)	14.5	14.7	10.2	11.8	21.6	9.9
Growth rate of real output in agriculture	4.1	4.7	5.8	2.5	–0.7	2.3
Growth rate of real output in manufacturing	6.6	4.7	6.7	9.1	12.7	1.5
Growth rate of real output in mining	6.5	–2.7	n.a.	24.1	3.9	2.5
Growth rate of exports	2.0	–6.8	–0.7	7.9	3.5	10.0
Growth rate of imports	7.8	2.8	6.1	7.1	28.6	11.3
Central bank borrowing as percent of GDP	3.6	8.2	2.9	2.3	3.7	0.9
Rural population as percent of total population	87.4	90.1	91.6	70.7	81.2	68.0
			1979–1981			
Growth rate of real GDP	4.2	2.1	2.0	13.9	0.9	1.9
Growth rate of population	4.0	3.2	2.6	3.2	2.8	2.9
Growth rate of GDP per capita	0.2	–1.1	–0.6	10.8	–1.9	–1.0
Ratio of investment to GDP	27.0	22.2	27.0	21.7	20.8	15.4
Ratio of savings to GDP	18.2	10.8	13.2	17.5	23.1	–0.3
Ratio of net exports to GDP	–8.8	–11.4	–13.8	–4.3	2.3	–15.8
Ratio of current account deficit to GDP	–10.5	–11.7	–12.7	–12.8	–1.4	–14.9
Ratio of debt to exports	120.2	261.1	211.4	101.5	19.5	136.8
Ratio of debt service to exports	14.3	9.4	24.8	9.3	2.6	17.5
Ratio of fiscal deficit to GDP	–4.6	–10.1	–1.0	–3.3	–13.9	–2.2
Rate of inflation (CPI)	11.2	23.2	4.0	8.9	13.1	8.1
Rate of inflation (GDP deflator)	9.0	21.9	9.1	8.4	14.2	8.8
Growth rate of real output in agriculture	1.5	–1.0	–3.9	12.1	–2.7	1.1
Growth rate of real output in manufacturing	5.5	–10.2	2.8	15.2	22.6	8.2
Growth rate of real output in mining	–8.3	2.7	n.a.	185.2	–7.4	4.4
Growth rate of exports	–1.3	7.1	11.9	22.1	–5.3	5.7
Growth rate of imports	–9.9	14.3	–4.6	12.2	5.3	7.5
Central bank borrowing as percent of GDP	6.0	18.6	9.3	1.5	13.9	5.9
Rural population as percent of total population	85.8	88.2	90.5	65.5	79.6	66.6
			1982–1984			
Growth rate of real GDP	3.7	0.6	3.5	5.9	–4.7	4.4
Growth rate of population	4.1	3.5	3.8	3.2	3.3	2.9
Growth rate of GDP per capita	–0.3	–2.9	–0.3	2.7	–8.0	1.6
Ratio of investment to GDP	21.2	16.4	21.9	22.8	11.9	15.8
Ratio of savings to GDP	18.3	9.3	14.9	28.0	9.3	2.4
Ratio of net exports to GDP	–2.9	–7.1	–7.0	5.3	–2.6	–13.4
Ratio of current account deficit to GDP	–4.7	–7.4	–3.0	–1.2	–4.9	–12.8
Ratio of debt to exports	135.2	513.1	253.2	98.5	92.4	218.5
Ratio of debt service to exports	18.2	12.1	22.7	12.4	17.9	9.5
Ratio of fiscal deficit to GDP	–3.9	–3.9	–0.7	–0.6	–10.5	–9.4
Rate of inflation (CPI)	14.0	30.6	5.4	13.8	23.5	13.6

(continues)

TABLE 11 (continued)

	Kenya	Tanzania	Malawi	Cameroon	Nigeria	Senegal
	1982–1984 (continued)					
Rate of inflation (GDP deflator)	9.6	12.9	9.4	12.3	11.3	10.4
Growth rate of real output in agriculture	4.4	1.8	5.8	1.7	−1.1	3.6
Growth rate of real output in manufacturing	3.0	−9.9	3.4	13.3	−8.1	5.5
Growth rate of real output in mining	0.0	−2.7	n.a.	22.4	−1.7	−0.8
Growth rate of exports	2.9	−16.7	−0.9	16.1	−3.5	2.4
Growth rate of imports	−6.4	−8.4	−0.4	−3.6	−19.5	−3.3
Central bank borrowing as percent of GDP	10.4	21.9	19.3	1.8	20.3	13.8
Rural population as percent of total population	82.0	85.0	88.0	59.0	70.0	65.0
	1985–1987					
Growth rate of real GDP	5.1	4.3	2.8	9.0	2.5	4.2
Growth rate of population	4.2	3.6	3.4	3.4	3.4	3.0
Growth rate of GDP per capita	0.9	0.7	−0.6	5.7	−0.9	1.2
Ratio of investment to GDP	24.0	17.2	13.5	19.8	8.9	13.7
Ratio of savings to GDP	21.7	4.8	11.6	25.3	9.7	3.6
Ratio of net exports to GDP	−2.3	−12.4	−1.9	5.5	0.7	−10.1
Ratio of current account deficit to GDP	−6.0	−12.7	−6.5	−0.2	−1.0	−13.4
Ratio of debt to exports	163.0	902.4	311.3	77.2	202.2	244.8
Ratio of debt service to exports	21.3	15.3	34.6	9.8	27.0	10.9
Ratio of fiscal deficit to GDP	−5.8	−4.3	−7.0	0.8	n.a.	−1.6
Rate of inflation (CPI)	7.4	33.1	18.8	2.2	4.4	9.7
Rate of inflation (GDP deflator)	9.8	29.4	16.0	2.9	10.3	8.4
Growth rate of real output in agriculture	4.3	4.5	2.3	2.4	4.9	8.9
Growth rate of real output in manufacturing	5.0	−5.3	1.6	0.9	5.5	1.9
Growth rate of real output in mining	3.3	−4.6	n.a.	1.3	−2.6	7.3
Growth rate of exports	4.5	6.0	9.2	6.6	−1.1	0.5
Growth rate of imports	5.6	13.8	−5.9	26.9	−22.6	−0.7
Central bank borrowing as percent of GDP	10.4	22.1	16.7	2.1	18.7	10.0
Rural population as percent of total population	80.0	86.0	n.a.	58.0	70.0	64.0

NOTES: n.a. = not available.

The average growth rates for the period 1960–1987 are calculated using the least squares method. They are all significant at the 5 percent level.

SOURCES: World Bank Database (BESD), World Bank Data File, 1989; IMF, *International Financial Statistics Yearbook*, 1987, for population figures.

Implicit and Explicit Taxation of Agriculture

Figure 7 shows the behavior of the trade-weighted exchange rates of the six countries, indicating the extent of implicit taxation. Tanzania and Nigeria had the most acutely overvalued rates, which led to substantial implicit taxation of export agriculture. In Tanzania's case, the coffee boom in the mid-1970s combined implicit taxation of this kind with considerable

explicit taxation of the coffee sector—the country's main export. In Nigeria, producer price subsidies to export crop cultivators in the 1970s did not adequately compensate for exchange rate overvaluation.[49]

Kenya and Malawi adjusted their exchange rates regularly, and Cameroon and Senegal (both of which are members of the West African Monetary Union) also had a relatively moderate record on exchange rate policy. Tables 12, 13, 14, and 15 show the ratios of producer prices to international prices at nominal exchange rates and purchasing power parity exchange rates. While they do not reflect transportation costs, they do provide a general indication of the level of taxation of export crops.

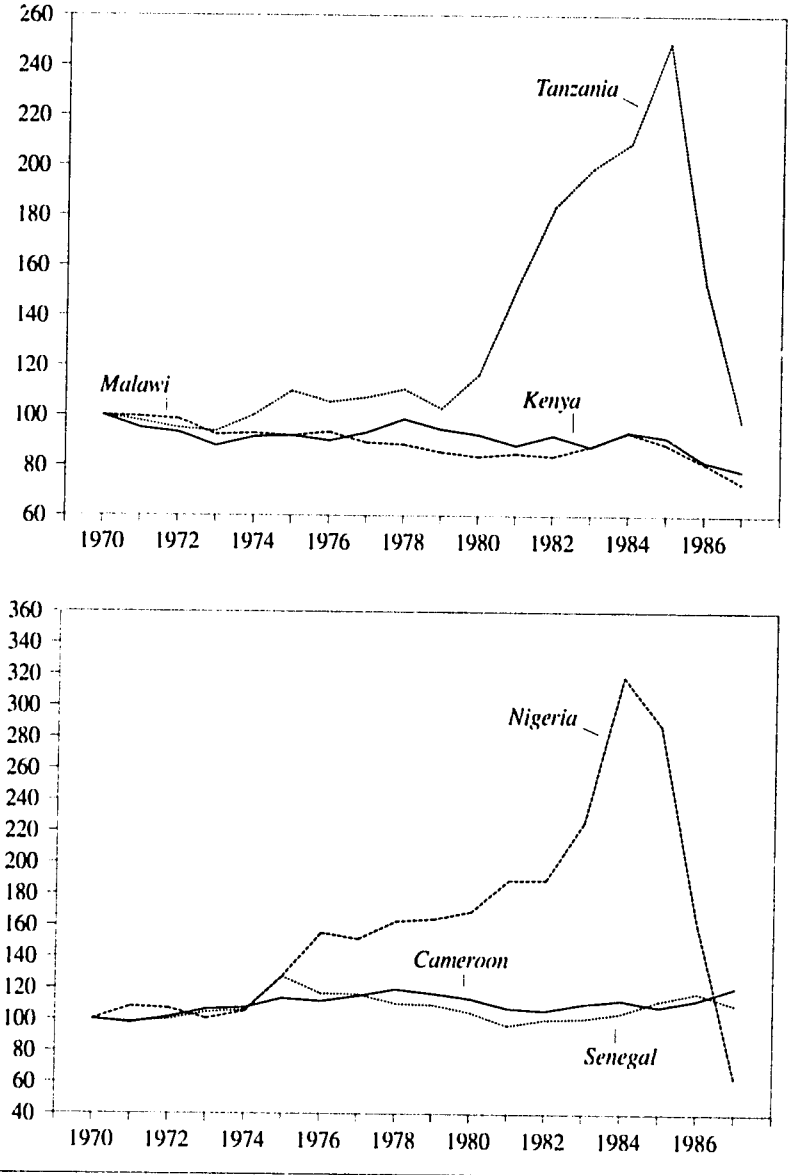
Only Kenya refrained from imposing any significant explicit taxes on its two important crops, coffee and tea, the prices of which were determined by the international market. Kenya also eschewed mobilizing resources through regressive taxation of the smallholder sector, offering the same price incentives to its smallholder tea and coffee producers as to estate producers (barring the slightly higher costs involved in the marketing of small farm production).

Malawi's smallholders, who were only allowed to produce dark-fired, sun-cured, and oriental tobacco (because growing of burley and flue-cured tobacco was reserved for estates through a licensing policy), were expected to sell their crops at officially fixed prices to the Agricultural Development and Marketing Corporation (ADMARC), Malawi's agricultural marketing parastatal; however, Malawi's estates could sell their tobaccos at open auctions. Small farmers typically received only about one third of the price ADMARC obtained for their tobacco on the auction floor. Even taking into account ADMARC's higher marketing costs for smallholders compared with those incurred by estates, this differential involved taxation of small farmers at rates of well over 50 percent.

In Senegal, as in Tanzania, expansion of the groundnut processing sector in the latter half of the 1970s resulted in higher margins going to the processing sector; this partly explains the lower producer share in the international price. Senegal's groundnut pricing problems were compounded by the removal in 1967 of the protection accorded by France since 1929. Under this arrangement, groundnut producer prices had been about 50 percent of the French import price (which itself was about 25 percent above the world price).[50]

Since the signing of the Yaounde Convention in 1967, the international groundnut prices received by Senegal have declined, and the ratio of domestic to international prices remained significantly below 0.5 throughout the 1970s.[51] Also, groundnut/millet price ratios, which had earlier

FIGURE 7 Purchasing Power Parity Exchange Rate Indexes for MADIA Countries, 1970–1987 (base year = 1970)



NOTE: Real exchange rates computed on the assumption of purchasing power parity. The rates are defined so that appreciation is reflected by an upward trend and depreciation by a downward trend.

SOURCE: Maria Cancian, "Aid Allocation to Cameroon, Kenya, Malawi, Nigeria, Senegal, and Tanzania: A Review of the OECD Databases," MADIA Working Paper (Washington, D.C.: World Bank, October 1987).

TABLE 12 Ratio of Producer Prices to International Prices for East Africa, 1970–1986 (converted at nominal exchange rates)

	Kenya		Malawi			Tanzania		
	Smallholder		Smallholder	Estate		Smallholder		
	Coffee	Tea	Dark-fired	Burley	Flue-cured	Tobacco	Cotton	Coffee
1970	0.91	0.60	0.22	0.43	0.57	0.43	0.72	n.a.
1971	0.90	0.67	0.25	0.39	0.68	0.50	0.61	n.a.
1972	0.98	0.63	0.23	0.40	0.62	0.46	0.57	0.57
1973	0.96	0.60	0.22	0.54	0.86	0.44	0.35	0.43
1974	0.97	0.55	0.23	0.62	0.84	0.42	0.32	0.43
1975	1.01	0.63	0.22	0.47	0.66	0.47	0.51	0.36
1976	0.85	0.57	0.21	0.48	0.70	0.40	0.41	0.30
1977	0.92	0.70	0.26	0.60	0.76	0.42	0.45	0.35
1978	0.94	0.64	0.26	0.50	0.74	0.47	0.55	0.39
1979	0.93	0.66	0.24	0.45	0.65	0.37	0.51	0.29
1980	0.98	0.76	0.23	0.46	0.40	0.35	0.52	0.41
1981	0.84	0.62	0.19	0.73	0.56	0.33	0.61	0.53
1982	0.83	0.56	0.24	0.51	0.50	0.30	0.73	0.52
1983	0.90	0.98	0.23	0.27	0.39	0.38	0.67	0.47
1984	0.80	0.66	0.25	0.30	0.38	0.27	0.65	0.47
1985	0.88	0.76	0.21	0.26	0.34	0.36	1.07	0.53
1986	0.79	0.69	0.22	0.43	0.45	0.32	1.11	0.33

NOTES: n.a. = not available.

Seed cotton producer prices converted to lint cotton equivalent using 34 percent conversion rate.

Green leaf producer prices converted to made tea equivalent using 22 percent conversion rate.

World prices are for products categorized as follows: coffee, "other mild arabica"; tea, "average auction (London)"; tobacco, "United States all markets"; cotton, "Egypt (Liverpool)."

SOURCES: IMF, *International Financial Statistics Yearbook*, various years; Kenya Ministry of Agriculture; Government of Malawi, Economic Report; FAO/World Bank, "Tanzania Agricultural Sector Review Mission," Annexes, Cooperation Programme Investment Center (Rome: FAO, 1987).

TABLE 13 Ratio of Producer Prices to International Prices for East Africa, 1970–1986 (converted at purchasing power parity exchange rates)

	Kenya		Malawi			Tanzania		
	Smallholder		Smallholder	Estate		Smallholder		
	Coffee	Tea	Dark-fired	Burley	Flue-cured	Tobacco	Cotton	Coffee
1970	0.85	0.56	0.22	0.42	0.56	0.41	0.68	n.a.
1971	0.88	0.66	0.24	0.39	0.66	0.49	0.59	n.a.
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

NOTES: n.a. = not available.

Seed cotton producer prices converted to lint cotton equivalent using 34 percent conversion rate.

Green leaf producer prices converted to made tea equivalent using 22 percent conversion rate.

World prices are for products categorized as follows: coffee, "other mild arabica"; tea, "average auction (London)"; tobacco, "United States all markets"; cotton, "Egypt (Liverpool)."

SOURCES: IMF, *International Financial Statistics Yearbook*, various years; Kenya Ministry of Agriculture; Government of Malawi, Economic Report; FAO/World Bank, "Tanzania Agricultural Sector Review Mission," Annexes, Cooperation Programme Investment Center (Rome: FAO, 1987).

TABLE 14 Ratio of Producer Prices to International Prices for West Africa, 1970–1986 (converted at nominal exchange rates)

	Cameroon				Nigeria		Senegal	
	Arabica coffee	Robusta coffee	Cocoa	Cotton	Cocoa	Palm kernel	Groundnuts	Cotton
1970	0.55	0.49	0.45	0.50	0.61	0.51	0.27	0.16
1971	0.60	0.48	0.60	0.44	0.77	0.59	0.27	0.14
1972	0.62	0.50	0.56	0.45	0.84	0.80	0.36	0.15
1973	0.65	0.53	0.40	0.37	0.66	0.76	0.26	0.10
1974	0.54	0.43	0.32	0.37	0.67	0.51	0.17	0.09
1975	0.76	0.50	0.49	0.50	0.86	1.18	0.45	0.14
1976	0.41	0.29	0.31	0.40	0.51	1.04	0.41	0.10
1977	0.26	0.21	0.24	0.50	0.42	0.71	0.31	0.12
1978	0.44	0.38	0.34	0.53	0.48	0.65	0.29	0.13
1979	0.43	0.40	0.41	0.57	0.61	0.60	0.35	0.14
1980	0.47	0.47	0.55	0.54	0.91	1.06	0.44	0.13
1981	0.48	0.54	0.55	0.53	1.02	1.03	0.30	0.12
1982	0.44	0.43	0.58	0.59	1.11	1.29	0.56	0.13
1983	0.37	0.37	0.46	0.48	0.91	0.87	0.53	0.11
1984	0.30	0.32	0.39	0.55	0.82	1.00	0.46	0.10
1985	n.a.	0.38	0.42	0.77	0.75	1.57	0.51	0.13
1986	n.a.	n.a.	n.a.	1.25	n.a.	1.61	n.a.	0.27

NOTES: n.a. = not available.

Seed cotton producer prices converted to lint cotton equivalent using 34 percent conversion rate.

World prices are for products categorized as follows: coffee, "other mild arabica" for Arabica and "Angolan (Ambriz 2AA)" for robusta, "ICCO average daily price (New York and London)"; cotton, "Egypt (Liverpool)"; palm kernel, "Nigerian (Europe)"; groundnuts, "Nigerian (London)."

SOURCES: IMF, *International Financial Statistics Yearbook*, various years; World Bank, Commodity and Price Trends, 1987; Republique du Cameroun, "Bilan Diagnostique," 1980; Government Ministries of Agriculture; Lele et al., "Nigeria's Economic Development."

TABLE 15 Ratio of Producer Prices to International Prices for West Africa 1970–1986 (converted at purchasing power parity exchange rates)

	Cameroon				Nigeria		Senegal	
	Arabica coffee	Robusta coffee	Cocoa	Cotton	Cocoa	Palm kernel	Groundnuts	Cotton
1970	0.56	0.49	0.46	0.51	0.65	0.54	0.27	0.16
1971	0.63	0.50	0.63	0.46	0.77	0.59	0.27	0.14
1972	0.63	0.50	0.56	0.45	0.84	0.80	0.36	0.15
1973	0.63	0.51	0.38	0.35	0.71	0.83	0.25	0.09
1974	0.52	0.41	0.30	0.35	0.68	0.52	0.16	0.08
1975	0.69	0.46	0.44	0.46	0.74	1.01	0.35	0.11
1976	0.37	0.27	0.28	0.36	0.37	0.74	0.35	0.09
1977	0.23	0.18	0.21	0.44	0.30	0.52	0.26	0.10
1978	0.38	0.33	0.29	0.46	0.33	0.45	0.27	0.12
1979	0.37	0.34	0.35	0.49	0.40	0.39	0.32	0.12
1980	0.41	0.40	0.47	0.47	0.56	0.65	0.44	0.13
1981	0.45	0.50	0.51	0.49	0.57	0.58	0.32	0.13
1982	0.43	0.42	0.56	0.57	0.62	0.72	0.57	0.13
1983	0.35	0.35	0.43	0.45	0.43	0.41	0.53	0.11
1984	0.28	0.29	0.36	0.50	0.28	0.34	0.53	0.12
1985	n.a.	0.36	0.39	0.72	0.29	0.60	0.53	0.14
1986	n.a.	n.a.	n.a.	1.13	n.a.	1.35	n.a.	0.26

NOTES: n.a. = not available.

Seed cotton producer prices converted to lint cotton equivalent using 34 percent conversion rate.

World prices are for products categorized as follows: coffee, "other mild arabica" for Arabica and "Angolan (Ambriz 2AA)" for robusta, "ICCO average daily price (New York and London)"; cotton, "Egypt (Liverpool)"; palm kernel, "Nigerian (Europe)"; groundnuts, "Nigerian (London)."

SOURCES: IMF, *International Financial Statistics Yearbook*, various years; World Bank, Commodity and Price Trends, 1987; Republique du Cameroun, "Bilan Diagnostique," 1980; Government Ministries of Agriculture; Lele et al., "Nigeria's Economic Development."

favored groundnuts, now favored millet and remained close to 1 throughout the decade. Groundnut prices also moved unfavorably vis-à-vis producer prices of rice. Import substitution of rice became the primary focus of Senegal's food self-sufficiency strategy.

Only Kenya maintained relative prices of coffee and tea vis-à-vis maize that ensured favorable (albeit fluctuating) returns to land and labor use in the production of the two export crops.[52] The higher returns to coffee and tea producers in Kenya also reflected the higher quality of Kenya's arabica coffee and smallholder tea. Thus, the actual international market prices earned by Cameroon, for example, were only 65 percent of those earned by Kenya at the end of the 1970s. When, for example, the effects of Kenya's quality premia are combined with other countries' taxation of major export crops (e.g., coffee in Cameroon and Tanzania, tobacco in Malawi, cocoa in Cameroon and Nigeria, etc.), the Kenyan ratios of export crop prices to maize prices were substantially higher than the comparable ratios in other MADIA countries (see tables 16 and 17).

Turning to trends in the producer price structure as a whole, all MADIA countries except Kenya (and Malawi in the case of estate-grown crops) had officially fixed export crop prices, and the structure of producer prices moved in favor of food crops. With the exception of rice, this was true regardless of whether food markets were controlled, as in East Africa, or free, as in West Africa[53]—despite the increase in food imports in several countries noted earlier. Overall, West African food crop prices tended to be substantially higher and far above international levels than those in East Africa. For example, the prices of maize were typically twice their East African levels (even when calculated at trade-weighted exchange rates). Relative prices thus help to explain production shifts from export to food crops in all MADIA countries, with the exception of Kenya.

Just how unfavorable West African ratios of export crop prices to food crop prices have been in comparison with those obtained in East Africa is evidenced by Kenya's coffee/maize producer price ratios. The latter were well over twice as high as Tanzania's (becoming even more favorable to Kenyan coffee since the late 1970s if higher informal maize prices in Tanzania are considered), but as much as four times as favorable compared with those in Cameroon. Meanwhile, Senegal's maize/groundnut price ratio favored maize twice as strongly as it did in Malawi, again reflecting Senegal's lower groundnut prices and higher maize and millet prices.

The correction of a combination of exchange rate and producer price distortions in Nigeria and Tanzania since the introduction of structural adjustment programs in the 1980s is shifting some resources from food to

TABLE 16 Ratio of Producer Prices of Export Crops to Food Crops in East Africa, 1967–1985

	Kenya		Malawi				Tanzania			
	Coffee/maize	Tea/maize	Tobacco/ maize	Coffee/maize	Groundnuts/ maize	Cotton/maize	Cotton/maize	Tobacco/ maize	Cashews/ maize	Coffee/maize
1967	n.a.	n.a.	6.09	9.79	3.30	2.73	n.a.	n.a.	n.a.	n.a.
1968	n.a.	n.a.	4.30	10.07	3.07	3.23	n.a.	n.a.	n.a.	n.a.
1969	n.a.	n.a.	6.83	14.69	3.31	3.38	n.a.	n.a.	n.a.	n.a.
1970	27.2	n.a.	7.84	11.66	3.31	3.28	n.a.	n.a.	n.a.	n.a.
1971	19.1	19.5	7.71	8.03	3.03	3.37	4.23	22.31	3.46	n.a.
1972	20.0	15.5	7.32	9.90	3.61	2.87	4.58	24.17	3.75	18.75
1973	23.7	15.2	5.97	9.49	3.51	3.43	4.35	21.88	3.46	15.96
1974	21.7	15.5	4.86	10.73	3.59	4.34	3.42	18.91	2.73	13.33
1975	15.3	11.6	6.05	11.19	3.70	3.77	2.73	14.29	1.87	7.00
1976	32.9	13.8	5.40	8.75	3.11	2.25	2.50	9.66	1.29	10.00
1977	44.7	24.2	6.24	8.70	3.39	3.52	2.50	10.90	1.33	18.75
1978	31.7	17.8	7.80	11.28	3.70	3.94	2.71	10.67	1.31	12.81
1979	36.8	17.6	7.88	12.54	5.81	4.19	2.82	10.51	1.92	10.67
1980	27.6	16.7	6.31	0.40	4.60	3.25	3.00	8.95	1.73	11.42
1981	22.6	17.7	6.53	7.58	4.65	3.24	3.20	9.64	2.75	12.36
1982	25.8	18.0	4.03	4.50	2.87	2.45	2.47	7.41	3.09	9.93
1983	22.7	14.2	7.56	9.35	4.64	3.39	2.69	9.96	2.65	8.67
1984	22.0	29.6	6.61	8.33	4.89	3.31	2.73	7.61	2.95	10.40
1985	21.2	18.0	8.11	n.a.	5.57	3.56	2.10	6.30	2.42	6.75

NOTE: n.a. = not available.

SOURCES: Kenya, Ministry of Finance, Economic Survey, Central Bureau of Statistics. Malawi: ADMARC and Ministry of Agriculture. Tanzania: "Tanzania Agricultural Sector Report" (Washington, D.C.: World Bank, 1983).

TABLE 17 Ratio of Producer Prices of Export Crops to Food Crops in West Africa, 1970–1986

	Cameroon				Nigeria						Senegal			
	Coffee/maize		Cocoa/ maize	Cotton/ maize	Cocoa/ maize	Palm oil/ maize	Rubber/ maize	Cocoa/ rice	Palm oil/ rice	Rubber/ rice	G'nuts/ maize	Cotton/ maize	G'nuts/ millet	Cotton/ millet
	Arabica	Robusta												
1970	10.20	7.40	4.95	1.76							1.03	1.67	1.09	1.76
1971	9.40	7.10	4.80	1.71							1.28	1.67	1.36	1.76
1972	9.70	6.90	4.80	1.78							1.28	1.72	0.92	1.24
1973	10.00	6.50	4.78	1.60							1.56	1.79	0.98	1.03
1974	7.90	5.60	4.58	1.46							1.66	1.68	1.38	1.40
1975	6.70	4.10	3.53	1.00							1.19	1.34	1.19	1.34
1976	9.50	6.10	4.40	1.09	3.37	1.50		2.19	0.99		1.19	1.34	1.19	1.34
1977	7.20	5.60	3.33	0.80	3.98	1.37	1.40	3.07	1.06	1.09	1.12	1.32	1.04	1.22
1978	7.20	5.60	4.40	0.72	4.18	1.44	1.47	2.57	0.89	0.92	1.12	1.32	1.04	1.22
1979	5.80	5.20	4.42	0.61	4.12	1.54	1.44	2.49	0.93	0.87	1.12	1.49	1.14	1.37
1980	5.70	5.30	4.83	0.61	4.19	1.59	1.56	2.09	0.80	0.79	1.35	1.62	1.00	1.20
1981	5.70	5.10	4.15	0.60	2.63	1.00	1.22	1.37	0.53	0.63	1.49	1.44	1.40	1.36
1982	6.40	5.00	4.04	0.64	3.05	1.16	1.64	1.54	0.59	0.83	1.49	1.66	1.40	1.56
1983					2.62	0.93	1.30	1.83	0.64	0.92	1.49	1.66	1.27	1.42
1984					1.97	0.79	0.99	1.14	0.46	0.57	1.60	1.56	1.45	1.42
1985											1.50	1.67	1.64	1.67
1986											1.29	1.43	1.29	1.43

NOTE: Blank cell = not available.

SOURCES: Cameroon: Ministry of Agriculture, "Bilan Diagnostique," 1980; World Bank, Country Economic Memorandum, 1987. Nigeria: Marketing Commodity Boards. Senegal: Ministere du Developpement Rural, "Programme de Sauvergerde et d'Adjustement de la Filiere Coton du Senegal," 1987.

export crops, although the growing domestic food demand and high food prices have moderated this shift (as has flexibility in the disposal of food crops relative to export crops). Nevertheless, if an aggregate supply response is going to materialize from the agricultural sectors of these countries, agricultural productivity will have to increase—and nonprice factors will be important in raising it. Before turning to this issue, however, public expenditure patterns in the six countries are briefly reviewed.

Public Expenditure Patterns

Information on overall expenditure patterns in MADIA countries varies. On the whole, among anglophone countries, Kenya and Malawi have better information than Nigeria and Tanzania, reflecting superior economic management. Systematic data on planned and actual expenditures have tended to be weak in francophone countries.

To the extent that data have permitted, the results of our detailed analysis of public expenditure patterns are presented in various MADIA papers.[54] In the East, Kenya and Malawi had a better intersectoral balance of government expenditures (i.e., between agriculture or transportation, relative to other sectors) than Tanzania; in the West, Cameroon had a better record than Nigeria and Senegal.[55] Comparisons of Tanzania's spending patterns at the beginning and the end of the 1970s and its performance relative to Kenya and Malawi, show a higher share of government expenditures to GDP at the end of the period from a lower initial base. Tanzanian programs focused heavily on industrial promotion, welfare services, and defense, but neglected agriculture, transport, and communication infrastructures. Kenya and Malawi had small expenditure programs but a more even, intersectoral balance of expenditures.[56] Unlike Tanzania, Nigeria did not neglect agriculture in government expenditures. Its *budgeted capital* expenditures on agriculture from 1981 to 1985 were 66 times greater than the *actual* expenditures from 1962 to 1968! Caution must be exercised, however, in taking the relative share of agriculture in relation to other sectors as an indication of commitment to agriculture without regard to expenditure quality. In Nigeria, the poor quality of government expenditures was reflected in the lack of a well-defined smallholder strategy—a fundamental constraint in increasing agricultural production even though price incentives for food crop production were favorable. As in the other MADIA countries, the lack of *recurrent* expen-

ditures has been another fundamental constraint for the development of smallholder agriculture as well as for other sectors.[57]

From this latter viewpoint, the countries with what we could suggest were superior intersectoral expenditure balances also operated superior expenditure programs in another sense; that is, their spending was more predictable in overall level, in the balance between recurrent and capital expenditures, etc. Nevertheless, it must be emphasized that there could be vast improvement in public expenditure quality—even in the best performing countries—and great benefit from a well-conceived overall agricultural sector policy.

Even well-intentioned donor expenditures did not have their expected results.[58] In Nigeria, where donors gave priority to smallholder agriculture, the government stressed irrigated agriculture and industry. In Malawi, donors supported smallholders, while the government favored the estate sector. Clearly, government and donor policy interactions on public expenditures as a whole, as well as at the sector level, are critical for understanding the precise nature and content of development policy.

Tanzania and Nigeria had the highest rates of public consumption and money stock among the six countries. Both these factors contributed to higher rates of inflation and hence higher rates of currency appreciation in the two countries. Real appreciation, moreover, hindered the production of tradables (including agricultural exports). The following section discusses the sector level analysis.

Relative Roles of Price and Nonprice Factors

Based on the preceding discussion, it would be tempting to conclude that the absence of price distortions in Kenya relative to other MADIA countries explains its better overall agricultural production performance. Certainly the shifts between food and export crop production in the MADIA countries can be explained by relative price incentives, as we pointed out earlier. The following pages focus on the relative roles of price and nonprice factors—first reviewing the importance of technological issues, and then considering the roles of price levels, stability, etc., and their importance in relation to other factors.

Table 18 gives yield differences for major crops grown in MADIA countries. As the data show, coffee, tea, and maize yields were as much as two to four times as high in Kenya as in Cameroon, Tanzania, or

Malawi. This means that the relative advantage of coffee over maize production in Kenya was at least twice as great than was suggested by the relative price differences reviewed earlier (allowing, of course, for some increase in input use that enabled the achievement of Kenya's higher yields).

The relatively easy access of Kenya's small farmers to research, extension, credit inputs, marketing, handling, processing, and information compared to the access and quality of services available to their counterparts in Tanzania, Malawi, or Cameroon is of special importance. These and other institutional factors can critically affect the willingness of producers to apply their labor in ways that enhance yields.[59]

Kenya's and Malawi's coffee and tea research is of high quality. Kenya's smallholder coffee cooperatives and the Kenya Tea Development Authority (KTDA) are recognized as among the most effective institutions for channeling export crop services to smallholders. Their clientele includes an unusually high proportion of politically conscious and vigilant small farmers (reflecting the generally more extensive grassroots development of Kenya's commercial and political institutions).[60] It is difficult to quantify the relative importance of these factors on the one hand and price levels on the other as determinants of the efficiency and profitability of particular crop growing activities, but there is no question of their positive impact.

Cotton in Cameroon and cocoa in Nigeria show that price levels are not necessarily the most important determinants of crop expansion and that technology and organization can actually counter adverse price effects. Cotton producer prices in Cameroon were substantially lower, not only in nominal terms, but also when converted at purchasing power parity rates, than in Kenya or Nigeria throughout the 1970s (see figures 8 and 9).[61] Nevertheless, cotton yields in Cameroon at the end of the 1970s were four to eight times as high as in Kenya, Nigeria, or Tanzania. As a result, returns to cotton production in Cameroon have been significantly higher than in the anglophone countries. This has greatly increased cotton production, at 8.3 percent a year (see table 3).

Interestingly, Cameroon's cotton success story seems to contain some of the same ingredients as that of smallholder tea and coffee in Kenya, raising important questions not simply about the respective roles of price and nonprice factors, but also about the relative roles of the private and public sectors, and the relative importance of financial, technological, and managerial factors. The Société de Developpement du Coton du Cameroun (SODECOTON) is a public-sector-operated agency whose

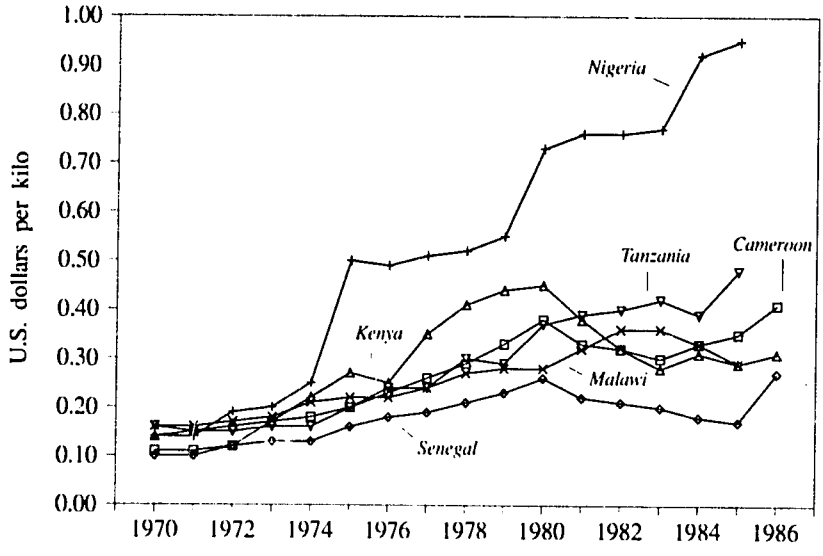
TABLE 18 Comparative Crop Yields in MADIA Countries, 1970–1985 (kilograms per hectare)

East Africa	Tea		Coffee		Tobacco		Sugar	Cotton	Maize
	Smallholder	Estate	Smallholder	Estate	Smallholder	Estate			
Malawi									
1971–75	231	1,399			375	1,076	10,696	406	
1976–80	416	1,734			398	1,189	10,528	614	
1981–85	648	1,929			342	1,238	11,290	537	1,171
Kenya									
1971–75	1,345	1,735	608	1,139				269	1,895
1976–80	1,199	2,289	737	1,271				278	1,881
1981–85	1,137	2,524	604	1,075				184	1,821
Tanzania									
1971–75		1,149						528	645
1976–80		1,356						592	
1981–85	430	1,291						380	

West Africa	Cocoa	Coffee	Rice	Millet/sorghum	Groundnuts	Cotton	Maize
Senegal							
1971–75			1,081	549	718	1,081	823
1976–80			1,328	565	706	816	811
1981–85			1,617	654	750	1,009	990
Cameroon							
1971–75	348	325	886	773	787	541	1,151
1976–80	252	270	1,751	848	520	1,146	822
1981–85	267	295	3,699	785	266	1,308	980
Nigeria							
1971–75	3,426		1,679	574	516	307	764
1976–80	2,374		1,906	613	702	203	857
1981–85	2,037		2,033	709	946	120	996

NOTE: Blank cell = not available.
SOURCE: World Bank Database (BESD).

FIGURE 8 Cotton Producer Prices (at nominal exchange rates in U.S. dollars per kilo)

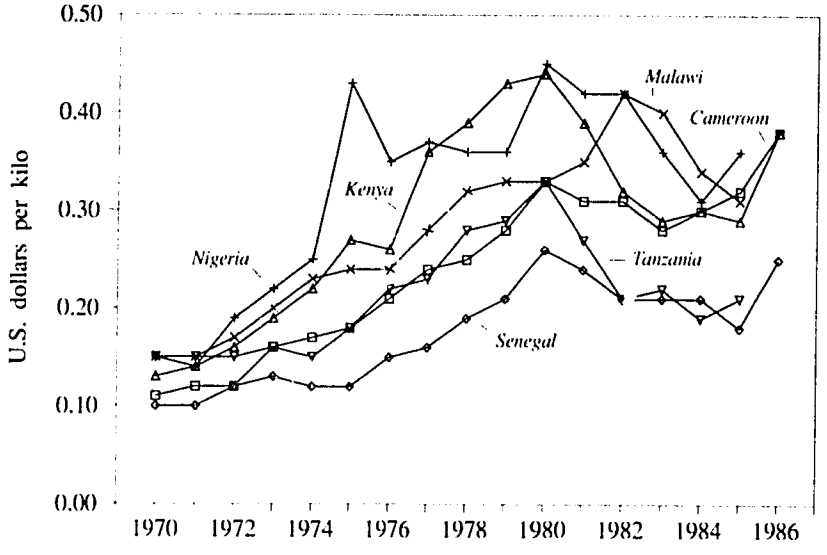


SOURCE: Uma Lele, Nick von de Walle, and Mathurin Gbetibouo, "Cotton in Africa: An Analysis of Differences in Performance," MADIA Working Paper (Washington, D.C.: World Bank, 1989).

management practices are more paternalistic than those of participatory agencies such as KTDA and Kenya's coffee cooperatives. Comparison of the services available to the cotton sector in Cameroon and its Nigerian or Kenyan counterparts indicate that SODECOTON has access (especially in contrast to anglophone Africa) to an excellent network of research on cotton in French West Africa, undertaken by the Compagnie Francaise pour le Developpement des Fibres Textiles (CFDT).

Moreover, since the returns to CFDT (which has equity interests in SODECOTON) depend on the amount of cotton exported, it has a strong incentive to provide high quality (albeit high-cost) technical assistance and to improve the provision of services to growers in order to increase cotton production. Cotton cooperatives and parastatals in anglophone East Africa have not had such a stake. The way in which grassroots cooperatives were undermined in Tanzania as they threatened to become an alternative political power base and a source of political influence is reviewed later.[62] In addition, Cameroon's cotton sector benefited from sound capitalization until 1986, when falling world market prices, over-

FIGURE 9 Cotton Producer Prices (at purchasing power parity exchange rates in U.S. dollars per kilo)



SOURCE: Uma Lele, Nick von de Walle, and Mathurin Gbetibouo, "Cotton in Africa: An Analysis of Differences in Performance," MADIA, Working Paper (Washington, D.C.: World Bank, 1989).

valuation of the CFA franc, and rising government demands that SODECOTON provide developmental services in the cotton areas, combined with higher producer prices, led to financial difficulties for SODECOTON. Until that point, stable access to capital had ensured that farmers actually received the official price at harvest time—in contrast to the situation in anglophone Africa, where the regular tardiness or absence of payments (along with underweighing the crop) has reduced the effective prices farmers have received. Finally, the political support of the government of Cameroon for development in the country's northern and extreme northern regions has been crucial to SODECOTON's success.

The private-sector nature of cotton production in Nigeria does not appear to have made the cotton sector efficient. Whether privately, cooperatively, or publicly operated, cotton production in anglophone Africa has suffered from inadequate capitalization, lack of credit, a poor record of payments for output, and in particular, lack of accountability to producers.

Two World Bank–funded cocoa projects in Nigeria offer another example in which nonprice factors explain both their success throughout the

1970s and the subsequent decline of project-level smallholder cocoa development. The Bank-funded projects coincided with the oil boom, when cocoa was relatively heavily taxed and when there was also a 300 percent increase in the nominal wage. Nevertheless, the two projects exceeded their cocoa planting targets—a rare occurrence in donor-funded agricultural projects in Africa—primarily because the almost totally Nigerian-operated cocoa subsector was well managed. A second contributory factor in this case was the fact that returns to planting of *improved* cocoa strains were fully competitive with labor use in the nonagricultural sector, which led participating farmers to conclude that benefits from cocoa would match those in other sectors of the economy once Nigeria's oil ran out. Finally, tree plantings have made land rights more secure than planting annual crops or leaving the land fallow, while increased land pressure in the cocoa belt has meant that investment in cocoa had a high return.

The World Bank, however, decided not to finance a third cocoa project in the 1970s (even after internal processing was well advanced) because of disagreements between the federal and state governments about the level of financing for cocoa investments and unresolved issues about the extent of subsidy on interest rates in the credit component. The Bank's pessimistic outlook on financing of cocoa investments (as in tea and coffee in East Africa) also played a part in their decision not to finance a third project. Finally, the Bank concluded (contrary to our assessment here) that the adverse macropolicy environment had undermined incentives to the cocoa sector to the degree that financing of a third project was not worthwhile.

These cases raise questions about the extent to which prices alone matter *relative* to numerous nonprice factors. They also raise questions about the role stable versus unstable prices play in increasing production and whether there are differences in this regard between annual and tree crops. In the case of export crops, price stabilization has typically been associated with taxation of the export crop sector. These two issues are therefore considered together.

Coffee and tea in Kenya, cotton in Cameroon, and cocoa in Nigeria show good export crop performance under both high and low taxation levels and stable and unstable prices. The argument for providing international (meaning unstable and high) prices to producers frequently states that tree crop prices fluctuate less than annual crop prices, that upswings in tree plantings occur in periods of price booms, and that countries that do not pass on international prices to producers lose out on the consequent

supply response. By the same token, in periods of low prices, producers tend not to uproot tree crops but simply to reduce variable expenditures—unless of course the price declines are sustained through public policy as in Tanzania. Certainly Kenya's experience supports all these arguments. It also shows that considerable revenues can be generated even at low (but mildly progressive) rates of taxation by increasing production in response to high prices. In addition, the *private* expenditures resulting from the increased household savings and the investment that higher producer incomes permit, stimulate higher growth because of the dynamism they create in the rest of the economy.

Many reasons are offered in support of price stabilization and export taxes. For example, relatively inelastic world demand for a given commodity under conditions of high producer responsiveness and high shares of individual countries in the world market could lead to excess supply and a fall in world prices. Moreover, if demand were primarily concentrated in developed countries, a fall in price would mainly benefit developed country consumers. Indeed, as we have shown elsewhere,[63] concern about this scenario led the World Bank to adopt a policy in 1972 to halt financing for further expansion of tea and coffee (except when countries had no production alternatives) and confine assistance for these crops to investments in improving productive efficiency (including the rehabilitation of existing acreages and the processing of output already on-stream). Similar, de facto guidelines applied to coffee. Paradoxically, Kenya's smallholder tea and coffee production rose in the 1970s, partly as a result of World Bank lending for processing. This growth came mainly from area expansion rather than from increases in land productivity. The reason for this was that the distinction between area expansion and rehabilitation made in donor policy toward export crop farming turned out to be arbitrary since much of the actual increase in smallholder export crop production in Africa has come from area expansion even though it was intended to come from productivity increases. Labor availability and the lack of farm services have been the most constraining factors, and it has been more profitable (at the margin) to increase acreage than to intensify production. Donor investments in processing and in rehabilitation measures have actually encouraged the expansion of acreage by providing a market stimulus that would not otherwise have existed.[64]

With regard to export taxes, a strong comparative advantage in the production of an export commodity may entail substantial producer rents, some of which could be taxed away without adverse effect on the return to resource use relative to the next best option.[65] Further, taxation of the

agricultural sector may be compensated for by government expenditures that directly or indirectly support agriculture—for example, by expanding markets and raising productivity through better farmer access to technology, inputs, and information. Thus, policies for taxing the agricultural sector or for producer price stabilization cannot be judged adequately without also taking into account public expenditures on agriculture that offset the revenue raised.

Stabilization may be more appropriate for annual crops than tree crops. First, annual crops' prices and yields vary more than those of tree crops, thereby increasing farmers' risks and uncertainties. Second, most annual crops are of lower value than tree crops (at international prices), so that the return to factor use tends to be less attractive compared to competing food crops—making switches from annual export crops to food crops more probable.

Finally, fluctuations in domestic production (to which annual crops are more prone than tree crops) may also adversely affect capacity utilization in downstream processing activities—as in the case of groundnuts in Senegal and cotton in Kenya (where price stabilization may help stabilize supply by permitting increased use of purchased inputs). Rising capacity utilization of processing facilities, however, may reduce processing margins and stimulate higher producer prices and production.[66] Supply stabilization through domestic production stabilization may also be necessary for trade policy, which is supposed, in theory, to improve internal supply. These were some of the reasons underlying British and French colonial decisions to support price stabilization for export crops.

These various arguments, and the ability to find evidence from MADIA countries to support conflicting conclusions, suggest that there is no unique solution to the pricing issue and that donors need to beware of overenthusiastic application of generalized blueprints for "reform" that gloss over the need for case-specific responses to individual crop production and country realities. Meanwhile, recipient governments also face domestic socioeconomic and political dilemmas of their own with regard to this issue; in particular, a stabilization-plus-export-tax approach may appeal to them on the grounds that they are unwilling to incur the substantial regional income disparities and income instability entailed in the application of international parity pricing. Their ultimate decisions on this point may depend a great deal on the political history of their countries. In the MADIA sample, Kenya seems better able to handle these sociopolitical problems than the other countries; however, recent studies of policy reforms suggest that even this might change over time.

Diversification Policies within Food Crop Agriculture

The priority given in West Africa to rice production is explained by government concern about food security for urban populations. Investment in sugar also increased in most MADIA countries in the 1970s.[67] The rapidly growing urban demand for rice, wheat, and sugar contrasts with the rural pattern of diverse and region-specific dominance of traditional food crops (sorghum, millet, cassava, and yams) in domestic production. The costs of domestic rice were subsidized through major investments in local production, and consumer prices of food imports were kept low through overvaluation of the exchange rate (in Nigeria) and through trade and price policies (in Cameroon and Senegal). In East Africa, where maize dominates in production and consumption, there were less acute import substitution efforts for rice and other preferred crops.

In view of the foreign exchange constraints faced by countries, it is instructive to note the heavy foreign exchange requirements of the "new" crops in relation to the needs of the traditional crops. For example, the needs of Tanzania's sugar industry in the early 1980s alone were estimated to be 40 percent of the total requirements of the agricultural sector.[68] The employment content of the "new" crops is also worth considering. Only Kenya pursued an active smallholder sugar production strategy; all the other MADIA countries treated it as a quasi-enclave industry. Only in Malawi was it an almost completely labor-intensive estate crop.[69]

Nigeria pursued by far the most active expansion of large-scale irrigation for rice production when considered as a share of total investments, although the other five countries also operated irrigation schemes costing between $10,000 and $25,000 per hectare. The role of price expectations is important in this context: many of the investments, including those financed by donors, were undertaken in the mid-1970s when world prices were projected to reach well over $500 per ton by 1990 (compared with the current projected 1990 prices of $240 per ton).

Although these schemes attracted substantial amounts of donor funding, little systematic information exists on their actual production costs, and few studies have been undertaken of the factors influencing internal demands for rice (especially of the factors determining the income and price elasticities of demand) or the likely effects of alternative production, consumption, and import policies on employment, income distribution, foreign exchange earnings and savings, government budget, and so forth.

Nevertheless, such data as the MADIA study has been able to draw on suggest that unit production costs of rice have been high in MADIA

countries compared to those in Asia. Inter alia, this reflects high costs of African projects' capital works and operation, low utilization of irrigation works, and high labor costs.[70] In addition, high internal transport costs of shipping rice to urban centers in the port cities of the south, compared to the current costs of rice imports, have resulted in a continuing need for subsidies in Cameroon, Senegal, and Nigeria, which can be as high as 100 percent of current international rice prices.

Meanwhile, individual countries subsidized domestic rice production (in order to make it competitive with imports in distant port cities) when the appropriate markets happened to be across national borders, a fact that raises important issues about international and regional trade policy. For example, the market for rice produced in northern Cameroon is logically located in nearby Nigeria, rather than in southern Cameroon. However, Nigerian bans on rice imports in 1986 have resulted in substantial losses in rice production in Cameroon. This does not mean that parallel markets across national boundaries do not exist; rather it implies that the costs of marketing are higher than need be, the risks and uncertainties greater, and the difficulties in planning production policy harder to overcome.

Given the growing urban demand for rice, the income effect of rising rice prices, and the investments that have already been made in domestic production, restraining (if not reducing) the future production costs of such investments is of considerable policy importance. In practice, however, governments and donors have tended to overlook the gross inadequacy of domestic capacity in Africa to operate and maintain these investments. This has resulted in a recurring need for rehabilitation, involving continued technical assistance and imported equipment. For instance, 30 percent of the investment costs of rehabilitation of rice schemes in the Fleuve region of Senegal has been spent on technical assistance for management.

Finally, high world market price projections in the past have exacerbated subsidies (resources which could have gone for traditional food and export crops), allowing for more efficient growth in the short and the medium run until true comparative advantage could be developed. Thus in Senegal, for instance, income from groundnut production in a normal year is seven times that of rice. Contrary to much donor analysis, MADIA results suggest that Senegal has a distinct comparative advantage in groundnut production *under improved technology*. Improvement in their groundnut production has, however, received relatively little attention compared to the policy priority given to the promotion of irrigated rice in the Fleuve.

Donors' Investments in Food Crop Diversification

A consistent and long-term financing policy toward diversification is clearly necessary, both within each donor agency and in the donor community as a whole, based on a probabilistic (rather than deterministic) analysis of world market prospects, country-specific and regional considerations, etc. In reality, however, the outcomes of investments in diversification in Africa have depended more on radically different price expectations over time (and on the ebb and flow of country-specific dialogue as well as the roles and views of individual donor and African government officials), rather than on a well-conceived overall strategy. Thus, while the World Bank provided financing for irrigated rice production in northern Cameroon during the early and mid-1970s, it withdrew support in the late 1970s as rice prices declined and production costs exceeded expectations. The EEC and France, however, continued their support. In Senegal, on the other hand, around the same time, the Bank did not participate in the investment in irrigation works in the Fleuve (for which several other donors provided support), but undertook financing of field investments for the production of rice in the large and small perimeters in the 1980s on grounds of sunk costs (once the investment in the barrage had been financed). More recently, donors have begun to coordinate their policies toward rice investment in West Africa, but it is too early to assess the results.

Similarly, several donors (including the World Bank) invested in Bura irrigation in Kenya in the mid-1970s (which later turned out to have had a negative rate of return); at around the same time, however, the Bank steadfastly—and wisely in our view—insisted on the pursuit of a rain-fed strategy in Nigeria and followed it up later with assistance for the development of low-cost irrigation. This approach had an important positive effect on Nigeria's own smallholder development strategy.

Diversification into Horticultural Crops

Horticultural crops tend to be high-value products with substantial scope for income and employment generation among small farmers. The growth of many such crops offers several impressive examples of "uncontrolled" diversification. Northern Nigeria, the northern and southern highlands of Tanzania, and the highlands of Cameroon are excellent examples, as is Kenya, whose growth of horticultural exports has increased at nearly 12

percent a year, albeit from a small base. This substantial diversification to meet growing urban and export demand has occurred in response to investments in physical infrastructure, particularly roads. Such diversification typically gets overlooked in an evaluation of price policy. The impact on welfare gains in particular can be underrated since the mainly partial analysis of efficiency and welfare losses focuses on traditional food and export crops. Unfortunately, and despite the importance of developments of this kind for income and employment generation, their implications for public policy (in terms of the need for supportive transportation, information, and financial market networks for private trade) have yet to receive attention by governments and donors on the necessary scale.

Land Policy

Much of the increase in agricultural production in the MADIA countries over the past two decades has resulted from an expansion of land area under cultivation, while the composition of output has been determined mainly by shifts in relative crop prices. Price variables have determined the value added by labor use—the single most important component of the value of output. The ability of producers to mobilize additional land and labor, along with such little capital as is used in production (for example, implements, animal traction, or fertilizer) has been crucial in raising production levels.

In Cameroon and Nigeria, access to tractors has influenced the ability of rural households to clear land, and subsidies on tractor operations have made a notable impact. On the other hand, the institutional and juridical aspects of land policy—such as legally specified rights to the use and ownership of land or rights to grow crops—have not been prominent issues there in contrast to the situation in the East African countries, where they have been of critical importance in determining agricultural performance.[71]

In Kenya, land policy meant settling Africans on land formerly owned and operated by European settlers in the Rift Valley and the White Highlands. A relatively competitive land market has evolved, and large increases in land titling have occurred in areas of high potential, where rights to grow high-value tree crops such as tea and coffee (along with dairying) have been promoted. Smallholder tea hectarage increased almost tenfold and coffee hectarage doubled between 1970 and 1985. The amount of land registered increased from 1.8 million hectares to 6.5

million hectares between 1970 and 1983. The share of smallholders in total registered land was 43 percent overall, but it was well over 80 percent in western, Nyanza, central, and eastern provinces—the heart of smallholder production in Kenya. Although smallholders have had recourse to legal ownership in Kenya, the process of land-titling has been fraught with unequal access to capital and land, because of ethnic biases, conflicting tenure customs, and registration fees.[72] These obstacles to land ownership have contributed to the migration of population onto marginal land and, consequently, contributed to an unsustainable process of soil exhaustion.

In Malawi, customary rights to cultivate and transfer smallholder land are conferred by traditional tribal chiefs, while the expansion of estate farming has been explicitly determined by government policies. Burley and flue-cured tobaccos have been reserved for estates through a licensing policy that accompanies the establishment of leaseholds on "unused" customary land. The transfer of land from smallholders to estates has contributed to economic growth through estate production but has worsened land distribution over time and led to a decline in average farm size in both sectors. The crowding out of land under increasing population pressure, as well as the growing subsistence requirements, appear even more serious in view of the estimated 75 percent of estate land that remains unused. Although the process of technical change may be slower for smallholders than for estates, land policy will be one of the most important factors determining future agricultural growth in Malawi.

In Tanzania, smallholder control over land has suffered as a result of state policy. Tanzania formally abolished traditional tribal village authority, replacing it with public ownership of land whereby an individual has no right of ownership or sale. The ideology of the ruling party, buttressed by growing support at the grassroots level, discouraged "capitalist farming" by large and small farmers alike in the 1970s. 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. Given the weak soils (the reason for traditionally sparser settlements), the Ujamma policy toward land increased environmental stress and led to greater problems of erosion and deforestation.

Yet there were also some positive aspects to land policy in Tanzania. Investments in the Tanzam road and rail links opened up areas of high agricultural potential for spontaneous settlement in the Southern Highlands. Since Western donors declined to finance the railway, Tanzania had to seek funding from China. These areas are now an important source of agricultural production of coffee, tea, maize, and tobacco. Unfortunately,

these gains have been offset by the government's discriminatory investment and pricing policies, which hurt the traditional production areas in the north and the west, as well as by the bias of these policies toward low-income, resource-poor regions.

Labor Policy

Another important issue relating to factor mobilization in East Africa has been the use of labor policy. The use of labor legislation and minimum wage laws as well as the prevalence of unionism have been most widespread in Tanzania, Together with the political campaign to discourage the use of hired labor, these factors have played a part in the decline of both smallholder and large-scale agriculture in Tanzania.

The Malawian government, on the other hand, neglected the unionization of labor, and wage employment in estate production grew at nearly 10 percent per year in the 1970s. This occurred in circumstances of falling real wage rates—due to the discriminatory land policy that created an elastic supply of labor from the smallholder sector.

Kenya, in contrast, created a wide range of employment opportunities in the agricultural sector in both smallholder and estate farming, as well as nonfarm activities. Although minimum wage guidelines were observed in agricultural employment, Kenya followed more moderate policies than the other two East African countries. Despite population growth, real wages have fallen less in Kenya in comparison to their levels in the early 1970s. In Malawi and Tanzania, on the other hand, they have fallen by half.

Transport Infrastructure

The development of rural feeder road networks—a key determinant of growth in smallholder production—has varied across the MADIA countries. Kenya, Malawi, and Senegal have had better programs of feeder road development and maintenance. In Senegal and Malawi, however, road development has had little effect on agricultural growth—in Senegal, because of poor natural resources, and in Malawi, because of land and pricing policies that have kept effective domestic demand very low. Both Nigeria and Tanzania have experienced serious problems with the maintenance of newly constructed and existing feeder roads, while Cameroon's transport network is still in its early stages of development.

Fertilizer Policy

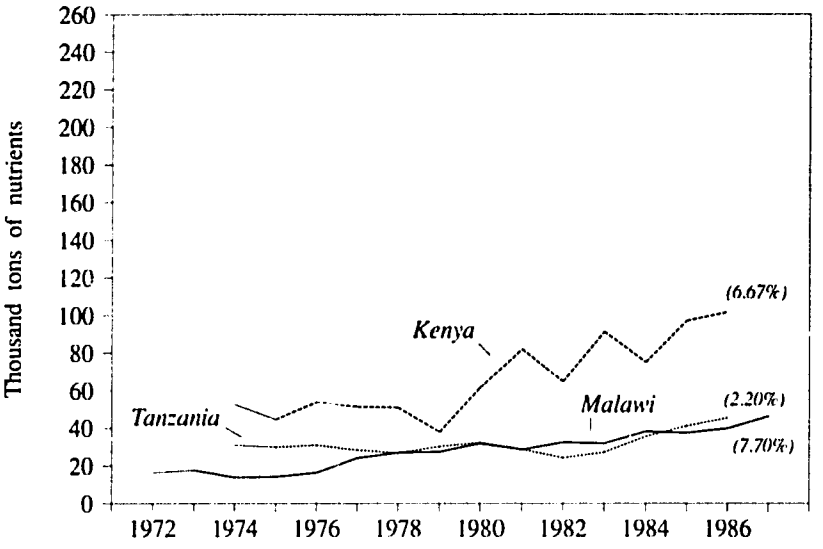
It is difficult to establish a global correlation between agricultural performance and the growth of fertilizer use in the MADIA countries. This is not surprising in view of the important role played by macroeconomic and other sectoral policies (including explicit and implicit taxation of agriculture, the rights to grow export crops, and the ability of small and large farmers to mobilize land and labor).[73] Kenya, which led the MADIA countries in growth of food and export crop production, was fourth in the growth of fertilizer use—6.7 percent between 1974 and 1986 (see figures 10 and 11). Nigeria, in contrast, shows the most rapid growth (18.0 percent from 1972 to 1987) but was one of the poorest agricultural performers. Tanzania and Senegal, both of which performed poorly in agriculture, also had the least satisfactory growth in fertilizer use (2.2 percent and 0.8 percent, respectively). Malawi and Cameroon were in the middle—both in performance and in the growth of fertilizer use (11.7 percent and 7.7 percent, respectively).

Among the six countries, Kenya has been least reliant on explicit subsidies of fertilizers (which were eliminated in 1977), while Tanzania and Nigeria have relied on them the most. The rate of explicit fertilizer subsidy in Tanzania and Nigeria was similar (75 percent in the 1970s in Tanzania, and 85 percent in the 1970s and 1980s in Nigeria). Explicit subsidies in Senegal (55 percent), Cameroon (54 percent), and Malawi (23 percent) have been relatively moderate.[74] The overvaluation of the exchange rate in Nigeria and Tanzania has meant implicit subsidization of fertilizers and other imported inputs.

Recent reform measures have focused on the removal of fertilizer subsidies and the privatization of distribution networks as a way of reducing deficits and the role of the public sector. Policy reform efforts have not, however, addressed the broader and longer-term issues of the role of fertilizer (1) in agricultural intensification; (2) in the context of low levels of agricultural productivity; (3) in increasing population pressure, the scarcity of arable land, and soil degradation; and (4) in increasing reliance on food imports.

It is important to recognize the extent to which a lack of supply of fertilizer to the smallholder sector—as distinct from demand—has been responsible for the insufficient growth in fertilizer use observed in many countries. Despite the overall success of agriculture in Kenya, for example, the supply of fertilizer has been hindered by a variety of constraints including, among other things, the shortage of foreign exchange; a lack of

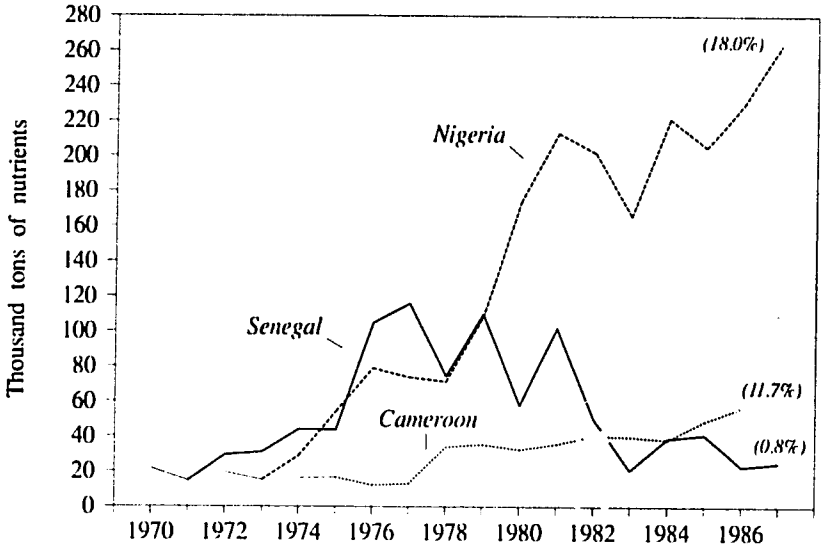
FIGURE 10 Trends in Fertilizer Consumption in East Africa, 1972–1987



SOURCE: Uma Lele, Robert Christiansen, and Kundhavi Kadiresan, "Issues in Fertilizer Policy in Africa: Lessons from Development Programs and Adjustment Lending, 1970–1987," MADIA Working Paper (Washington, D.C.: World Bank, 1989).

credit to importers, distributors, and farmers; and the limits of the private sector in increasing the supply of fertilizer in areas where returns to fertilizer use are low. Tanzania and Cameroon have faced similar supply problems. In Malawi, on the other hand, the lack of effective demand for fertilizer has been a greater problem than in other countries because of low returns to and high risk in fertilizer use by small farmers—although a number of supply constraints also exist. In Senegal, the collapse of fertilizer use in the groundnut basin is largely the result of the failure of the supply system, although the demand for fertilizer fluctuates from year to year because of the risks associated with low and declining rainfall. In Nigeria, a strong supply push by the government (both through a generous allocation of foreign exchange and an active role in distribution) led to impressive growth in fertilizer use in the past. The highly distortionary effect of large implicit and explicit subsidies made fertilizer application

FIGURE 11 Trends in Fertilizer Consumption in West Africa, 1970–1987



SOURCE: Uma Lele, Robert Christiansen, and Kundhavi Kadiresan, "Issues in Fertilizer Policy in Africa: Lessons from Development Programs and Adjustment Lending, 1970–1987," MADIA Working Paper (Washington, D.C.: World Bank, 1989).

highly profitable, despite response coefficients that some sources reported to be low but that others contested.

In general, fertilizer subsidies are to be regarded as undesirable for a variety of reasons, including their equity effects and the difficulty of controlling their cost. They are often ineffective because they address only the price dimension of fertilizer use and not the supply constraints. Nonetheless, it must be recognized that a combination of supply constraints and benefit-cost ratios that (because of low response coefficients) do not compensate for the risk of fertilizer use even though it is profitable, may restrict the use of fertilizer among some groups (as observed, for example, in the case of smallholders growing local maize in Malawi). In these circumstances subsidies are necessary in the short run as a device to encourage fertilizer use until the other constraints hindering the latter are addressed.

Although evaluating the experience with privatization of fertilizer distribution may be premature in some of the countries—for example, in Malawi, where private trading has been planned but has not been

implemented—the trends in other countries permit a judgment. Though Kenya, with its history of a dynamic private sector, might be regarded as the country where privatization would be most successful, its experience has been mixed. On the one hand, privatization and liberalization have allowed large agricultural units such as estates and some cooperatives improved access to fertilizers. On the other hand, small-scale agricultural producers, especially those in remote areas, have not benefited because the private sector has tended to concentrate its attention on the large producers. Although the private sector can improve the efficiency of input distribution, it must be recognized that, in general, it cannot alone meet the needs of all producers. Nor can it be expected to promote or create demand for inputs where fostering a profitable level of demand will require a substantial investment of time and resources. In addition, given the complex agronomic dimensions of soil fertility that need to be addressed in most African countries, it is unreasonable to expect the private sector alone to attempt solutions to problems of soil management and credit supply for farmers.

It is important to stress that lack of knowledge about physical responses to fertilizers is one of the most serious problems in formulating effective long-term policy. Because relatively little donor assistance has been directed toward understanding the determinants of fertilizer use at the farm level in Africa, policy makers and donors are poorly equipped to design and implement policies in support of intensification. Given the amount of time required to generate reliable data and the confusion caused by the results of short-term trials financed by donors, a long-term commitment by donors and governments to produce better information on the fertilizer sector is urgently needed. This will require developing the capacity of African analysts and institutions to undertake this work on a long-term basis as a routine component of agricultural policy.

Credit Policy

All six countries have subsidized agricultural interest rates, but in Kenya and Malawi these have been lower than in Tanzania, Nigeria, or Senegal. The amount of seasonal and medium-term credit available has been largest in Kenya, followed by Malawi, Senegal, and Tanzania. In Cameroon, credit has been tied to the promotion of specific export crops, such as coffee and cotton, and this has benefited fewer farmers than in Kenya or Malawi. In all the countries, much of the available subsidized credit has

accrued to the larger farmers. Only in Kenya and to a lesser extent in Malawi have smallholders benefited significantly from the provision of institutional credit.

Agricultural Research and Technology

The relative neglect of research and technology by both governments and donors has been one of the most important long-term reasons underlying the poor agricultural performance in Africa. Increased factor productivity is important not only because of its welfare implications, but also because the achievement of food security can help release land and labor for diversification into higher value production for domestic use or for export.

African political elites have not shown sufficient appreciation of the fundamental importance of science and technology in modernizing smallholder agriculture. Furthermore, small farmers' interests are so poorly articulated in African countries (although Kenya is an exception) that this has not been an avenue for exercising influence on research priorities. Donor efforts, including those of the Consultative Group on International Agricultural Research, have been largely supply- rather than demand-driven, and they have not adequately reflected the constraints faced by the mass of small farmers.[75]

The growth of maize production in a wide range of ecological conditions in the MADIA countries provides one of the few examples of technical change in the food crop sector. Not only do traditional varieties of maize offer higher yields than sorghum or millets, but more fertilizer-responsive varieties of maize have become available. Despite weak 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 fact that up to 60 percent of its smallholder maize acreage is under hybrid or composite varieties, compared to less than 10 percent in any of the other countries. Much of this gain was achieved in the 1960s, and little subsequent intensification has taken place. Malawi's hybrid maize research program faces the question of 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 varieties primarily reflects the inadequate resource base of small farmers and their inability to bear the risk of variable output—but is also due to a complex of other

factors including consumer preference for flint maize, its better storage characteristics, and inadequate access of farmers to credit and extension. In West Africa, improved maize has done well in northern Nigeria and in the high-potential areas of Cameroon. Little technical change has occurred, however, in the production of other food crops.

In contrast, export crop research has been of high quality historically, but has deteriorated in countries such as Tanzania and Nigeria in the postindependence era. Despite a substantial increase in research expenditures during the oil boom in Nigeria, the lack of political commitment and stability has seriously undermined the capabilities of a once impressive scientific community. In Tanzania, major adverse factors have included the breakup of the East African Community on which it had depended for research, especially in tea and coffee; the sudden withdrawal of the British Cotton Research Corporation in 1975; and the primacy of ideological over technocratic considerations in the content and conduct of agricultural policy. Kenya and Malawi, in contrast, have had excellent agricultural research systems for their major export crops that have been financed through levies on these crops.

In the francophone countries, commodity research carried out by the French has continued uninterrupted; however, less training of nationals has occurred in comparison to what was formerly provided by the British for export crops in the anglophone countries (and more recently by the Americans for food crops). Although research efforts have yielded some important innovations—such as drought-resistant varieties of groundnuts, promotion of sole cropping, and the increased use of animal traction in Senegal—they have not addressed the serious problem of soil degradation, or the special need to integrate cropping, livestock, and tree farming by smallholders in order to protect the environment.

In contrast to the colonial era, export crop research has been neglected by governments and donors alike since the early 1970s. Both humanitarian concerns regarding food security as well as environmental effects of export crop development have dominated constituency concerns in the Western community. The Consultative Group on International Agricultural Research, for instance, has provided little support for export crop research.

Although the recent trend among donors to invest in agricultural research is long overdue, it seems to be overloading recipient capacities to manage such research effectively (as observed in Tanzania, Malawi, and Kenya) and to integrate work done by national researchers with that of expatriates (as in Senegal). A common defect of these efforts has been excessive emphasis on the provision of "brick and mortar" and expatriate technical assistance, and

not enough emphasis on establishing long-term human and institutional capacity—or even on using the pool of human capital that has been developed—to address the substance of technological issues.

Institutional Development

Each of the six countries has faced special problems in establishing effective institutions for smallholder development. The successful cases of smallholder development in the MADIA countries highlight the role that stable and flexible institutions for agricultural research, marketing, credit, and extension play in providing important preconditions for growth. The development of responsive agricultural institutions in turn depends on the effective political and technocratic representation of small farmer interests.[76]

The responsiveness of agricultural policy to grassroots institutions has been greatest in Kenya, where routine mechanisms have been established to articulate the interests of smallholders. The role of smallholders in Kenya's struggle for independence—based as it was on the Africans' assertion of land rights denied to them during the colonial era—together with significant government support (including the allocation of administrative and financial resources) has contributed to the development of a highly decentralized system that articulates and responds to producer interests. In fact, cooperatives represent 50 percent of small farm households. Kenya has also produced successful and internationally renowned smallholder organizations such as the Kenya Tea Development Authority.

In the other countries, however, governments have shown an active pessimism about the efficiency of small farmers and little enthusiasm for grassroots organizations. The latter have often been viewed as alternative bases of political power—a perception that has caused much institutional instability despite the existence of stable political regimes. Tanzania's socialist policies, for example, extolled the rhetoric of participation, but were associated in practice with a high degree of centralization—as reflected in top-down directives for moving the rural population into "Ujamaa" villages and in the abolition of cooperatives, which were, at least in part, seen as a threat to the party's political dominance. Despite the fall in the share of estates in the production of tea and coffee from 1965 to 1984, the political representation of smallholder interests did not improve.

In Malawi, the productive base has been oligarchic and has virtually stunted smallholder development. Smallholder participation consequently

has been bypassed and cooperatives have not been permitted. With the demise of estate-led growth in the late 1970s, the onset of structural adjustment, and the growing power of the technocracy, greater attention has been focused on broad-based participation.

In much of West Africa, smallholder participation has suffered from weak organization and strong ethnic cleavages. In Nigeria, where the production of individual crops can be closely identified with specific regional groups, ethnic factors—coupled with organizational problems such as inadequate resources and geographic dispersion—have made impossible the formation of producer organizations that cut across ethnic barriers. In Cameroon, the government has pursued a top-down, "vertically integrated" approach to smallholder farming. Yet the successful experience with cotton production in the north illustrates how even a top-down approach can confer substantial benefits to the smallholder sector if price and nonprice factors are favorable.

Technocrats have played a more active role in Kenya, Malawi, and Cameroon than in Nigeria, Tanzania, or Senegal. In Tanzania and Nigeria, technocrats have been largely subordinated to ideological and military interests. The different roles of the technocracy in the management of the oil boom in Nigeria and Cameroon explain, in part, the differences in their agricultural performance. Despite large public expenditures on agriculture, the military leadership in Nigeria relegated agricultural policy to a secondary role in the 1970s, which led to a weakening of the Nigerian technocracy at the state, district, and local government levels, placing a serious limitation on the national capacity to generate responsive smallholder development programs and policies. The technocracy in Cameroon, on the other hand, showed greater effectiveness in combining the benefits of the oil boom with the need to maintain a strong agricultural base.

The fragmentation of responsibility for policy planning has been a major problem in several MADIA countries. Ministries of agriculture in Kenya and Malawi have had relatively strong, clear roles in policy making, even though their capacity to implement programs has been rather weak.[77] In Tanzania, the party and the prime minister's office have had far greater policy influence in agriculture than the Ministry of Agriculture or other technical ministries since the decentralization of government in the 1970s. In Nigeria, Cameroon, and Senegal, on the other hand, the locus of policy responsibility has been widely dispersed among numerous parastatal agencies and autonomous project units—instead of being concentrated in government departments and ministries of agriculture.

Conclusion

This study has demonstrated the complexity of agricultural development in Africa, the number of variables that impinge on the outcomes, and in particular, the extent of variability in national endowments as well as in policy responses and outcomes.

In terms of initial conditions, Kenya and Nigeria were the best endowed, followed by Cameroon and Tanzania. Senegal and Malawi inherited by far the least favorable initial conditions. Nigeria and Cameroon had favorable external shocks, primarily because of the dominance of oil. In Senegal, while changes in external terms of trade were favorable, primarily because of the role of phosphates, other external shocks relating to agriculture turned out to be unfavorable (i.e., the terms of trade for groundnuts and the climate).

In this respect, the fortunes of the more agriculturally based economies in the East were less favorable than in the West. Terms-of-trade losses were the greatest for Kenya, although both Malawi and Tanzania also suffered major losses.

Among the MADIA countries, only Kenya made the most of its initial conditions and pursued a combination of macroeconomic and sectoral policies that achieved rapid agricultural growth while also promoting equity.

Malawi's growth record was good in the 1970s, primarily reflecting its good macroeconomic policies, but land and price policies swamped the effects of other favorable policies in smallholder agriculture.

Nigeria's adverse policies and "luck" in terms of internal shocks to the system meant that it did not make good use of the resources at its disposal for laying the foundations of long-term growth, although much physical infrastructure was developed and social indicators improved. Political problems have been enormous in Nigeria, and the nature of its policy responses were in many ways symptomatic of its political and institutional problems.

Cameroon followed more moderate policies than Nigeria, albeit with highly variable performance, as between cotton and other subsectors of the agricultural economy.

Tanzania and Senegal performed least well. Whereas adverse policies played a part in both countries, Tanzania had more favorable resource endowments than Senegal, which underlines the role of policies in explaining performance. In Tanzania's case, genuine strides were made on the equity front, but they could not be sustained because too little attention was paid to agriculturally led growth.

While favorable price incentives based on appropriate macroeconomic and sectoral policies played a key role in explaining performance, the quality of natural resources and of technological, institutional, political, human, and physical investments critically determined the ability of small farmers to mobilize land and labor, the two most important factors explaining growth. There was relatively little technical change in the agricultural sectors of MADIA countries.

Important physical and human capital foundations were laid in all countries, but the record of both successes and failures in MADIA countries highlights the amount of time needed for learning-by-doing, the underlying importance of exploiting initial conditions, and the difficulty in creating a new market niche through diversification. Ironically, the countries that moved to diversify their economies least rapidly did the best.

The growing population pressure on limited land resources in Kenya, Malawi, and Senegal confronts these countries with exceptionally difficult problems. Now that Kenya has developed a sound smallholder agricultural base, productivity increases will be crucial for growth. In Malawi and Senegal, smallholder agriculture faces far more complex problems, partly because of the policies pursued in the 1970s. Tanzania and Cameroon, and to a lesser extent Nigeria, have better prospects, if only because of their favorable resource endowments.

Donor assistance has played a relatively small role in the growth that occurred in MADIA countries. Large amounts of aid have been allocated

with the best of intentions, but to types of activities that have had little effect on growth. Nonetheless, there are some outstanding examples of the catalytic role that well-conceived donor assistance can play. They include smallholder tea and coffee development in Kenya, cotton in Cameroon, and maize and small-scale irrigation in northern Nigeria and elsewhere. The success with which donors have contributed to the growth process seems fundamentally to depend on the extent to which they understand the myriad of microlevel constraints on growth prospects in individual projects and subsectors. Not surprisingly, therefore, those donors with prior colonial connections with Africa have had a relatively greater share of the successes achieved than others. The importance of the "colonial" donors has been declining in Africa, however, and their ability to create sustainable indigenous systems has been limited. This decline in external expertise and knowledge about Africa is especially worrying in relation to the amount of external financial resources being devoted to alleviating the continent's crises. Equally concerning is the fact that with the major exception of the U.S. record in Africa (as in Asia), and the singular contribution of the Nordic Cooperative Project in strengthening the managerial capabilities of the Kenyan cooperatives, "new" donors have tended to underemphasize the importance of human and institutional capacity, while overestimating the utility of aid in the form of physical plant and expatriate technical assistance.

It is important to stress that our findings reflect the donor studies carried out for the wider MADIA program. The official studies contributed by donors themselves emphasize the extent to which the effectiveness of external assistance has been undermined by the donors' limited abilities to tailor their assistance to important aspects of the local conditions under which their programs operate, as well as their limited ability to take adequate account of the impact of microlevel constraints. Donors also note the tendency to respond to such problems by falling back on technological and organizational solutions arising from their own particular backgrounds and expectations, which may have relatively little connection in practice with recipients' needs or organizational and manpower capabilities. Time and again, studies by MADIA's collaborating donors stress the problems associated with lack of country-specific knowledge, including historical and situation-specific constraints. They also emphasize that if the current focus of reform programs on the removal of price distortions is to be appropriately complemented by institutional and other nonprice changes needed to give the pricing reforms a chance to work, there is pressing need for a greater institutional memory in the donor

community and a better understanding of the sociopolitical and technological factors operating in recipient countries. There must also be greater emphasis on the longer-term "superstructural constraints" that persist even while structural adjustment loan–type programs are being completed; these are constraints that only Africans themselves can remove through increased political will and improved human and institutional capital.

The MADIA study further stresses the imperfect understanding of the real sources and causes of growth and the methods used to promote them—which means that donors and governments do not always agree on means, or even on specific ends. An objective diagnosis of a particular development problem (or definition of a particular policy goal) can only be built up through data-based analysis in which donors and recipients need to share. This should enable donors and recipients to reach a consensus about the steps needed to solve the problem or achieve the goal. A second broad consensus then needs to be built within the recipient country (based on the involvement of individual recipient country policy makers in the previous two stages) so that there is a sustained, indigenous commitment to the reform process.

Finally, if the MADIA study has one observation to offer in addition to that of the need for greater depth in framing and implementing agricultural development strategies, it is the extent to which the swinging pendulum of donor concerns—from a preoccupation with equity in the 1970s, to emphasis on efficiency in the 1980s—has tended to divert attention from more basic, long-run problems. The emphasis on "quick" poverty alleviation during the 1970s gave priority to helping low-income regions and populations and to raising food crop production. The present tendency to emphasize equally "quick" solutions based on correction of price incentives and markets can lead to inadequate attention being paid to an appropriate balance between food and export crop development, between growth and equity objectives (regionally and nationally), between short-term macropolicy adjustments and long-term capacity building, and between physical and human capital development.

The problems associated with framing and maintaining agricultural development strategies based on specificity and balance are very real. If such strategies are to become successfully institutionalized, fundamental changes in approach will be needed. This entails a new focus—by donors and recipients alike—on a more comprehensive, data-based, systematic, and comparative understanding of specific development issues and constraints on a *continuous* basis, perhaps using much broader-based pro-

grams of analysis of the kind attempted in the MADIA study. As a part of the aid coordination process, donors need to specialize and concentrate their resources on their respective comparative advantages, while the process of knowledge acquisition and utilization by African governments themselves must be supported in order to improve their ability to address their own development needs successfully. This process should include establishing and fostering centers of excellence on African issues in both African and donor countries.

NOTES

1. MADIA is a World Bank research project. The African countries covered by the study are Kenya, Malawi, and Tanzania in East Africa, and Cameroon, Nigeria, and Senegal in West Africa. The collaborating donors are USAID, UKODA, DANIDA, SIDA, the EEC, and the French and German governments. After developing generic terms of reference, the scope of each donor study was tailored to the respective donors' activities. Nationals from donor countries with knowledge of Africa and aid processes were selected to carry out analyses of donor policies and programs. Bank staff and consultants, including African nationals, participated in the study of recipient country policies and performance, and political scientists prepared studies on the politics of agricultural policy. Donors and governments participated actively in the study by giving access to valuable material and commenting extensively on the output. A major conference of senior policy makers from donor and recipient countries, designed to explore the implications of the study's findings for government and donor policies, is scheduled for March 1989. The final output of the study, comprising a substantial number of country-oriented and cross-country books and monographs, is currently being prepared and will be reviewed at the conference.
2. For example, the three East African countries are all ex-British colonies or protectorates and have inherited a similar dualistic structure of relatively few large European farms and many small African farms;

all three grow many of the same crops. Cameroon and Nigeria, which have similar ecological zones and grow many of the same crops, benefited from the oil bonanza in the 1970s, although the magnitude and timing of their gains differed and had very different effects on their economies and agricultural sectors. Senegal's dependence on low and uncertain rainfall and its limited production possibilities provide an opportunity for examining agricultural growth prospects in circumstances of poor resource endowments.

3. Regional resource endowments determine income possibilities, with tea, coffee, and cocoa generally providing the highest income per hectare at international prices, followed by tobacco, cotton, sugar, and groundnuts. Rice has tended to generate high incomes for a few, while sorghum and millet areas tend to be the lowest income providers. Although government concerns about regional income distribution have influenced price and expenditure policies affecting agricultural growth, patterns have varied greatly between countries.
4. Land pressure can be a positive factor to the extent that it facilitates intensification, but a negative one insofar as it reduces the bush fallow system, increases deforestation, and affects soil fertility.
5. See Yaw Ansu, "Macroeconomic Shocks, Policies, and Performance: A Comparative Study of Kenya, Malawi, and Tanzania, 1967–1984," MADIA Working Paper (Washington, D.C.: World Bank, July 1986) and Pierre Seka, "Macroeconomic Shocks, Policies, and Performances: The Case of Three West African Countries—Cameroon, Nigeria, and Senegal," MADIA Working Paper (Washington, D.C.: World Bank, forthcoming).
6. It is important to stress that *average* yields have not grown, although some location- and crop-specific increases have occurred. The decrease in fallow and accompanying soil degradation due to rising population pressure, the movement of populations into marginal areas, and the low production responses to increases in fertilizer use have all contributed to the stagnation in average yields.
7. On agricultural exports, economic diversification, and how they affected lending patterns, see Uma Lele and L. Richard Meyers, "Growth and Structural Change in East Africa: Domestic Policies, Agricultural Performance, and World Bank Assistance, 1963–1986, Parts I and II," World Bank DRD Discussion Paper, Nos. 273 and 274 (Washington, D.C.: World Bank, 1987); Uma Lele and L. Richard Meyers, "Agricultural Development and Foreign Assistance: A Review of the World Bank's Experience in Kenya, 1963–1986,"

MADIA Working Paper (Washington, D.C.: World Bank, December 1986); U. Lele, A. T. Oyejide, B. Bumb, and V. Bindlish, "Nigeria's Economic Development, Agriculture's Role and World Bank Assistance, 1961–1986: Lessons for the Future," MADIA Working Paper (Washington, D.C.: World Bank, forthcoming). On the way export pessimism affected donors' policy advice to governments, see also Uma Lele, Mathurin Gbetibouo, and Nick Van de Walle, "Agricultural Development in Cameroon: A Review of the World Bank's Experience, 1967–1986," MADIA Working Paper (Washington, D.C.: World Bank, forthcoming).

8. For agricultural development strategies in each of the MADIA countries and the World Bank's role, see Lele et al., "Nigeria's Economic Development"; Lele and Meyers, "Agricultural Development and Foreign Assistance"; Lele, Gbetibouo, and Van de Walle, "Agricultural Development in Cameroon"; and J. Kydd and N. Spooner, "The World Bank's Analysis of Malawian Agriculture: Changing Perspectives, 1966 to 1985," MADIA Working Paper (Washington, D.C.: World Bank, February 1987).
9. *The Assault on World Poverty: Problems of Rural Development, Education and Health* (Washington, D.C.: Johns Hopkins University Press for The World Bank, 1975).
10. Bruce Johnston, Allan Hoben, and William K. Jaegar, "A Review and Assessment of U.S. Activities to Promote Agricultural and Rural Development in Sub-Saharan Africa," in Uma Lele, ed., *Aid to African Agriculture: Lessons from Two Decades of Donor Experience* (Washington, D.C.: World Bank, forthcoming); see also Johnston et al., "An Assessment of Aid Activities to Promote Agricultural Development in Sub-Saharan Africa," MADIA Working Paper (Washington, D.C.: World Bank, February 1987). See John Howell, "British Aid to Agriculture in Malawi, Tanzania, and Kenya," in Uma Lele, ed., *Aid to African Agriculture* (Washington, D.C.: World Bank, forthcoming).
11. Nigeria, which benefited from the oil bonanza, did not experience any increase in official development assistance (ODA). Its substantial oil windfall was spent no more efficiently than the extra ODA flowing to other African countries, although Nigerian expenditures did differ from those that donors supported in other MADIA countries. See Lele et al., "Nigeria's Economic Development." Nevertheless, the World Bank assistance that was dominant in Nigeria focused explicitly on increased food production.

12. See postscript to Uma Lele, *The Design of Rural Development: Lessons from Africa* (Baltimore: Johns Hopkins University Press, 1975).
13. Lele and Meyers, "Growth and Structural Change."
14. See Maria Cancian, "Aid Allocation to Cameroon, Kenya, Malawi, Nigeria, Senegal, and Tanzania: A Review of the OECD Databases," MADIA Working Paper (Washington, D.C.: World Bank, October 1987). Data were derived from *Geographical Distribution of Financial Flows to Developing Countries.* According to page 281 of this document, official development assistance (ODA) is defined as "flows to developing countries . . . provided by official agencies for development purposes with a grant element of at least 25 percent."
15. Total receipts net (TRN) includes ODA as well as other official nonconcessional, bilateral, multilateral, and trade related transactions, including export credits and other changes in bilateral long-term assets of the private nonmonetary and monetary sector, private direct investment, portfolio investment, and loans by private banks, as defined in *Geographical Distribution*, 282.
16. Johnston et al., "A Review and Assessment."
17. Danish TRN to Kenya and Tanzania was 99 percent and 97 percent ODA respectively; Swedish TRN to these countries was 94 percent and 96 percent ODA respectively. German TRN to the MADIA countries (with the exception of Nigeria) was 72 percent and 93 percent ODA respectively, while U.S. TRN to MADIA countries was 62 percent and 98 percent ODA respectively.
18. See Ellen Hanak and Michael Loft, "Danish Development Assistance to Tanzania and Kenya (1962–1985): Its Importance to Agricultural Development," and Marian Radetzki, "Swedish Aid to Kenya and Tanzania: Its Impact on Rural Development," in Uma Lele, ed., *Aid to African Agriculture*, (Washington, D.C.: World Bank, forthcoming).
19. Howell, "British Aid."
20. Ibid.
21. Radetzki, "Swedish Aid."
22. Claude Freud, "French Economic Cooperation with Senegal and Cameroon: Rural Development from Independence to the Present," in *Aid to African Agriculture.*
23. We have shown elsewhere that nearly 40 percent of the contributions to Nigeria's Agricultural Development Projects (ADP) strategy has come from the World Bank. As the budget crunch increased, the Bank may have been influential in protecting expenditures on the small-

holder sector relative to other expenditure cuts in, for example, irrigation investment. See Lele et al., "Nigeria's Economic Development."

24. Radetzki, "Swedish Aid."
25. Cancian, "A Review of the OECD Database."
26. Michael Lipton, "Limits of Price Policy for Agriculture: Which Way for the World?" *Development Policy Review* 5 (1987): 197–215.
27. Freud, "French Economic Cooperation."
28. See Annual Meeting Speech of Barber Conable, President of the World Bank, to the Board of Governors (Washington, D.C.: World Bank, September 1987) and "Poverty and Hunger" (Washington, D.C.: World Bank, 1986).
29. Lipton, "Limits of Price Policy."
30. Lele and Meyers, "Agricultural Development and Foreign Assistance."
31. It should be noted, however, that Kenya's gains in the smallholder sector were slow and steady, arising from growth in smallholder production over a long period beginning in the late 1950s and the early 1960s, whereas Malawi's estate-led export crop growth showed a rapid burst during the 1970s and peaked at the end of the 1970s and early 1980s (a point we shall take up later when discussing structural adjustment). Malawi's superior performance has tended to be attributed to favorable macroeconomic policies and outward orientation. This observation is only partially true as it applies to the estate sector. See Bela Balassa, "Policy Responses to External Shocks in Sub-Saharan African Countries, 1973–76," *World Bank Reprint Series No. 270* (Washington, D.C.: World Bank, 1987).
32. Uma Lele and Mohan Agarwal, "Smallholder and Large-Scale Agriculture: Are There Tradeoffs in Growth and Equity?" MADIA Working Paper (Washington, D.C.: World Bank, 1989).
33. Nigerian food crop production data are by far the most inconsistent among MADIA countries, and subjective judgment is needed to arrive at conclusions.
34. See E. Boserup, *The Conditions of Agricultural Growth* (New York: Aldine Publishing, 1965). See also Prabhu Pingali, Yves Bigot, and Hans P. Binswanger, *Agricultural Mechanization and the Evolution of Farming Systems in Sub-Saharan Africa* (Baltimore: Johns Hopkins University Press for the World Bank, 1987).
35. Uma Lele and Steven Stone, "Population Pressure and Agricultural Intensification: Variations on the Boserup Hypothesis," MADIA Working Paper (Washington, D.C.: World Bank, 1989).

36. The high degree of micro variability in soils and rainfall, however, makes a global evaluation difficult, and little systematic analysis of soils, rainfall, and technological possibilities exist on a comparable basis, with the notable exception of a recent FAO study. See G. M. Higgins et al., "Potential Population Supporting Capacities in Developing Countries" (Rome: FAO/IIASA, 1983). Kenya has a greater range in the quality of land (high and low potential and rainfall levels and patterns) whereas a relatively greater proportion of the land in Tanzania and Malawi is of medium potential. Malawi only has a unimodal rainfall compared to the bimodal rainfall regimes in Kenya and Tanzania, a combination of land quality and rainfall regime means that production possibilities are more limited in Malawi than in Kenya and Tanzania.
37. In Senegal's groundnut basin, the inferior soil texture, lower rainfall, and greater overall rainfall variability have limited the production possibilities of groundnuts and sorghum/millet.
38. It is hard to make comparisons in land quality between countries in East and West Africa. For example, whereas the FAO study shows greater carrying capacity in Nigeria than Kenya (defined by agroclimatic potential), what limited data on fertilizer responses exist for various ecological zones in Nigeria suggest much lower response coefficients for maize, sorghum, and millet than in areas of *comparable* rainfall in Kenya. At an aggregate level, average maize yields are also lower in Nigeria than in Kenya, but this is because much of Kenya's maize production is in areas of relatively high potential not found in Nigeria. See Uma Lele, Robert Christiansen, and Kundhavi Kadiresan, "Issues in Fertilizer Policy in Africa: Lessons from Development Policy and Adjustment Lending Experience, 1970–87," MADIA Working Paper (Washington, D.C.: World Bank, 1989). Some agronomic studies conclude, as we do, that on the whole, the East African semi-arid tropical soils may be superior to those in West Africa. See Peter J. Matlon, "The West African Semi-arid Tropics," in John Mellor, Christopher Delgado, and Malcom Blackie, eds., *Accelerating Food Production in Sub-Saharan Africa* (Baltimore: Johns Hopkins University Press for IFPRI, 1987).
39. Freud, "French Economic Cooperation."
40. It should be noted that this section refers only to items that are in a broad sense formally measurable. It does not include natural or man-made disasters, such as droughts or wars that have substantial, but essentially unquantifiable, "shock" effects.

41. See Ansu, "Macroeconomic Shocks." See also Seka, "Macroeconomic Shocks."
42. Some commentators consider a number of the items listed here to have been consequences of voluntary policy decisions, and thus not "shocks" in the strict sense. See Ansu, "Macroeconomic Shocks."
43. Uma Lele, "Structural Adjustment, Agricultural Development, and the Poor: Some Lessons from the Malawian Experience," MADIA Working Paper (Washington, D.C.: World Bank, 1989).
44. Lele et al., "Nigeria's Economic Development."
45. See Uma Lele, "Tanzania: Phoenix or Icarus?" in Arnold Harberger, ed., *World Economic Growth* (San Francisco: Institute for Contemporary Studies, 1984) and Paul Collier, "Aid and Economic Performance in Tanzania," in Uma Lele and Ijaz Nabi, eds., *Aid and Development: The Transition from Agriculture to Industrialization, and from Concessional to Commercial Capital Flows* (Washington, D.C.: World Bank, forthcoming).
46. Lele et al., "Nigeria's Economic Development," and Christine Jones, "A Review of World Bank Agricultural Assistance to Six African Countries," MADIA Working Paper (Washington, D.C.: World Bank, May 1985).
47. Ansu, "Macroeconomic Shocks."
48. The nominal wage rate in agriculture in Nigeria's Kaduma State increased from N 1.75 in 1976 to N 7.0 in 1986.
49. Lele et al., "Nigeria's Economic Development."
50. Freud, "Policies of Rural Development."
51. To an extent, the EEC's STABEX assistance, intended to compensate producers for this loss, did contribute to stabilizing their revenues (largely by canceling debts on input supply). Because of the fungibility of transferred funds, however, STABEX appears to have supported the expansion of other activities as well.
52. While the maize producer price was fixed by the government and increased at about 10 percent annually in local currency terms to make up for the low maize prices in the early 1970s, it was subsequently adjusted so that it remained by and large in tune with international prices.
53. In West Africa, rice prices were influenced by a combination of trade policy and internal price controls.
54. See Lele et al., "Nigeria's Economic Development"; Lele, Gbetibouo, and Van de Walle, "Agricultural Development in Cameroon"; and Sidi Jammeh, Mathurin Gbetibuo, Riall Nolan, and Uma Lele,

"Agricultural Development in Senegal: Domestic Policies and the World Bank's Role, 1963–88," MADIA Working Paper (Washington, D.C.: World Bank, forthcoming). See also Lele and Meyers, "Agricultural Development and Foreign Assistance," and "Growth and Structural Change."

55. Lele and Meyers, "Growth and Structural Change."
56. Ibid.
57. Lele et al., "Nigeria's Economic Development."
58. For example, the MADIA country study on Kenya (see Lele and Meyers, "Agricultural Development and Foreign Assistance") shows that Kenya's agricultural sector generally performed well in the 1970s, but that the World Bank's agricultural portfolio did poorly (see Lele and Meyers, "Growth and Structural Change") because its assistance went largely to projects for agricultural credit, sugar, development of semi-arid areas, etc., which had relatively low (or even negative) rates of return. In Tanzania, virtually all MADIA donors' projects performed relatively poorly. Production did not match up to the agroprocessing capacity established, and overcommitment of government expenditures in the economy as a whole undermined the effectiveness of area projects. In Nigeria, however, the Bank played an important role in providing assistance that improved the quality of expenditures both between agriculture and the rest of the economy, and within agriculture (by focusing its resources on smallholder-related agriculture). See Lele et al., "Nigeria's Economic Development," Lele and Meyers, "Agricultural Development and Foreign Assistance," and "Growth and Structural Change." See also Lele, "Price and Non-Price Aspects of Sources of Growth in East African Agriculture: Some Lessons for Government and Donors," *World Bank Economic Review* 3 (January 1989): 119–44.
59. The processing units for smallholder tea and coffee funded by the World Bank and CDC in Kenya also improved crop collection and greatly encouraged production of both these crops.
60. Members of KTDA recently won a lawsuit against the Authority for having illegally retained funds from the proceeds of tea payments for construction of an office building in Nairobi. KTDA was obliged to pay back the sum with accumulated interest.
61. This is despite the fact that the bulk of Cameroon's cotton gets classified as higher quality (strict middling 1" 1/16 to 1" 3/32 Memphis) compared to Nigeria's strict low middling (medium staple) from 1" to 1" 1/32 Texas. The differences in Memphis and Texas cotton were

estimated to be some $125 dollars per ton of lint. Moreover the ginning outturn in Cameroon had reached 39.5 percent in 1986 compared to an estimated 33 percent in Nigeria, leading to a difference of $250 per ton of lint. See Uma Lele, Nicolas Van de Walle, and Mathurin Gbetibouo, "Cotton in Africa: An Analysis of Differences in Performance," MADIA Working Paper (Washington, D.C.: World Bank, 1989).

62. Tanzania's cooperative sector did, however, have an impressive record of cotton development in the 1960s. See Lele, *The Design of Rural Development.*
63. Lele and Meyers, "Agricultural Development and Foreign Assistance."
64. Meanwhile, concern that falling tea prices would mainly benefit developed world consumers rather than developing country producers has been substantially offset by the fact that much of the growth in consumption has taken place in developing rather than developed countries. This may also turn out to apply to coffee and cocoa as the future demand for them grows in developing countries.
65. Uma Lele, "Comparative Advantage and Structural Transformation: A Review of Africa's Economic Development Experience" (Paper presented at the Symposium on "Current State of Development Economics: Progress and Perspective," Yale University, 11 April 1986).
66. Sidi Jammeh and Chandra Ranade, "Agricultural Pricing and Marketing in Senegal," MADIA Working Paper (Washington, D.C.: World Bank, January 1986).
67. Small producers have also pursued increased production of horticultural crops for domestic urban markets and exports, while sugar and irrigated or mechanized rice have played an important role, particularly in West Africa.
68. *Tanzania Agriculture Sector Report* (Washington, D.C.: World Bank, August 1983).
69. Lele and Meyers, "Growth and Structural Change."
70. The Nigerian Agricultural Development Projects (ADPs), funded by the World Bank, provide an important, positive example of a significant effort to introduce low cost tubewell and surface irrigation which have the potential to transform agricultural prospects in that country. Even in these projects, however, emphasis on improving indigenous capacity for policy planning, implementation, management, and operations of irrigation development, including, in particular, implication for long-term soil and resource management, have been few. See Lele et al., "Nigeria's Economic Development."

71. See Uma Lele, "Sources of Growth in East African Agriculture," *The World Bank Economic Review* 3 (January 1989): 119–44.
72. See Uma Lele and Steven Stone, "Population Pressure, the Environment, and Agricultural Intensification in Sub-Saharan African."
73. See Uma Lele, Robert Christiansen, and Kundhavi Kadiresan, "Issues in Fertilizer Policy in Africa: Lessons from Development Programs and Adjustment Lending, 1970–87," MADIA Working Paper (Washington,D.C.: World Bank, 1989).
74. These rates of subsidies represent averages—for Senegal, they represent the mean for 1970–1982; for Cameroon, the mean for 1977–1982; for Malawi, the mean for 1983–1987. See Lele, Christiansen, and Kadiresan, "Issues in Fertilizer Policy."
75. See Uma Lele, William Kinsey, and Antonia Obeya, "Building Agricultural Research Capacity in Africa: Policy Lessons from MADIA Countries," MADIA Working Paper (Washington, D.C.: World Bank, 1989).
76. See Uma Lele and Ellen Hanak, eds., *The Politics of Agricultural Policy in Africa* (Washington, D.C.: World Bank, forthcoming).
77. In Malawi, the increasing institutionalization of the power of the state as president Banda has aged, together with the growing importance of the technocracy in the 1980s (in part due to pressure from the World Bank), has strengthened the planning and implementation capabilities of the Ministry of Agriculture.

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