PN-ABL-788

JUNE 25-28, 1989

PROGRAM

Sunday, June 25

6:00-7:30 Reception

7:30-10:00 Dinner and Welcoming Remarks
Mr. Jaycox, Vice President Africa Region
Mr. Fischer, Vice President Development Economics and Chief Economist
Mr. Aboyade, Chairman, PAI Associates International
Mr. Bollinger, Acting Assistant Administrator for Africa, USAID

Monday, June 26

7:30-9:00 Breakfast

9:00-10:30 **Session I: External Environment, Internal Policies, and Agricultural Performance**

Chair: Mr. Fischer, World Bank

Presentation: Mr. Mule **"Agricultural Growth, Domestic Policies, the External Environment and Assistance to Africa: Lessons of a Quarter Century."** (Lele)

Discussants: Mr. Holmberg, Mr. Namu, Chief Oyaide, Mr. Wolgin, Mr. Ndisale, Mr. Diop, Mr. Sandstrom, Mr. Tchatat, Mr. Mshangama

10:30-11:00 Break

11:00-12:00 Session I—Open Discussion

12:00-12:15 Chair's Summary

12:15-2:15 Lunch

Speakers: Mr. O'Brien, **"The MADIA Study: A View from Inside the Bank."**
Mr. Ingram, **"The MADIA Study: Donor Involvement and Aid Coordination."**

2:30-3:45 **Session II: Population Pressure, Agricultural Intensification, and Environmental Sustainability**

Chair: Mr. Cobb

Presentation: Mr. Bennett **"Issues in Fertilizer Policy in Africa: Lessons from Development Programs and Adjustment Lending, 1970-87."** (Lele, Christiansen, and Kadiresan)

Mr. Norse **"Population Pressure, the Environment, and Agricultural Intensification: Variations on the Boserup Hypothesis."** (Lele and Stone)

Discussants: Mr. Falusi, Mr. Mansuri, Mr. Güsten, Mr. Magani

3:45-4:15 Break

4:15-5:20 Session II—Open Discussion

5:20-5:30 Chair's Summary

6:00-7:00 Walking Tour of Historic Annapolis

Tuesday, June 27

7:30-9:00 Breakfast

9:00-10:45 **Session III: Agricultural Pricing, Markets, Food Security, and Adjustment Policy**

Chair: Mr. Holmberg

Presentation: Mr. Andersen "**Markets, Marketing Boards, and Cooperatives in Africa: Issues in Adjustment Policy.**" (Lele and Christiansen)

Ms. Lele "**Planning for Food Security in Africa: Lessons and Policy Implications, 1960-88.**" (Lele, Gbetibouo, and Fishstein)

Mr. Oyejide "**Food Security and Food Aid.**" (Mellor and Pandya-Lorch)

Discussants: Mr. Stryk
Mr. Banda
Mr. Cleaver
Mr. Markensten
Mr. Karanja

10:45-11:15 Break

11:15-12:20 Session III—Open Discussion

12:20-12:30 Chair's Summary

12:30-2:30 Lunch

2:30-3:45 **Session IV: The Role of Technology and Human Capital in Agricultural Development**

Chair: Mr. Johnston

Presentation: Mr. Idachaba "**Building Agricultural Research Capacity in Africa.**" (Lele, Kinsey, and Obeya)

Ms. Nowak "**The Development of National Agricultural Research Capacity: India's Experience with the Rockefeller Foundation and its Significance for Africa.**" (Lele and Goldsmith)

Discussants: Mr. Wai
Mr. Touré
Mr. Husain

3:35-3:45 Chair's Summary

3:45-4:15 Break

4:15-6:00 **Session V: Issues in Aid Effectiveness: Growth, Equity, Structural Adjustment, and Agricultural Trade Strategies**

Chair: Mr. O'Brien

Presentation: Mr. Candler "**Smallholder and Large-Scale Agriculture in Africa: Are There Trade-offs in Growth and Equity?**" (Lele and Agarwal)

Mr. Mwamufiya "**Structural Adjustment, Agricultural Development, and the Poor: Some Lessons from the Malawian Experience.**" (Lele)

Mr. Tchatat "**Cotton in Africa: An Analysis of Differences in Performance.**" (Lele, van de Walle, Gbetibouo)

Discussants: Mr. Norse
Mr. Mrisho
Mr. Ali
Mr. Ngenge

5:50-6:00 Chair's Summary

6:30 Boat Tour and Dinner

Wednesday, June 28

7:00-8:30	Breakfast		
8:30-10:30	**Session VI: Issues in Aid Effectiveness: Lessons From Two Decades of Donor Experience**		
	Chair:	Mr. Wyss	
	Presentation:	Ms. Nowak Mr. Karanja Mr. Shivakumar Mr. Hoben Mr. Howell Mr. Mshangama Ms. Simmons Mr. Dubey	
10:20-10:30	Chair's Summary		
10:30-11:00	Break		
11:00-1:30	**Roundtable Discussion: Implications for Donor Policy: Adjustment Lending, Project Assistance, and Donor Coordination**		
	Chair:	Mr. Jaycox	
	Panel Members:	Mr. Aboyade Mr. Caudron Mr. Diop	Mr. Namu Mr. Shirima Mr. Lund-Jensen Mr. Westley
1:00-1:15	Chair's Summary		
1:15-1:30	Closing comments Ms. Lele		
1:30	Lunch		

The MADIA study wishes to gratefully acknowledge a generous grant from USAID in support of this symposium and for the dissemination of the MADIA findings.

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Issues in Fertilizer Policy in Africa: Lessons from Development Programs and Adjustment Lending, 1970-87

UMA LELE • ROBERT CHRISTIANSEN • KUNDHAVI KADIRESAN

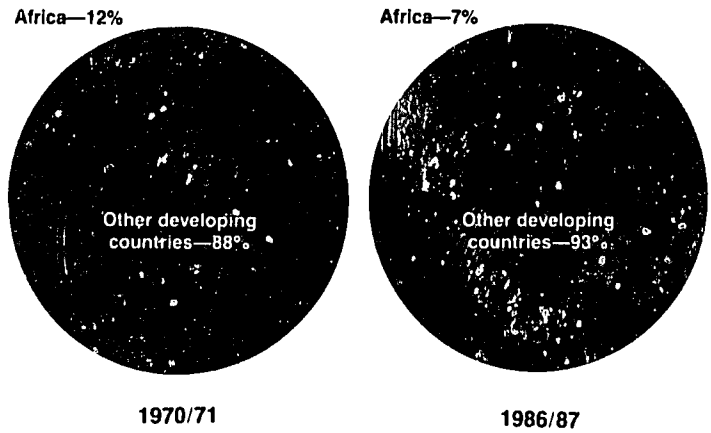
Increasing population pressure on arable land, low productivity, an increasing reliance on food imports combined with stagnant export earnings, the rapid movement of population to the areas of marginal physical potential, and the rapid degradation of soils due to the decline in bush fallow all contribute to the need for agricultural intensification in the MADIA countries. Despite this need, Africa's share of fertilizer use among developing countries declined between 1970/71 and 1986/87—a period during which the developing country share of world consumption doubled (see Figure 1). Recent reform measures have focused on the removal of fertilizer subsidies, privatization, and liberalization of importation and distribution networks as part of a larger strategy to reduce budget deficits and the role of the public sector. This paper argues that neither these reforms nor earlier project assistance have adequately taken into account the much broader and longer-term implications of fertilizer's role in agricultural intensification.

The MADIA study's analysis of reform policies explores the supply and demand contraints that hinder the rapid growth and diffusion of fertilizer use. *Supply constraints* include: (1) macroeconomic factors, most notably foreign exchange and budgetary constraints; (2) institutional factors, including changes in import licensing systems, lack of working capital for importers, wholesalers, transporters, and retailers, officially fixed distributive margins, and poor transport facilities; and (3) political factors affecting the fertilizer distribution arrangements. Demand constraints include the level and variability of fertilizer prices and output, different physical responses to fertilizer application related to location, land potential, population densities, transportation networks, the availability of working capital for small farmers, and the ability of small farmers to undertake risks under rainfed agriculture.

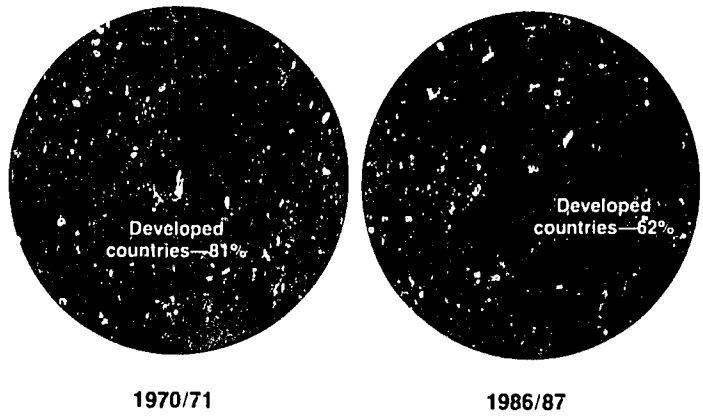
Supply constraints

Supply constraints are by far the most significant in expanding fertilizer use on a sustained basis. Foremost among them are shortages of foreign exchange and weaknesses in the domestic procurement and distribution network. In both Nigeria and Cameroon, oil revenues allowed for adequate supplies of foreign exchange that contributed to their rapid growth of fertilizer use. Malawi ranked third in growth of fertilizer use despite being the poorest of the MADIA countries and having the largest current account deficits as a share of GNP. An important feature of Malawi's performance in recent years has been the Smallholder Fertilizer Revolving Fund, supported by IFAD and IDA, which was designed to ensure the availability of foreign exchange for fertilizer import. In Kenya, despite its superiority in achieving broad-based development in smallholder agriculture, its growth in fertilizer use ranked only fourth during 1970-87. Although fertilizer prices in Kenya were not subsidized they were regulated; and restrictions on import licensing affected the availability and timeliness of fertilizer deliveries in rural areas. The disappointing growth in Tanzania and Senegal resulted partly from the collapse of internal distribution networks because of unpredictable government policies and unstable institutions.

Figure 1
Africa's share of fertilizer use among developing countries



Developing countries share of fertilizer use



Demand constraints

Differences among countries in demand-related factors and their impact on fertilizer use are striking. The price of fertilizer relative to maize, the food crop most commonly grown among MADIA countries, has been highest in Malawi and lowest in Nigeria.

Further, the sharp differences in physical response of crops per unit of nutrient among countries and regions within each country affect profitability. For example, responses of hybrid maize per kilogram of nutrient are four times (20-30 kilograms) higher in Malawi than in northern Nigeria (6-7 kilograms). Within Kenya there are dramatic differences in responsiveness, e.g., maize response in the low potential districts is half that in high potential districts.

Further, the location-specific knowledge about fertilizer responsiveness that is needed to formulate sound policy is lacking, which makes efficient intensification difficult. Within each country fertilizer use should be given priority in areas and on crops where the marginal value of its use is highest from the viewpoint of maximizing growth. This issue is complicated by the fact that population densities are not always greatest in areas where responses to application are high. Political considerations, poor transport networks, taxation of export crops, excess demand for food, tying of fertilizer access to certain projects and areas, and restrictions on distributive margins are all factors that have diverted application to less productive uses. While reform measures are alleviating some of these constraints, others, such as inadequately articulated location-specific technical packages, poor transport networks, and growing market dependence of households in marginal areas for food may well result in continued suboptimal application of fertilizer. Therefore any fertilizer policy requires consideration of both growth and equity.

Fertilizer subsidies

In some of the MADIA countries there are compelling arguments in favor of a fertilizer subsidy based on the need to increase the quantity of fertilizer demanded. The rationale for subsidies reflects the need for household food security, as well as market imperfections, e.g., failure of credit and insurance markets. Specific examples of these circumstances include benefit-cost ratios greater than 1 (but less than the critical value of 2 needed to make fertilizer use attractive); growing household dependence on the market for food, which limits output price increases as a means to ensure the profitability of fertilizer; lack of access to credit; and the increasing scarcity of arable land. In Malawi, leakage of subsidized fertilizer to the estate sector has made the issue of continuing with a generalized subsidy to the smallholder sector even more difficult. Malawi is a clear case where demand constraints have been as binding as supply constraints in the smallholder sector. Efforts to target fertilizer subsidies to the poorest households and fertilizer for work programs are under consideration, but the problem of fertilizer leakage to the more commercially-oriented smaller farmers may remain. Because so little knowledge exists on how targeted subsidy programs work in practice, this lack of knowledge will need to be recognized explicitly, monitored carefully, and modified in light of experience.

Where?

Subsidies in Nigeria now amount to nearly 1 billion naira or 71 percent of the budget devoted to agriculture in 1987. Clearly more permanent investments in agricultural research, small-scale irrigation, transportation, and credit are needed to replace fertilizer subsidies. Despite nearly 11 billion naira spent by the Nigerian government on agriculture since the oil boom including $1.7 billion committed by the World Bank between 1971 and 1988, there is no firm information on technical packages for complex mixed cropping practices of small farmers; this leads to substantial uncertainty about the profitability of fertilizer use, and hence about the demand for fertilizer use. The Nigerian case illustrates the much broader phenomenon documented in the case of Senegal and the semiarid parts of Kenya and Tanzania, emphasizing the need for developing location-specific research and technology suited to the complex and diverse needs of African farming systems.

Roles for the public and private sectors

The private sector can and must play an important role in distribution. It operates most effectively in the areas of established demand, easy access to transportation, and assured profits. This leaves the public sector to establish new demand, especially among low income producers with little or no access to credit. This paper illustrates how and why the public sector has fulfilled this important developmental task in countries with stable institutional arrangements, and the extent to which climatic, political, and financial problems have hindered the operations of the public sector. It also demonstrates the important contributions made by many public sector institutions in promoting the growth of use stressing that the effectiveness of public and private institutions must be assessed in the context of the particular circumstances in which they operate.

Policy recommendations

- *Long-term*, untied import support for fertilizers is needed as a way to ensure supply and improve the research, planning, implementation, monitoring, and policymaking capacity of African governments in order to promote sound intensification of fertilizer use on a sustained basis.
- The knowledge base must be improved on a location-specific basis, especially the relative role of fertilizers vis-a-vis other more complex resource management needs.
- Food and fertilizer stocks should be financed at the national and regional levels as a way of encouraging governments to remove intra- and intercountry restrictions on trade, to broaden markets, and to increase the profitability of fertilizer use over time.
- Fertilizers alone cannot solve the range of complex agronomic problems and must be combined with improved crop rotation and the application of organic matter to maintain soil quality.
- Although privatization offers great potential for improving procurement and distribution of fertilizer, the need for complementary public sector involvement must also be recognized. — in terms of what

MANAGING AGRICULTURAL DEVELOPMENT IN AFRICA

POPULATION PRESSURE, THE ENVIRONMENT, AND AGRICULTURAL INTENSIFICATION: VARIATIONS ON THE BOSERUP HYPOTHESIS

UMA LELE • STEVEN W. STONE

In this paper we explore the relationship among population densities, agricultural production, land, labor, and rural incomes in order to expand the explanatory base of the Boserup hypothesis, which holds that with increasing population densities, a corresponding shift to greater agricultural production and more intensive use of the land takes place autonomously through the development of market forces. The movement away from traditional area-extensive farming methods is associated in the model with higher levels of technology, labor, and capital investment in land. In view of the rapid rates of population growth in Africa and the decreasing frontier, the question arises: "how far can market forces alone induce a productivity-enhancing process of agricultural intensification in Sub-Saharan Africa, and to what extent must it be complemented by an active public policy to support broad-based agricultural development?" The answer is critical to the increasing concern about food security and environmental degradation prompted by rapid population growth on the one hand, and on the other, to the pressure on governments to privatize smallholder services because of fiscal problems and questions about the efficiency of the public sector. To address these issues, the paper surveys existing literature and compiles data at the regional level for the six MADIA countries to isolate variables in the equation linking the intensity of land use, the increasing opportunity costs of idle or fallow periods, the effects of continuous cropping on the soil, and their policy implications.

Two types of intensification are distinguished in the paper. The first, identified by Boserup, occurs spontaneously as more land is brought under cultivation and cropped more frequently in response to higher population densities. The spontaneous movement toward better adapted technology and higher levels of productivity was observed first in the development of Europe and Asia; this paradigm of demand-led growth—what we call "autonomous intensification"—has served as the standard model, but worsening conditions in Africa are casting doubt on its value as a historical precedent. A combination of apparently more fragile African soils (see Figure 1), declining rainfall, and historically unprecedented population growth rates makes the exclusive dependence on the market for achieving rapid growth in productivity more questionable. The paper documents several inherent limitations in the original model, e.g., (1) the negative effects of extremely rapid population growth compared to the slowly rising densities envisaged in the hypothesis; (2) the substantial concentration of population, even in land-abundant countries (see Figure 2); (3) the conflict between social and private gain of

Figure 1
Classification of arable land in Kenya

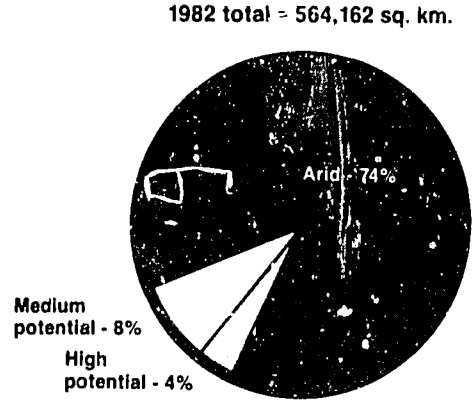
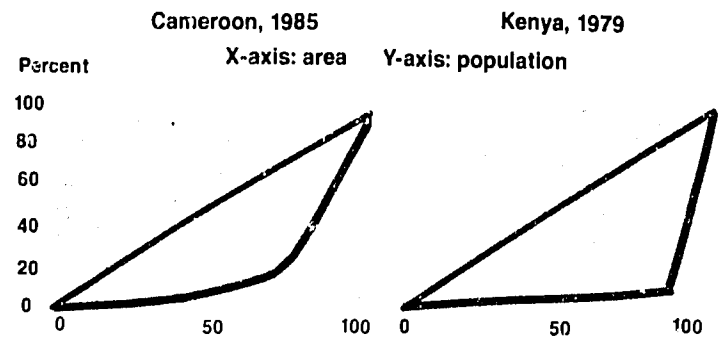


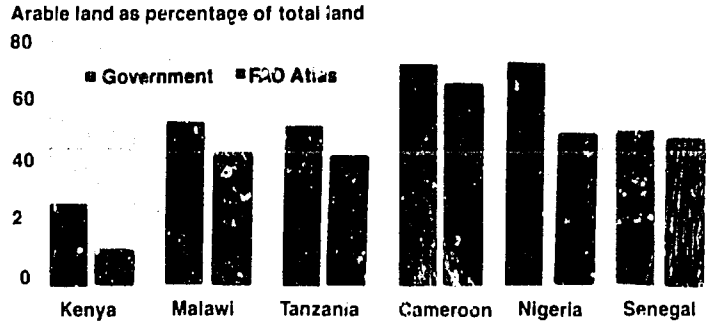
Figure 2
Distribution of population on total land area



large family size at low levels of labor productivity for poor households; (4) the tendency to "mine" the land for immediate survival versus the social need to protect soils as a productive resource; and (5) the unequal access to land and even expropriation from smallholders as land values increase.

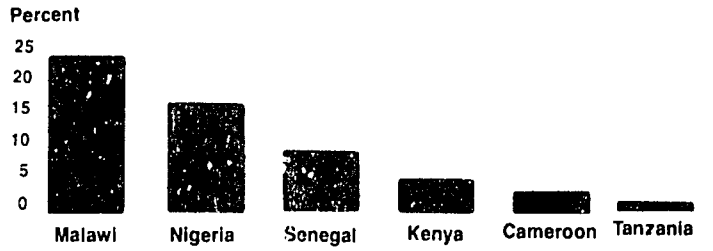
The limitations of the hypothesis have not been easy to document because of contradictory and inadequate information about such matters as the extent of arable land remaining, the size and dynamics of population growth, and the impact of policy on the environment (see Figure 3). Government figures are generally more optimistic than those of FAO, and population data is not always consistent (e.g., Nigerian government projections to the year 2000 are 23 million persons shy of the World Bank's estimate). Even

Figure 3
Differences in arable land by country and source



so, the scattered evidence that is available suggests that the environmental damage caused by deforestation (see Figure 4), decline in soil fertility, and retrenchment into subsistence and wage labor may well outweigh the effects of autonomous intensification.

Figure 4
Deforestation in the MADIA countries relative to per capita cultivable land



The second, less obvious type of intensification must therefore extend the Boserup hypothesis to include measures of output and productivity as well as frequency of cropping. The paper shows that higher yields, better inputs, and larger incomes for small farmers do not axiomatically follow from higher population densities or more frequent cropping of the land. Three measures of this latter type of intensification are particularly salient:

1. Shifts to areas of high potential (and subsequent expansions onto marginal areas) occur spontaneously, unless restricted by public policy or by natural or social causes. In some cases, disease and pests pose a significant health problem; in others, land policy proscribes this type of shift by giving a few etates preferential access to land over samll farmers (as in Malawi) or constrains population movement (as did the Ujamaa policy in Tanzania). In other cases (such as Kenya), smallholders also have recourse to legal ownership, but the process of titlement is fraught with unequal access to capital and land, due to ethnic biases, conflicting tenure customs, and registration fees. In these cases population is being forced onto marginal land and exhausting soil nutrients.

2. Shifts to higher-yielding crops and improving crop yields can be achieved by promoting high-yielding varieties of seed and complementary modern inputs such as fertilizers. Research priorities will critically affect whether the "improved" planting material has local appeal. If new seeds require additional cash, increase risk, or do not store, process, or taste good, they will probably not be adopted even where population density is high. Planting hybrids or using more inputs to boost yields will also depend on the degree of farmer confidence in the market to purchase crop surpluses. Hybrid maize in Malawi is one such example. In Senegal, similarly, a return to planting sorghum and millet reflects the farmers' desire for greater food security over potential (but risky) gains from higher-yielding or higher value crops at international market prices.

3. Shifts to higher value crops depend on the right and incentive to grow such crops. Population density has little bearing on whether governments encourage or circumscribe smallholder production of cash crops. Densities are extremely high in Malawi and low in Tanzania; but each has pursued policies that effectively curb the supply response of smallholders, who either cannot grow high value crops or have until recently had no incentive to do so. At the other extreme are Kenya and Cameroon: although densities run much higher in Kenya, both have adopted policies enabling the small farmer to reap the fruits of higher value crops. These policies include ensuring rural transport, passing along close to world prices, and providing a variety of support services that enable small farmers to grow these crops.

The paper demonstrates how high on-land densities do not lead directly to progress in intensification as defined in this paper. The shift to higher-yielding and higher value crops and more productive land, as opposed to merely cropping the land more intensively and "mining" soils, requires that changes in factor costs be reflected in agricultural pricing and marketing, land tenure, and crop research policy. Three countries in particular—Kenya, Malawi, and Cameroon—have provided a stable policy environment and performed well, but broad-based growth was achieved only in Kenya, and even there, gains in the smallholder sector came mostly through shifts to higher value crops such as tea rather than improvements in productivity. Where price distortions are not compensated for by public initiatives or where policies do not facilitate the move to intensification, environmental degradation will increase as a very rational response to the conditions of rural households.

The paper finds that the most direct means of addressing the problems of rapid population growth and environmental stress include among others, the following:

- **Redefining land policy:** To ensure equal access, land policy must be complemented by compiling a detailed inventory of data on rights to land, its use, potentials, and availability.
- **Stabilizing production and consumption policies:** Production policy must aim toward rapid, equitable, and highly participatory growth. That process will require stable prices to increase farmer confidence to grow high value crops and to rely on the market to provide food staples. Predictable or reliable incentives and clearly stated national objectives will help farmers to plan ahead, finance investments in the land, and sustain broad-based productivity increases. The following means are available to ensure that end:
  - **Targeting crop research**
  - **Improving rural physical and social infrastructure**
  - **Accelerating fertilizer use**
  - **Extending credit**
  - **Granting access to export markets**
  - **Rethinking population policy**

Failure to address these crucial policy areas will lead to increasing stress on the environment, with negative repercussions in other sectors of the economy.

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BUILDING AGRICULTURAL RESEARCH CAPACITY IN AFRICA: POLICY LESSONS FROM THE MADIA COUNTRIES

UMA J. LELE. BILL H. KINSEY. ANTONIA O. OBEYA

Technological change is considered in terms of: (1) yield potential and responsiveness to available chemical fertilizers and pesticides; (2) adaptation to the growing period and drought tolerance; (3) disease and pest resistance; (4) improvements in quality, palatability, and consumer acceptance; (5) storage, transport, and other handling qualities (including processing) with available technology; (6) changes in labor requirements in production and processing in relation to the available mechanical technology, in view of other requirements for household labor and incentives for labor use; and (7) compatibility with other social, cultural, and economic norms.

Demand for research can originate from producers who are the beneficiary of new technology or in the absence of their ability to organize themselves, from the political elite who understand the role of science and technology in the development of smallholder agriculture, and who support efforts of scientists and research systems, through an assured and stable supply of public resources. The lumpy capital needed for research and technology development, and the long gestations lags in delivery benefits, require that the state play an important role in the development of technology for smallholder agriculture. The demands of different types of farmers with diverse resource requirements for technology tend to be different. In Africa, particularly within the MADIA countries, while small farmers were linked to the international markets prior to independence through the production of export crops, their interests have subsequently been whittled away. Thus the role of the political elite in articulating and supporting the demand for technology has become more important.

As reflected in terms of stable and assured funding for research Kenya, Malawi, and Cameroon have had better managed research systems than the three other MADIA countries - Tanzania, Senegal, and Nigeria. (Even though overall research expenditures have declined for all six countries since the mid 1980's). These are also the relatively better performing countries agriculturally. However, even these countries have not had much of an impact on production. Moreover, with the exception of hybrid maize, coffee and tea in Kenya; estate sector tobacco in Malawi; maize, rice and cotton in West Africa; and the adoption of short duration groundnut varieties in Senegal, there has been relatively little impact of research and technology on production of smallholders, even among the countries with relatively better support for research. Most of the increase in production has come from area expansion and shifts from low to high value crops rather than with yield increases.

The poor impact of research is a result of the poor linkage between agricultural research and extension in articulating the demands of small farms for technology, and the current unpredictable financial support of public funds by governments, despite the fact that funding needs were by and large not a problem in the 1970's (although there were exceptions such as Tanzania). Indeed, unpredictability appears to be characteristic of countries with poor overall agricultural performance. Since the structural adjustments got underway, however, recurrent funding shortages have been pervasive and have been a major problem hampering research efforts. The large increases in research staff that occurred in the 1970's and early 1980's, without corresponding cuts in the late 1980's, has compounded the recurrent budgetary problem, as large shares of the budget go to par personnel costs, with very little left over for the actual conducting of research.

The CGIAR's operations have been based on an assumption that the demand

for appropriate research and technology exists and simply needs to be serviced, and that the capacity of national research systems to absorb technology exists. Finally, by implication it also assumes that the inadequate capacity of national systems is not a bottleneck, because there are generic research results which can be applied over larger areas without much adaptation. Consequently its own approach as well as that of donors has been supply-driven rather than based on creating demand for research. Research thrusts have swung between commodity versus farming systems research, rather than being viewed as part of a holistic approach which involves: (1) organizational and management issues; (2) effective work programming; (3) incentive systems and formal training of local staff to support the work program; (4) development of indigenous educational and training capacity which would support human capital development; and (5) long-term technical assistance of high caliber operating with excellent rapport with nationals (Lele and Goldsmith 1989).

It must be acknowledged that the set of issues which research must address in the post-independence era has become much more complex. In the colonial era, most research aimed at estate crops (particularly in Eastern Africa) and settler farming could address only high-potential areas where the Europeans settled (this is particularly in East Africa). Growing population pressure and the extensification of agriculture, to say nothing of equity considerations, now dictate that research must generate technology for medium and low potential areas, which have received little attention to date.

Finally, donor assistance has tended to focus on "brick and mortar" details of construction programs, with secondary attention being paid to the substantive research issues facing these countries.

POLICY IMPLICATIONS

This paper argues that the CGIAR's mandate in Africa should be reconsidered in a way which recognizes the fundamental lack of demand for research. A problem which has become more serious with the pervasive shortage of resources and short term policy reforms. It should be increasing such demand for research. There should be stronger links between development programs for small farmers, national research systems and the CGIAR. Its current format in simply training national scientists is distinct from what is really needed to develop effective viable long-term national research systems. This includes developing human capacity and addressing the needs of a mass of small farmers through a holistic approach to research, involving:

- o Farming Systems and Commodity research
- o Food and export crop research
- o Plant Breeding and Other Needs Such as Soil and Resource Management
- o The Development of Research Results as Distinct from the Capacity to do Research; and
- o The Development of Brick and Mortar as well as Other Human and Institutional capital.

Table 1: Agricultural Research Expenditure in the MADIA Countries, 1970 to the Latest Available Year

	1970	1975	1980	Latest*	Change: 1980 to Latest
	(1980 US$ '000)				(Percent)
Cameroon	3,052	5,259	10,994	15,065	37
Nigeria	21,158	84,747	235,286	149,000	-37
Senegal	6,574	9,244	16,300	14,168	-13
Malawi	2,443	3,190	6,121	6,489	6
Tanzania	10,263	8,130	11,787	10,700	-9
Kenya	7,773	12,226	19,895	24,624	24
Mean	8,544	20,466	50,064	36,674	-27
Mean for Africa**	4,048	6,842	12,642	10,430	-17

* 1984; Nigeria 1983.
** Based on 33 to 38 countries, depending upon availability of annual data.

SOURCE: Based on data provided by Peter Oram, ISNAR.

MANAGING AGRICULTURAL DEVELOPMENT IN AFRICA

GROWTH AND STRUCTURAL CHANGE IN EAST AFRICA: DOMESTIC POLICIES, AGRICULTURAL PERFORMANCE, AND WORLD BANK ASSISTANCE, 1963-1986

UMA LELE • L. RICHARD MEYERS

Comparisons between Kenya, Tanzania, and Malawi are of interest because all three countries started with somewhat similar initial conditions at independence, although Kenya was more advanced in its development and Malawi much less. They have followed quite different policy paths with very different economic outcomes. Agriculture is the most important source of employment, income, and exports in all three countries. Not surprisingly, the performance of the agricultural sector and the agricultural policies pursued have been closely related to each country's overall economic performance and policies.

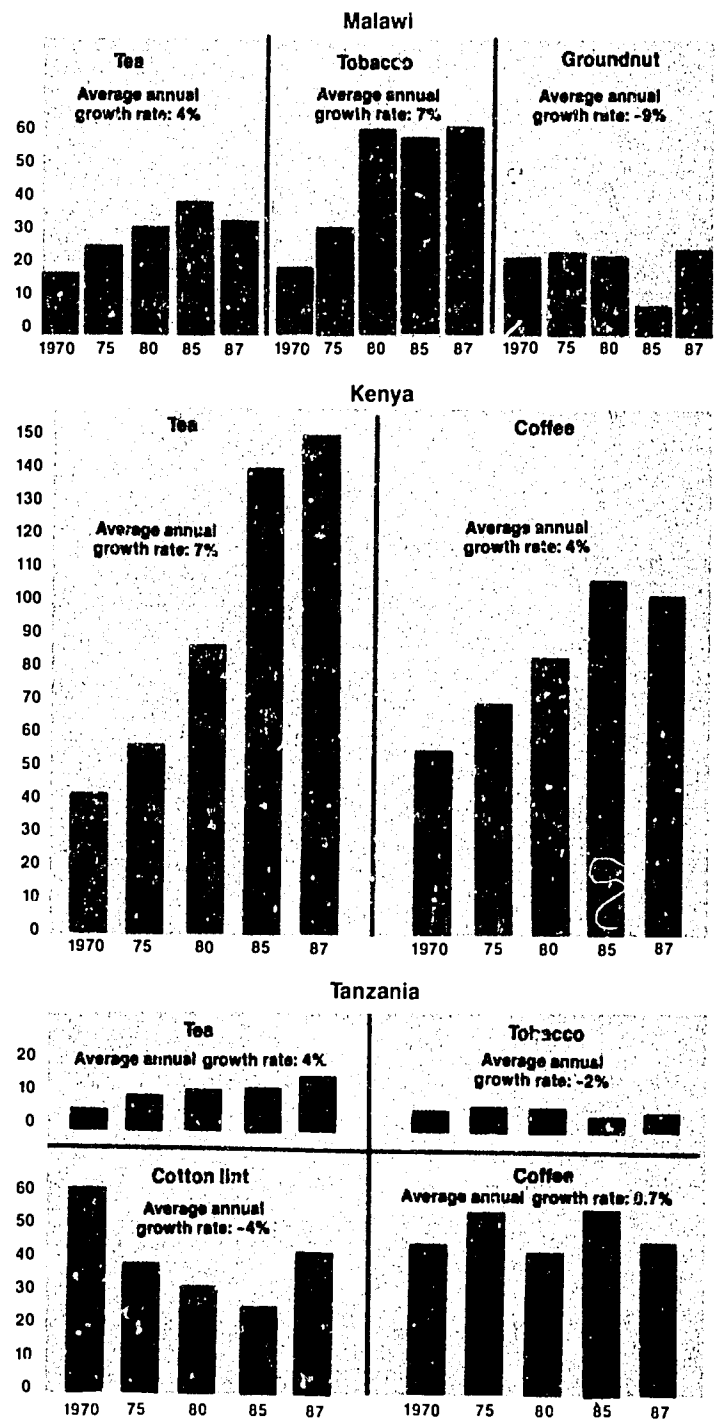
Export growth and internal equity

Kenya and Malawi have both done quite well in terms of growth of export crop production, but Kenya's performance has been far superior in reconciling growth with equity. Tanzania has done least well on growth of export crops, including those produced by smallholders. Tanzania's efforts to sustain policies to achieve equity, on which it laid more stress, have been hampered by the lack of growth of the economy. Malawi's strong export growth has come mainly from the estate sector, but until recently it had diverted the attention of many observers, including the Bank, from the sources of that growth, including examination of (1) the basic structural policies the government has pursued toward access to land, rights to grow crops and to sell them in the same markets and (2) the technological constraints that have adversely affected Malawi's smallholder sector performance.

Weak data make the relative performance of each country in the food sector more difficult to compare. Again, however, Kenya appears to be more advanced in promoting the process of technical change in the smallholder sector, especially in maize production.

The breadth of participation in growth has had a profound impact on the process of economic development in each country. Achieving equitable growth requires the development of a sophisticated network of institutions to service the needs of a large number of small, geographically dispersed producers with diverse resource endowments. Kenya, which admittedly started out with the most favorable institutional base at independence derived from its large (European) farm structure, used this base and greatly broadened small farmer access to institutional services. Malawi's historical institutions serving a modern European agriculture were fewer than Kenya's. Subsequent growth has maintained this narrow European estate sector base along with an evolving but equally narrow indigenous estate sector in which growth appears to have occurred at the cost of incentives and investment opportunities for the small-

Figure 1
Exports of principle crops in Kenya, Malawi, and Tanzania, 1980-87 (volume in thousand metric tons)



holders. Tanzania, by contrast, pursued policies aimed at dismantling its historical institutional base and experimented with many new institutional arrangements that greatly destabilized the environment for smallholder production.

Structure, resources, and policy

The structure of agricultural production and its growth, however, are not simply determined by institutional and microeconomic factors, but also by the quality and the stability of the macroeconomic policy environment within which agricultural production is carried out. Kenya's macroeconomic and sectoral policies and institutional arrangements were far more conducive to growth than Tanzania's throughout the 1970s. Depending on the particular policy under examination, Kenya and Malawi exchange places in terms of demonstrating superior macroeconomic management; and if the interaction of structural (estate-oriented) policies with macroeconomic policies is considered, Kenya was certainly superior to Malawi. Both Kenya and Malawi have provided a more stable institutional environment for development than has Tanzania. Also, external shocks were more adverse in the case of Kenya and Malawi than of Tanzania.

Table 1
Agricultural production/employment, trade, per capita arable land, and basic social indicators in Kenya, Malawi, and Tanzania in the the 1960s and 1980s

Item	Year	Kenya	Malawi	Tanzania
Agricultural production/employment				
Share in GDP	1967-73	34%	44%	41%
	1982-84	33%	40%	52%
	1985-87	30%	37%	58%
Share in employment	1965	84%	91%	88%
	1980	81%	83%	86%
Trade				
Exports and imports as % of GNP: degree of openness	1967-73	60.1%	59.1%	52.7%
	1979-81	62.6%	65.1%	37.8%
	1985-87	52.5%	50.3%	30.4%
Per capita arable land				
Population (in millions)	1965	9.5	3.9	11.7
	1985	20.2	7.0	22.2
Land area[1]				
in million hectares	1985	56.4	9.4	88.4
arable as % of total	1985	26%	37%	56%
Hectares per person	1965	1.54	0.89	4.23
	1985	0.73	0.50	2.23
Basic social indicators				
Population average annual growth rate	1965-73	3.8%	2.8%	3.2%
	1980-85	4.1%	3.1%	3.5%
GNP per capita (current US$)	1965[2]	103	63	76
	1986	300	160	250*
Life expectancy (years)	1965	45	39	43
	1985	54	45	52

Notes: [1] Arable land defined as cultivable rainfed land. Lele and Meyers 1987.
[2] Per capita GNP for 1965 calculated from IMF, IFS Statistical Yearbook 1987.
*Use of overvalued official exchange rate in the case of Tanzania overstates per capita income.
Sources: World Development Report 1986-88, except where indicated in notes.

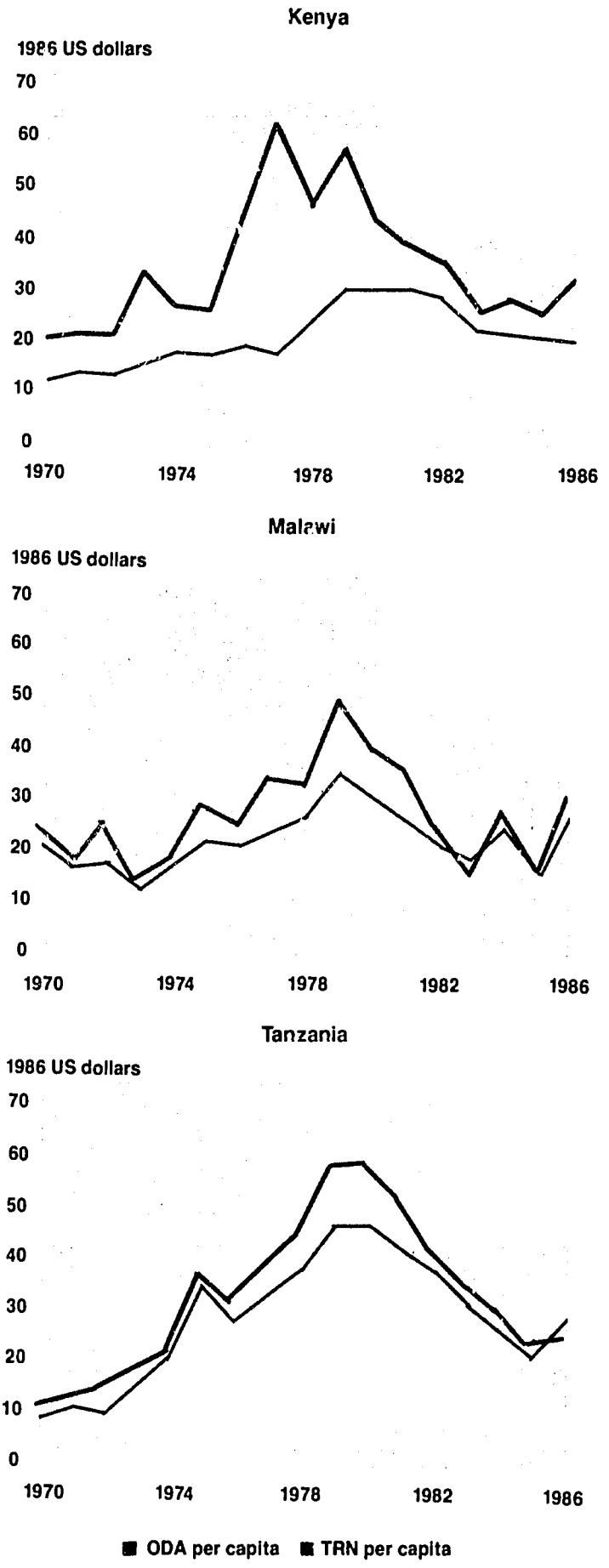
While Kenya's initial development at independence was greater, Tanzania's resource base is far more diversified and favorable for growth than that of Malawi and perhaps even Kenya. Land availability, as reflected in land-person ratios, is much greater in Tanzania than in Kenya or Malawi, although a small proportion of Kenya's land (4 percent) is of very high quality. Per capita ODA levels have, moreover, been substantially higher in Tanzania than in Kenya and Malawi (see Figure 2). While they began to decline from their 1981 peak because of Tanzania's tardiness in adjusting its macroeconomic and sectoral policies, they were still higher than in Malawi and Kenya in 1984 as donors were slow to recognize the adverse effects created by Tanzania's domestic policy environment. All of this leads to the conclusion that Kenya made the best use of its initial circumstances. Policy variables thus explain much of the subsequent growth or stagnation that has occurred in the three countries. Similarly, they help to explain how the benefits of growth have or have not been distributed.

The role of the World Bank

With the exception of smallholder tea, coffee, and dairying in Kenya, there appears to be relatively little connection between where growth has occurred in the agricultural sectors of the three countries and where the Bank provided about $994.1 million worth of agricultural project assistance by 1986. In addition the Bank provided $440.9 million of assistance in the form of sectoral or structural adjustment lending in the three countries during the 1980 to 1986 period. The fungibility of resources, many of which were diverted to the estate sector, explains this lack of connection in Malawi, where the Bank concentrated its resources in the smallholder sector, but saw little growth. Growth in smallholder tea and coffee in Kenya—the main source of its agricultural growth—occurred contrary to the Bank's worldwide advice against tea and coffee expansion to countries producing these commodities (although, paradoxically, the Bank's lending for agroprocessing was crucial for expansion of smallholder production in Kenya).

In Tanzania the Bank's 1973 Agricultural Sector Report correctly identified the constraints to growth and stressed the need for a sequential approach to the development of smallholder agriculture that could capture the most obvious sources of growth. However, this approach conflicted with Tanzania's policies. The Bank's policy analysis after that was constrained by its reluctance to question Tanzanian policies directly. Until about 1981, therefore, its project portfolio was heavily conditioned by Tanzanian policies that were not growth-oriented.

Figure 2
ODA and TRN, 1970-86



Bank policy and the macroeconomic environment

By the early 1980s macroeconomic difficulties in all three countries were reinforced by external shocks. These shocks were combined with severe project implementation difficulties, especially in Kenya and Tanzania, partly as a result of the rapid expansion of Bank lending, as well as that of other donors, to the agricultural sectors of these countries. These loans were often made for quite marginal activities under conditions of weak planning and institutional capacity.

The World Bank financed a total of 68 agricultural project operations in Kenya, Malawi, and Tanzania between 1965 and 1986—26 in Kenya, with commitments of $500.50 million; 18 in Malawi, with commitments of $172.69 million; and 24 in Tanzania, with commitments of $320.95 million. Of 24 World Bank agricultural project operations completed in the three countries between 1965 and 1986, involving investments of $266 million, only 14 had positive rates of return; the other 10 had ERRs equal to or exceeding 10 percent. Moreover, not all these poor returns were the result of unanticipated problems; many marginal investments, especially concerning interregional income distribution, were approved in support of political objectives of the governments. Even taking these concerns into account, it can nonetheless be argued that the projects financed were often not necessarily the most cost effective way of addressing such concerns. This and other evidence suggests that the countries would have been better-off if they had not borrowed from the Bank for many of the activities funded. This is more valid for Kenya and Tanzania than for Malawi, where ERRs for a larger number of projects suggested a more positive impact. However, economic evaluations are done immediately upon the completion of projects. More recent data on Malawian smallholder agriculture raise questions about the long-term effects of projects initially regarded as favorable.

Constraints on Bank action

Another noteworthy feature is that until quite recently the Bank's assistance (as well as aid levels) was not positively related to the appropriateness of policies or the level of performance of the three countries. Pressure to lend in the 1970s resulted in indiscriminate growth in lending, as well as to weak project portfolios that did not clearly reflect the positive features of the Bank's macroeconomic and sector analysis.

The early 1980s ushered in an era of greater appreciation within the Bank of the nature of the interactions between macroeconomic, sector, and micro constraints to growth and the need to relate the level and the composition of lending more directly to the macroeconomic and sectoral policy environment. This realization had three consequences: (1) attempts by the Bank to seek macroeconomic and sectoral policy and institutional reforms in each of the three countries; (2) cancellation of poorly performing projects; and (3) development of new projects that were geared to improving the capacity of the governments to deliver basic agricultural services such as research, extension, and input supply more effectively.

Policy distortions in the three countries have been least in Kenya, although some difficult institutional problems remain with regard to land tenure and the role of the private sector in agroprocessing and marketing. The Bank, however, was slow to appreciate the complexity of these

issues. This led to an untimely attempt to liberalize grain marketing through the second SAL in a period that culminated in a severe drought. By 1985, the Bank's policy and project dialogue in Kenya had returned to a more balanced effort to address the problem of priorities in the sector, as well as a number of institutional issues of a long-standing nature that had been met repeatedly in the course of project lending.

Commodity market considerations: Kenya. The past and future sources of growth in Kenya center on the issue of intensification in tea, coffee, maize, and dairying. The Bank would appear to be on the right track now in Kenya as it concentrates on improving agricultural research and extension, credit, and marketing, in order to achieve that intensification. Nevertheless, the relatively limited diagnosis, through primary data collection and analysis, of the precise constraints to achieving growth, as well as the speed of reform, may continue to be problems unless the balance of resources devoted to lending versus analysis changes.

Second, the Bank needs to reconsider seriously its policy advice to Kenya about the development of coffee and tea. The policy has been prompted by concerns about limited world market prospects for tea and coffee and the collective good of beverage producing countries, whose interests are served by limiting production. However, this advice has not served Kenya well and has been inconsistent with the realization of a dynamic comparative advantage. Besides, the objective of intensification of existing area has not been achieved. Rather, small farmers have found it more useful to expand area under cultivation. Equally important, the treatment of risks has been quite weak—including those related to the nonrealization of the Bank's price forecasts in the estimation of economic benefits. At a more general level, the prospects for primary commodities produced in Africa and the implications for country and project-specific advice needs serious review by the Bank.

Policy distortions: Tanzania. The effects of macroeconomic and sectoral distortions on agricultural performance and on the Bank's portfolio have been greatest in Tanzania. The Bank was tardy in taking into consideration the importance of the policy environment for the size and the content of its lending program and in several ways reinforced the government's worst tendencies through its project assistance, i.e., by supporting the government's import-substituting industrialization strategy and its excessive focus on equity. These problems were identified in the Bank's 1983 Agricultural Sector Report, which repeated many of the themes of the 1973 report. Once recognized, the difficulties of the large project portfolio—consisting of rural development and agroprocessing projects—combined with the government's slowness in responding to macroeconomic and sectoral problems, brought the Bank's agricultural lending activity to a virtual standstill from about 1983 to 1986. Since that time, at which the government began to reconsider structural reforms, it has made major strides in adjusting the exchange rate, improving producer incentives, and increasing the role of individual initiative. Tanzania, however, faces a shortage of physical and institutional infrastructure which hampers the otherwise impressive performance of its industrious and ingenious peasantry.

Estates vs. smallholders: Malawi. In Malawi, the Bank, through the SAL process and several new projects in agricultural research and fertilizer distribution, has since the early 1980s helped the government to correct some of the more important policy distortions—i.e., those that favored the estates at the cost of smallholders in the 1970s. On other sectoral policy issues that will have profound long-term effects on development, e.g., the land issue, the speed of removal of fertilizer subsidies, and the restructuring of ADMARC (the agricultural marketing parastatal), the Bank needs to go further in analyzing the basic sources of Malawi's structural problems and helping to design a long-term strategy of development that will address the question of how better to reconcile growth with equity. In this analysis the political economy and social welfare aspects of policy reform need far greater emphasis than is provided by the more narrowly defined economic analysis usually conducted by the Bank.

Conclusions

The most important conclusions of this research concern the recognition of the Bank's obvious comparative advantage in policy analysis and in the articulation of long-term country-specific development strategies in support of which donor assistance and domestic resource mobilization can be organized through aid coordination. However, there is in the Bank's operations a pattern of insufficient analysis of specific constraints to long-term development, including consideration of the implications for sequencing and phasing of policy reforms and investments, *before* reform packages are put in place. This has been accompanied by the lack of a long-term view of development, one that in particular places greater emphasis on human capital/institutional development in the recipient countries relative to the emphasis placed on financial resource transfers. There is also an inadequate effort at the kind of aid coordination in which the comparative advantages of other donors to undertake specific activities in support of a long-term strategy are explicitly recognized.

The issues of the comparative advantage of donors and the lack of analysis of specific constraints are closely related. The latter is due in part to the insufficient attention paid to micro-level factors that profoundly inhibit the success of investments. This in turn stems from limited analytical capacity in recipient countries with which to undertake the necessary microanalysis. Governments should make greater demands on the Bank and other donors; donors need to devote greater attention to helping governments build up such analytical capacity. Because this is an area where the Bank does not have a particular comparative advantage, it needs to recognize and encourage the efforts of those donors who do possess such comparative strengths.

MANAGING AGRICULTURAL DEVELOPMENT IN AFRICA

NIGERIA'S ECONOMIC DEVELOPMENT, AGRICULTURE'S ROLE, AND WORLD BANK ASSISTANCE: LESSONS FOR THE FUTURE

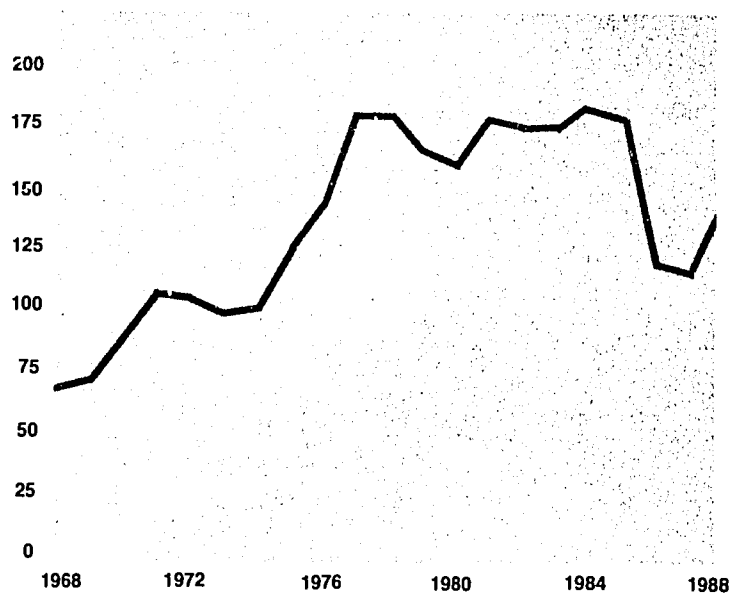
UMA LELE • ADEMOLA OYEJIDE • VISHVA BINDLISH • BALU BUMB

Nigeria is representative of Africa's larger problems, as it contains a quarter of Africa's population, accounts for more than one-third of its total import and export trade (excluding the Republic of South Africa), and produces all types of tropical tree and field crops. Improved prospects for Nigerian agriculture have an important bearing on the prospects for African agriculture as a whole.

This paper examines the role of agriculture in economic development and the past impact of the government's policies and the Bank's advice and lending for agriculture in the context of developments within Nigeria in order to draw lessons for the future. It focuses on the relative roles of a variety of price incentives, and on the technological, organizational, institutional, infrastructural, and human capital constraints to growth. The study concludes that Nigeria cannot industrialize without addressing the fundamental issue of the wage goods constraint associated with food, fibers, and edible oils. Increased food imports cannot be an adequate solution for facilitating rapid industrialization. Even in the late 1970s and early 1980s, large food imports, reaching 19 percent of the rapidly growing oil export earnings in 1981, did not succeed in shifting the intersectoral terms of trade, which had moved rapidly in favor of food after the first oil boom (Figure 1). These imports only stabilized food prices relative to nonfood prices (1978-85) around a level far exceeding that of the 1960s. This is because domestic production did not increase to meet the burgeoning demand for wage goods, following the labor transfers from agriculture to the urban sector that resulted from the rapid expansion of government expenditures. Although there was a shift in the intersectoral terms of trade toward nonfood commodities in 1986 and 1987, food prices again rose more steeply than nonfood prices in 1988, and that trend is evidently continuing in 1989.

The increased revenues following the first and second oil booms resulted in more acute Dutch disease effects in Nigeria compared to other oil producing countries, and led to a reduction in the production of tradables through both the spending effect and the resource transfer effect. Nevertheless, Nigeria's international terms of trade, which explain about 90 percent of the variations in its current account, continued to be highly favorable until 1981, with a major deterioration since then. The Nigerian economy thus has to adjust now in unfavorable circumstances (as world trade is growing more slowly than in the 1970s), with a large accumulated debt of about 26 billion dollars. Debt servicing accounts for almost 50 percent of the government's total budget for 1989.

Figure 1
Food and nonfood terms of trade, 1968-88



Note: Expressed in terms of the ratio of the food price index to the nonfood price index with 1970-72 as the base. For 1988, the ratio of the food to nonfood price is based on an increase of 32.5 percent in the food price index in the first half of 1988, and an increase of 25 percent in the overall consumer price index for 1988 as a whole, with the share of food assumed to be 75 percent in the overall consumer price index.

Source: World Bank, "Agricultural Sector Review", Vol. II for 1968-85; CEM May 3, 1988 for 1986-87.

Reliable data are lacking for Nigeria on virtually every parameter of development. As Nigeria has not had a census since 1963, population is generally assumed to increase by about 3 percent a year. Per capita incomes on which data are highly conflicting might have increased by 3-4 percent a year between 1973 and 1981, followed by rapid declines. In view of the weakness of data, the intersectoral terms of trade and agricultural imports and exports are the most significant guides to determining what might have happened in the agricultural sector, but even their interpretation is colored somewhat by the existence of unreported trade across Nigeria's borders.

The most optimistic interpretation suggests that food production might have grown by only 2.3 percent a year between 1970 and 1986. The production of traditional export crops declined, and agriculture's share in the value of total exports dwindled from 38 percent during 1967-73 to 4 percent during 1979-81. Nigeria's share of the world cocoa market fell by over one-half, from 20 percent during 1971-73 to 9 percent during 1983-86. Because of declining production and rising domestic demand, the exports of palm oil, groundnut products, and cotton were eliminated in the 1970s, with Nigeria becoming an importer of these commodities.

Policies toward agriculture

Contrary to general belief, agriculture was not neglected by the Nigerian government after the oil boom, but there has not been a consistent and systematic strategy for its development. In response to the very high domestic food prices, successive Nigerian governments have stressed the goal of food self-sufficiency. The government's investment expenditures on rainfed agriculture increased 63-fold between 1962-68 and 1980-85, only slightly lower than the 66-fold increase in the government's overall investment expenditures. In real terms, the increase in agricultural expenditures was sixfold.

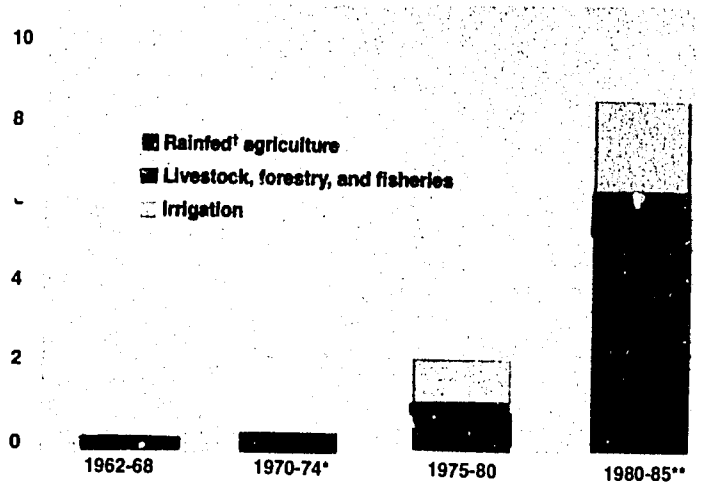
The total budgeted capital expenditures for agriculture of the Nigerian federal and state governments between 1962 and 1985 amounted to 11 billion naira (Figure 2); shortfalls between the budgeted and actual amounts were no worse for agriculture than for other sectors. The World Bank's commitments to Nigerian agriculture accounted for another $1.7 billion dollars between 1971 and 1988. Fertilizer consumption grew at 18 percent a year between 1972 and 1987, with the fertilizer price subsidized by 80-85 percent in most years. Indeed, the fertilizer price-output price ratios in Nigeria have been among the lowest in the developing world. The government's investments in large-scale irrigation and subsidies on mechanization amounted to about 3 billion naira. Technological, organizational, institutional, and infrastructural weaknesses, as well as shortages of recurrent resources, however, undermined the effectiveness of these large capital expenditures. For example, oil palm and cocoa plantings could not be undertaken for organizational reasons, despite the adequate incentives that would have accrued from the use of improved technologies.

World Bank's role

The World Bank has played an important catalytic role through the ADPs in bringing about a consistent focus on smallholders who constitute 90 percent of Nigeria's farming population. Bank lending to Nigerian agriculture accelerated sharply after 1975 and continued to increase through 1984 (Figure 3). Agriculture's share in the Bank's total loan portfolio has been higher in Nigeria (43 percent for the 1965-88 period) than in any of the other MADIA countries. There was a decline in agricultural commitments after 1984 as the Bank's focus shifted from project-based lending to reform-based lending, although some of the focus remained on agriculture with resulting benefits for smallholders, such as the exchange rate reforms that increased the producer prices of export crops.

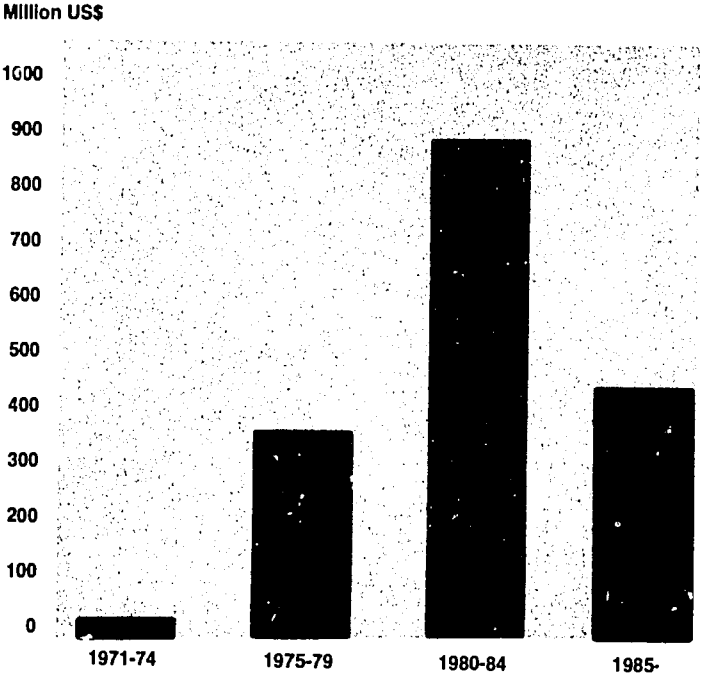
Almost two-thirds ($1.1 billion) of the Bank's total commitments for Nigerian agriculture ($1.7 billion) between 1971 and 1988 went for the support of the smallholder rainfed food crop development strategy encapsulated in the 13 ADPs (Figure 4). Traditional export crops, for which domestic demand has been increasing rapidly, have accounted for only 7 percent of the Bank's total commitments for Nigerian agriculture. Following the Sahelian drought and the increase in internal food crop prices, the Bank's focus in Nigeria, as elsewhere in Africa, shifted from export to food crop production. Given the government's own focus on large-scale irrigation and mechanized

Figure 2
Composition of total government agricultural expenditure for the First, Second, Third, and Fourth National Development Plan periods



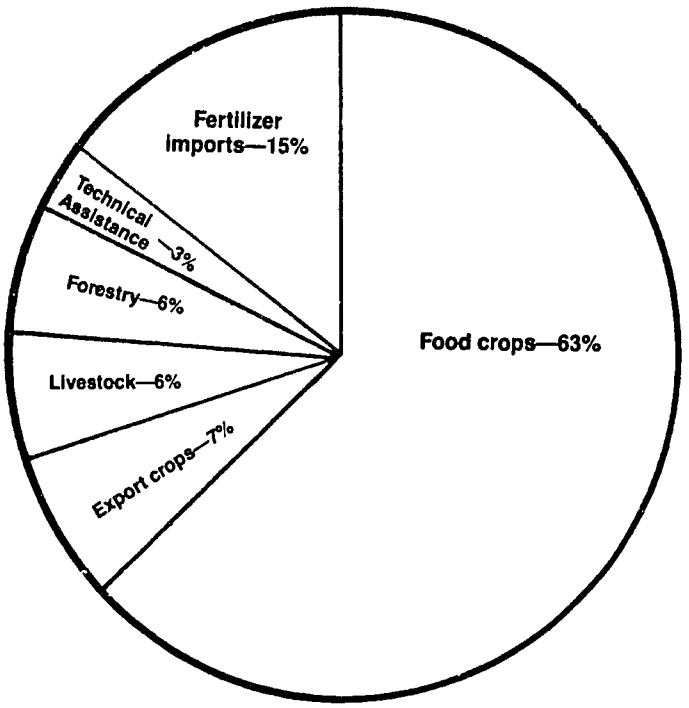
†May include some small-scale expenditures through ADPs.
*1970-74 irrigation expenditure included in rainfed agriculture.
**Refers to the budgeted expenditures and not the actual.
Source: Government of Nigeria, First, Second, Third, and Fourth National Development Plans.

Figure 3
Bank commitments for Nigerian agriculture, 1971-74, 1975-79, 1980-84, and 1985-88



Source: "Statement of Loans and Credits."

Figure 4
Distribution of Bank's loan portfolio for Nigerian Agriculture



Source: "Statement of Loans and Credits."

agriculture for achieving food self-sufficiency, the Bank focused on the smallholder sector. Its strategy of making a visible impact on smallholder agriculture in the shortest possible time through the first 3 enclave ADPs was successful.

Through the ADPs, the Bank has helped to create a lobby for smallholder agriculture in the government, thereby providing stability of policy in an otherwise unpredictable and unstable environment. Nigeria has had 6 military governments and only 4 years of civilian rule since 1965. The Bank has also made a significant contribution to the development of small-scale irrigation, and to the increased production of rice, maize, and vegetables. In addition, the Bank has helped to create a large apparatus of institutions at the federal and state levels to support smallholder agricultural development.

The ability of the ADPs to deliver results and accelerate the production growth rate has been characterized by a degree of optimism but three types of weaknesses associated with sequencing and phasing present constraints:

1. Implementation before developing a planning and implementing capacity

The ADPs were approved in rapid succession, but the planning and implementation capacity of the state and local governments was incommensurate with their scope. Such weaknesses are being addressed in the multistate ADPs initiated in 1986, which recognize the importance of training and incentives for Nigerian staff and allocate funds explicitly for strengthening the planning capacity in the state ministries of agriculture. Because this attempt is project-focused, however, it is unable to address the broader issue of federal, state, and local government relations, which needs to be resolved. To strengthen the planning and implementing capacity, large numbers of skilled personnel also need to be absorbed in the public sector; this entails attention to (i) the inferior incentive system in the public sector relative to the opportunities in the private sector; (ii) the greater shortages of skilled personnel in the North by comparison with the South; and (iii) the very substantial investments in education and training needed to increase the pool of skilled personnel in the framework of a long-term agricultural growth strategy.

2. Extension before research

The first three enclave ADPs hoped to promote sole cropping and fertilizer among small farmers through extension. Nigerian research had indicated as early as the 1960s that the availability of improved technologies for small farmers who prefer to spread risks through the practice of intercropping was limited, and they were likely to adopt only selective elements of the available sole crop technologies. The subsequent inability of ADP extension to convert the majority of small farmers to sole cropping needs to be viewed against this, as well as the experience of other West African countries (e.g., Cameroon) with cotton, which suggests that farmers convert relatively easily when the available crop technologies promise dramatic results. Thus, the highest priority should have been given to agricultural research to develop appropriate technological packages. The fundamental task of strengthening the national agricultural capacity for developing these packages is yet to be addressed.

Fifteen years have lapsed since the first ADPs were designed, and as the record of other countries shows, ten years is about the minimum it takes to absorb lessons of experience and change priorities. In 1988, the Nigerian government agreed to the implementation of an agricultural research project now under preparation. The Bank documents still convey an impression that priority to extension, followed by improvements in agricultural research, will accelerate production.

3. Construction before maintenance capacity

The viability of the 140 million dollars invested by the ADPs in the construction and rehabilitation of 9,000 kilometers of feeder roads (1976-87) is seriously affected by the lack of a maintenance capacity in Nigeria. While not a problem unique to Nigeria, it is closely linked to the weak institutional capacity of state and local governments. Whereas this weakness has long been recognized, the Bank projects have not addressed the issue of strengthening the capacity of local governments to construct and maintain roads.

Growth prospects of Nigerian agriculture and policy recommendations

If a growth rate higher than the current 2-3 percent is to materialize, a rethinking of policy strategy is needed for the following reasons:

- Even if the entire existing potential for formal small-scale irrigation (800,000 hectares) is developed, it will amount to less than 5 percent of the total cultivated area. This will require substantial augmentation of the state and local capacity for implementing such irrigation.
- The long overdue reduction in the admittedly excessive fertilizer subsidy will increase its price, and likely lead to decreased demand. As a result, the labor returning to the agricultural sector may become a substitute for fertilizer, just as in the oil boom years fertilizer appears to have substituted for the outmigrating labor. Without a subsidy fertilizer use may not be profitable under mixed cropping circumstances.
- It will take at least 10 to 15 years after the development of the national agricultural research system becomes a priority to obtain appropriate technological packages.
- The highly inadequate feeder road network will remain a bottleneck.
- Recurrent resources may pose a constraint on the pace at which programs are implemented.

To improve the per ormance of Nigerian agriculture, the alleviation of major constraints should address:

- technologies acceptable to farmers in a mixed cropping context;
- the planning and administrative capacity of state and local governments;
- a long time horizon in the context of a well conceived and internally consistent agricultural policy for both the government and the Bank; and
- the establishment of an effective transport network.

In addition the paper makes a number of recommendations on a crop-by-crop basis for the acceleration of production growth.

MANAGING AGRICULTURAL DEVELOPMENT IN AFRICA

SENEGAL HIGHLIGHTS

Senegal's agricultural resources are the most limited of the MADIA countries. Two-thirds of the country's agricultural land lies in the Sahelian zone, where rainfall levels are low, declining, and highly variable. These suboptimal levels of rainfall, combined with an increasing population pressure on land, and salt water intrusion in the agricultural potential area of Casamance, have produced a significant deterioration of the environment. As a consequence, overall soil fertility has deteriorated, a situation exacerbated by the fact that the administered producer prices for major crops have decreased in real terms since the early 1970s. Thus per capita food production declined at an average annual rate of −0.72 percent between 1961 and 1987, and the production of groundnuts, a commodity which had put Senegal onto the world economic map, by −1.2 percent. Per capita imports of cereals (of which rice alone represented 35.5 percent of the total food import value in 1980-86) increased by 2.2 percent per annum and food aid by 7.7 percent during the period 1961-87. The decline in producer prices, and consequently in farm incomes (75 percent of which are derived from groundnuts, millet, and sorghum) contributed to the overall decline in real GNP, to a level effectively below that reached in 1961 (see figure). After the divestiture of the state from important, facilitating functions in marketing and credit, probably one of the most challenging tasks of Senegal's agricultural policy will be an institutional one: how to promote and sustain private initiative in a context of high risk and low return.

The groundnut rice dilemma

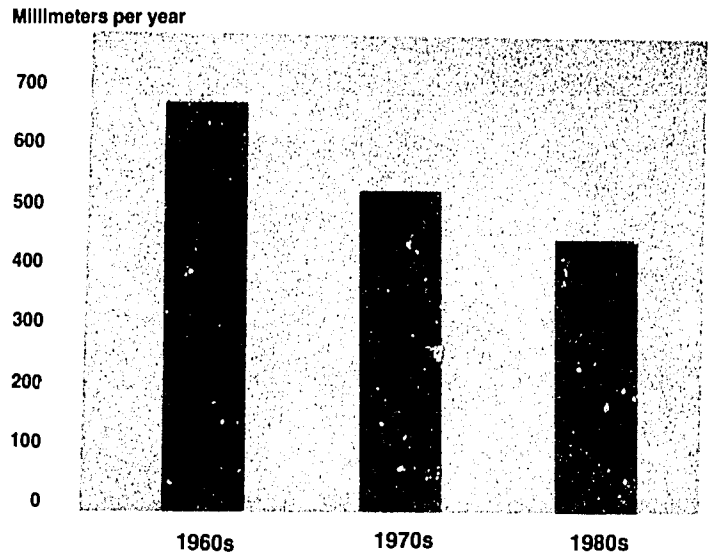
For a long time, Senegal's agricultural economy—hence overall economy—could be simplified to a groundnut rice equation. Indeed the groundnut rice tandem (which later turned out to be a key agricultural policy dilemma) dates back to the French colonial era. To sustain the production of groundnuts for export to the French preferential market, subsidized imports of rice from Indochina, another French colony, were to play the role of a

Groundnuts (oil equivalents): Gross exports ('000 tons) by main countries and economic regions

	1969-71	1979-81	1986
United States	46	36	140
Asia	47	87	236
Senegal	223	155	81
Latin America	146	340	96
Other	339	280	117
World	801	898	670

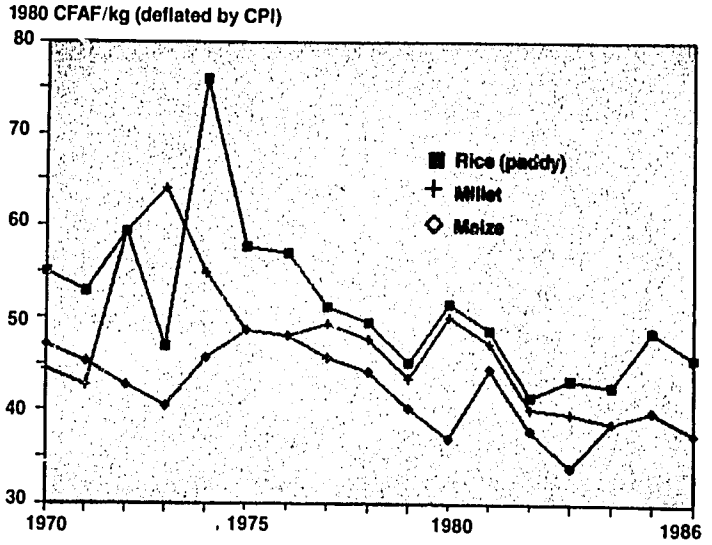
Source: "Price Prospects for Major Primary Commodities", The World Bank, November 1988, page 184.

Average annual rainfall levels, 1961-84



Source: Lele and Jammeh 1989, 'Building Agricultural Research Capacity in Senegal." MADIA Working Paper.

Official producer prices for cereals, 1970-86



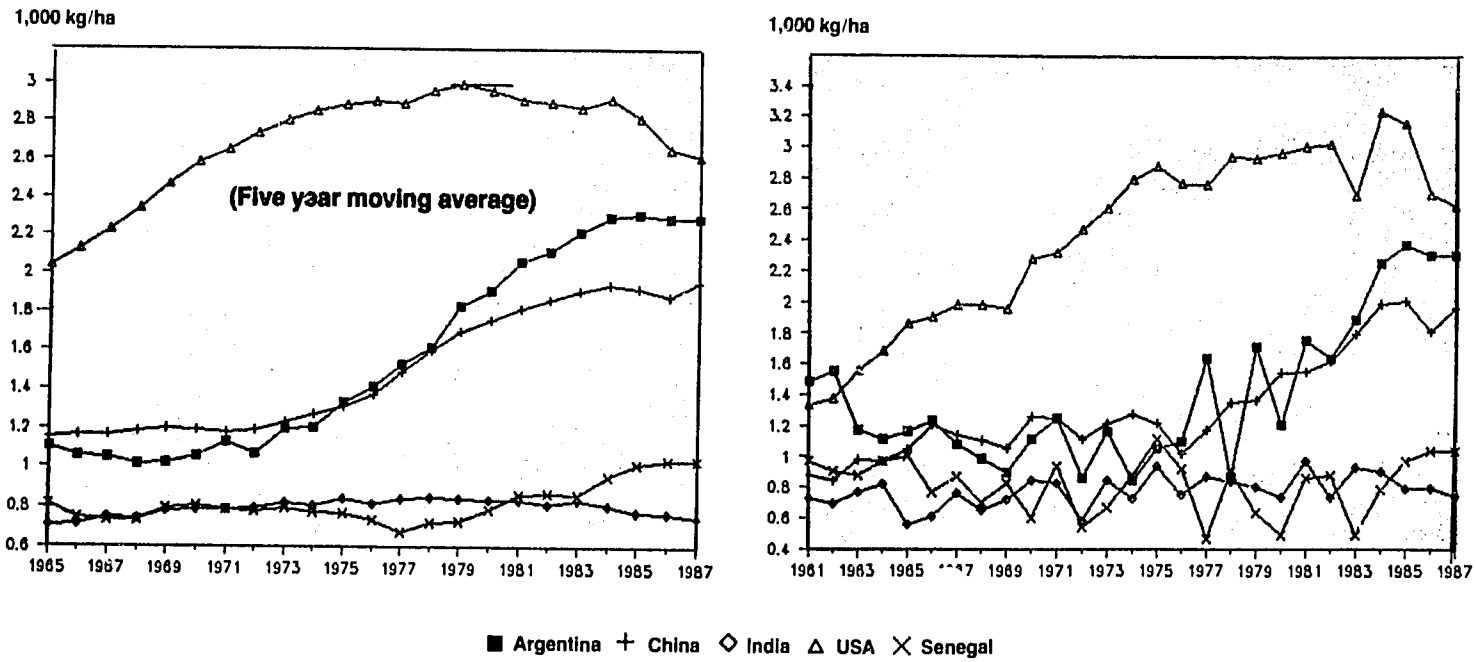
Source: République du Sénégal. Ministère du Développement Rural. Direction de la Production Agricole.

needed cheap wages good. However, in the 1970s, observers of the Senegalese economy came to the conclusion that the country had lost its comparative advantage in the production of groundnuts. This bleak assessment, combined with the high projected price of rice, the main food staple of the urban Senegalese (40 percent of the total population), reinforced the government's desire to shift both its own and donor support out of groundnuts and into irrigated rice. Senegal thus lost its share of groundnuts and related products in world trade. Lessons from countries in Asia and the Americas, that took over Senegal's former market position, suggest that their successful performance was the result of productivity increases that made them less vulnerable than Senegal to declining international prices. Indeed during the period 1961-87, Senegal's groundnut yields (in addition to being among the lowest of the major producing countries) declined an annual rate of −0.4 percent whereas those of the United States, China, and Argentina increased during the same period at a rate close to 3.0 percent per annum. With the adoption of short duration groundnut varieties, Senegal was able to maintain—and even slightly increase, in certain regions of the country, as in Eastern Senegal (Tambacounda)—yields through extreme successive drought spells from 1968-73 and 1976-80. During the latter period rainfall was 15 percent to 35 percent below normal in the Sahelian part of the country and as much as 50 percent below normal along its arid northern margin. Since the early 1970s, and coinciding with the shift from an emphasis on groundnuts to rice, yields have remained constant or declined, partly because no further significant groundnut research breakthroughs occurred to maintain the momentum of earlier productivity gains. (The 90-day cycle variety 55-437 which made up about 40 percent of seeds distributed in 1986 was first introduced in 1967.)

Meanwhile, Senegal's rice production has stagnated and fluctuated between 60,000 and 150,000 tons. Only its geographic distribution underwent significant changes, with the relative importance of the irrigated rice-growing Fleuve region, and the rainfed rice-growing Casamance, changing from 66 percent and 23 percent of total production, respectively, in the period between 1975-80, to 49 percent and 44 percent between 1980-83. Senegal now imports about 350,000 tons of rice. In the 1960s groundnut exports alone could ensure as much as a seven year's rice import supply to Senegal; by the mid-1980s, however, they could only cover that for one year. This has happened despite the fact that relative producer prices of groundnuts and rice have moved in favor of groundnuts, net groundnut producer prices have increased more rapidly than those for rice, and the international groundnut to rice price ratio has moved in favor of the former. While part of the groundnut purchasing power is due to a declined share of groundnuts in Senegal's export basket in favor of phosphates and fisheries, the country's overall import capacity has not increased. The food import bill continued to represent a substantial share of the country's total export revenues: from over 35 percent in the late 1960s to around 25 percent in the early 1980s; this compares with Cameroon and Kenya, for instance, at only 5.4 percent and 6.4 percent.

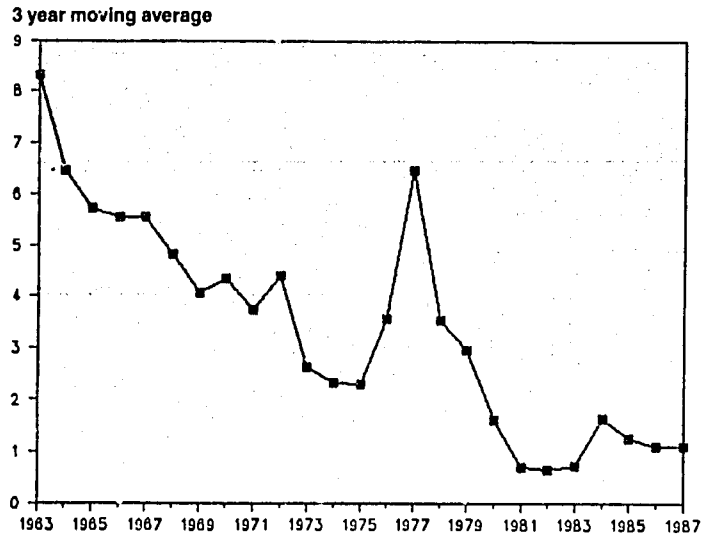
What concerns most observers is not so much the quantity of rice imported as the high cost of its domestic rice production in the large-scale irrigation of the Fleuve region, when the possibility for low cost irrigation exists in Casamance. If Senegal's goal of rice self-sufficiency is not realistic, since it still must import approximately 70 percent of all rice consumed at costs that are several times those in Asia (although donors have subsidized initial investment costs), then clearly better

Groundnut yields in major producing countries, 1965-87



Source: World Bank Database (BESD)

Ratio of value of groundnuts exports and rice imports, 1963-87



Source: World Bank Database (BESD)

uses of the country's scare resources should be sought. The employment effects of this large-scale investment seems to be minimal since it is in an area where only 9 percent of the total population lives.

One complicating factor contributing to the loss of groundnuts' market share in the 1980s that has rendered rice self-sufficiency even less viable an economic option is the overvaluation of Senegal's currency, the CFA franc, since it makes imports cheaper than they otherwise would be. However, the country has no unilateral ruling over its exchange rate.

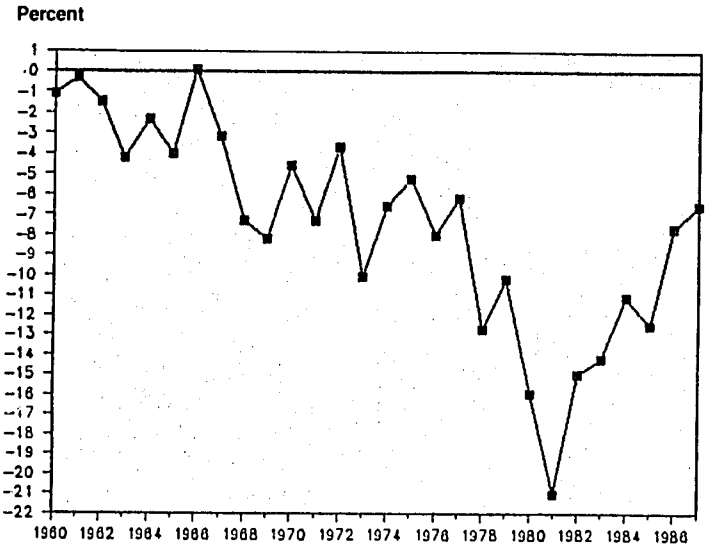
A (long-term) solution to increasing the competitiveness of groundnut exports, through yield increases at the production level, and to reducing the cost of irrigation (now that realism compels donors to consider the irrigation structures sunk costs) resides in further agricultural intensification and in improving indigenous research capacity and investing in low cost irrigation. The eventual collapse—after years of institutional instability—of the groundnut production support structure (including credit and input distribution) led *inter alia* to a sharp decrease in average annual fertilizer use from 38 kilograms per hectare in the 1960s to 23 kilograms per hectare in the 1970s. In rebuilding the support system, a heavy reliance has been placed on the private sector. While evidence suggests that the private sector has been very active in output marketing, it would need stronger incentives to operate in the high risk, low expected yield, low input demand situation which characterizes Senegal's farm input delivery system. This could pose a challenge for the agricultural intensification that has become necessary.

The stated strategy to increase the consumption of locally produced cereals seems to have been inconsistent with the policy of rice consumption support. Imported rice distribution subsidies have ensured that the commodity is reaching most of rural Senegal at a cost bearable to the rural population, while domestically produced cereals have faced uncertainties in their marketing. Indeed the internal price ratio of sorghum/millet to rice has been near one, when that of their international prices has been near two, in favor of rice—thereby contributing to the substitution of rice for millet/sorghum in consumption. With the *perequation system* the state earns revenues from the difference between the administered higher selling price of rice and its lower imported cost. Besides, the price elasticity of the supply of rice is estimated to be low (0.1 to 0.2) since production growth has been more responsive to nonprice factors, i.e., investment in irrigation. The responsiveness of demand for rice to higher prices (resulting from a real exchange rate devaluation or a corresponding tariff) is also believed to be very low since the demand for rice has increasingly been determined by nonprice factors (such as urbanization and the convenience in food preparation). One downstream attempt to reduce the dependence on rice and substitute traditional cereals was to partially replace wheat with millet/sorghum in bread. The attempt failed partly because of the inelastic demand for rice and partly because of a lack of follow-through in the agroprocessing industry.

External environment, foreign aid, and Dutch disease

Senegal's terms of trade did not move unfavorably during the period under study. After a precipitous decline in the mid-1960s (the period which also corresponds to the discontinuance of French preferential support to Senegal's groundnut exports) the terms of trade index has been fairly constant—hovering around 100, which means a near parity price, between export and imports. However, due to the slow growth of exports (in fact declining in the case of groundnuts) at a rate less than the import volume, Senegal's trade deficit has widened steadily from the mid-1960s until 1981. Although the trade balance has improved since then, it remains negative and in 1987 represented 6 percent of the GDP.

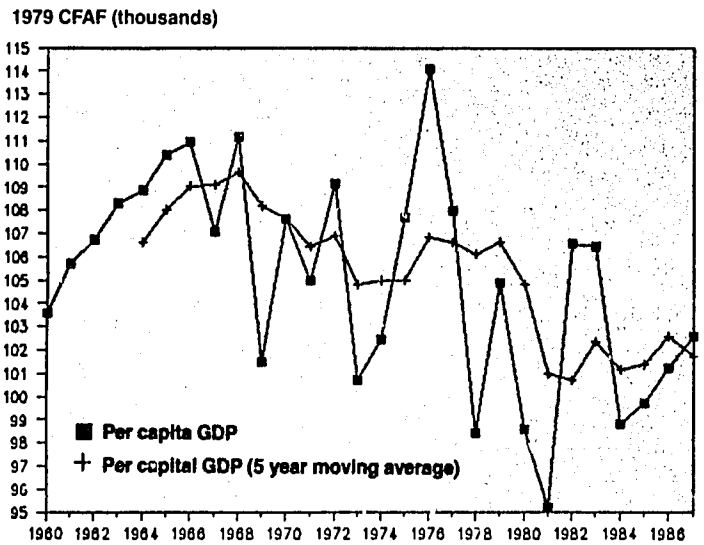
Trade deficit as a percentage of GDP, 1960-86



Source: World Bank Database (BESD)

By 1986, after having received $US 84 per capita in official development assistance (ODA), Senegal ranked as the world's second largest recipient (behind Mauritania with $US 103 ODA per capita). During the period 1970-84, ODA represented 42 percent (with a peak of 62 percent in 1982) of Senegal's government expenditures, nearly twice that of Cameroon (23 percent) and Kenya (22 percent). The sheer size of Senegal's service sector (which constitutes 50 percent of the GDP, a large figure for a low income country) and of the public sector could be symptoms of the "Dutch disease," induced by foreign aid. However, due to the country's stringent money supply control under the UMOA regulations, the inflationary impact of the oversized service sector has been somewhat subdued. The average money supply (M1) growth and inflation in Senegal were the lowest of the MADIA countries during the period 1960-87: 9.7 percent and 7.4 percent, respectively (compared with 13 percent and 8.3 percent for Kenya—a country that had overall better economic performance than Senegal during the stated period).

Per capita GDP, 1960-86



Source: World Bank Database (BESD)

Strategies and key choices for the future

The pessimism about the future of Senegal's agriculture has diverted both the assistance of donors and the country's emphasis to diversification out of groundnuts and out of agriculture in general. Several areas will need to be addressed as a matter of defining a comprehensive and coherent long-term strategy for Senegal's agriculture. Key choices may concern:

1. Export and food crops

Groundnuts: While diversification out of groundnuts is necessary, the importance of the Groundnut Basin in Senegal's economy will continue. It should be recognized that a margin for productivity increases and new market developments exists. A sensible diversification effort out of the groundnut economy should first explore a more aggressive development of new market outlets (especially toward the high income vegetable oil consuming countries of Asia and Africa—especially since Nigeria now is a net importer) and of new groundnut-based products (such as confectionery groundnuts, which stand favorable price competition with the other high income-elastic edible nuts).

Cotton can play an important role in Senegal's diversification and agricultural management efforts; its past development can provide lessons for the development of other commodities—effective "Senegalization" of the cotton filière needs to be achieved.

Millet/Sorghum: As for food crops, the importance of millet/sorghum will continue to be unparalleled. The major challenge here may reside in improving its acceptance and its competitiveness vis-a-vis rice in the urban centers or its more widespread use in livestock feed formulas.

Irrigated vs. rainfed rice: There is a need to reassess the economics of rainfed versus irrigated production of rice and of large versus small-scale irrigation in the Sahel. The geographical distribution of rice in Senegal has changed in favor of irrigated rice in the Fleuve region. Yet overall production has remained stagnant despite the high yields (as high as 4.9 tons per hectare) obtained in the Fleuve. Further increases in production will require additional investments in the irrigation structures. Given the high yields obtained in smaller-scale, privately managed structures in the Fleuve and Casamance, priority should be given to the development of small-scale irrigation and to the resuscitation of rice production in Casamance.

Maize production underwent an impressive yield increase and presents better prospects for further yield improvement. However, the domestic demand would need to be boosted with the development of rice substitutes for human consumption or as an animal feed.

Livestock development has been relatively neglected in the past, despite its potential for reducing the growing urban demand for animal protein. Its successful integration with agriculture should be pursued more purposefully and receive more attention from the government and donors alike.

2. Intensification and its implications for research and institutional support

Senegal's deteriorating agricultural environment has especially heightened the need for agricultural intensification and the reassessment of regional and crop priorities. In this respect, there should be more congruence with perceived agro-ecological constraints and regional comparative advantages.

Agricultural research will play a key role in the drive for intensification as will the system of distribution of modern inputs to farmers. In this latter respect, the role of the private sector for ensuring the adequacy of services for farmers—including credit and input supply—will be a challenging one. Given high risk and low return, the extent and speed at which the private delivery system will effectively cater to farmers may be inadequate.

As for diversification out of agriculture, investments in education to develop a skilled labor force for the manufacturing sector seem more urgent for Senegal than for other agricultural countries.

MARKETS, MARKETING BOARDS, AND COOPERATIVES: ISSUES IN ADJUSTMENT POLICY

UMA LELE • ROBERT E. CHRISTIANSEN

The structural adjustment efforts underway since the early 1980s in the MADIA countries have emphasized the liberalization of agricultural marketing and have led to a vigorous debate about the appropriate roles of the private and public sectors in pricing and marketing of agricultural commodities. Among the issues raised in this debate are the nature and causes of observed weaknesses in public and private sector marketing activities, whether and at what level to tax the export crop production, and whether there is a need and an ability to stabilize producer and consumer prices. Even more central to this debate is the need to articulate the circumstances under which public sector intervention in marketing activities is appropriate in a broader developmental context. On the one hand, advocates of increased liberalization argue that the failure of so many public marketing institutions to perform satisfactorily is evidence of the need to privatize a wide range of marketing activities and to press even those public parastatals that may remain to perform solely as commercial entities. On the other hand, others cite the limits of the private sector in terms of its ability to perform certain developmental functions which must be undertaken by the public sector. The need for these development functions stems from the nature of risks in agriculture in general and African agriculture in particular, as well as the weaknesses of the private sector. The latter in turn have been reinforced by the pervasive presence of the public sector.

Although public sector intervention in agricultural marketing is closely linked to the nature of agricultural production and the processing requirements of crops, its implementation is frequently based on political objectives. The marketing arrangements that many African countries inherited from the colonial era were influenced largely by the economic interests of expatriate farmers and traders. In order to preserve the benefits derived from state-dominated marketing structures, many of the independent African governments retained the marketing boards and parastatals bequeathed by the colonial governments; thus newly dominant groups came to direct marketing policy and institutions. In this context, market intervention was increasingly seen as a means of ensuring food security, enabling the government to perform development functions, stimulating agricultural production, maintaining control over politically strategic commodities, and providing a source of political patronage.

These interventions by governments in the operations of marketing boards and cooperatives have often adversely affected the efficiency of these agencies. Although there is a tendency to assume that the failure of many parastatals is due to their inherent inefficiency, the sources of inefficiencies often lie beyond the control of the parastatals, e.g., in pressure from the government to overstaff as a form of political patronage or to perform development functions without remuneration.

Many of the policy reforms that pertain to agricultural marketing undertaken by African governments during the 1980s emphasized the need to improve parastatal performance through a combination of restructuring, greater emphasis on commercial criteria, and privatization. This emphasis frequently requires that part or all of the agency in question be privatized and the losses of the operations that remain in the public sector be minimized or eliminated. Since extensive public sector control has been crucial to maintaining control over crucial marketing functions, most African governments have been reluctant to allow anything other than selective and closely regulated private sector involvement in agricultural marketing. Given the importance of parastatals and even cooperatives as institutions that can extend the political and economic power of governments, it is unlikely that they will relinquish completely the right to intervene in agricultural markets.

Despite the political nature of marketing organizations, there are legitimate economic functions that these institutions need to perform, including: (i) reducing the inherent riskiness of agriculture for small-scale farmers, (ii) ensuring markets and input supply to promote price stability, (iii) providing revenues for the public sector, (iv) supporting large-scale investments in processing that the private sector is unwilling or unable to attempt, (v) addressing the constraints imposed by inadequate financial markets, (vi) creating demand for inputs, and (vii) assuring supply of food and inputs to low income households in remote regions, which may not otherwise be reached.

The experience with public sector intervention in agricultural marketing in the MADIA countries indicates a clear need for institutional pluralism in order to foster competition. Although the private sector can provide increased competition and can clearly perform some tasks more efficiently than parastatals, the public sector must insure that certain requirements are met before the private sector can operate effectively. These requirements include: (i) stimulating the development of an entrepreneurial class capable of undertaking risk, (ii) encouraging free entry into markets, (iii) creating adequate infra-

structure, transport, and communication networks for the efficient movement of goods, and (iv) promoting efficient financial markets that are able to support commodity markets.

With respect to the role of cooperatives, the experience of the MADIA countries indicates that there are two requirements for successful cooperatives that are often contradictory. First, independent cooperatives that are able to represent the interests of their membership effectively are most likely to be successful. Governments, however, are often fearful of the political power of such cooperatives and are therefore reluctant to encourage grassroots arrangements. Second, cooperatives need support to deal with the complex organizational, technological, and financial requirements of modern cooperative management. In this light, it is abundantly clear that cooperatives cannot be used as substitutes for parastatals with the public sector controlling their operations, since by their nature they require active and democratic grassroots participation.

In Africa, privatization has not been preceded by the strengthening of the private sector or the establishment of legal and other institutions (e.g., standardization of weights and measures, collection and dissemination of market information, availability of credit to traders, transporters, wholesalers, and retailers). Thoughtful and long-term donor assistance to the private sector is required in transport, communication, information, and credit to contribute to the decentralization of economic and political power. The issue of timing will be critical to the development of an efficient and effective marketing system and will determine whether the private sector will be competitive or merely replace public sector oligopolies while continuing to serve the same vested interests. Thus far, donors have tended to be naive about the appropriate extent and pace of privatization, especially given that the interests in public sector operations, which they supported, have become entrenched.

The implication of these findings for donors is that although the perception of politicized and inefficient parastatals is correct, it is not sufficient to sponsor reforms that in effect expect the private sector to address even a majority of agricultural marketing needs. Policies must be devised that continue to encourage the private sector and at the same time, depoliticize parastatal operations in such a way that competition can be enhanced while development requirements are met. This means defining the appropriate role of the public sector in terms of the circumstances in which public support and regulation is required to ensure a competitive environment and intervention is needed to provide services that the private sector is unwilling or unable to provide. The need to assist producers in confronting the risks associated with rainfed agriculture as practiced in Africa, establish an environment where capital and technological inputs are readily available, and act as a buyer and seller of last resort combined with the need to protect consumers, particularly low income consumers, from wide price fluctuations will continue if there is to be agricultural growth with development in Africa. A limited amount of market intervention will necessarily be part of any overall agricultural strategy. Progress will in all likelihood be slow; and donors must recognize the major differences among and within countries in order to play a useful role in developing appropriate marketing institutions and arrangements which include both the private and public sectors.

MANAGING AGRICULTURAL DEVELOPMENT IN AFRICA

SMALLHOLDER AND LARGE-SCALE AGRICULTURE: ARE THERE TRADE-OFFS IN GROWTH AND EQUITY?

UMA LELE • MANMOHAN AGARWAL

Experience of the relationship between farm size and productivity in South Asia indicates that small farms produce greater yields per hectare than large farms and that therefore a smallholder strategy is at once equitable and efficient.

This paper based on evidence from Kenya and Malawi documents that the reverse is true in East Africa. Yields per hectare are greater on large than on small farms. However, when total factor productivity is considered smallholders are as efficient as large farms.

The lower yields on small farms are a result both of inadequate access of small farmers to factors of production and their limited ability to undertake risk. Large farms are able to achieve higher yields per hectare because of their greater ability to mobilize modern inputs, labor, and credit, and to undertake risk.

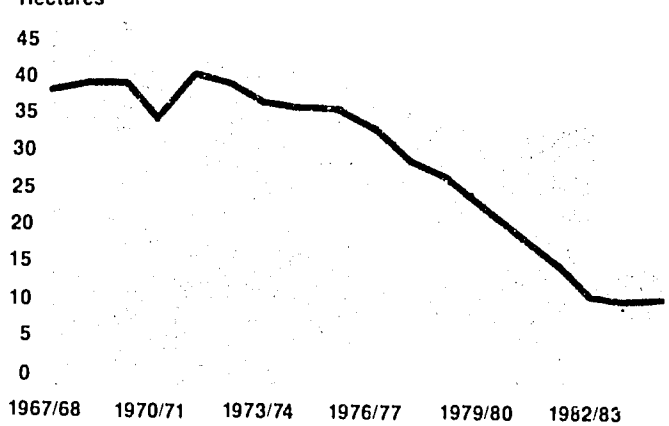
Defining large and small farms

The distinction between smallholders and estates, usually reflecting farm size, can also be based on differences in rights to grow certain crops and to sell them in different markets. In Kenya, where three quarters of all smallholdings are now less than 2 hectares, small farmers grow the same crops as large farmers and sell their output in the same auctions or to the same marketing boards at prices similar to those earned by large farms. On the other hand, in Malawi the distinction between small farms and estates is based mainly on the legal right to grow certain crops. Estates are defined as those licensed to grow burley or flue-cured tobacco, mainly for export, sell the output at auctions at prices close to world prices, and hire wage labor or rent land to tenants. Smallholders are permitted to grow dark-fired, sun/air cured, and oriental tobaccos. They cultivate customary land and are required to sell their output to the public marketing agency, ADMARC, at prices determined by the government. These prices have tended to be between one third and one half of the price received by estates for the same type of tobacco. Despite these official distinctions between large and small farms, there may be little difference in actual farm size.

Land distribution

In Malawi land under estate cultivation, mainly leasehold, has grown rapidly since the mid-sixties, increasing from about 14 percent of total arable land in 1968 to 19 percent in 1981. In Kenya 27 percent of arable land in 1978 was under large farm cultivation. Although the average size of tobacco estates in Malawi has declined (Figure 1), the estate sector's share in total cultivated tobacco area almost doubled from 1970 to 1985 (24 percent to 47 percent). The amount of customary land cultivated by smallholders has declined, and there has been an increase in the number of smallholdings, and therefore a decrease in their average size. Similarly, rural surveys in Kenya indicate a rather rapid decline in the average size of smallholdings.

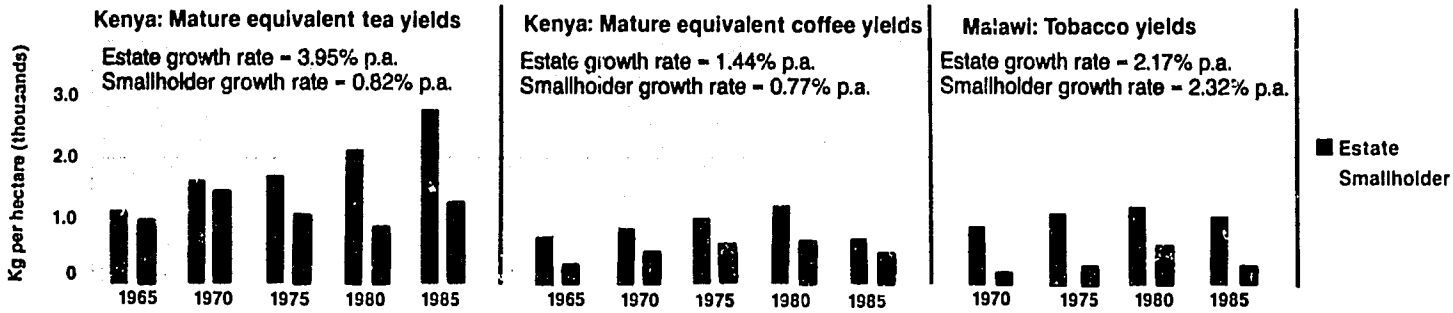
Figure 1
Average tobacco estate area in Malawi, 1967/68—1984/85



Productivity differences between smallholdings and estates

The process of modernization of agriculture seems to have changed significantly the relative productivity of small and large farms. With the introduction of new technologies following the Green Revolution, in South Asia the productivity differential between small and large farms decreased considerably, and in many cases was reversed. This phenomenon is mirrored in the MADIA countries. For export crops, such as tea and coffee in Kenya and tobacco in Malawi, productivity per hectare is higher on large farms than on small farms (Figure 2). What is even more striking, however, is that the mature equivalent yields of tea production on smallholdings in Kenya have remained virtually constant, while they have more than doubled on estates, so that the differential has grown despite the sustained efforts of the Kenya Tea Development Authority to make technology and inputs accessible to small farmers. On the other hand, in the case of coffee the mature equivalent yields on smallholdings have increased at roughly the same rate as on estates, though in total they still remain about half the estate yields. In the case of tobacco in Malawi, estate yields are two to three times those of smallholdings. Yields on smallholdings have been stagnant since the 1970s, while they have increased on estates, although yields on both estates and smallholdings have fluctuated considerably.

Figure 2
Productivity difference between smallholders and estates in Kenya and Malawi



Why are yields higher on large farms?

Evidence from the Tobacco Sector Study in Malawi indicates that tobacco yields in Malawi are a function of both holding size and the type of tobacco produced. Yields of tobacco cultivation on estates average 1450 kilograms per hectare for burley and 1500 kilograms per hectare for flue-cured. Smallholders, with the necessary licenses, average yields for flue-cured and burley tobacco of about half those of estates, at 800 and 600 kilograms per hectare, respectively. Average smallholder yields for their legally restricted production of sun/air cured, dark-fired, and oriental tobacco are far lower, at about 250 kilograms per hectare. The differential between smallholder and estate per hectare yields can be explained partly by differences in the intensity of input use. For example, smallholders cultivating dark-fired or sun/air cured tobacco use hardly any fertilizer or pesticide, whereas in the case of flue-cured and burley tobacco they apply only about half the amount of fertilizer and chemicals per hectare that estates use. Surprisingly in Malawi, a labor surplus country, small farms use only about three quarters as much labor per hectare as estates. The Tobacco Sector Study suggests that greater application of fertilizer by estates in maize production, in addition to their ability to purchase maize from ADMARC, enables the subsistence requirements of estate workers to be met using relatively less labor in food crop cultivation than smallholders, so that estates can use more labor, as well as more fertilizer and other chemicals, per hectare of tobacco. Even less labor time per hectare (two thirds of their total labor input) was used by smallholders in cultivation of sun/air cured and dark-fired tobacco. This is because farms engaged in cultivating sun/air cured and dark-fired tobacco tend to be smaller, and therefore they must devote a larger share of inputs to maize cultivation to meet their subsistence requirement.

In Kenya, despite the fact that there is little difference in the price received by smallholders and estates for coffee and tea, the latter use four to five times as much fertilizer and pesticide. But what is perhaps unexpected is that Kenyan estates also use considerably more labor than smallholders for weeding and pruning. Whereas in most regions of Kenya smallholders use about 200 person days of labor per hectare of coffee, estates use about 400 person days. Thus the higher land productivity on estates seems to stem from greater input use.

Efficiency of production on small and large farms

Since the higher productivity per hectare on estates seems to result from greater use of all major inputs, the question arises whether this higher productivity is proportionately more than the greater input use, i.e., what is the relative efficiency of smallholder versus estate cultivation? Domestic resource costs (DRCs), which measure the value of domestic resources needed to obtain one unit of foreign exchange through sales of export crops such as tobacco and coffee or import substitution crops such as maize, were estimated to measure the efficiency of resource use.

In the case of coffee production in Kenya, DRCs for smallholders were consistently less than for estates. DRCs for irrigated estates were lower than for non-irrigated estates.

The results are more complex in the case of Malawi. An important factor to note is the relative sensitivity of the results to changes in price. Using 1982 prices, cultivation of sun/air cured and dark-fired tobacco was inefficient as compared to burley and flue-cured tobacco, irrespective of whether the latter was produced by smallholders or estates. Smallholder cultivation of flue-cured and burley tobacco and maize was about as efficient as estate cultivation of tobacco. The results are quite different, however, when DRCs are calculated using 1986 prices. Because of the relatively more rapid increase in the prices of imported fertilizers than (as a result of increased transport costs, currency devaluation, and removal of the fertilizer subsidy), smallholder cultivation of flue-cured and burley tobacco increased its advantage over estate production.

The DRC calculations for 1986 also show that the relative efficiencies of maize and tobacco have changed over time. In 1982 smallholder cultivation of maize was as efficient as smallholder cultivation of flue-cured or burley tobacco and more efficient than smallholder cultivation of sun/air cured and dark-fired tobacco. However, in 1986 tobacco prices were higher and maize prices lower, so that DRCs for maize production were higher than for tobacco production.

Overall, the analysis of DRCs shows that the lower per hectare productivity on small farms in tobacco cultivation in Malawi and coffee cultivation in Kenya reflects the less intensive use of all inputs, including labor, but there is little difference in efficiency of production between small farms and estates.

Policy implications

Several policy actions are needed to foster more rapid growth in smallholder productivity. First, it is necessary to ensure equal access by all households to land, rights to grow crops, and opportunities to sell crops in the same markets regardless of farm size or income. Second, programs targeted toward smallholders need to develop a much better understanding of the precise constraints facing small farmers. Third, in formulating public policy it is critical to recognize that although a smallholder strategy tends to be efficient in the long run, even a well-designed strategy is likely to involve lags in realizing the benefits because of the need to alleviate a more complex set of constraints on small farms; this will lead to tradeoffs in growth and equity in the short run. To minimize such trade-offs it is critical that the factors which constrain small farmers be better understood. A focus on small farm development may also require more explicit recognition of the need for recurrent costs, as well as the inevitability of slower short run growth.

MANAGING AGRICULTURAL DEVELOPMENT IN AFRICA

FOOD AID AND DEVELOPMENT IN THE MADIA COUNTRIES

JOHN W. MELLOR • RAJUL PANDYA-LORCH

Introduction

In general, food aid is not sufficiently large in the MADIA countries to be a major determinant of food security, development project size and policy, or foreign assistance flows. Moreover, it has been mildly destabilizing in its timing. However, food aid could effectively and productively fill those roles. The MADIA countries have been grossly underinvesting in projects with large employment and hence food consumption components. Given that they have large numbers of poor, underfed people, it would require approximately two million tons of cereal of food aid per year to lift the "hungry poor" of these countries up to acceptable dietary levels. More than three-quarters of that food aid could be effectively used in developing, over a twenty-year period, the rural infrastructure grid essential for agriculture to play an optimal role in growth and poverty alleviation. For food aid to be effective, major policy changes by food aid donors and recipients alike would be required.

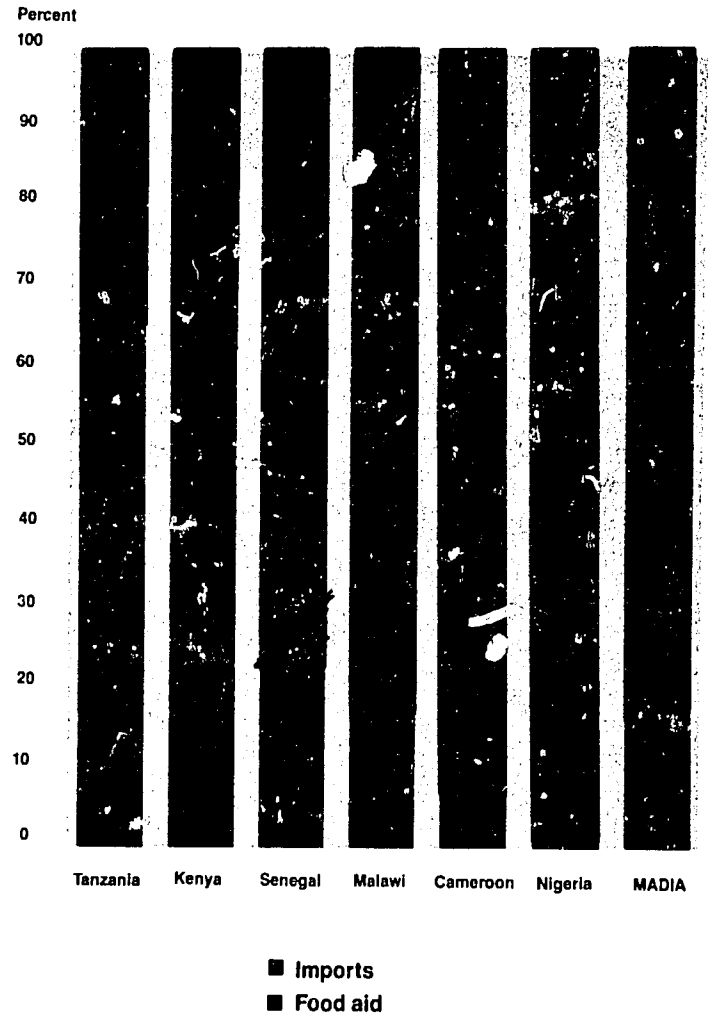
Food aid levels

Nigeria has received no food aid since 1972 and Cameroon has received negligible quantities. It has been generally inconsequential in Malawi as well. Senegal, Kenya and Tanzania received significant quantities of food aid Senegal did so in a context of continually bad weather and not particularly favorable development policies. Kenya and Tanzania are the most interesting food aid cases, representing, in the former case, the role of food aid in the support of effective, growth-oriented and poverty-alleviating development policies and, in the latter case, the role of food aid in facilitating continuation of quite inappropriate development policies.

In Kenya, food aid may have been responsible for enlarged net disbursements of Official Development Assistance and public expenditure without having affected food prices more than marginally. During the period 1980-86, food aid comprised over half of all cereal imports although it represented less than 5 percent of cereal food consumption. More importantly, food aid was a substantial 12 percent of ODA and 4 percent of government revenue during the mid-1980s.

Food imports grew rapidly in the context of development policies which were extremely favorable for nonfood agriculture production, quite favorable for food production and favorable for growth in nonagricultural production. The result has been rapid growth in employment and demand for food. Food aid has been effectively used to pay for a substantial proportion of these increased imports, thereby allowing the foreign exchange component of capital formation to proceed rapidly in pursuit of an effective development strategy.

Figure 1
Volume of food aid relative to cereal imports, 1980/81—1985/86



In Tanzania, food aid's influence on policies towards food prices and public expenditure would be larger than in Kenya, but hardly a dominating element. Tanzania has had a similar level of food aid compared to Kenya in every respect, except as a proportion of ODA, which was lower—5 percent compared to Kenya's 12 percent . In 1984-86, food aid comprised 43 percent of cereal imports—somewhat less than for Kenya—although over the longer period, 1981-86, the average level was the same. It can be surmised that food aid was a much larger percentage of cereal food consumption and government revenues in Tanzania relative to Kenya.

The Tanzanian case is the opposite to Kenya's. The Tanzanian development strategy rhetorically favored the agricultural sector, rural investments, rural participation and decentralization but in practice favored the growth of capital-intensive urban industry and parastatal employment (see MADIA papers on Tanzania). Large foreign assistance flows allowed rapid growth in public employment and urban growth. At the same time, policies towards the rural sector, including lack of maintenance of rural infrastructure, resulted in decreased commercialization of agriculture. The result of these divergent forces in the rural and urban sectors was a tremendous increase in food imports. For example, in the period 1980 to 1984, food imports increased by two-thirds from the 1975 to 1979 period. Note, however, that while food aid clearly facilitated these policies, they were so entrenched that the drop in food aid in 1982, following donor disenchantment, did not result in significant decline in imports between 1982 and 1986.

Given the importance of stability in food supplies to the poor, it is disconcerting that food aid has been administered in a manner that at best was neutral to fluctuations in domestic food production and in some MADIA countries was further destabilizing. Only in Tanzania does it appear that food aid may have played a mildly stabilizing role, perhaps because Tanzania's donors have been relatively more sympathetic to poverty alleviation objectives.

Projected absorptive capacity for food aid

While food aid levels in the MADIA countries have been low, demand for food imports has been growing much more rapidly than domestic production. The processes underlying these relations create a fairly rapidly growing absorptive capacity to utilize food aid. Import and distribution facilities and market processes are all utilizing more and more imported food. If food aid meets those growing needs foreign exchange and public agencies can be diverted to development purposes. Projections of the underlying trends show a massive absorptive capacity for food aid over the next decade. These projections reflect the use of food aid in Kenya, Cameroon, and Malawi to support continuation of moderately to highly effective development processes. In the case of Nigeria and, to some extent Senegal, it would make possible the continuation of ineffective policies for rural development and hence for overall growth.

Infrastructure, growth, and poverty

In none of the MADIA countries can more than a small proportion of the rural sector presently contribute effectively to national growth. Rural infrastructure networks are such that transaction costs are so high that the commercialization incident to more productive farming does not pay. The result is slow growth in food supplies and employment, and therefore little reduction in poverty.

It would require, for the MADIA countries, over a 20 year period, approximately $1 billion per year, including over 1.5 million tons of incremental cereal consumption, to put in place adequate rural infrastructure.

Other calculations indicate that it would require about two million tons of cereals per year in the MADIA countries to lift the poorest people to a level of adequate food consumption. Following from this, a major rural public works program would take care of about three-quarters of the worst poverty. In the MADIA countries, about 90 percent of the "hungry poor" are in rural areas.

Policy needs

If food aid is to play a major effective role in development, the following changes need to occur.

For the MADIA countries:

1. Continued effort to decentralize the political and administrative processes of revenue collection and expenditure into rural areas. This is essential to administer the construction and maintenance of rural infrastructure as well as for the elements of rural development;
2. Massive expenditure on rural infrastructure and of course the complementary central infrastructure;
3. Recognition that rural infrastructure does not provide growth without a complex set of technologically oriented institutions. Expenditure patterns have to be completely reoriented per the MADIA findings.

For the donors:

1. Successful coordination of food aid and financing for the nonfood components essential to productive projects;
2. Aid conditioning on the sub-sectoral, political, and administrative changes needed to build and obtain returns from massive infrastructure investment;
3. Provision of greatly expanded project-oriented technical assistance to make food and labor-intensive projects work;
4. Management of programming to stabilize food availability, not to destabilize it; or, the development of the IMF cereal facility as a viable means of meeting developing country needs by stabilizing food supplies through international borrowing.

It is time to get away from the divisive political controversies surrounding food aid and to recognize that optimal growth strategies require much more rural investment than in the past and that they will result in much more food consumption, both in the short and long term, even as production accelerates so that food aid can play a constructive role in development.

MANAGING AGRICULTURAL DEVELOPMENT IN AFRICA

STRUCTURAL ADJUSTMENT, AGRICULTURAL DEVELOPMENT, AND THE POOR: SOME LESSONS FROM THE MALAWIAN EXPERIENCE

UMA LELE

Malawi faces complex problems in trying to achieve equitable growth while coping with formidable external shocks. Adjusting to external shocks is more complex in Malawi than in other countries because of its extreme poverty, tenuous external transport links, and the highly dualistic structure of the agricultural sector. This dualism stems not only from the export-oriented estate and the smallholder sector, but also from the division within the smallholder sector between farmers who have sufficient land to allow cash cropping and those who do not. For this reason agricultural sectoral policies are crucial in determining whether or not Malawi can achieve sustained and broad-based growth in the future.

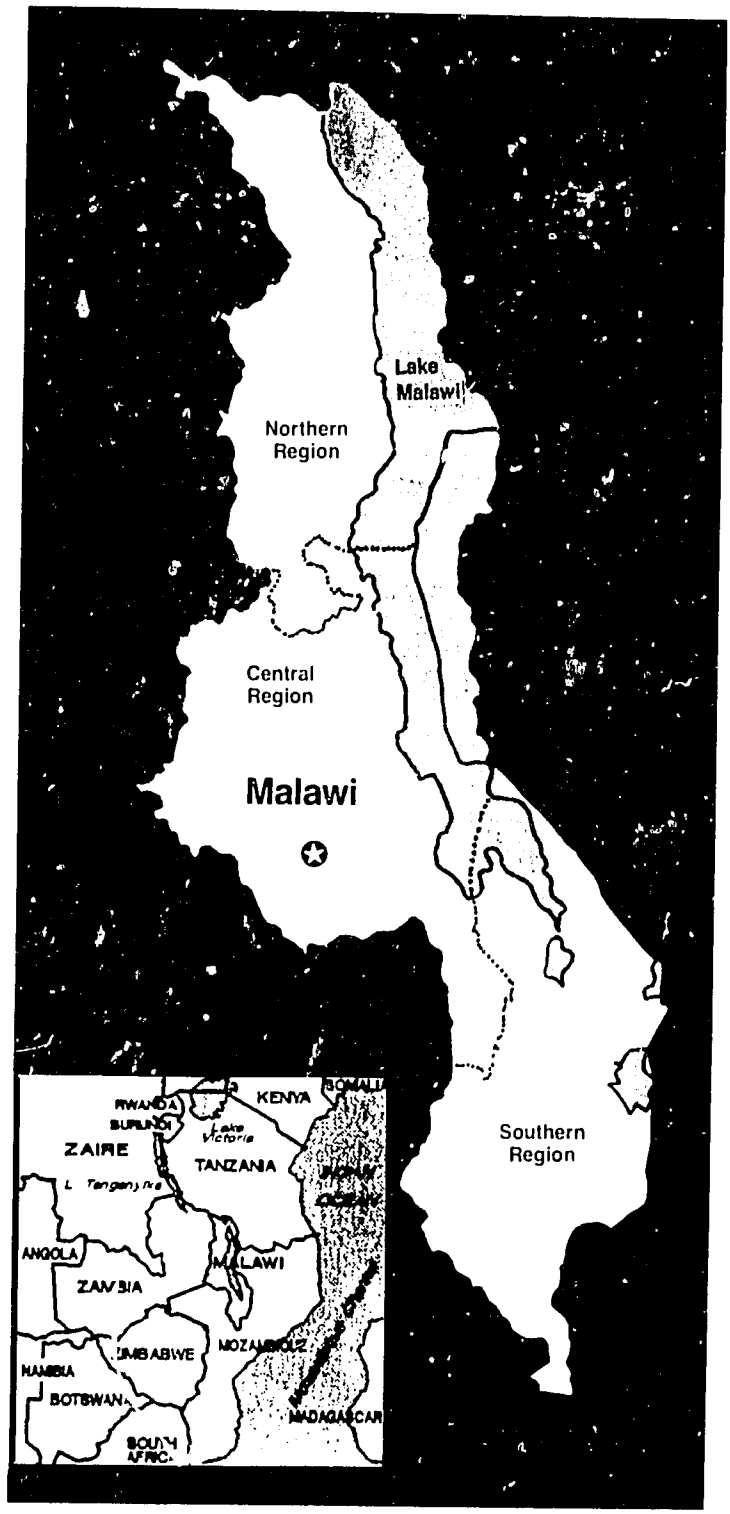
The nature of external shocks

Relative to its neighbors, Malawi adjusted well to the adverse external shocks of the 1970s. Since the second oil shock in 1979, however, it has faced numerous other external problems including drought, a major decline in external terms of trade, high interest rates on its external debt, a sharp increase in external transport costs, and an influx of well over half a million refugees. The major structural imbalances have led the government to seek to restore macroeconomic balance through one of the most ambitious programs of structural adjustment in Africa.

Dualisms within agriculture

Conditions inherited at independence and policy choices made in the 1970s have divided Malawi's agricultural sector into a rapidly growing estate sector that accounts for 95 percent of exports, and a smallholder sector characterized for the most part by extreme poverty. The smallholder sector faces sharply increasing land pressure and is overwhelmingly dependent on agriculture for employment. The policies that have reinforced this dualism include differential access to land rights and rights to grow and sell export crops at international market prices, rapid alienation of land for the formation of estates, and the growing disparity in income and land pressure in the smallholder sector. The smallholder sector itself divides into two parts: whereas (1) nearly 45 percent of smallholder households have enough land—1 hectare or more—for either actual or potential self-sufficiency or surplus production for the market, (2) over 55 percent do not have enough land—cultivate less than 1 hectare—and therefore rely substantially on wage employment for income and on the market for food.

Although the structural adjustment process has helped to restore macroeconomic balance, it has had little impact on aggregate supply response because the majority of households are not in a position to respond to the higher food prices with an increased marketable surplus.



The lack of supply response is rooted in the precarious economic situation of the majority of Malawi's smallholders which has affected their access to agricultural credit and information, and their attitudes toward risk-taking and the ability to adopt modern technology. These factors are only now beginning to be understood, but the understanding of some of these constraints, e.g., to the adoption of hybrid maize by poor households, is still incomplete.

The way in which the future benefits of agricultural growth are distributed toward low income producers will have a profound effect on the overall structure of demand, and through their effect on growth linkages, on the development of the rest of the economy. Goals of growth and equity, while conflicting in the short run are congruent in the long run.

The challenge facing Malawi's government and its donor supporters is how to improve economic conditions among the bulk of the very poor rural households, while also resuming the high overall growth rates achieved before the onslaught of external shocks that began in 1979.

Policy implications

Encouraging the smallholder sector to respond to market incentives with greater overall production requires an improvement in smallholder access to technical knowledge, credit, storage and transport, and most notably, fertilizer to increase productivity. Improvement on each of these fronts will require a period of price and supply stabilization and assured markets to safeguard national food security, to help reduce risk aversion among producers, and maintain welfare among food deficit households. A vigorous program for the development of appropriate technology for low income households for both flint and dent maizes and other crops that will increase nutrients (such as groundnuts) and will reflect an understanding of the complex constraints that inhibit adoption of modern technology by small farmers will also be necessary.

Role of National Rural Development Program

The National Rural Development Program (NRDP) had been at the center of Malawi's smallholder agricultural strategy since 1978. A shift away from it toward a variety of important but uncoordinated activities such as agricultural research and extension, credit, growth centers, fertilizer imports, food and fertilizer storage, and fisheries is an expression of donor disenchantment with NRDP for failing to reach subsistence and below-subsistence farmers. This failure has its roots in NRDP's earlier design, in which donors played a major part. NRDP has focused on physical infrastructure; it did not recognize the presence of the agricultural dualisms and therefore did not include explicit means to address the needs of subsistence and below-subsistence farmers. For example, the complex problems involved in adopting improved maize varieties and providing fertilizers to small-farm households below subsistence are only now being considered. A means of devising services for this purpose is not yet well understood. Disenchantment with NRDP is based in part on its failure to meet objectives it was never designed to serve.

NRDP's impact in reaching 20 percent of the small farmers with credit and only 5 percent with hybrid maize technology seems unimpressive, and attempts by the government to reduce unit costs by expanding services have been seen by donors to be slow in achieving results. But the current coverage of NRDP involving close to half of the 25 percent of households *above subsistence* with agricultural credit is not unimpressive.

The recalcitrance of Malawi's dualisms to ameliorating measures, such as project assistance or structural adjustment, argues for a great deal of experimentation and well coordinated, fine-tuned policies and instruments for reaching the poorer smallholders. These should be planned and implemented by trained Malawian personnel who are knowledgeable about local circumstances and in a position to encourage the participation of the rural people themselves in the design of programs which to date have been relatively top-down. This means that donors and the Malawian government need to place greater emphasis on increased training of Malawian personnel. Clearly the government cannot afford the current expenditures required for extension, fertilizer subsidies, price and supply stabilization, and other efforts to increase smallholder production and protect consumption without greater internal progressive resource mobilization.

Increased internal resource mobilization and its different allocation

Granting smallholders increased access to land and conferring rights to grow export crops and receive international prices similar to those received by estates will achieve broad-based, sustainable growth and generate strong growth linkages with the rest of the economy. A mild progressive tax on tobacco on farm households of all sizes and types—instead of the current totally inequitable heavy tax on small farmers on the tobaccos that they are allowed to grow—will alleviate the pressure on fiscal resources. (Donors have encouraged a land tax for estates on grounds of its greater neutrality, however, weak implementation of the tax has hurt resource mobilization while increasing the burden on the poor by constraining government resources for social programs.)

Role of external donors

- Donors will need to recognize that growth will initially be slow in Malawi if it focuses on small farmers and the poor;
- They will need to be more generous with recurrent resources;
- They will need to recognize their lack of knowledge about addressing poverty issues and learn to experiment; and
- Most importantly, they will need to have a more continuous means of learning by doing and obtaining field information on responses of rural households.

MANAGING AGRICULTURAL DEVELOPMENT IN AFRICA

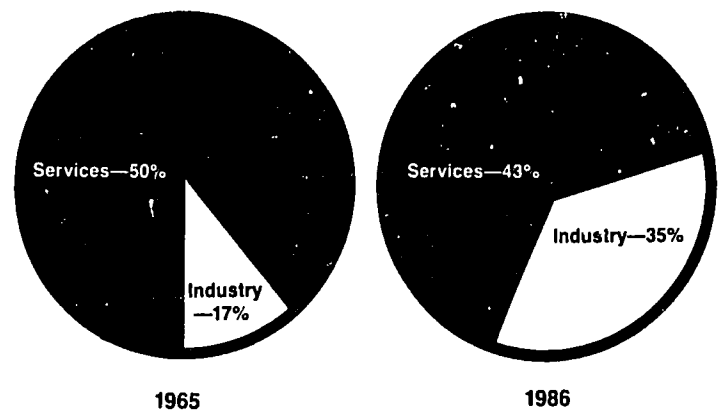
HIGHLIGHTS FROM CAMEROON

Cameroon is a relatively enigmatic country compared to the other MADIA countries. It has been praised for its sound economic management, especially for the fact that the country did not change its agricultural vocation after the discovery of oil and the subsequent oil price boom. Although the mining sector, with a current large 17 percent share of the overall GDP and 45 percent share of export earnings, is seen as the engine of the Cameroonian economy, agriculture is foreseen to resume its role as a leading sector when the oil era ends. The challenge for Cameroon will be to set the base for the transition from an oil dominated economy to one where a relatively undersized agricultural sector will have to play the leading role, making the need for productivity increases more pressing. The country possesses potential for agricultural growth, with less than 20 percent of its land being cultivated and an overall low population density. However, the advent of oil that led to a high level of urbanization, currently 44 percent of total population and growing at a high rate of 8 percent per annum will heighten the need for agricultural productivity increases. Food production growth has kept pace or exceeded the rate of growth of population. The only area of concern has been in the domain of its traditional export crops, cocoa and coffee, for which despite large public investments, the volume exported has been stagnant or grown at a rate slightly less than that of world demand (for cocoa, Cameroon's exports grew by 1.8 percent in 1960-86 whereas world demand grew by 2.0 percent in the same time period, leading to a decline in world market shares from 8 percent in 1969-71 to 6 percent in 1986). Few observers of the Cameroonian economy point to the fact that the country could have achieved better economic performance and are especially puzzled by the current financial stress plaguing a country that in addition to its sound, conservative economic management has benefited from favorable external shocks. The current crisis will reveal the weak aspects of the structure of an economy that perhaps have been overlooked and understudied because of the absence of the acute growth problems that are conspicuously prevalent in the other countries of Africa.

Economic structure and performance 1960-88

In 1978 the Cameroonian economy experienced a profound structural change when the country became a net oil exporter. The share of agricultural output which was about 32 percent in the 1960s fell to about 22 percent by the second half of the 1980s. In general the share of agriculture fell to the profit of the oil sector, while the shares of services and manufacturing have stayed relatively stable at about 46 and 11 percent, respectively.

Figure 1
Cameroon: Structure of production (as % of GDP)



Source: World Bank: *World Development Report* 1988.

Table 1
Net cocoa exports by main countries and economic regions ('000 metric tons)

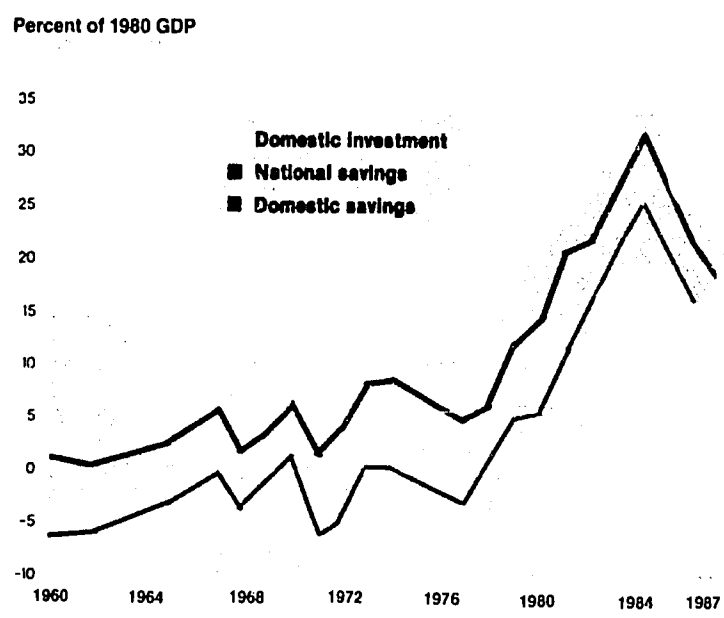
	1969-71	1979-81	1986
Asia	11	50	175
Cameroon	108	117	118
Other Africa	893	843	996
Latin America	284	477	566
Other	70	107	115
World	1366	1594	1970

Source: World Bank, "Prospects for Primary Commodities" 1988.

The economy has performed rather well; it grew at an average rate of 5.9 percent per annum and led to an increase in per capita GNP from only $160 at independence in 1960 to $810 by 1985. The share of savings rose from 19 percent of GDP in 1978 to 35 percent by 1985. Although the oil sector has indisputably enhanced the pace of growth in Cameroon, the good economic performance achieved by the country over a quarter of century would have been different had agriculture been neglected, as the Nigerian experience seems to have demonstrated.

Cameroon is one of the few middle income countries which has cautiously used its oil surpluses. During the first half of the 1980s the government sterilized the oil revenues by creating an extra-budgetary account overseas to finance investments and

Figure 2
Cameroon: Real investment and savings, 1960-87



Source: International Financial Statistics.
World Bank, BESD Databank.

to pay off in advance costly commercial loans. This account was intended to stabilize the budget with domestic resources and avoid massive borrowing. As much as CFAF 800 billion were repatriated to support budgetary needs during the period 1980-85. This conservative policy management contrasts with Nigeria, another oil exporter, where the oil revenue was budgetized and instantaneously allocated. However, unlike in Nigeria, the extra-budgetary accounts prevent a more transparent public accountability of oil revenues.

Agricultural performance

Agriculture which is by far the dominant sector of the economy, employing about 80 percent of Cameroon's work force, grew at 4.4 percent per year in 1960-87 and explains the relatively higher overall economic performance of the country.

Cameroon's public investment in the agricultural sector has strongly favored the estate subsector although traditional smallholder peasant farming dominates the sector in terms of employment and production (93 percent of agricultural output). Of the amounts invested in crop development in the Second (1966-70), Third (1971-75), and Fourth Plans (1976-80) a major portion was allocated to the estate sector (72 percent, 52 percent, and 62 percent, respectively). Parastatal institutions that have helped promote undeniable technical successes — dramatic yield increases for rice and cotton, for example — have been much less successful from a financial perspective and are encountering serious problems today.

While Cameroon's overall agricultural performance has been satisfactory in individual crops or regions, the gamut runs from great success to worst performer. Of all the export cash crops, cotton is the only one that experienced sustained growth; and productivity growth has been notably absent for coffee and cocoa, the country's leading export crops. The future of the cocoa and coffee industry depends on the government's ability to resolve its existing problems of the low planting rates, the relatively old age of the plantations, and to make more vigorous efforts in ensuring farmers' access to inputs and extension services.

Rice production increased appreciably in the last two decades, albeit in the midst of pervasive marketing problems, which included high transport costs that made domestic rice less price competitive than imported rice in the major consuming areas of the South. There is evidence of persistent food insecurity in certain regions of the country and important differences in purchasing power between urban and rural areas.

Salient issues and future strategy

Institutional reform is obviously an important feature of any future agricultural strategy. Land abundance together with the provision of agricultural services through a larger number of parastatal development agencies operating in a stable production environment has been the landscape for smallholder agriculture. Development led by parastatals has been considered costly, however, and there is an increased tendency to reduce their role, to transfer responsibility for agricultural research and extension to the Ministry of Agriculture, and to expect the market to play a role in the provision of agricultural credit, and input and output purchases. Responsibility for the very primary feeder roads has been with the parastatals, and there has been a major problem in their construction and maintenance. A great deal of scope exists for increasing the role of the Ministry of Agriculture, its provincial branches, and the private sector. However, the weakness of the capital markets, the mixed record of cooperatives, the lack of access of the private sector to working capital, poor roads, and low levels of technology mean that the private sector is likely to remain weak for a considerable period especially in agricultural credit and input supply, and to a lesser degree in output marketing, especially if production increases beyond what the immediate market can absorb. The provision of credit and inputs will require integration of those services through the public and cooperative sectors. Facilitating the planning and implementing the capacity of the relatively weak Ministry of Agriculture and the provincial Departments of Agriculture will remain a major task.

In this respect training and agricultural research should get very high priority. The IITA/Cameroon approach toward cereals research has been successful. Nevertheless, linking agricultural research with extension remains an important area that needs to be supported and developed further. The issue of technology for small farmers in the context of mixed farming will also be a fundamental problem, and proceeding with extension, on an assumption that all the solutions are in hand, may not be the best approach.

In areas such as North Benoué where parastatals have played an important role in the development of cotton, their role needs to be redefined to reduce costs, rather than rapidly turning over activities to the provincial Departments of Agriculture without first developing the capacity to handle complex developmental tasks.

Finally, Cameroon can also benefit from considerably greater attention to the development of the transport network to improve the functioning of markets.

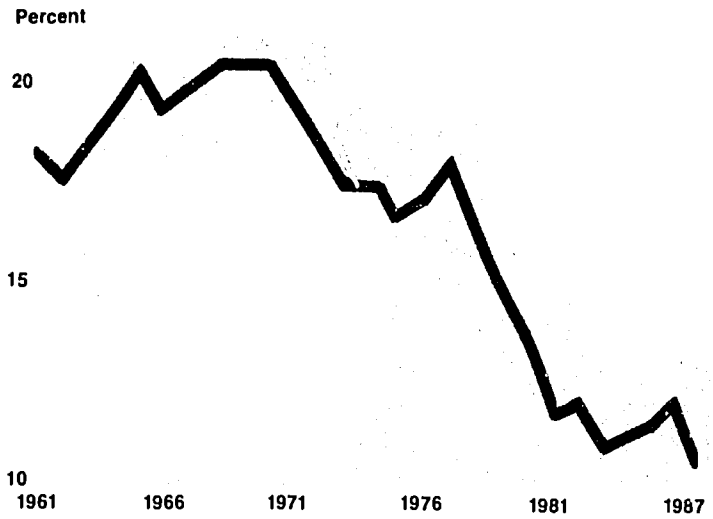
MANAGING AGRICULTURAL DEVELOPMENT IN AFRICA

COTTON IN AFRICA: AN ANALYSIS OF DIFFERENCES IN PERFORMANCE

UMA LELE • NICOLAS VAN DE WALLE • MATHURIN GBETIBOUO

Africa's share of the world trade for its traditional export crops has steadily been declining during the last two decades (see Figure 1), despite the fact that the overall development of most African economies largely depends on the performance of the agricultural sector—of which its export crop activity is an important component. An investigation of the factors behind the success and failures (in effect all other major agricultural export crops except tea) of various commodity development schemes across Sub-Saharan Africa will help to enhance future sectoral adjustment policies in the ailing export crop sectors and provide lessons for successful diversification into new export crops.

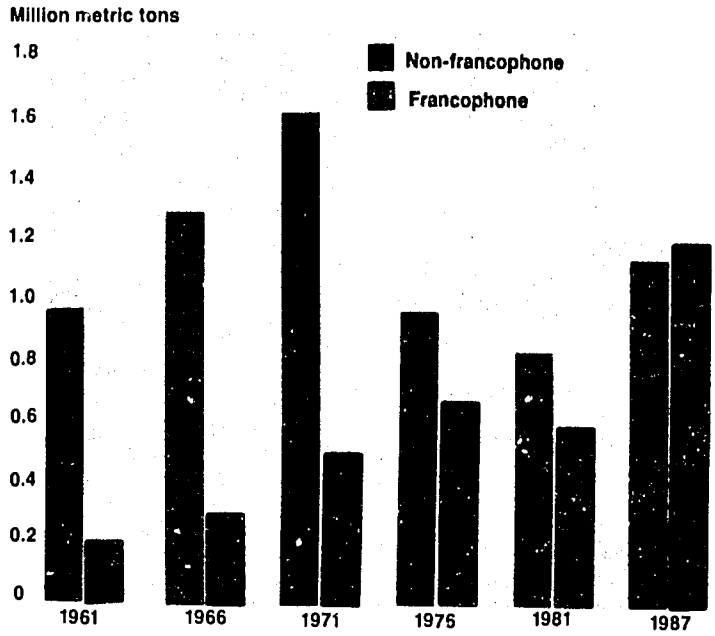
Figure 1
Share of Sub-Saharan Africa in world agricultural exports, 1961-87



Source: World Bank, BESD Databank.

The study "Cotton in Africa: An Analysis of Differences in Performance" attempts such investigation by focusing on cotton, which is grown in 30 out of the 44 countries and has had mixed output performance in the MADIA countries (Cameroon, Senegal, Nigeria, Kenya, Malawi, and Tanzania). With the exception of Zimbabwe, cotton production has decreased in anglophone Africa since the early 1970s, whereas it has increased by 6.2% over the period 1961-87 in francophone Sub-Saharan Africa (see Figure 2). This pattern is replicated in the MADIA countries; the paper asks why.

Figure 2
Seed cotton production in francophone and anglophone Sub-Saharan Africa (excluding Zimbabwe), 1961-87



Source: World Bank, BESD Databank.

Distinguishing features

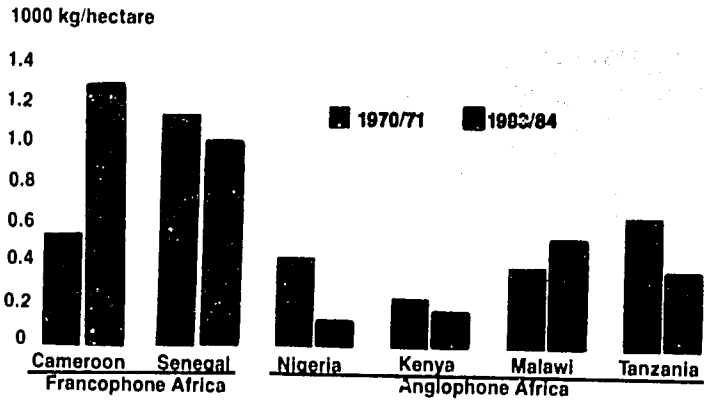
Two distinguishing features of cotton production in the selected countries are (1) the structure of their domestic cotton industries—ranging from vertical integration, provided by the presence of CFDT (prevalent in francophone Africa) to relatively greater decentralization (prevalent in anglophone Africa) and (2) the role played by institutional factors in alleviating physical constraints and ensuring effective price incentives.

The central conclusion of the paper is that while differences in macroeconomic and sectoral pricing policies appear to have been very important, institutional factors provided by CFDT's presence, through their influence on the development and extension of technology, on the increased availability of inputs, marketing, and processing facilities, and on the adequacy of financing of the cotton sector have been fundamental in explaining the sustained growth of cotton production.

The relative farm-level profitability of growing cotton instead of an alternative crop, such as groundnuts in Senegal and maize in the rest of the MADIA countries, can be altered through price and nonprice factors. Indeed, changes in relative prices between cotton and its competing crops explain shifts away from cotton in several anglophone countries. Changing the relative profitability of cotton through a macroeconomic and sector pricing policy of exchange rate reform and producer price manipulation can reverse the allocation of land and labor between cotton and other crops. However, the increases in profitability of cotton per hectare brought about through the use of nonprice factors for intensification, such as improved technology and the reliable availability of inputs, is several times what could be achieved through shifts in traditional inputs.

Two specific pieces of evidence are discussed in the paper. First, the data show that the announced cotton price levels, which usually tend to be the preoccupation of government policymakers and donors, were lower in francophone countries than in the selected anglophone countries throughout the 1970s; but the yields were two to ten times higher in the former countries (Figure 3). Second, the extent to which proposed official prices were actually paid to farmers was determined by institutional factors, which in turn influenced the actual incentive of farmers to use modern inputs and cultivation practices. In the francophone countries prices were guaranteed effectively, whereas in the anglophone countries farmers heavily discounted the apparently high announced prices.

Figure 3
Seed cotton yields in the MADIA countries, 1970/71 and 1983/84



Note: 1970/71 and 1983/84 are midyears in 5 year averages.
Source: Lele, van de Walle, and Gbetibouo.

Price vs. nonprice factors

To explain specific variations in the performance of the cotton subsector, this paper focuses on the key interactions between price factors in a broad sense and nonprice factors, i.e., those related to the agro-ecological, institutional, and technological environment. In demonstrating the fundamental importance of the institutional environment in the effectiveness of price and nonprice incentives, the paper shows, for example, that the capitalization of institutions has critically influenced their ability to implement a pricing policy, and that poor capitalization is not necessarily explained by currency overvaluation.

The larger political, historical, and trade relationships between African countries and their former colonial powers have also critically influenced the price and nonprice incentives. The importing countries' continuing interest in francophone Sub-Saharan Africa, as reflected in the commission earned by the CFDT on cotton exports, and the disengagement of that interest in anglophone Africa, explain why the once effective cotton research, extension, and institutional arrangements, which involved a complex contribution of regional and national sectors, have deteriorated in anglophone Africa, but not in francophone Africa. The broad political environment that determines a national commitment to succeed in cotton and the development (and retention) of human capital have determined the quality of the institutions that carry out cotton research, extension, input supply, and commercialization.

Relative price changes to boost production are an easier and the least-cost policy reform in the short run compared to an institutional overhaul that requires a complex and lengthy round of consensus building within the countries. However, the paper, borrowing from the cotton development experience in the selected African countries, provides a case for seriously considering the important role that nonprice factors can play in commodity development strategies—especially in view of the high fixed costs of processing and unstable demand markets, conditions that are conducive to natural monopoly or to destructive competition.

Institutional weaknesses

Donors to MADIA countries should be aware of the continuing institutional weaknesses of many Sub-Saharan African countries so that they do not rely too quickly on these institutions to foster the needed development. Donors need (1) to devote greater attention to the overriding institutional factors that determine the technological and price incentives to producers; (2) to pay greater attention to the capitalization of institutions; (3) to place greater emphasis on the quality, critical mass, and length of period for which technical assistance is provided for the development of the cotton sector, with an explicit goal of creating professional, indigenous, institutional, and human capacity, as well as an incentive structure conducive to good economic performance. This is an objective that was previously missing from donor assistance and which has not been articulated explicitly by African governments. Lastly, donors need (4) to place an emphasis on the development of regional and international cotton marketing strategies for and within African countries in view of the changing geographical pattern of world market demand.

As for the recipient countries, it is found that politics has played an overwhelming role in the support or demise of the cotton sectors in the MADIA countries. Depending on the political strength of the cotton producing populations, which has itself varied over time, governments have been willing or reluctant to let producer organizations effectively represent the interest of cotton producers in running the cotton industry. Given the technological, financial, international market, and ecological complexities in developing the cotton sector, governments need to place a greater emphasis on the incentive structures for managers of the cotton industry to address the complex issues in order for the sector to improve its performance; most important they need to allow the interests of the cotton producers to be reflected more effectively in the cotton industry. This requires a broader set of incentives, including the development of professionalism in all links of the long chain of this industry, as well as its smooth coordination, rather than the far too narrow emphasis on producer prices characteristic of the past.

Agricultural Growth, Domestic Policies, the External Environment, and Assistance to Africa: Lessons of a Quarter Century

UMA LELE

The agricultural sector plays an important role in the development of African countries because of its contribution to food and export crop production, employment and income generation, government revenues, savings, investment, and raw materials for the development of industry. Agriculture has, however, performed poorly in Africa and explains a large part of the macroeconomic crisis. To resolve the crisis, many general solutions are being applied to the problems of African development and specifically to agriculture. Yet the ecological, political, and institutional diversity of African countries requires that country-specific and even region- and location-specific solutions be sought to the complex problems of Africa's development based on detailed knowledge of individual country circumstances. Such knowledge can only be deployed through the expansion of a sophisticated indigenous economic and sectoral management capacity in Africa.

In order to develop a better understanding of the problems of African agricultural development, the World Bank undertook a study in collaboration with seven other donors and six African governments. The donors include USAID, UKODA, DANIDA, SIDA, the EEC, France, and West Germany and the countries are Kenya, Malawi, and Tanzania in East Africa and Cameroon, Nigeria, and Senegal in West Africa. Covering a period of a quarter century, the study has involved an analysis of three factors: (1) initial conditions and subsequent external events that reflect the "luck factor," (2) the domestic, macroeconomic and sectoral, institutional, and technological policy responses to these conditions, including the role of internal political factors, and (3) the role of foreign donors in influencing the policies and investments in the countries. The relation between higher agricultural growth, growth in other sectors, overall growth, export growth, sources of growth, and the distribution of benefits from growth were empirically established. The study concludes that the countries which performed better in agriculture had better overall growth. However, the better performing countries are not necessarily those which have had favorable initial endowments or subsequent favorable shocks. All face major problems in accelerating growth to address the problems of growing populations and land pressure, but countries with poor initial endowments face the greatest problems.

The analysis explored the reasons for the distinction between Kenya, Malawi, and Cameroon, as "better performers," and Tanzania, Nigeria, and Senegal, as "poor performers." Where countries had a lower level of performance there was generally a sharper shift in production from export to food crops as well as from high potential to low potential areas. Expectations played an important role in these decisions. Inadequate attention was given to exploiting the most obvious productive potential to generate food and export crop surpluses. The development of areas with limited physical potential or with high costs of exploitation therefore proved onerous. Lack of suitable food crop technologies in marginal areas explains the limited impact of the government and donor policies that caused these shifts.

The luck factor

In terms of *initial conditions*, Kenya and Nigeria were the best endowed, followed by Cameroon and Tanzania. Resource poor Senegal and landlocked Malawi inherited by far the least favorable initial conditions.

As to *subsequent external shocks* the more agriculturally-based economies in East Africa were the least fortunate. Terms of trade losses were the greatest for Kenya, although both Malawi and Tanzania also suffered major losses. In West Africa, Nige-

Table 1:
The Luck Factor, Subsequent Policy Responses and Comparative Macroeconomic Performance of MADIA Countries.

	Luck Factors		Policy Responses		Performance (% growth rates, 1960-87)		
	Initial Conditions	Subsequent Shocks	Macroeconomic Policies	Sectoral Policies	GDP	GNP per capita	Agricultural sector
Cameroon	favorable	favorable	favorable	favorable	5.9	2.8	4.4
Kenya	favorable	unfavorable	favorable	favorable	5.8	2.1	4.0
Malawi	unfavorable	unfavorable	favorable	unfavorable	4.4	1.5	2.8
Tanzania	favorable	unfavorable	unfavorable	unfavorable	3.3	0.2	1.4
Nigeria	favorable	favorable	unfavorable	unfavorable	3.1	−0.2	0.6
Senegal	unfavorable	unfavorable	unfavorable	unfavorable	2.2	−0.9	1.2

Source: Data on growth rates are from World Bank Data File, 1989.

ria and Cameroon had favorable external shocks in the 1970s, due to the dominance of oil. In Senegal, the world price of phosphates played a positive role. Removal of French protection for its groundnut exports led to a steep decline in terms of trade over 1967-69 but overall relative terms of trade between groundnuts which Senegal exported and rice which it imported were still more favorable to groundnuts. Climatic irregularities have contributed significantly to agricultural stagnation in Senegal, and to a lesser extent in other MADIA countries.

Domestic policy response and performance

Macroeconomic and sectoral policies have been more important in explaining performance than luck.

For instance, over the 1960 to 1987 period, Cameroon, Kenya, and Malawi experienced the fastest growth in per capita GNP while Tanzania, Nigeria, and Senegal had no growth or negative growth (see Table 1). *Kenya* made the most of its initial conditions and pursued a combination of macroeconomic and sectoral policies that achieved rapid agricultural growth while also ensuring participation of a large number of small farmers in the growth of various food and export crops. Although on average Kenya lost world market shares, it gained shares in tea and coffee.

Malawi's growth record was also respectable. Malawi's agricultural growth came mainly from the estate sector which gained market shares in tobacco. Land and price policies as well as restrictions on rights to grow export crops discriminated against small farmers and swamped the effects of the favorable macroeconomic policies on their growth. Smallholder production stagnated and declined in per capita terms.

Despite the oil bonanza, *Cameroon* followed moderate policies and performed well with a large number of small farmers participating in the production of a range of food and export crops, although the performance of its various crop sectors was uneven with stagnation in cocoa and arabica coffee, and growth in cotton.

Following the oil boom *Nigeria's* macroeconomic policies became highly adverse to agricultural development and led to rapid migration of labor to the urban sector and an increase in demand for food. Internal terms of trade moved sharply in favor of food because food production did not respond to the rising urban demand, agricultural exports dwindled, and food imports increased. Despite large expenditures for agriculture, unpredictable policy responses were in many ways symptomatic of the political and institutional problems, including a civil war and six changes in government.

Tanzania and Senegal also performed poorly. Whereas adverse policies played a major part in both countries, Tanzania's favorable resource endowments underline the fundamental role of policies in explaining its stagnation. Genuine strides were made on the equity front in Tanzania, but they could not be sustained because too little attention was paid to agriculturally-led growth, while basic industrialization received primacy. Adverse macroeconomic and sectoral policies were also combined with numerous and unpredictable institutional experiments following the Arusha Declaration.

Senegal's policy responses were similar in character to those of Tanzania, including emphasis on import substituting industrialization and diversification out of its traditional export crops. Whereas the withdrawal of French protection for groundnut exports justified the diversification into irrigated rice, Senegal like Tanzania has not been able to produce rice at low enough cost to meet the growing rice demand, nor meet the demand for its groundnut exports. The loss of world market shares was greatest in Senegal, after Tanzania.

Overall, the countries that relied on their comparative advantage and moved least rapidly to diversify their economies out of agriculture performed well and achieved rapid diversification. But only the smallholder export crop expansion in Kenya can be considered as having become self-sustaining in a financial, institutional, and human capital sense.

Sources of growth

Land and labor played a fundamental role in increasing production. Important technical progress is noted in hybrid maize, small-scale irrigated rice, tea, coffee, cotton, and tobacco. However, the MADIA sample illustrates the *amount of time* needed to develop technological, institutional, political, and human capital, and therefore *the importance of taking advantage of initial conditions*, as well as the difficulty in creating a new market niche through diversification, or to create new internal productive capacity.

Recent policy responses to external disequilibrium and future prospects

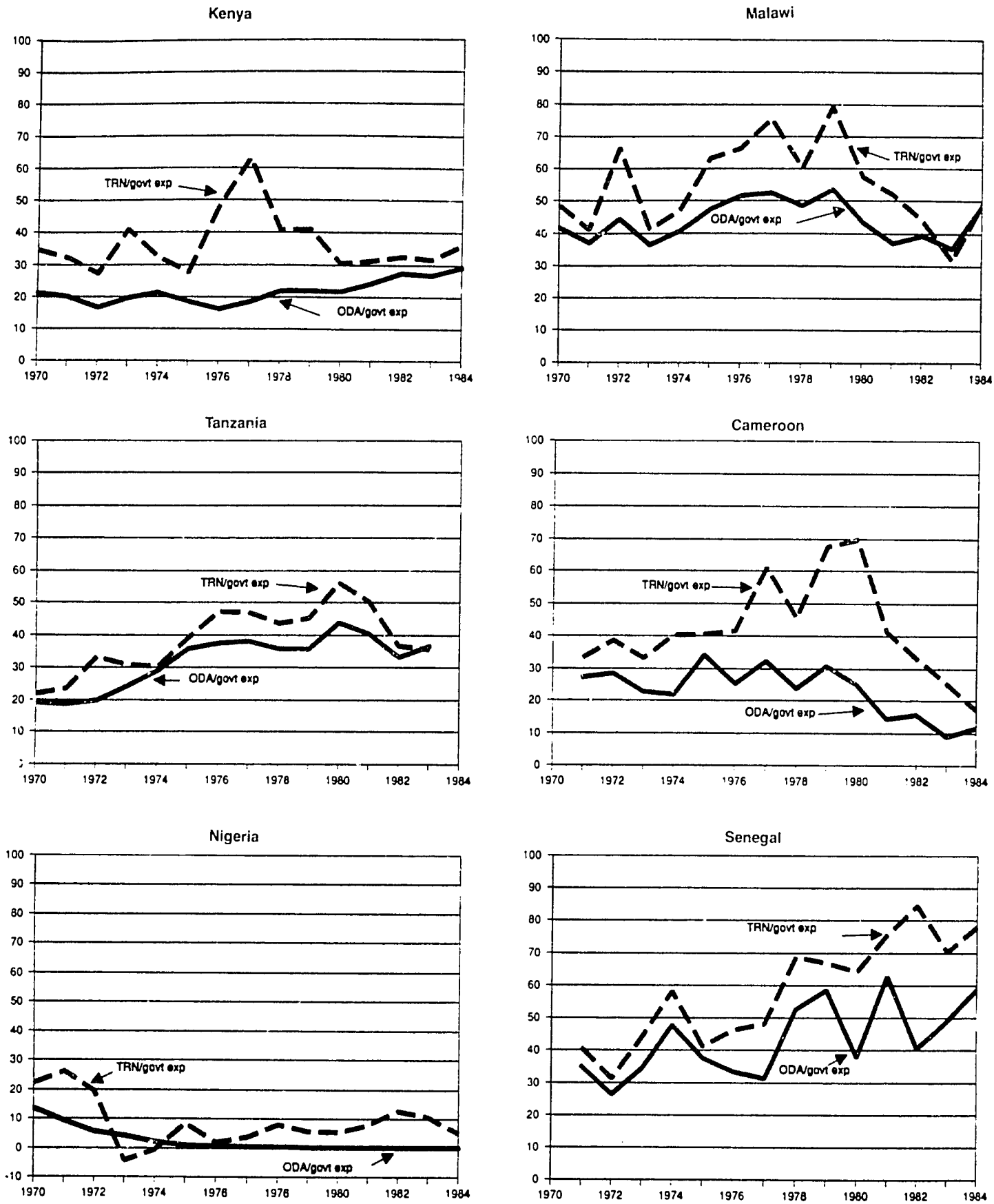
Cameroon, Nigeria, and Tanzania have better prospects because of their more favorable resource endowments. To a degree all three countries have embarked on the process of adjustment. In *Nigeria* and *Tanzania* especially—whose economies were the most distorted—there have been major adjustments in the exchange rate and producer price incentives together with an increased role for the private sector, although their exchange rates remain overvalued. The growing population pressure on limited land resources in Kenya, Malawi, and Senegal makes productivity increases crucial for future growth. Only *Kenya* seems ready for sustained productivity growth. Dualism within agriculture in *Malawi* has created a risk-averse subsistence farming sector. In *Senegal* the poor resource base, declining rainfall, and commitment to import substitution of high cost irrigated rice has made export orientation toward groundnuts perhaps politically difficult.

The role of donors

Donor assistance has been large in all the MADIA countries (except Nigeria) with average annual per capita ODA ranging from $41 (in constant 1983 US$) in Senegal over 1971-84, to $19 in Malawi and Kenya. Moreover, it has accounted for up to 60 percent of government expenditures in some of these countries (see Figure 1). Donor efforts in agriculture have, by and large, focused on *smallholders*. Excellent examples of how donor assistance can act both as a catalyst and protector of smallholder development include: the promotion of smallholder export agriculture by the United Kingdom (such as tea and coffee in Kenya) and France (cotton in Cameroon and Senegal), the development of small-scale irrigation in northern Nigeria by the World Bank, the assistance of SIDA and DANIDA to soil conservation and dairying, respectively, in Kenya, the role of the EEC's STABEX assistance in stabilizing the groundnut economy in Senegal, German assistance to maize in Senegal, and the contributions of USAID to develop longer-term human and institutional capital through agricultural colleges and universities.

Despite these achievements, it is difficult to find much connection between where donor assistance has been applied and where growth has occurred in the MADIA countries, especially when considered in relation to the *levels of aid flows*. In *Malawi*, while donors focused on smallholders, growth occurred in the

Figure 1
Official Development Assistance (ODA) and Total Resources Net (TRN) as a percentage of government expenditures in MADIA countries, 1970-84



Source: Cancian 1987.

estate sector. In *Senegal* (despite massive amounts of donor assistance) and in Nigeria (despite the oil boom), there was little growth in the agricultural sectors except for high cost irrigated rice, maize, and horticultural crops, all of which are minor parts of agriculture in terms of either area planted or employment generated. In *Tanzania*, donors focused on agroprocessing of exports and food crop production through rural development projects, the export crop sector declined, and food production stagnated and moved to the parallel market. Even in Cameroon and Kenya, countries that performed relatively well, donor interventions explain but a small part of their achievements. In *Cameroon* the economic viability of irrigated rice has been in question. In *Kenya*, while donor assistance accrued mostly to marginal areas, much of the growth was accounted for by the production of high value crops, e.g., tea, coffee, and dairying in areas of high agricultural potential. The World Bank and the Commonwealth Development Corporation played an important role in Kenya's development of tea and coffee, but their financing of tea and coffee retrenched due to a concern about poor world market prospects for these crops and their policy advice recommended diversification. It was the strong *political motivation for export agriculture* within Kenya that provided a crucial impetus for its growth.

Lessons for external assistance

The success with which donors contribute to the growth process seems fundamentally to depend—in addition to a conducive policy and institutional environment in the recipient countries—on the extent to which they understand the myriad macro- and micro-level constraints on growth prospects in individual projects and subsectors. Not surprisingly, those donors with prior colonial connections with Africa have had a relatively greater share of the success achieved. The importance of the "colonial" donors has been declining in Africa, however, and their record in creating sustainable indigenous systems for broad-based agricultural development of food and export crops has been limited. The decline in external expertise and knowledge of colonial donors about Africa is not being compensated adequately by a commensurate increase in internal African management capacity, although great strides have been made since independence in each of the countries. The massive amounts of external financial and technical assistance being devoted to alleviating the continent's crises have *not* given priority to the fundamental importance of developing human and institutional capacity, while overestimating the utility of aid in the form of physical plant and expatriate technical assistance. African governments in turn have similarly neglected to place emphasis on the development of human and institutional capital, attempting instead to maximize financial flows regardless of quality or content, an outcome directly related to the limited ability of countries to formulate their own policies and investments that can forward the cause of development.

The donors' limited ability to tailor their assistance to important aspects of the local conditions under which their programs operate leads to a tendency to respond to problems by relying on technological and organizational solutions arising from *their own* particular backgrounds and expectations, with emphasis on *large amounts of technical assistance* that may have relatively little connection in practice with recipients' needs or human and organizational capabilities.

The studies emphasize the 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, if the current focus of reform programs on the removal of price distortions is to be appropriately complemented by the institutional and other nonprice changes needed to give pricing reforms a chance to work. There also needs to be greater emphasis on longer-term "superstructural constraints" e.g., land distribution, inadequate technology and institutional and policymaking capacity, and the role of export crop development that persist even while SAL-type programs are being completed; constraints that only Africans themselves can remove with increased political will and improved human and institutional capital.

The process of diagnosis and solutions

The imperfect understanding of the *real sources and causes of growth* and the methods used to promote them means that donors and governments do not always agree on means, or even on specific ends.

- A long-term agricultural strategy, set in a conducive macroeconomic and sectoral policy framework that is feasible on a day-to-day basis, is essential for broad-based growth.
- Building human and institutional capacity is crucial for planning and implementing strategies for long-term growth and for maintaining a supportive policy environment.
- A strategy for long-term growth must assure balance between the production of export crops and food crops.
- Raising factor productivity is essential and urgent in view of rapidly increasing population pressure, the deterioration of the natural resource base, and low rates of agricultural intensification.
- Programs for increasing agricultural production should focus on high potential areas. Policies to address the employment and consumption needs of populations in remote and resource-poor regions must be conceived in the context of a long-term strategy.
- Donors should address micro constraints in conjunction with macrostructural reform and privatization.
- Donors should establish and emphasize their own comparative advantage in developing assistance strategies.
- An objective diagnosis to reach a consensus requires data-based analysis, in which donors and recipients need to share.
- Development of a consensus within the recipient country involving a broad segment of actors is crucial for a sustained indigenous commitment to the reform process.
- The swinging pendulum of donor concerns—from equity in the 1970s to emphasis on efficiency in the 1980s—which has tended to divert attention from more basic, long-run problems should be avoided.
- Donors need to coordinate their assistance around the substance of a development strategy in which recipients play an important role.