



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search
<http://ageconsearch.umn.edu>
aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

**THE ROAD HALF TRAVELED:
AGRICULTURAL MARKET REFORM IN
SUB-SAHARAN AFRICA**

**Mylène Kherallah, Christopher Delgado, Eleni Gabre-Madhin,
Nicholas Minot, and Michael Johnson**

FOOD POLICY REPORT

**INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE
WASHINGTON, D.C.
OCTOBER 2000**

Copyright © 2000 International Food Policy Research Institute. All rights reserved. Sections of this report may be reproduced without the express permission of but with acknowledgment to the International Food Policy Research Institute.

ISBN 0-89629-525-7

CONTENTS

Preface	5
Introduction	7
The Need for Agricultural Reform	7
How Far Did Reforms Go?	9
Impact of the Reforms	12
The Future of Agricultural Market Reform in Sub-Saharan Africa	19
Notes	22

PREFACE

During the past two decades, most countries in Sub-Saharan Africa undertook extensive economic reforms to reverse declining growth rates and reverse balance-of-payments deficits. Because of the importance of the agricultural sector in the region, agricultural market reforms occupied a central place in these liberalization efforts. These reforms were designed to reduce or eliminate the bias against agriculture and open the sector to market forces. The expectation was that improving price incentives for farmers and reducing government intervention in the agricultural sector would be enough to generate a supply response and allow well-functioning markets to emerge quickly. Almost two decades later, the general consensus is that the reform programs in Sub-Saharan Africa have not met expectations.

This report reviews the extensive evidence on agricultural market reforms in Sub-Saharan Africa and summarizes the impact reforms have had on market performance, agricultural production, use of modern inputs, and poverty. The report offers eight recommendations for completing the reform process and developing a new agenda for agricultural markets in Sub-Saharan Africa.

The reform experience in Sub-Saharan Africa has varied widely across countries and crop subsectors. The available evidence shows clear progress in some areas and mixed results in others. Most reforms were only partially implemented and policy reversal was common. Once implemented, however, reforms have increased competition and reduced marketing margins, benefiting both producers and consumers. Reforms have also boosted export crop pro-

duction. On the other hand, food crop production has stagnated and yields have not improved. Further expansion of private trade is constrained by lack of access to credit, uncertainty about the government's commitment to reform, and high transaction costs. Input use, especially on nontraded food crops such as maize, has declined in some cases because of the elimination of input subsidies and devaluation of the local currency. Reforms have had mixed impacts on poverty, increasing the income of small export growers but hurting farmers living in remote areas. Contrary to conventional wisdom, however, the evidence indicates that since the 1980s rural poverty has declined in many African countries.

The authors have benefited from discussions with Raisuddin Ahmed and Ousmane Badiane as well as several researchers in the United Kingdom, including Jonathan Kydd, Andrew Dorward, and Colin Poulton at Wye College; Stephen Jones, Brendan Bayley, and Alex Duncan at Oxford Policy Management; Simon Maxwell, Tony Killick, and Elizabeth Cromwell at the Overseas Development Institute; Bob Baulch and Howard White at the Institute of Development Studies; Stefan Dercon at the Centre for the Study of African Economies; and William Masters from Purdue University in the United States. The authors would like to thank Klaus von Grebmer and participants at the IFPRI policy seminar held on April 13, 2000, for their useful comments. The authors are also indebted to Raisuddin Ahmed for his guidance and support during the writing of this manuscript. Uday Mohan is duly acknowledged for his editorial contribution to this manuscript.

INTRODUCTION

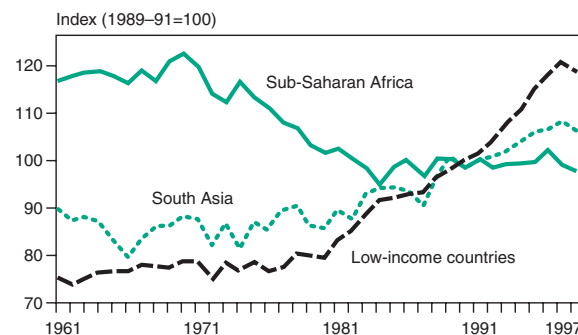
During the past two decades, most countries in Sub-Saharan Africa undertook extensive economic reforms to reduce the role of the government and increase the role of the market in their economies. Because of the importance of the agricultural sector in the region, agricultural market reforms occupied a central place in these liberalization efforts.¹ Agricultural reforms included the removal of price controls, deregulation of agricultural marketing, closure of state-owned enterprises that monopolized agricultural trade, and changes in the foreign exchange market to provide greater incentives for exports. The expectation was that improving price incentives for farmers and reducing government intervention in the agricultural sector would be enough to generate a supply response and allow well-functioning markets to emerge quickly.

Almost two decades later, the general consensus is that the reform programs in Sub-Saharan Africa have not met expectations. Average annual growth rates of per capita gross domestic product (GDP) and agricultural value-added have been negative throughout the 1980s and 1990s. Economic performance has trailed that of other developing regions (Figure 1). At the beginning of the 21st century, Sub-Saharan Africa confronts a number of daunting problems: exten-

sive hunger, malnutrition, poverty, resource degradation, and the spread of AIDS. Because the majority of the region's population remains dependent on agriculture for its livelihood, well-functioning and efficient agricultural markets continue to be key to improving Sub-Saharan Africa's economic health.

This report reviews the extensive evidence on agricultural market reforms in Sub-Saharan Africa and summarizes the impact reforms have had on market performance, agricultural production, use of modern inputs, and poverty. The report offers eight recommendations for completing the reform process and developing a new agenda for agricultural markets in Sub-Saharan Africa.

Figure 1—Net per capita agricultural production, 1961–97



Source: FAOSTAT 1998 (statistical database of the Food and Agriculture Organization of the United Nations.)

THE NEED FOR AGRICULTURAL REFORM

Why were agricultural market reforms needed? Answering this question calls for a look at the agricultural policies of the 1960s and 1970s and the problems that resulted.

Agricultural Policies before Reforms

From independence through the 1970s, African governments played a relatively

large role in national economies, and the agricultural sector was no exception. Policymakers held the common view that private traders were exploitative and that markets could not be trusted with the critical task of feeding the nation. Furthermore, they equated economic development with industrialization, relegating agriculture to the role of supplier of labor, raw material, and cheap

food to industry. Small-scale agriculture was seen as inherently inefficient because uneducated farmers were unable or unwilling to apply modern techniques such as mechanization.

Because of these views, state enterprises (often inherited from colonial powers) were given the responsibility of organizing food markets and fixing nationwide prices for farmers and consumers. Their success in doing so varied (Box 1). State enterprises also managed export crop production by farmers by providing inputs on credit, fixing crop prices, and monopolizing the processing and export of the crop. The prices farmers received were generally low because of taxation or high costs incurred by state enterprises, or both. In many countries, export crop prices averaged less than half the world market rate.² State enterprises also monopolized the import and distribution of fertilizer and other inputs, which were often supplied to farmers at subsidized prices and on credit.

Pressure for Reform

Pressure for economic reforms came from several sources. In the 1970s, commodity prices boomed, allowing governments to expand their operations and greatly increase the size of the civil service. When commodity prices declined in the late 1970s, governments found it difficult to cut expenditures, resulting in large fiscal deficits. Significant losses incurred by state-owned enterprises exacerbated these deficits. Governments generally used monetary expansion to cover the deficits, thus causing inflation. Because exchange rates were fixed, inflation made export commodities less competitive on the international market, simultaneously increasing incentives to import goods that could be produced locally. Import tariffs and other barriers, already kept high to protect domestic industry, were increased further to stem the growing flow of imports.

Box 1 **Postindependence State Intervention in Food Markets**

The nature and extent of postindependence state intervention varied widely among Sub-Saharan African countries, depending in part on their colonial legacies. In general, state intervention in the food sector before market reform can be distinguished by its support for, discrimination against, or relative neutrality toward agricultural production. In countries committed to supporting agriculture, such as Kenya, Zambia, and Zimbabwe, the use of subsidies for inputs, credit, and transport costs promoted smallholder incomes, albeit at a substantial fiscal cost. Countries in which prereform policies discriminated against agriculture, such as Ethiopia, Guinea, Madagascar, and Mozambique, harmed smallholder incomes by banning private trade and engaging in direct food distribution through rationing. But countries with few colonial settlements and no single dominant crop, such as Ghana and Cameroon, hardly intervened in food markets.

These policies often had adverse effects on farmers and on the agricultural sector generally. Explicit taxation, the high marketing costs of state enterprises, and the overvaluation of the currency hurt export crop production in particular. In countries with repressive food marketing policies, farmers switched into unregulated crops such as roots and tubers. The emergence of parallel or black markets and cross-border smuggling provided additional evidence of the failure of interventionist policies. Although inputs were subsidized, budget constraints and bureaucratic problems often led to shortages and delays in delivery of these goods.

Inflation, stagnant economic growth, and shortages of consumer goods created doubts about the existing economic strategy. For many countries, however, significant reforms were postponed until trade deficits began depleting foreign reserves and could no longer be covered by foreign borrowing. At this point, political leaders were forced to seek funding from the World Bank and the International Monetary Fund (IMF), accepting the policy conditions that were attached. Although the process was not uniform across the region, almost all countries adopted a series of economic reforms, including agricultural market liberalization, during the 1980s and early 1990s.

The Nature of the Reforms

The agricultural reforms introduced by the World Bank and IMF were designed to reduce or eliminate the bias against agriculture and open the sector to market forces.³ The reforms were based on two beliefs: that reducing or eliminating state control over marketing would promote private-sector

activity and that fostering competitive markets would lead to increased agricultural production. To these ends the reforms included four types of measures:

- liberalizing input and output prices by eliminating subsidies on agricultural inputs such as fertilizer and credit, by bringing domestic crop prices in line with world prices, and by ending the practice of imposing a single price for all regions and seasons
- reducing overvalued exchange rates by partially liberalizing the market for foreign exchange
- encouraging private-sector activity by removing regulatory controls in input and output markets, lifting restrictions on the internal movement of food crops, and relaxing delivery quotas, licensing arrangements, and similar regulations
- restructuring public enterprises and restricting marketing boards to activities such as providing market information and maintaining security stocks

HOW FAR DID REFORMS GO?

Some Reforms Were Partial

The pace and extent of reforms have varied widely across countries and crop subsectors (Tables 1 and 2). For the most part, reforms were not fully implemented. For example, many governments liberalized internal trade but maintained a state monopoly over external trade (Box 2). In other instances, although fixed prices were eliminated, price bands for food crops were imposed to limit market price fluctuations and protect consumers and producers from the allegedly “exploitative” behavior of private traders. State-owned enterprises remain active in several commodity subsectors, notably cotton in West Africa and maize in Kenya, Malawi, and Zimbabwe.

Policy Reversal Was Common

Many countries reversed reforms as a result of external shocks or changing economic conditions. Malawi, for instance, reinstated fertilizer subsidies that were to be phased out in the mid-1980s because currency devaluation and the severance of transport routes through Mozambique significantly raised fertilizer prices. Zambia reversed maize market liberalization under pressure from urban consumers who faced higher prices. In general, countries did not follow a linear path toward liberalization, and reforms often were not seriously implemented until the early to mid-1990s (Box 3).

Table 1—Extent of food marketing reform in selected countries

Country	Crop	Output market		Wheat imports		Rice imports	
		Before	After	Before	After	Before	After
Benin	Tubers	●	○	⊛	⊛	⊛	⊛
Ethiopia	Teff, maize, wheat	●	○	*	⊛	*	⊛
Ghana	Tubers	○	○	*	*	⊛	⊛
Kenya	Maize	●	●	*	*	*	⊛
Madagascar	Rice	●	○	*	*	—	⊛
Malawi	Maize	●	◐	⊛	⊛	⊛	⊛
Mali	Millet, sorghum	●	○	*	⊛	*	⊛
Tanzania	Maize	●	○	*	⊛	*	⊛
Zambia	Maize	●	◐	—	—	—	—
Zimbabwe	Maize	●	●	*	*	*	⊛

Sources: World Bank, *Adjustment in Africa: Reforms, Results, and the Road Ahead* (Washington, D.C., 1994), cited in P. Seppala, *Food Marketing Reconsidered: An Assessment of the Liberalization of Food Marketing in Sub-Saharan Africa*, Research for Action No. 34 (Helsinki: United Nations University, World Institute for Development Economics Research, 1997); and for Ethiopia see A. Lireno, "A Grain Marketing Reform in Ethiopia," Ph.D. thesis (School of Development Studies, University of East Anglia, U.K., 1993).

Notes: ● Major restrictions on purchases and sales. ◐ Limited intervention by state buying agency.
○ No intervention except food security stocks. * State monopoly. ⊛ No monopoly.
— Data not available.

Table 2—Extent of market reform in the export crop sector

Country	Commodity	Marketing channel after reforms
Benin	Cotton	Full parastatal control of prices, marketing, and inputs.
Cameroon	Cocoa, coffee	Liberalized marketing and export starting in 1994 for both crops.
Côte d'Ivoire	Cocoa	Caisse de stabilization system until 1998/99; liberalized thereafter.
Ghana	Cocoa	Full parastatal control of prices and marketing.
Malawi	Tobacco	All marketing through private auctions with low competition.
Mali	Cotton	Full parastatal control of prices, marketing, and inputs.
Nigeria	Cocoa	Complete liberalization in a short period.
Senegal	Groundnuts	Most groundnuts exported as oil. Marketing and processing only partially liberalized.
Tanzania	Coffee, cotton, cashew	Coffee largely liberalized starting in 1990/1991. Cotton partially liberalized at first, now fully, as is cashew. State-run cooperative unions continue to compete with the private sector but only handle a small share of crop output.
Uganda	Coffee	Full liberalization, with parastatal primarily playing a regulatory function.

Sources: R. F. Townsend, *Agricultural Incentives in Sub-Saharan Africa: Policy Challenges*, Technical Paper No. 444 (Washington, D.C.: World Bank, 1999). Information on cashews for Tanzania comes from C. L. Delgado and N. W. Minot, *Agriculture in Tanzania since 1986: Follower or Leader of Growth?* World Bank Country Study (Dar es Salaam and Washington, D.C.: Government of the United Republic of Tanzania, World Bank, and IFPRI, 2000).

Government Commitment Was Weak

A slow and incomplete reform process resulted from several factors, including weak commitment on the part of African policy-makers to reforms imposed by donors, fear of disturbing existing patron-client relationships, and concern over losing important sources of public revenue. Reforms designed to eliminate the rents and privileges enjoyed by public enterprise employees met with strong resistance. And because governments negotiated and implemented the structural adjustment pro-

grams, they often continued the old ways of doing business.⁴ For the most part governments did not encourage the participation of important constituents such as private businesses and nongovernmental organizations, choosing instead a top-down approach. At the same time, governments themselves rarely felt the sense of ownership necessary to sustain the reform effort.⁵ The resulting climate of uncertainty and mistrust affected private investment, because private businesses were generally reluctant to invest in countries where governments lacked credibility.

Box 2

Partial Reform in Senegal's Groundnut Market

Intervention in Senegal's groundnut market was designed to protect the country's parastatal processing mill, which contributes a large share to Senegal's export earnings. Because this revenue is so important, the government has fought to maintain some control over the unshelled groundnut subsector. The country still has official pricing schemes and regulatory controls over the unshelled groundnut market, so the subsector faces many of the same problems it faced before the reforms were initiated. Private-trader involvement remains limited because of the uncertainty of the policy environment. Moreover, the existence of parallel marketing channels, one official and the other unofficial, means that prices vary widely over time. The result is an underdeveloped and inefficient marketing system for groundnuts, with high processing costs that may ultimately prevent Senegal from competing in international markets.⁶

Box 3

Policy Reversal in Fertilizer Subsidies

Some countries abandoned early attempts to remove fertilizer subsidies, only to restart and complete them later. Ghana, Malawi, and Nigeria all had announced programs to phase out fertilizer subsidies in the mid-1980s. In Ghana, the subsidy was eliminated in 1984–85, but in order to sell government stocks the nominal price was fixed for 1986, thus reintroducing the subsidy. It was phased out again in the late 1980s. In Malawi, the government launched a program to phase out subsidies during 1985–88, but abandoned the effort in the second year because of poor rains, disruption of the transport routes through Mozambique, and a large currency devaluation. Fertilizer subsidies were removed in 1995–96. Nigeria reduced fertilizer subsidies from about 80 percent to 26 percent in 1986, but by failing to adjust the nominal price following a large devaluation, it effectively reestablished the subsidy. The government removed the subsidy in the mid-1990s, but a new government has announced its intention to reintroduce the subsidy.⁷

Reforms Were Most Comprehensive in the Food Sector

In general market reforms were more comprehensive in food markets than in export crop or input markets. The main reason for this difference was that the purchase and sale of export commodities brought considerable revenue to many governments, while food-crop marketing typically brought losses.⁸ In much of Africa, government intervention is still pronounced in the input sector, which traditionally has been more heavily controlled than cereal trading and distribu-

tion. Although multinationals and private traders have penetrated the fertilizer and seed markets in many countries, state-owned enterprises still dominate those markets in Benin, Ethiopia, Mali, Malawi, Senegal, and elsewhere. In Mali, for example, two state enterprises account for 95 percent of fertilizer distribution.⁹ In Benin, the cotton parastatal distributes 85 percent of the fertilizer. Although it contracts private companies to import and deliver fertilizer, it fixes prices based on the average bid.¹⁰

IMPACT OF THE REFORMS

How successful has agricultural market reform been in Sub-Saharan Africa? How has it affected market performance, agricultural production, input use, farm productivity, and poverty? The available evidence shows clear progress in some areas and mixed results in others.

Market Performance

Assessments of market performance since the reforms have focused on the expansion of private trading, reductions in marketing margins, and increases in market efficiency (measured by the degree of market integration). In general all three areas have seen improvements since the 1980s. However, further expansion of private trade faces many constraints and marketing boards are still active in some countries.

Private trade has expanded. Market liberalization has encouraged private trade, even in cases where parastatals are still active. Small private traders have emerged in response to increased market opportunities.¹¹ In certain export markets, the presence of multinationals has fostered a well-coordinated

domestic private-trading sector. In Tanzania, multinationals contract with private, domestic traders to buy tobacco and cashew nuts from small farmers, and these traders have little difficulty accessing credit or finding buyers. In Malawi, small farmers sell their tobacco on auction floors to international buyers, something only large estate farms could do before the reforms.

Further expansion is constrained. Private dealers are constrained by lack of credit and uncertainty about the government's commitment to reform. The lack of access to credit and working capital is a significant barrier to further expansion of private trade, preventing traders from moving into areas such as wholesale commerce, transport, and storage.¹² Uncertainty about the role of the state has led to a vicious cycle of mistrust and speculative behavior that hampers the reform process in East and Southern Africa. Other constraints to private-sector expansion include lack of adequate market information, poor roads and communications infrastructure, limited access to storage and transport facilities, and unclear property rights (Box 4).

Marketing boards are still active. Marketing boards also continue to constrain private trade. Grain marketing boards in most countries of Sub-Saharan Africa were restructured and given responsibility for a few functions—developing a market information system, stabilizing prices, and ensuring food security, in part by maintaining stocks.¹³ But many marketing boards lack the money to support prices and in some countries are still active in the grain trade, competing with private dealers. The combination of the private sector's uncertainty about future policy and state involvement in grain trading makes for volatile grain markets. In Benin, Côte d'Ivoire, Mali, and

Senegal, parastatals continue to handle the majority of marketing and distribution for export crops.

Marketing margins have narrowed. Marketing margins—defined as the spread between producer and consumer prices—have fallen from prereform levels, reflecting the lower marketing and processing costs of a more competitive private sector. In turn, this has improved transmission of world prices to farmers and forced real consumer prices downward.¹⁵

Two main factors have helped reduce marketing margins in maize markets. First, in East and Southern Africa, private-sector participation in grain marketing and milling and the liberalization of interregional trade have narrowed the margins between producer and consumer prices for maize meal and increased consumer access to maize markets. When the government stopped subsidizing large maize mills, many households began buying from smaller mills where maize meal was cheaper, raising market share for these small enterprises.¹⁶ Second, price spreads between surplus and deficit regions have declined (Figure 2). Cereal market liberalization in Mali, for instance, has reduced transaction costs for private traders (who no longer need to operate on the black market) and increased the flow of cereals from surplus to deficit areas.

Marketing margins have decreased similarly in the export crop sector, in countries where export market liberalization has occurred. The producer's share of the f.o.b. (free on board) price is the best measure of how well the reforms have succeeded in passing on the benefits of liberalization to producers. The producer's share of the f.o.b. price has ranged from 64 to 98 percent in Cameroon, Malawi, Tanzania, and Uganda, where markets have been widely liberalized. But in Benin, Côte d'Ivoire, Ghana, and Senegal, where reform has been slow or nonexistent, the producer's share has remained low—between 37 and 62 percent.

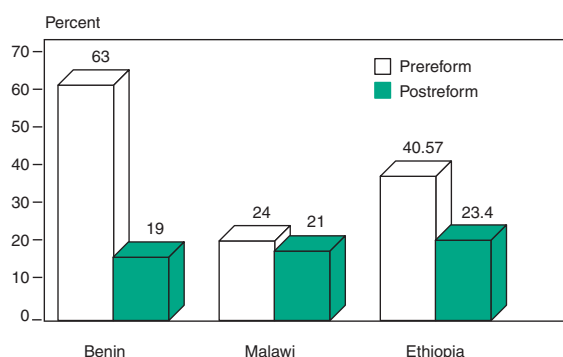
Box 4

Input Market Liberalization and Private Trade in Madagascar

Madagascar has experienced positive gains from liberalization in terms of private trader participation. The level of competition is relatively high and barriers to entry are low.¹⁴ Enterprising traders are not held back by policy constraints in either the input or output market.

Yet other serious constraints exist, especially poor infrastructure and a lack of access to credit. The transportation infrastructure is so underdeveloped that transportation costs for individual traders account for about 52 percent of total business costs. High interest rates (up to 20 percent) often prevent traders from borrowing. In addition the volume of trade in inputs has remained small, in part because small farmers often cannot afford modern inputs. Import prices for inputs such as fertilizer are high, and a shortage of information (including extension services) further limits demand.

Figure 2—Difference in marketing margins between central markets in selected countries



Sources: O. Badiane F. Goletti, M. Kherallah, P. Berry, K. Govindan, P. Gruhn, and M. Mendoza. "Agricultural Input and Output Marketing Reforms in African Countries," final donor report (IFPRI, Washington, D.C. 1997); A. Negassa and T. S. Jayne, *The Response of Ethiopian Grain Markets to Liberalization*, Working Paper 6 (Addis Ababa: Grain Market Research Project, Ministry of Economic Development and Cooperation, 1997).

Notes: With the exception of Ethiopia, margins are the relative margin, defined as the price spread divided by the producer price. For Benin, the price spread for maize is between Parakou and Cotonou for the periods 1985–89 and 1990–95. For Malawi, price spread for maize is between Nkhotakota and Lilongwe for the period 1984–87 and 1988–91. For Ethiopia, the price spread for teff is the absolute margin between Addis Ababa and Bako for the period 1986–1996.

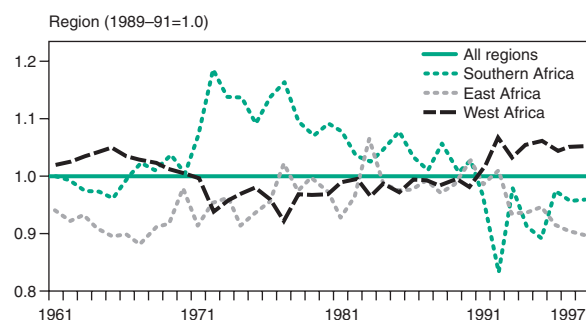
Markets have become increasingly integrated. In general, market integration is measured by how well price signals are transmitted among markets. Integrated markets allow for the efficient flow of commodities from surplus to deficit regions. While the level of market integration in Africa remains lower than in other developing countries, it has improved since the reforms were instituted.¹⁷ In part this improvement has depended on the prereform situation. For example, countries such as Benin and Ghana, where the private sector controlled food marketing before liberalization, have developed better-integrated grain markets than countries such as Malawi and Madagascar, where parastatals dominated food marketing.¹⁸ Most of the improvement is the result of increased private-sector participation in trading activities—participation that has fostered the efficient transmission of information and prices among markets.

Agricultural Production

The basic premise of agricultural market reform is that improving the incentive structure for small farmers (in the form of higher prices and well-functioning markets) will generate a positive supply response, increasing both agricultural output and income levels. But the average growth of agricultural production per capita has been negative in Sub-Saharan Africa since the 1970s (Figure 1). For small farmers in some countries, reform has meant the elimination of government input and credit subsidies—a loss that has kept yields stagnant or reduced them. Where production growth has occurred, it is the result of increases in the amount of land under cultivation rather than of yield increases. And where producers have benefited, the bulk of the gains have gone to export and cash-crop farmers with access to credit and modern inputs (such as fertilizer).

Food production has stagnated. Although positive changes have occurred in some sectors and countries, overall food production per capita in Sub-Saharan Africa has stagnated. West African countries have performed better in terms of food production than countries in East and Southern Africa, for several reasons (Figure 3). First, the food markets in West Africa have traditionally been more open than those in other parts of the continent. Second, the 1994 devaluation in West Africa increased the relative price of imported foodstuffs, boosting the demand for local food crops. Finally there is some evidence that because of higher prices received by cash-crop producers, fertilizer use on cash crops has increased in some West African countries (Benin, Burkina Faso, Mali). Increased access to fertilizer and cash income from export crop production has also allowed farmers in parts of West Africa to use more fertilizer on food crops. In contrast, food crop production in several East and Southern African countries has declined because the elimination of food subsidies has resulted in lower farm-gate prices for maize.

Figure 3—Net per capita food production, 1961–97



Note: Each graph line represents the index for that region divided by the index for all regions.

Source: FAOSTAT 1998 (statistical database of the Food and Agriculture Organization of the United Nations).

The food supply response in Sub-Saharan Africa has been limited by structural and institutional constraints that have persisted despite market reforms. Nonprice factors can have a more profound impact than prices on aggregate agricultural output.¹⁹ These factors include the condition of infrastructure (such as roads, irrigation schemes, and communication networks); the availability of marketing services, modern inputs, and credit (especially in rural areas); and government support in the form of research and extension services, human capital development, and commitment to reform. Physical factors such as the weather and soil quality also affect output.

Export crop production has increased.

Export crops have responded more strongly to liberalization than foodgrains. Most price changes have favored tradables, making export crops more attractive than domestic staples. Export crops were also taxed more heavily before the reforms, making their postreform response particularly vigorous. In addition, price control was far less effective for food than for export crops, so that farmers growing food crops were less affected by official prices (and more responsive to unofficial prices) than farmers growing export crops. Cash-crop sectors such as cotton in Benin and Mali, cashew nuts in

Mozambique and Tanzania, and coffee in Uganda have been among the most responsive to reforms, largely because of higher producer prices, exchange rate liberalization, privatization, infrastructure investment, and improved input supply.

Input Use

The use of modern inputs declined in some countries—more so for food than for cash crops, and in part because of the elimination of input subsidies. The lack of well-functioning agricultural credit markets to finance purchases of inputs has exacerbated the problem. In general, the use of fertilizer, arguably the most important purchased input in African agriculture, is still very low, especially compared with other developing countries (Table 3).

Fertilizer prices have risen. A number of reforms have affected fertilizer prices, including the elimination of fertilizer subsidies, the depreciation of the real exchange rate, and liberalization of fertilizer imports and distribution. The fertilizer-crop price ratio has more than doubled in four out of ten countries examined (Benin, Ghana, Nigeria, and Tanzania) and increased at least 50 percent in three more (Malawi, Senegal, and Zambia). On the other hand, the fertilizer-crop price ratio fell in Ethiopia, Kenya, and Zimbabwe.

Fertilizer use declined before rebounding slightly. Fertilizer use rose steadily from 1970 until 1992 (Figure 4). The positive trend stopped in 1992 as fertilizer use dropped more than 20 percent in 1994 and 1995 before partially rebounding in 1996. The drop in Nigerian fertilizer use, which accounts for more than one-third of fertilizer use in Sub-Saharan Africa, explains the decline in fertilizer consumption in 1994 and 1995. Fertilizer application rates, expressed as kilograms of nutrients per hectare of arable land, generally followed the trend in use.

Table 3—Global fertilizer application rates, by region

Region	1980–81	1990–91	1996–97	Annual growth rate from 1980–81 to 1996–97
	(kg of nutrients/ha of arable land)			(percent)
World	88	100	98	0.7
Developed countries	120	112	86	- 2.1
Economies in transition	104	104	33	- 6.9
Developing countries	57	89	107	4.0
Latin America and the Caribbean	64	63	71	0.7
Near East and North Africa	45	67	65	2.3
Sub-Saharan Africa	8	10	9	0.7
East Asia and Southeast Asia	121	179	238	4.3
South Asia	37	80	93	5.9

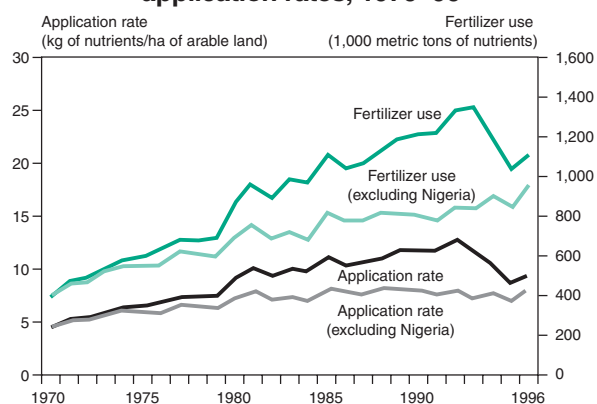
Source: FAOSTAT 1998 (statistical database of the Food and Agriculture Organization of the United Nations).

Note: kg stands for kilogram, ha for hectare.

Declining demand for fertilizer since liberalization has led to speculation that fertilizer market reform has had adverse effects on agricultural productivity and rural incomes. Indeed, some of the effects of fertilizer reform have been less positive than expected. Cost savings from privatization have not been enough to prevent prices from rising as subsidies were removed. Despite the increased availability of fertilizer through new, more efficient delivery networks, demand remains weak. Increased

fertilizer-crop price ratios mean that many farmers have been reluctant to increase their use of fertilizer, and in some countries farmers use less fertilizer than they did before the reforms.

On the other hand, fertilizer market reform has fulfilled expectations in some respects. Comparing the early 1980s and the mid-1990s, fertilizer use has fallen in 7 of the main fertilizer-using countries, but increased in 14. Countries devoting a higher share of fertilizer to cash crops have seen fertilizer use grow relatively rapidly through the reform period. This includes most of the cotton-producing countries of West Africa. In contrast, countries using fertilizer mainly on maize, such as Ghana, Malawi, Tanzania, and Zambia have seen slower growth and some declines in absolute fertilizer use.

Figure 4—Trends in fertilizer use and application rates, 1970–96

Source: FAOSTAT 1998 (statistical database of the Food and Agriculture Organization of the United Nations).

Effects on production and income are negligible. It is difficult to find evidence of any adverse impact of fertilizer market liberalization on agricultural production in Sub-Saharan Africa. Agricultural production appears to be more sensitive to weather, agricultural policy, and shifts in exchange rates than to fertilizer policy. The removal of subsidies and subsequent increases in the

fertilizer-crop price ratios have had negligible impacts on welfare. The changes affected approximately 15–35 percent of rural households (that is, those that used fertilizer) and had a greater impact on relatively larger farms located in high-potential areas because these farms benefited the most from fertilizer subsidies. Several estimates suggest that fertilizer subsidy removal reduced rural income by 1–2 percent at most. On the other hand, the positive effects of better availability, timing, and product choice have not been evaluated.

Access to credit for input use has decreased. Access to credit for input use has declined in cases where state-sponsored credit systems have collapsed. The decline in input use in Sub-Saharan Africa is most serious in countries where input and credit subsidies were eliminated at the same time, and where fertilizer is mostly applied to maize (such as in Malawi). In Tanzania, where inputs on credit are not available and export markets are no longer dominated by state-owned enterprises, input use on cotton has also declined. In contrast, in countries such as Benin and Burkina Faso, where cotton inputs are available on credit through the government, input use has increased and has had positive spillover effects on food production.

The integrated cash-crop marketing and input distribution system provided by state-owned enterprises allowed inputs to be purchased on credit. But the private sector has not been able to provide inputs on credit to farmers because of its inability to enforce loan repayment. Under parastatal marketing arrangements, farmers often received seed, pesticides, and fertilizers from the parastatal. The cost of those inputs was later deducted from what the parastatal paid for the crop. With multiple outlets now available, the farmer is not obliged to sell the crop to the entity that advanced funds for inputs. This situation has prevented the private sector from offering inputs on credit.

Total factor productivity has increased.

Changes in total factor productivity, defined as the amount of total output generated by all factors used in production, provide the most accurate measure of national and regional productivity trends. Total factor productivity stagnated throughout the mid-1960s and 1970s but appears to have increased in the 1980s and 1990s. The lagged effect of research expenditures and policy reform account for as much as two-thirds of the growth in total factor productivity during the 1980s.²⁰ This raises questions about whether the recovery in the 1980s is sustainable in the long run given the reduction in research expenditures throughout the reform period. Countries such as Kenya and Zimbabwe, for example, have not experienced significant increases in food productivity since liberalization. In these countries the elimination of public support for small farmers cost these producers access to affordable modern inputs. Land productivity stagnated or declined as a result.²¹

Poverty

Agricultural production constitutes the most important source of income and employment for the majority of households in Sub-Saharan Africa. By stimulating agricultural production, market reforms were expected to improve rural incomes and alleviate poverty. In many Sub-Saharan African countries, rural poverty rates have declined since the 1980s. Although not all of the decline can be attributed to agricultural reforms, this trend challenges the view that the rural poor have been adversely affected by agricultural market liberalization.

Changes in producer food prices have had mixed effects. The impact of market reforms on income through changes in food prices has varied across countries and crops, in large part owing to differences in prior conditions and levels of intervention. Many smallholder farmers in Sub-Saharan

Africa are net foodgrain buyers. Therefore, in the short run, higher farm prices could be detrimental to these households unless market reform can reduce the margin between producer and consumer prices. For example, one-third of rice farmers that fell below the poverty line were hurt by higher and more variable rice prices following agricultural market liberalization in Madagascar.²² However, in countries such as Côte d'Ivoire, where both agricultural production and household food consumption are diversified, increases in producer prices had no significant impact on the rural poor.²³

A larger marketable surplus is usually associated with larger and wealthier farms, and therefore higher farm prices tend to favor the better-off farmers more than the poor ones.²⁴ In East and Southern Africa, however, reforms have resulted in lower farm prices, thereby hurting commercial farmers. Some households may produce mainly for subsistence—especially in remote areas—and therefore will have little or no contact with agricultural markets and will be insulated from changes in product prices.²⁵

Market reforms have reduced consumer food prices. Although market reforms could lead to higher farm prices they could simultaneously reduce consumer prices by decreasing marketing costs. Increased competition and greater efficiency brought about by liberalization have reduced marketing margins in many African countries, thereby benefiting both food producers and consumers.²⁶ In Ghana food prices have decreased since the reforms, in part because investments in roads and better trucks have reduced marketing costs.²⁷ In East and Southern Africa maize meal production has shifted to cheaper mills, offsetting the price increases that came with the elimination of consumer price subsidies.²⁸ Overall, consumer prices for major food crops have fallen in a number of countries, including Ethiopia, Ghana, Kenya, Mali, Tanzania, and Zambia.

Reforms reduced market inefficiencies, offsetting some of the negative effects of price rises. Even if food crop prices did rise, their negative impact on net food buyers and poor consumers was mitigated by a reduction in market inefficiency following liberalization. Before reforms, many governments were ineffective in providing cheap food to the most needy and created many marketing inefficiencies.²⁹ As a result, many poor consumers had to rely on parallel markets to meet their food requirements because government-subsidized grain was often rationed or poorly targeted.

Higher export crop prices have benefited export crop farmers. Devaluation and export market liberalization increased the income of small export growers by about 20 percent on average between 1990 and 1997, although this varied greatly across countries and crops. The income of poor and nonpoor rural households has increased in several countries, including Benin, Cameroon, Gambia, Madagascar, Malawi, Niger, and Uganda. Small-scale cotton growers in Benin and producers of cashew nuts and tobacco in Tanzania have benefited from higher producer prices thanks to declining marketing margins and the depreciation of the real exchange rate. Similarly, following the liberalization of burley tobacco production and marketing in Malawi, increased tobacco production increased the cash income of smallholder farmers in that country (Box 5).³⁰

Rural poverty has declined in many African countries Contrary to conventional wisdom, the evidence indicates that rural poverty has fallen in many African countries. In Tanzania, for example, a comparison of pre- and postreform household surveys suggests that rural incomes rose and poverty declined between the late 1970s and the early 1990s.³³ Similarly, a comparison of two household surveys in Uganda estimates that the incidence of poverty fell from 56 percent in 1992 to 46 percent in 1996.³⁴

Using an index that combines information on the ownership of household assets and housing characteristics, another study finds that rural poverty declined in Ghana, Kenya, Madagascar, Mali, Tanzania, Uganda, and

Zambia.³⁵ In half of the countries, poverty fell more than 9 percentage points. The evidence was mixed in Senegal, and poverty increased in Zimbabwe.

Box 5

Tobacco and Smallholder Agriculture in Malawi after Liberalization

The success of smallholder tobacco production in Malawi is in large part a consequence of the recent liberalization efforts that allow smallholder participation in tobacco auction floors, either through farmer clubs or through sales to licensed traders. So far the initial response has been positive, with the number of smallholders growing tobacco more than doubling between the 1993/94 and the 1994/95 growing seasons. Tobacco production has increased smallholder farmers' cash income.³¹ However, some studies report that liberalization, in general, has benefited mainly households that produce a substantial marketed surplus and those located in areas with good transportation and road infrastructure.³²

THE FUTURE OF AGRICULTURAL MARKET REFORM IN SUB-SAHARAN AFRICA

The reform efforts of the 1980s and late 1990s have generated a positive response in the agricultural sector of Sub-Saharan Africa. Despite the progress that has been made, however, the results of market reform have generally not met expectations, and much remains to be done.

The reforms focused on eliminating government control and increasing the producer price of tradable agricultural commodities but placed little emphasis on developing the institutions needed to support private sector activity. Improving price incentives and liberalizing markets were expected to be enough to generate a supply response and create well-functioning markets. The private sector was expected to take over the institutional functions the state had been providing. The reality has been quite different. While private trade has increased in virtually all agricultural mar-

kets, the private sector has been unable or unwilling to supply credit and marketing services in remote areas. And although the elimination of policies enforcing a uniform, nationwide price has been a boon for many producers and consumers close to markets, it has often left farmers in remote areas worse off than they were before liberalization.

Constraints to Further Reform

Sub-Saharan Africa faces a number of constraints in its efforts to reduce poverty through agricultural market development. These constraints include

- **Structural factors:** Investments in infrastructure, communication, research and extension, and marketing information have been reduced as part of broader budget-cutting efforts.

- Institutional factors: Government regulations regarding property rights, quality control, contract enforcement, and good governance continue to be weak.
- Implementation factors: The reform process has suffered from incomplete reforms, delays, and reversals owing to a lack of government commitment and political opposition by those with a vested interest in the status quo.
- Exogenous factors: Drought, disease, war, and civil strife have contributed to the poor economic performance of Sub-Saharan Africa.

These constraints mean that traders in the region still face a great deal of risk. Transaction costs are generally high and unstable, and postreform marketing systems do not operate efficiently yet, nor do they provide market stability. Improving price incentives for farmers, while necessary, has not been enough to boost production. Furthermore, in liberalized food- and cash-crop markets, farmers have less access to credit to purchase modern inputs. Finally, Sub-Saharan African governments still intervene in agricultural marketing activities in many countries, sometimes because of market failures.

What must be done to overcome the remaining constraints and make agricultural market reform more effective?

A New Agenda

Further progress in developing well-functioning markets will require not only further liberalization but also a more concerted effort to go beyond the withdrawal of the public sector from agricultural marketing. The state must assume a new, supportive role as market facilitator. One aspect of this role is to strengthen investment in public goods such as infrastructure, research and extension, and public market information. The second is to foster institutions required for the development of competitive and efficient markets. The new agenda for market

development in Sub-Saharan Africa includes the following eight priorities:

1. Fully implement all reforms. Experience shows that market performance improves and marketing costs fall once the government no longer monopolizes trade.

2. Find institutional solutions to provide input credit to farmers. Credit for input use can be provided through a number of institutional innovations, including contract farming, credit associations, group lending, and farmers' organizations.

3. Develop a legal infrastructure for market transactions. This long-term step will reduce the risk of investment and decrease transaction costs for both farmers and traders by clarifying property rights, enforcing contracts, ensuring quality control, and establishing rules of market conduct, among other legal concerns.

4. Increase investment in infrastructure and institutions. Higher productivity and effective markets require investment in research and extension, access to market information, and efficient transportation and communication networks.

5. Promote effective governance and state capacity to monitor market development. Proper governance will prevent investment from being channeled to rent-seeking groups and will ensure that funds are distributed to their intended uses. Improved state capacity to monitor market development would allow governments to anticipate undesirable market developments and devise appropriate responses to eventual short-term difficulties in a timely and effective manner.

6. Encourage smallholder production of export crops. In many areas, food and export crop production are highly complementary and export crop production has positive spillover effects on input use and food crop

productivity. Therefore, promoting smallholder production of export crops should have beneficial impacts on agricultural production in general and on the food security and income of smallholder farmers in particular.

7. Address the problems of vulnerable groups in remote areas. Farmers in remote rural areas have suffered from the loss of parastatal activity and official pricing that effectively subsidized high transportation costs. Short-term targeted interventions may be needed to alleviate these problems.

8. Institute credible, sustainable macroeconomic policies. Indirect taxation through overvalued exchange rates and protective industrial policies can have a more negative effect on agricultural incentives than direct taxation. In addition, stable and predictable macroeconomic policies encourage savings and investment and focus private sector effort on efficiency rather than on anticipating and reacting to macroeconomic shocks.

NOTES

1. Agriculture is the mainstay of African economies. In Sub-Saharan Africa it represents between 27 and 42 percent of gross domestic product, employs between 65 and 80 percent of the labor force, and in more than half the countries accounts for as much as 60 percent of export revenue. See A. Abdulai and C. L. Delgado, *Re-establishing Agriculture as a Priority for Development Policy in Sub-Saharan Africa* (Washington, D.C.: International Food Policy Research Institute, 1995).
2. See, for example, World Bank, *Accelerated Development in Sub-Saharan Africa: An Agenda for Action* (Washington, D.C., 1981); U. Lele, *Agricultural Growth and Assistance to Africa: Lessons of a Quarter Century*, International Center for Economic Growth Sector Studies 2 (San Francisco: ICS Press, 1990); W. K. Jaeger, *The Effects of Economic Policies on African Agriculture*, Discussion Paper 147, Africa Technical Department Series (Washington, D.C.: World Bank, 1992).
3. World Bank, *Accelerated Development in Sub-Saharan Africa*.
4. R.H. Bates, "The Reality of Structural Adjustment: A Skeptical Appraisal," in *Structural Adjustment and Agriculture: Theory and Practice in Africa and Latin America*, ed. S. Commander (London: James Currey for Overseas Development Institute, 1989).
5. See, for example, G. K. Helleiner, "From Adjustment to Development in Sub-Saharan Africa: Consensus and Continuing Conflicts," in *From Adjustment to Development in Africa: Conflict, Controversy, Convergence, Consensus?*, ed. G. A. Cornia and G. K. Helleiner (New York: St. Martin's Press, 1994); J. P. Meerman, *Reforming Agriculture: The World Bank Goes to Market*, Operations Evaluation Study (Washington, D.C.: World Bank, 1997).
6. O. Badiane and M. Gaye, *Liberalization of Groundnut Markets in Senegal: Impact on the Marketing and Processing Sectors* (Washington, D.C.: International Food Policy Research Institute, forthcoming).
7. For Ghana: C. Jebuni and W. Seini, *Agricultural Input Policies under Structural Adjustment: Their Distributional Implications*, Cornell Food and Nutrition Policy Program Working Paper 31 (Ithaca, N.Y., U.S.A.: Cornell University, 1992); for Malawi: U.S. Agency for International Development, *The Malawi Fertilizer Subsidy Reduction Program: The Impact of the African Economic Policy Reform Program*, CDIE Working Paper Report 143 (Washington, D.C., 1990); and for Nigeria: F. Idachaba, "Desirable and Workable Agricultural Policies for Nigeria in the First Decade of the 21st Century," lecture on Topical Issues in Nigerian Agriculture (Department of Agricultural Economics, University of Ibadan, Nigeria, January 25, 2000).
8. J. Beynon, S. Jones, and S. Yao, "Market Reform and Private Trade in Eastern and Southern Africa," *Food Policy* 17 (No. 6, 1992):399–408.
9. J. Egg, *Etude de l'impact de la libéralisation sur le fonctionnement des filières céréalières au Mali*, Rapport de Synthèse (Bamako, Mali: Office des Produits Agricoles du Mali, 1999).
10. B. Soule, *L'impact des réformes de politiques agricoles sur les petits producteurs au Bénin*, Rapport provisoire (Cotonou, Bénin: Laboratoire d'Analyse Régionale et d'Expertise Sociale, 1999).

11. See O. Badiane, F. Goletti, M. Kherallah, P. Berry, K. Govindan, P. Gruhn, and M. Mendoza, *Agricultural Input and Output Marketing Reforms in African Countries*, Final Donor Report (Washington, D.C.: International Food Policy Research Institute, 1997); C. B. Barrett, "Food Marketing Liberalization and Trader Entry: Evidence from Madagascar," *World Development* 25 (No. 5, 1997):763–77; M. Fafchamps and B. Minten, *Relationships and Traders in Madagascar*, MSSD Discussion Paper 24 (Washington, D.C.: International Food Policy Research Institute, 1998).
12. See, for example, Benyon, Jones, and Yao, "Market Reform and Private Trade"; Barrett, "Food Marketing and Trader Entry"; J. Coulter and P. Golob, "Cereal Marketing Liberalization in Tanzania," *Food Policy* 17 (No. 6, 1992): 420–30.
13. J. M. Staatz, J. Dione, and N. N. Dembele, "Cereals Market Liberalization in Mali," *World Development* 17 (No. 5, 1989):703–18; Badiane et al., *Agricultural Input and Output Marketing Reforms*.
14. O. Badiane, F. Goletti, C. Lapenu, M. Mendoza, B. Minten, E. Ralison, C. Randrianarisoa, K. Rich, and M. Zeller, *Structure and Conduct of Major Agricultural Input and Output Markets and Response to Reforms by Rural Households in Madagascar*, Final Donor Report (Washington, D.C.: International Food Policy Research Institute/Centre Nationale de Recherche Appliquée au Développement Rural, 1998).
15. T. S. Jayne, M. Mukumbu, J. Duncan, J. M. Staatz, J. A. Howard, and M. Lundberg, *Trends in Real Food Prices in Six Sub-Saharan African Countries*, Technical Paper 39, SD Publication Series, Office of Sustainable Development, Bureau for Africa (Washington, D.C.: United States Agency for International Development, 1996).
16. T. Jayne and S. Jones, "Food Marketing and Pricing Policy in Eastern and Southern Africa: A Survey," *World Development* 25 (1997): 1505–1527.
17. See, for example, F. Goletti and S. Babu, "Market Liberalization and Integration of Maize Markets in Malawi," *Agricultural Economics* 11 (Nos. 2/3, 1994): 311–324; Coulter and Golub, "Cereal Marketing Liberalization in Tanzania"; Badiane et al., *Agricultural Input and Output Marketing Reforms*.
18. Badiane et al., *Agricultural Input and Output Marketing Reforms*.
19. See A. Chhibber, "The Aggregate Supply Response: A Survey," in *Structural Adjustment and Agriculture: Theory and Practice in Africa and Latin America*, ed. S. Commander (London, U.K., and Portsmouth, N.H., U.S.A.: Overseas Development Institute and Heinemann, 1989); K. M. Cleaver, *The Impact of Price and Exchange Rate Policies on Agriculture in Sub-Saharan Africa*, Staff Working Paper 728 (Washington, D.C.: World Bank, 1985); N. Mamingi, "The Impact of Prices and Macroeconomic Policies on Agricultural Supply: A Synthesis of Available Results," *Agricultural Economics* 16 (No. 1, 1997): 17–34.
20. S. Block, "The Recovery of Agricultural Productivity in Sub-Saharan Africa," *Food Policy* 20 (1995): 385–406.

21. T. Jayne, J. Shaffer, J. Staatz, and T. Reardon, *Improving the Impact of Market Reform on Agricultural Productivity in Africa: How Institutional Design Makes a Difference*, MSU International Development Working Paper No.66 (East Lansing, Mich., U.S.A.: Michigan State University, 1997).
22. C. B. Barrett and P. A. Dorosh, "Farmers' Welfare and Changing Food Prices: Nonparametric Evidence from Rice in Madagascar," *American Journal of Agricultural Economics* 78 (No. 3, 1996):656–669.
23. J. W. Budd, "Changing Food Prices and Rural Welfare: A Nonparametric Examination of the Côte d'Ivoire," *Economic Development and Cultural Change* 41 (No. 3, 1993):587–603.
24. T. Addison and L. Demery, "The Economics of Rural Poverty Alleviation," in *Structural Adjustment and Agriculture: Theory and Practice in Africa and Latin America*, ed. S. Commander (London, U.K.: James Currey, 1989); Barrett and Dorosh, "Farmers' Welfare and Changing Food Prices."
25. Addison and Demery, "The Economics of Rural Poverty."
26. Jayne et al., *Trends in Real Food Prices*.
27. H. Alderman and G. Shively, "Economic Reform and Food Prices: Evidence from Markets in Ghana," *World Development* 24 (1996): 521–534.
28. Jayne and Jones, "Food Marketing and Pricing Policy in Eastern and Southern Africa."
29. D. Sahn, "Economic Liberalization and Food Security in Sub-Saharan Africa," in *Food Security and Nutrition: The Global Challenge*, ed. U. Kracht and M. Schulz (Munster, Germany: Lit Verlag, 1999).
30. M. Zeller, A. Diagne, and C. Mataya, *Market Access by Smallholder Farmers in Malawi: Implications for Technology Adoption, Agricultural Productivity, and Crop Income*, FCND Discussion Paper 35 (Washington, D.C.: International Food Policy Research Institute, 1997).
31. Ibid.
32. P. Peters, *Failed Magic or Social Context? Market Liberalization and the Rural Poor in Malawi*, Development Discussion Paper 562 (Cambridge, Mass., U.S.A.: Harvard Institute of International Development, 1996); and W. Chilowa, "The Impact of Agricultural Liberalization on Food Security in Malawi," *Food Policy* 23 (1998): 553–569.
33. A. Sarris and P. Tinios, "Consumption and Poverty in Tanzania in 1976 and 1991: A Comparison Using Survey Data," *World Development* 23 (August 1994): 1401–1419.
34. S. Appleton, "Changes in Poverty in Uganda, 1992–1996," mimeograph (Centre for the Study of African Economies, Oxford, U.K., 1998).
35. D. Stifel, D. Sahn, and S. Younger, "Intertemporal Changes in Welfare: Preliminary Results from Nine African Countries," mimeograph (Ithaca, N.Y., USA, Cornell University, 1999).

Mylène Kherallah is a research fellow, Christopher Delgado a senior research fellow, Eleni Gabre-Madhin a postdoctoral fellow, and Nicholas Minot a research fellow in IFPRI's Markets and Structural Studies Division. Michael Johnson, an IFPRI consultant when this study was completed, is an AAAS fellow at the U.S. Agency for International Development. This report is based on a forthcoming book by these authors.