CHAPTER 6

Spurring Agricultural and Rural Development

Comprehensive improvements in policies, institutions, and investment could accelerate agricultural and rural growth to levels that would help reduce rural poverty

CENTURIES OF POOR POLICIES AND INSTITUTIONAL FAILures are the primary cause of Africa's undercapitalized and uncompetitive agriculture. Adverse resource endowments have also had some direct effects, as well as indirect effects through their influence on policy. The lack of a prolonged period of favorable incentives, rural public investments, and institutional supports has limited the opportunities for African farmers and agroindustrialists.

As a result the potential of African agriculture remains latent—good reason for optimism. Indeed, modest policy improvements in the 1980s and 1990s triggered a significant response. Thus persistent and comprehensive improvements in policies, institutions, and public and private investment could accelerate agricultural and rural growth to levels that would help reduce rural poverty.

Indeed, the undercapitalization of agriculture will have to be addressed if Africa is to feed itself, compete in world markets, and reduce rural poverty. As the main source of rural livelihoods, agriculture dominates many African economies, accounting for about 35 percent of the region's GDP, 70 percent of employment, and 40 percent of exports (World Bank 1997a).

One often overlooked contribution of agriculture is the strength of backward and forward linkages within agriculture and with other sectors of the economy. Recent evidence from Africa suggests that the added growth and rural income from such linkages, especially from increases in farm incomes, has been underestimated (Delgado, Hopkins, and Kelly 1998).[1] Moreover, these linkages generally become stronger with development (Vogel 1994) and drive agriculture-led industrialization (Adelman 1984).

Indeed, few low-income countries have achieved rapid nonagricultural growth without rapid growth in agriculture. Thus agriculture cannot continue to be neglected.

Drawing on analysis of these issues, this chapter offers a "business plan" for agricultural and rural development in the 21st century—a strategy for capitalizing agriculture and increasing its competitiveness. In developing the elements of this strategy, several questions need to be answered:

Few low-income countries have achieved rapid nonagricultural growth without rapid growth in agriculture

- What are the main issues confronting African agriculture as it enters the 21st century?
- What should be done to address these issues?
- What should be the roles of African states, other stakeholders, and development partners?
- What is the likely impact of the proposed strategy on overall agricultural performance, food security, natural resources, and rural poverty?
- Where will the resources come from to finance the strategy, and how should they be used and allocated?
- What challenges lie ahead, and what can be learned from leading and emerging agricultural countries?

Explaining the Poor Performance of African Agriculture

DESPITE AGRICULTURE'S IMPORTANCE TO AFRICA, IT HAS remained below its potential—even backward relative to other developing regions. This is apparent in agriculture's extreme undercapitalization and lack of competitiveness in world markets (table 6.1; figure 6.1).

Less than 7 percent of cropped area in Africa is irrigated, and the use of purchased inputs and machines is limited. Cereal yields (a reflection of the productivity of land under cereal production) are less than half those in other developing regions.[2] Even for tubers and plantains, which have suitable agroecological conditions in Africa, yields are lower than in Asia and Latin America.[3] Agricultural labor productivity is low: historically, the marginal product of labor has been about the same as the average product, whereas in Asia and Latin America the average product of

labor is much greater than the marginal product (Delgado and Ranade 1987). Africa's agricultural capital stock per hectare of agricultural land in 1988–92 was about one-sixth of that in Asia and less than one-quarter of that in Latin America (UNCTAD 1998).

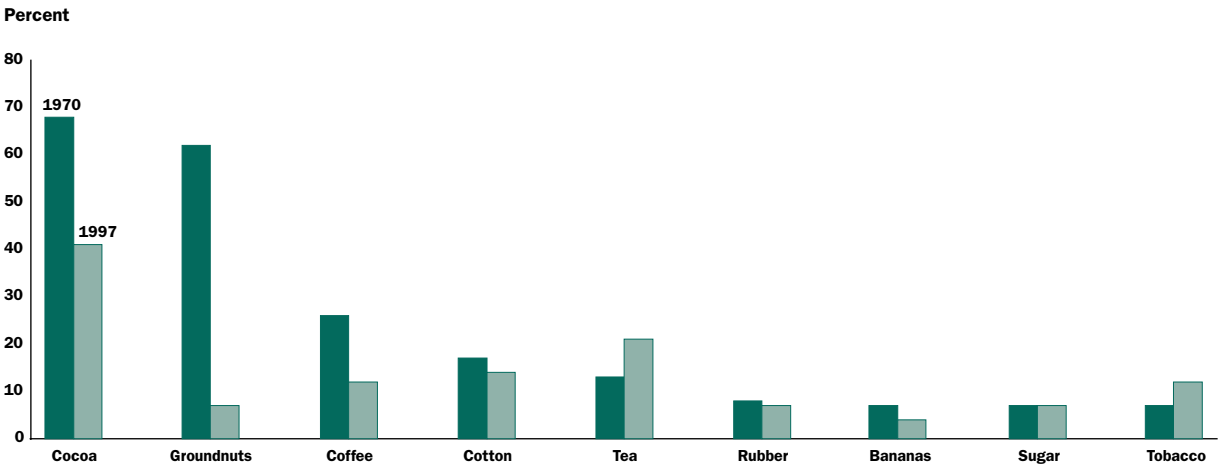
Undercapitalization is associated with the lack of competitiveness of African products in world markets. And this position is made worse by high transactions costs (Ahmed and Rustagi 1987; Jaffee and Morton 1995), inadequate market infrastructure (Hayami and Platteau 1997), weak institutions and support services (Eicher 1999), inadequate diversification, and limited vertical integration (Delgado 1998b). As a result

Table 6.1 Agricultural Indicators for Africa, Asia, and Latin America

Indicator	*Africa*	*Asia*	*Latin America*
Agricultural GDP (millions of dollars), 1997	62,367	400,105	143,186
Agriculture/GDP (percent), 1995	30	25	10
Labor force/agriculture (percent), 1995	70	72	29
Agriculture/exports (percent), 1995	40	18	30
Agricultural production index (1961–64 = 100)			
1965–69	113	115	115
1975–79	135	154	153
1985–89	166	230	200
1995–98	221	338	253
Agricultural production per capita index (1961–64 = 100)			
1965–69	100	103	102
1975–79	92	110	106
1985–89	84	135	112
1995–98	87	169	120
Cereal yields (kilograms per hectare), 1994	1,230	2,943	2,477
Cereal output per capita (kilograms), 1993–96	133	285	256
Agricultural land/labor (hectares per worker), 1994	5.9	1.3	24.8
Fertilizer/arable land (kilograms per hectares of arable land), 1993–96	15	180	75
Irrigated area/arable land (percent), 1994	6.6	33.3	9.2
Tractors/arable land (number per 1,000 hectares), 1994	290	804	1,165
Road density (kilometers of road per square kilometer), 1995	0.06	0.37	0.16
Paved roads (percentage of total roads), 1995	15	29	25
Population density (people per square kilometer), 1995	25	146	24
Rural nonfarm income/total rural income (percent)	42	32	40
Nonagricultural/agricultural value added per worker, 1980–90	7.8	3.6	2.5

Source: World Bank 1997a, 1999a, 1999c; FAOSTAT 2000; UNCTAD 1998; Hayami and Platteau 1997; Reardon and others 1998; Larson and Mundlak 1997.

Figure 6.1 Africa's Share of World Trade for Its Main Export Crops, 1970 and 1997



Source: FAOSTAT 2000.

African agriculture has been steadily marginalized in world trade (Ng and Yeats 1996). What caused these factors to occur?

History and Policy

African agriculture has been plagued by centuries of poor policies and institutional failures—and a record of heavy extraction and heavy taxation of rural areas (box 6.1). Although there were policy improvements between the mid-1950s and the late 1960s, these were temporary. Subsequent policy distortions—in the form of overvalued exchange rates and inward-looking industrialization policies—reversed the gains, particularly in crop exports.

Over the past few centuries private individuals and groups have had few opportunities to engage in free, competitive trade and investment in agriculture and agroindustry. Farmers have had little incentive to invest in cash or in kind in their farms and natural resources. There has been no extended period of active public investment for agricultural and rural development—and the programs that were implemented have suffered from severe public sector bias and excessive centralization. In most countries local populations have not been able to use local tax bases for their development—because tax bases were assigned, by design or default, to colonial or central governments or to monopolistic private or

state structures. Despite high taxes, public investment in rural services and infrastructure has been poor.[4] Indeed, if high taxes had been complemented with significant public investment in agriculture (as in Asia), the sector would not have fared so poorly.

Box 6.1 Centuries of Extraction from African Agriculture

Precolonial era. Extraction from rural Africa during the precolonial era occurred through the slave trade. Especially between 1650 and 1850, the slave trade disrupted Africa's demographic, social, institutional, and moral development (Fage 1977, Aplers 1977, Curto 1992). The political entities that conducted the slave raids were never able to reproduce themselves (Meillassoux 1981). They even failed to reproduce the population of captured slaves, depending on ever-widening geographic areas to capture new slaves from subsistence agricultural systems.

Colonial era. With the onset of colonialism, policies for extraction from rural areas changed. Several mechanisms were developed to ensure labor supplies for mines, plantations, settler farms, and public works (Binswanger, Deininger, and Feder 1993). Access to markets was restricted through cooperatives or monopoly marketing schemes that excluded peasant farmers or forced them to sell their crops at depressed and uncompetitive prices. In East and Southern Africa land for peasant agriculture was systematically reduced, confining these farmers to less fertile lands. In addition, access to agricultural public goods and services (roads, extension, credit) was limited to plantations or settlers. Such distortions were also used on other continents, but in Africa they persisted much longer and left policy and institutional remnants still visible today.

Between the mid-1950s and late 1960s, however, policy improvements, together with favorable world prices, bolstered the performance of African agriculture, and export cropping spread rapidly (Anthony and others 1979; Kamarck 1967; De Wilde 1967). Export crops induced technological change because they had different seasonal labor profiles from traditional crops, allowing farms constrained by seasonal labor bottlenecks to significantly expand cultivated land (Delgado and Ranade 1987). Market-oriented agriculture grew rapidly in many countries (Delgado 1998b). But this improved performance was halted by policy changes that shifted from export crop growth strategies toward import-substituting industrialization, partly induced by the 1973 oil shock. Real exchange rates became overvalued, and incentives shifted from agriculture to manufacturing.

Postcolonial era. The chance was missed to create a better policy environment for agriculture at the start of the postcolonial period. Policies continued to impose high explicit and implicit taxes on agriculture: pricing policies taxed agriculture about as much as the indirect tax resulting from industrial protection and macroeconomic policies (Schiff and Valdés 1992; Herrmann 1997). With help from donors, postcolonial regimes built on the institutional residues of colonial powers and increased public sector dominance over agricultural marketing and input supply systems, inhibiting the development of individual traders, private companies, and farmer cooperatives. In most countries output markets were dominated by marketing boards (World Bank 1994). In more than 60 percent of African countries, governments completely controlled the procurement and distribution of fertilizer and seeds (World Bank 1981), yet these systems were unreliable. Parallel trading or processing was inhibited. Controls on crop movements, particularly for grains (Jayne and Jones 1997), were common. And such marketing systems imposed huge fiscal costs.

More recently, particularly in the 1970s and 1980s, heavy taxes and constraints on private and collective initiatives continued to retard agricultural growth and rural development. Consider the limited opportunities of a dynamic rural entrepreneur in a typical African country around 1980. Private investment in agriculture and agroindustry was undermined by heavy taxation, and the space for private sector activity was severely limited by the dominant public sector. There was little potential for producer organizations and nongovernmental organizations to be involved in the development process. Local governments could not provide public services (roads, schools, health, agricultural services) because the authority and financing needed to do so were with centralized government agencies. Even if they wanted to raise revenues for local development, local governments did not have access to significant tax bases.

Economic policies and institutions in Africa have been characterized by urban bias and by centralized political, fiscal, and institutional systems

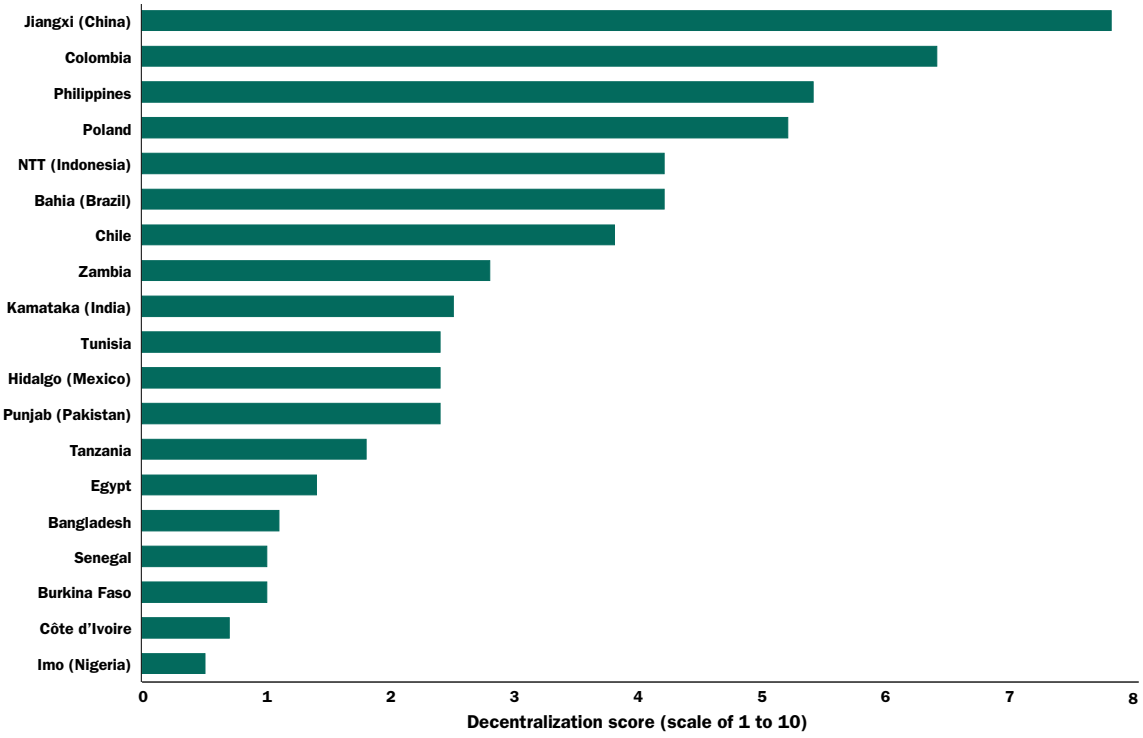
Economic policies and institutions in Africa have been characterized by urban bias and by centralized political, fiscal, and institutional systems (chapter 2). Both features have inhibited agricultural and rural development. And both have received increased attention in the literature.

The urban bias in services and prices persistently favored urban people over rural, harming efficiency and income distribution (Lipton 1977). By organizing, centralizing, and controlling political and economic power, elites have controlled policy and the distribution of resources. In many other countries pernicious political, administrative, and fiscal consequences have made urban bias unsustainable. But these pressures do not seem to have been strong enough in most of Africa, despite the continent's exceptionally high urban bias. Why? Because of the lack of open political systems and of well-articulated, competitive institutions in civil society (Lipton 1993).

Africa's postcolonial regimes had many reasons for establishing highly centralized political, fiscal, and institutional systems for rural development. These reasons included a desire for political integration of fragile nations and the dominance of state-led development and planning ideologies in the Western and Marxist development economics of the time (Manor 1999).

Recent World Bank research on decentralization and rural development developed scores for decisionmaking and resource allocation in six important areas of rural development: rural primary education, rural primary health care, rural road maintenance, agricultural extension, rural water supply, and forestry management.[5] The African countries in the

Figure 6.2 Levels of Decentralized Rural Service Delivery in Various Parts of the Developing World, 1990s



Source: McLean, Kerr, and Williams 1998.

sample had the most centralized institutions for rural development in the first half of the 1990s (figure 6.2). High centralization inhibited the development of local institutional capacity, limited local resource mobilization, undermined the accountability of development programs to local populations, and discouraged popular participation (McLean, Kerr, and Williams 1998; Parker 1995). Further inhibiting local initiatives was the lack of democracy in most countries—and the discouragement or even suppression of voluntary private associations.

Agricultural subsidies and market access restrictions in developed countries have limited Africa's agricultural export growth

In addition to Africa's poor policies and institutions, developed country policies and market access restrictions—prominent in the postcolonial period—have limited Africa's agricultural export growth (box 6.2). Several developing countries (Brazil, Thailand) have managed to penetrate developed country markets for some products despite such restrictions. But Africa, for the most part, has not. Indeed, poor domestic policies and institutional failures, as well as developed country policies limiting market access, have reduced incentives to invest in African agriculture.

Box 6.2 OECD Subsidies to Agriculture—Equal to Africa's GDP

TRANSFERS TO FARMS IN OECD COUNTRIES FROM TAXpayers and consumers—a result of the agricultural policies used by OECD members—have changed little in recent years. In 1996 these transfers were estimated at $300 billion (OECD 1997), about the same as Africa's GDP. These transfers are largest in the European Union, with Japan and the United States transferring income at just over half the EU level (Josling 1998).

Removing these supports would have significant benefits. Global trade in beverages, meat, and livestock products would increase significantly (Hertel, Anderson, and Francois 1999). Production patterns would shift, with agricultural production declining in Western Europe and increasing in developing countries. Meat production in Africa could increase 20 percent (Anderson and Strutt 1996).

The welfare cost to developing countries of OECD agricultural policies is well above that of OECD textile and clothing trade barriers. Not only are OECD countries' protection rates still very high, but "dirty" tariffs and the introduction of tariff rate quotas in the Uruguay Round mean that large commitments to bound tariff cuts, quota expansion, or both will be needed to significantly reduce agricultural protection (Anderson 1999).

What would happen if OECD countries reformed their agriculture policies?

- *World food prices would increase, but not by much.* Expected price increases are 4–6 percent for wheat, rice, and coarse grains (Valdés and Zietz 1995)—and many of these commodities show a downward trend in real prices over time.
- *Commodity prices would become more stable.* The freer is world trade, the less volatile will world food prices become. Surpluses and deficits can be evened out more easily when there are more trading partners with different climate conditions for food crops (Bale and Lutz 1979; Zwart and Blandford 1989).
- *Real income in Africa and other poor regions would increase.* Annual per capita income would increase by $1 in South Asia, $4 in Southeast Asia, $6 in Africa, and $30 in Latin America. The average producer household in developing regions would gain from liberalization, while consumer households with a food deficit would incur losses. But the gains for producers would be larger than the losses for consumers and would have dynamic multiplier effects for rural areas and developing economies as a whole—so even consumers could benefit in the long run.
- *Welfare in OECD countries would increase as well.* OECD countries are incurring $63 billion a year in welfare losses from their distortionary policies (Anderson, Hoekman, and Strutt 1999). The main losers are consumers, who pay higher prices for such commodities as milk, sugar, and bananas. The main gainers are favored producers, who will likely be strongly opposed to the needed liberalization.

Source: Adapted from Binswanger and Lutz 2000.

Geography and Resource Endowments

Africa's natural adversities have often been used to explain agriculture's poor performance. Indeed, many studies have highlighted Africa's adverse conditions: landlockedness (Bloom and Sachs 1998; Collier and Gunning 1997), poor land quality (Voortman, Sonneveld, and Keyzer 1998; Donovan and Casey 1998), endemic livestock diseases (Coetzer, Thomson, and Tustin 1994), and human diseases (Bloom and Sachs

1998)—the most devastating being malaria, tuberculosis, and AIDS (chapter 4; UNAIDS 1998). UNCTAD (1998) suggests that almost half of Africa's land is unsuitable for direct rainfed cultivation because the growing period is too short, mainly due to aridity. In addition, there is a high risk of drought on 60 percent of African land.

The low productivity of African agriculture cannot be attributed exclusively to bad technology or bad geography—it also reflects unfavorable legacies, including policy failures

In discussing endowment effects, a distinction needs to be made between the direct effects of adverse endowments on agricultural development and their possible indirect effects as codeterminants of poor policies for agricultural and rural development.

Bloom and Sachs (1998) focus on the direct effects, discussing the consequences of Africa's climate, soils, topography, and disease ecology on agricultural productivity. In addition, they suggest that the isolation of African agriculture from major global markets renders it noncompetitive because, with a few exceptions, it is concentrated in the deep hinterlands and supported by a low-density, widely dispersed rural population. These factors retard agricultural development directly by increasing transportation costs, inhibiting technology adoption, raising the costs of agricultural and social services, and suppressing competitive product, factor, and credit markets (Hayami and Platteau 1997). The direct effects of adverse endowments, not just adverse policies, therefore explain many of the institutional and market failures holding agriculture back.

While there is little doubt that adverse endowments and physical conditions continue to be a negative factor in African agricultural development, it is not clear how important they are relative to adverse policies and institutions. As Udry (1998) points out, the low productivity of African agriculture cannot be attributed exclusively to bad technology or bad geography; it has clearly also been the result of policy failures. There is much evidence that farmers and rural nonfarm entrepreneurs respond to incentives (box 6.3). Conversely, there are many examples of well-endowed and well-connected regions and countries—Ghana, Guinea, Madagascar—whose performance has deteriorated rapidly as a consequence of worsening policies in the postcolonial period. Indeed, some of the areas with the strongest agricultural resource base are among the least developed on the continent—Angola, Central African Republic, Democratic Republic of Congo, Republic of Congo, Gabon, Guinea-Bissau, Liberia, Sierra Leone, and Sudan.

In many countries agricultural performance over the past 25 years has been inhibited by civil war and conflict (chapter 2). Sudan has huge potential, but its current phase of civil war has lasted 16 years, about

2.5 million people have lost their lives, and the country has the largest number of internally displaced people in the world—hardly an environment conducive to sustained agricultural growth. Conflict also continues in Angola, Burundi, Democratic Republic of Congo, and Somalia, and has recently occurred in Guinea-Bissau, Liberia, and Sierra Leone. The benefits to agriculture from a cessation of conflict have recently been illustrated by Mozambique (luckily the main agricultural production regions have not been widely affected by the recent massive flooding).

Countries that emerge from conflict can reap benefits for agriculture

Political Economy

A growing literature suggests that there are indirect causal links between low population density, remoteness from markets, and abundance of natural resources on the one hand, and conflict and adverse policies and institutions on the other (Brenner 1977; North 1989; Tilly 1990; Rueschemeyer, Stephens, and Stephens 1992; Collier and Binswanger 1999, chapter 2). Binswanger and Deininger (1997) summarize the key arguments for population density as follows:

- Low-density economies are subsistence-oriented, with little specialization.
- As a result few economic transactions can be taxed. Neither a profit

Box 6.3 Do African Farmers Respond to Price Incentives?

AFRICAN FARMERS, LIKE THEIR COUNTERPARTS ELSEwhere, respond significantly to both price and nonprice policy reforms. The level of this response has generally been found to be lower in the short than in the long run, for perennial than for annual crops, and for aggregate than for individual crop output (Bond 1983; Oyejide 1986; Tshibaka 1986; Binswanger 1989; Elamin and Mak 1997). There is also a high degree of complementarity between pricing policies and investments in public goods (Schiff and Montenegro 1997).

This relationship suggests that the removal of price distortions (due to both direct and indirect government interventions) through macroeconomic and sector policy reforms will have only a limited impact on farmers' supply response if market infrastructure, institutions, and support services are undeveloped (Kwanashie, Ajilima, and Garba 1998; Elamin and Mak 1997; Tshibaka 1997; Killick 1990; Oyejide 1990; Binswanger 1989). In these situations transactions costs will be high and farmers are at a double disadvantage because of high input costs and low output prices. Similarly, the removal of structural and institutional constraints alone will have only a limited impact on farmers' response if price distortions remain significant. Thus African farmers do respond. But they also face both price and nonprice constraints.

nor an income tax can be used. Land has little or no value and cannot be a tax base.

- Extraction of a surplus therefore has to be based on one or more of the following: coercion through slavery, servitude, or tribute; head or hut taxes to force the local population to supply cheap labor to large estates of the ruling elite or in mines and public works; discriminatory interventions in product and factor markets—whether limitations on economic opportunities, restrictions on spatial or occupational mobility, or overt discrimination; and taxation of export commodities by the state, parastatal bodies, or monopolies (see box 6.1).
- All these policies and institutions for extracting an economic surplus undermine the incentives of the poor to produce and invest—and so have a much higher deadweight loss than modern forms of taxation.

Rural public investment has typically been low, and subsidies have usually benefited large farmers and other members of the rural elite

Throughout history and across continents, a mix of such policies was often used in low-density areas. Clearly, it is not simply low population density that significantly retards agricultural development. Rather, it is the inability of sparse agricultural populations to organize themselves to have political voice.

The negative effects of heavy taxation and extraction on agricultural growth could also have been mitigated if the ruling elite set taxes low enough and invested some of the surplus in rural public services and infrastructure. Indeed, East Asia provides some 20th century examples of relatively high extraction from rural areas. But this extraction was combined with substantial public investment in smallholder agricultural and rural development (Karshenas 1998).

In Africa rural public investment has typically been low, and subsidies for fertilizer and credit have usually benefited large farmers and other members of the rural elite. The persistence of these policies is the result of the much greater capacity of the rural and especially the urban elite to organize relative to small farmers. The elite are therefore able to control policies, institutions, and the distribution of public resources. As noted, lack of open political systems and of well-articulated, competitive institutions in civil society have characterized these systems (chapter 2).

If policies and institutions are endogenous, and if a particular configuration of resource endowments—such as low population density and high mineral wealth—is an adverse codeterminant of policies, how can poor policies and institutions be corrected? The power of external actors is real but limited, as shown by the increasing evidence on the effect of conditions tied to external loans and grants. Conditionality has only been

effective in bringing about lasting reform when there has been a strong domestic movement for change (World Bank 1998).

Over time increasing population density and market access, and the associated increase in economic specialization and growth, could help improve policies. But that would be a painfully slow evolution. Surely no one would advocate increasing Africa's population growth to get there faster. Instead the focus will have to be on helping poor rural populations organize themselves more effectively through education, training, and direct support to their economic and social organizations, and allowing them to build coalitions with internal and external allies that support policy and institutional change. Such an approach can only succeed if political systems become more open and competitive, and if there is freedom to organize for economic, social, and political purposes.

Macroeconomic and agricultural reforms have begun to make agriculture more competitive

Thus African agricultural growth requires more than just reforming policies and institutions and increasing rural public investment. It also requires developing open political systems in which organizations of the poor can thrive and creating political coalitions that help improve policies and keep in place the gains already achieved (chapter 2*)*.

Assessing the Impact of Agricultural Policy Reforms

DESPITE ADVERSE RESOURCE ENDOWMENTS, IN RECENT YEARS macroeconomic and agricultural reforms have begun to improve the competitiveness of the sector, though the effect on capitalization of agriculture and rural areas has been limited (chapter 1). The analysis in this section covers factors influencing the incentives facing agriculture (recent macroeconomic and pricing reforms as well as the evolution of real prices for commodity exports) and a range of reforms in other areas influencing agricultural supply (transactions costs, entry barriers, investment and agricultural technology).

Macroeconomic Policy Has Improved, but New Challenges Have Emerged

The exchange rate overvaluations of the 1970s and 1980s have been reduced, and inflation and budget deficits have been lowered. Trade

policies still raise import prices (chapter 7), but the antiexport bias has been eased. But while macroeconomic stability has generally improved, in many countries it remains fragile. Financial sectors, a key area for improvement, need development (chapter 5). And institutions and rules are weaker than in other regions, diminishing investor confidence (Brunetti, Kinsunko, and Weder 1998).

Reforms have focused on improving agricultural incentives by reducing domestic market distortions

Further, in some countries there is still a danger that short-term capital inflows triggered by high interest rates could lead to exchange rate overvaluation (Elbadawi 1998; Asea and Rinehart 1995). To keep price incentives stable, despite current low capital inflows, African governments need to develop suitable approaches to global financial markets and consider the capital account effects of domestic fiscal and monetary policies.

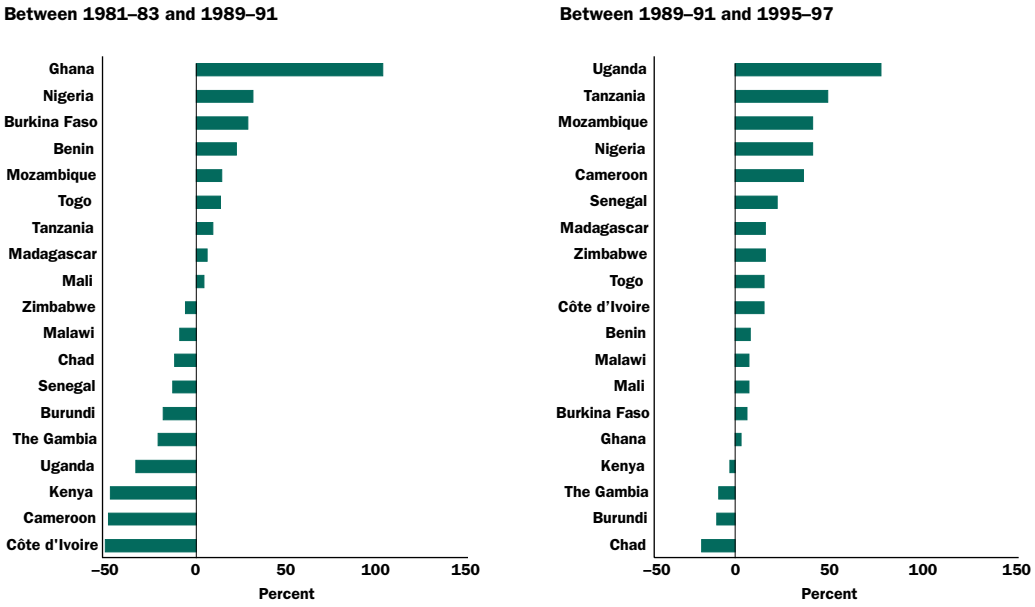
Export Crop Policy Has Improved, but Reforms Need to Be Consolidated

Africa's agricultural reforms over the past decade have focused on improving agricultural incentives by reducing domestic market distortions through open trade policies. Emphasis has been placed on moving domestic prices to border parity levels and reducing overvalued exchange rates (Meerman 1997). As a result price incentives for export crops have generally improved.

Between 1990 and 1997 real domestic producer prices for agricultural exports increased in 15 of 19 African countries; in the 1980s only 9 of these countries experienced price increases (figure 6.3).[6] This favorable trend is due to both higher world prices and better policies (Townsend 1999). In the 1980s real world commodity prices declined significantly. While world prices were falling, macroeconomic policies improved considerably, with sharp declines in overvalued exchange rates. But in many countries this barely offset the large declines in world prices. Over the same period the nominal protection coefficient for agriculture barely changed, indicating that changes in sector policies did little to raise farm-level prices.

The situation changed in the 1990s. Real world commodity prices were more favorable in 1990–97, and sector policies contributed to higher domestic prices. Macroeconomic policies continued to improve, though these changes were less dramatic than in the 1980s because the space for further improvement was limited. Even so, the changes improved price

Figure 6.3 Changes in Real Producer Prices of African Agricultural Exports, 1981–97



Source: World Bank 1994; Townsend 1999.

incentives. For the 15 countries experiencing real producer price increases in 1990–97 (see figure 6.3), the increase due to real exchange rate devaluation was more than twice the increase due to improvements in domestic policy. The decline in real domestic prices in Burundi, Chad, The Gambia, and Kenya is explained by the large decline in the producer's share of the border price—suggesting that sector policies were the main cause of the price declines. Indeed, in a few countries agricultural policies have continued to erode the price benefits from higher world prices and inhibited the pass-through of exchange rate depreciations to producer prices. So for some countries, even basic agricultural policy reforms are not yet complete. Real world prices became less favorable in the later half of the 1990s, declining from 1996–97 onward. [7]

Marketing boards and price stabilization funds (*Caisse de Stabilization)* were common export crop interventions across Africa, with the state controlling pricing, distribution, and marketing. Marketing boards typically set fixed prices that applied throughout the year in all growing areas, and controlled the physical handling of crops. Under the Caisse system, common in West Africa, prices were determined administratively—with purchasing and selling prices set at each stage of internal commercialization

(as with cocoa in Côte d'Ivoire). Most of these state interventions have been or (as with cocoa) are being removed.

West Africa's cotton sector continues to be controlled by cotton parastatals (Pursell and Diop 1998). Under this scheme a single producer price for seed cotton is established each year before planting, and the guaranteed price applies throughout the year in all growing areas.[8] Although prices have been more stable, the benefits have been outweighed by the low share of the border price that farmers receive. These countries did not fare as well as other African countries in terms of real producer price increases between 1990 and 1997 (see figure 6.3).

Active support may be required to encourage producer organizations or private firms to enter output and input markets

Wide adoption of market liberalization policies was fueled by the idea that the private sector performs marketing functions more efficiently and competitively than the state. While there have been successes of private entry into markets after marketing boards have withdrawn (as with coffee in Uganda and cotton in Zimbabwe), in some countries the liberalization of domestic markets has not yet lowered the transactions costs involved in marketing export commodities (UNCTAD 1998). Privatization has reduced the role of marketing boards, but it has often not yet managed to improve marketing arrangements for inputs and products, provide access to credit and storage, and increase competition. This suggests that reforms need to be further consolidated, keeping in place gains already made. In some cases collateral reforms needed to facilitate private entry may not have been completed. In other cases active support may be required to encourage producer organizations or private firms to enter output and input markets.

Real Prices for Commodity Exports Are on a Secular Decline

Between 1990 and 1997 several export crops—coffee, rubber, cocoa, groundnuts—experienced large world price increases that converted into more favorable terms of trade for many African countries. This was a welcome upturn after significant price drops in the 1970s and 1980s. But in the last few years many of these favorable cyclical (short-term) trends fell to the downturn of the world market.

The declines hurt African economies, whose agricultural exports continue to be dominated by a few crops. (Since the 1970s nine crops have accounted for about 70 percent of agricultural exports.) Moreover, secular (long-term) price trends toward lower prices for traditional African export crops appear firmly set in place. This suggests that Africa needs

both to diversify and to produce agricultural commodities at lower cost—using new technologies—if its position in world markets is not to erode further.

In sum: macroeconomic reform and liberalization of export crop sectors began only in the mid-1980s, and in some places was fairly notional until the early 1990s. In most cases real world export prices for agriculture fell from the mid-1980s to the early 1990s, rose from the early 1990s to 1997, and fell sharply thereafter. A few generalizations can be made:

Africa needs to diversify and to produce agricultural commodities at lower cost if its position in world markets is not to erode further

- Where true export liberalization and macroeconomic reform occurred together in the mid-1980s, export crop incentives were favorable despite falling world prices.
- Where true export crop liberalization did not occur, price incentives remained poor.
- Where governments went backward on macroeconomic reform in the first half of the 1990s, exports started to slow down despite improving world prices.

Further Reductions in Food Costs Require Fewer Market Entry Barriers

State intervention in Africa's food markets has been sharply reduced. Marketing boards have been dismantled, and in most countries market forces now determine prices. East and Southern African governments have generally intervened more in food markets than their West African counterparts, with several countries continuing to set floor prices (Malawi) or ceiling prices on foods (maize meal in Zimbabwe). Food security concerns, still high on the agenda of many African governments, are usually the reason for continuing intervention in these markets. There are high risks of drought, and many domestic food staples (millet, cassava, plantains, sorghum, yams, white maize) are nontradable at current prices and transfer costs (Delgado 1992).

Several factors led to initial market reforms in East and Southern Africa. Grain marketing board costs had escalated to unsustainable levels. The system of input delivery and crop payments had become increasingly unreliable. Parallel markets had developed due to pan-territorial pricing. Increased instability in marketing board purchases and sales added to fiscal demands. And smallholders had limited market access (Jayne and Jones 1997). The common reform package for marketing maize, a dominant

staple, included moving farmgate prices toward export or import parity, announcing administered prices closer to the planting times of crops on farms, speeding up payments to farmers, eventually liberalizing prices altogether, relaxing maize movement controls and other restrictions on trade, and restructuring parastatal maize marketing companies (Donovan 1996).

The greatest beneficiaries of food crop reforms appear to have been consumers—with smaller marketing margins and lower food costs

The reforms have had observable impacts, the most apparent being a reduction in the huge fiscal costs incurred by marketing boards. Another impact is a reduction in the cost of marketing food to grain-deficit rural areas, primarily by expanding small trading and milling networks to fulfill the residual grain needs of rural households (Jayne and Jones 1997). In many countries (Kenya, Mali, Zambia, Zimbabwe) opening grain markets to private traders has increased competition and lowered costs in food marketing and processing, reducing marketing margins and food prices (Jayne and others 1995). But some mobility barriers—such as access to capital, energy, and spare parts, as well as political risk—continue to constrain trader entry into market niches (Barrett 1997). The greatest beneficiaries of these reforms appear to have been consumers—with substantially lower food costs.

With the reduction of state production subsidies, producer prices have fallen for many food crops (UNCTAD 1998). Lower producer prices, higher fertilizer prices, the focus on export crop promotion, and the removal of marketing boards have raised considerable debate on food security. Studies on a range of countries (Kenya, Mali, Mozambique, Senegal, Zimbabwe) have demonstrated synergies between cash crop investment and food crop production (Strasberg and others 1999). Still, ensuring an increase in the level and reliability of food staples supplied will require improving food production policies (for example, raising productivity) in some countries and lowering the costs and risks of importing (for example, by lowering transportation and other marketing costs) in others (Delgado 1992).

Fertilizer Policy Reforms: A Mixed Bag

Fertilizer application rates in Africa remain low—on average, one-fifth the rates in Latin America and one-twelfth the level in Asia (see table 6.1). Much of this difference is due to the dominance of rainfed agriculture and the characteristics of the land in Africa (Voortman, Sonneveld, and Keyzer 1998). This average application rate masks great contrasts in fertilizer use across countries, with some (Mauritius, Swaziland, commer-

cial agriculture in South Africa and Zimbabwe) applying fertilizer at the same rate as other developing or even developed regions.

In the late 1970s and early 1980s almost all countries in the region adopted fertilizer subsidies, distorting prices and leading to an unreliable, high-cost marketing and distribution system with a limited choice of basic fertilizers (Lele, Chistiansen, and Kadiresan 1989).[9] Most of the gains from these subsidies went to better-off farmers and intermediaries. Fertilizer reforms began in the 1980s with the removal of these subsidies in nearly all African countries. This, together with currency devaluations and world price increases, caused fertilizer prices to rise, sometimes by 200–300 percent. These high costs have led several countries to backslide on previous reforms, reintroducing fertilizer subsidies.

The mechanisms used to deliver fertilizer aid inhibit the development of sustainable private supply systems for agricultural inputs

A key issue in the reform process, one that is not always considered, is the sequencing of subsidy removal. Eliminating subsidies at the same time as major macroeconomic reforms (such as currency devaluation) will exacerbate fertilizer price increases and inhibit the entry of the private sector to fulfill the role of parastatals. Alternatively, removing subsidies at the same time as a reduction in fertilizer import duties would mitigate some of the price increases from subsidy removals.

The private sector has responded weakly to fertilizer market liberalization. A few large private firms dominate the market. Trade restrictions are still widespread, with tariff and nontariff barriers. Some countries impose restrictions on the types of fertilizer that can be imported, along with stringent clearance requirements for imports and specifications for who can import (Gisselquist 1994). Many countries also rely almost exclusively on fertilizer aid to meet their domestic requirements, causing uncertainties in supply, limiting product choice, and disrupting domestic fertilizer markets. In addition, the mechanisms used to deliver fertilizer aid inhibit the development of sustainable private supply systems for agricultural inputs (box 6.4).

Exploiting the Synergy between Price and Nonprice Factors

RECENT REFORMS HAVE IMPROVED AGRICULTURAL PRICE INCENTIVES. But they have not done as well at addressing other structural and institutional constraints, including rural infrastructure (irrigation,

Box 6.4 The 2KR Aid Program

Japanese Grant Aid for the Increase of Food Production, also known as the 2KR aid program, provides grant aid tied to the purchase of fertilizer, machinery, and chemicals. In 1996 the 2KR program provided 58 countries with these inputs. Twenty-six African countries received this aid, accounting for about 40 percent of the annual 2KR budget of $260 million. The process of supplying inputs under the program is similar to programs of other donors. Formal requests are made to the government of the donor country, discussions are held to assess the merits of the request and the ability of the donor country to supply the goods, the donor opens a restricted tender for the requested goods, an award is made to the lowest bidder, and counterpart funds are deposited by the recipient country into a designated domestic account upon sale of the goods. The 2KR program has been a significant source of agricultural inputs for the poorest African countries, but several concerns have been raised.

The procurement process has often resulted in a disconnect between the inputs acquired under the program (for example, the types of fertilizer, machinery, and chemicals) and the inputs needed by recipient countries. Inputs acquired through the program typically arrive too late for effective use. Recipient country governments usually distort the domestic markets for inputs received under the program, inhibiting private sector involvement in input (particularly fertilizer) importation, distribution, and storage. In particular, 2KR fertilizers have not been well integrated with the domestic market, being distributed through government channels with the exclusion of the private sector.

Competition in 2KR tendering and procurement is limited. Restrictions on who can participate in the program were most prevalent in the 1980s, when aid was tied exclusively to Japanese products procured through Japanese trading companies. Even today the tendering process appears to be insufficiently competitive, as indicated by the high price of 2KR inputs relative to the cost in competitive markets. Some countries even have difficulties setting up counterpart funds, which vary between one-half and two-thirds of the value of the aid (depending on recipient country conditions). Where these funds have been set up, they have often been used counterproductively.

Changes to the program must ensure the emergence of strong private networks for input delivery and should offer greater transparency and consistency as well as faster delivery.

Source: Tobin 1996; Adachi and Townsend 1998.

roads, power, telecommunications), agricultural research and extension, and farmer education and health—factors that impede agricultural productivity and output (Binswanger 1989). Removing these impediments would require substantial increases in both public and private investments in rural areas. Not only is there a direct effect of public investments, there is also complementarity between public and private investments.

Public Investments in Agriculture: Too Few and Too Inefficient

Data on public spending and investment in African agriculture are hard to come by, but the available evidence suggests that since the 1960s the level of public resources allocated to agriculture has been consistently

low relative to the sector's size and contribution to the economy. In most African countries the sector receives less than 10 percent of public (recurrent and investment) spending but accounts for 30–80 percent of gross domestic output.

Moreover, the direct and indirect transfers of income from agriculture to government and the rest of the economy have been larger than the public resources allocated to the sector. Inadequate public resources have constrained the development of rural public goods (infrastructure, institutions, human capital, support services) and the ability of the private sector to develop. In turn, these policies have stifled economic development by forfeiting the strong linkage effects of high agricultural growth on the rest of the economy.

Spending on agricultural research has a potentially high payoff in Africa

Moreover, where public investments in African agriculture have been high, as in a number of countries in the postcolonial period, they have often been misallocated. Or the recurrent budgets to maintain these investments have been low (box 6.5)

African countries that have maintained strong price incentives and developed rural public capital goods and services have enjoyed faster growth—price and nonprice incentives are complementary (see box 6.3). That makes it imperative for policymakers to enhance the price incentives facing farmers and other economic agents in agricultural activities. Policymakers also have to promote rural public goods and services and stimulate private agricultural investments.

Despite High Returns, Research and Extension Remain a Low Priority

We know a little more about public spending on agricultural research, for which donors have typically contributed about 40 percent of the funds (Pardey, Roseboom, and Beintema 1997). These investments have a potentially high payoff in Africa: a recent study finds a median internal rate of return on research spending of 37 percent (table 6.2). But after increasing from $256 million in 1961 to $701 million in 1981, agricultural research spending in Africa dropped to $684 million in 1991.

The consistently high returns achieved in research stations and demonstration plots suggest that such research could contribute greatly to agricultural growth and development. Research continues by international and national agricultural research stations, though with shrinking budgets. But many constraints, including those discussed above, prevent farmers from adopting and internalizing these technologies.

Box 6.5 Problems with Public Investment in African Agriculture

Low public investment in Nigeria. The size and structure of public spending on agriculture have been grossly inadequate in Nigeria, with weak government commitment to agricultural funding worsening after structural adjustment. The share of agriculture in government spending was 1.9 percent during the boom period (1972–80), 3.0 percent during the crisis period (1981–87), and 1.1 percent after structural adjustment (1988–92) (Olomola 1998). Agriculture accounts for about 30 percent of GDP.

Misallocation of public investment in Senegal. An analysis of 79 agricultural projects and programs implemented in Senegal in 1990–95, costing about 3 percent of GDP, provides a good illustration. About 75 percent of the resources were allocated to crops, 15 percent to forests and other natural resources, 6 percent to fisheries, and 3 percent to livestock. For crops the overwhelming share went to irrigated rice. Factors such as agroecological potential, natural constraints, infrastructure development, human resources, institutions, demographics, and an area's contribution to GDP do not seem to have been considered in the regional allocation of public resources—the case in most of Africa.

Maintenance failures in Chad, Ghana, and Senegal. Africa's capital investments are often not matched by adequate recurrent budgets, limiting the maintenance and management of these public goods. Examples abound for roads, irrigation infrastructure, and other public structures. Even where significant investments developed public agricultural capital goods, governments have often not provided resources to maintain them and achieve high standards of management and use.

Irrigation infrastructure suffering from poor management and use is so widespread that it deserves mention. In Ghana, of 18,000 hectares developed, only 33 percent is cultivated; the rest requires rehabilitation to be effectively cropped. In Chad, of 12,000 hectares developed, only 25 percent is used effectively. In Senegal, where large investments were made to develop irrigation infrastructure in the north, the experience is the same.

Why do most African governments put such a low priority on investments in such a key sector? Simple benefit-cost analyses often grossly underestimate the benefits of rural investments, particularly in rural infrastructure (Lipton 1987). For example, rate of return calculations for building new roads usually ignore both the multipliers and upsurge of economic activity that come from resource movement following new road development. But even when there is ample evidence of high returns, as in agricultural research, government commitment is hard to obtain. Political economy issues are a major determinant of government spending—widely dispersed smallholders have a hard time organizing themselves for economic, social, and political purposes. Given the tight budget constraints facing most African governments, expenditures that are not defended by a well-organized constituency will likely be squeezed out, no matter what is known about high returns.

Better Policies Have Stimulated Agricultural Growth

Agriculture has become more competitive as better policies have improved incentives. But it remains undercapitalized. In 1990–97, 25 countries had real agricultural GDP growth rates over 2 percent, with 12 over 4 percent (Benin, Cameroon, Chad, Guinea, Guinea-Bissau, Equatorial Guinea, Lesotho, Malawi, Mauritania, Mozambique, Namibia, Togo).[10] In 1993–97 five more countries joined this group (Côte d'Ivoire, Ethiopia, Mali, South Africa, Zimbabwe). This is a big

Table 6.2 Internal Rates of Return on Agricultural Research and Extension Spending by Region

	Applied research		*Extension*	
Region	*Number of studies reviewed*	*Median return (percent)*	*Number of studies reviewed*	*Median return (percent)*
Africa	44	37	10	27
Asia	120	67	21	47
Latin America	80	47	23	46
OECD	146	40	19	50

Source: Evenson forthcoming.

There is still much to be gained from yield improvements in every African country

improvement over the 1980s, when only three countries (Benin, Guinea-Bissau, Togo) had annual agricultural growth rates exceeding 4 percent.

Though Still Low, Land Productivity Is Rising

Between 1980 and 1995 cereal production increased by 3.4 percent a year, mostly from area expansion. Cereal yields improved in 24 countries, and 9 countries had growth of more than 2 percent a year (Benin, Burkina Faso, Cameroon, Central African Republic, Ghana, Guinea, Guinea-Bissau, Mauritania, Mauritius). But there is still much to be gained from yield improvements in every African country. Continuing growth through area expansion is possible in only a few countries, because institutional and economic constraints generally limit access to land.

Labor Productivity Has Increased, Particularly in West Africa

In 19 of 31 African countries agricultural value added per worker increased between 1979–81 and 1995–97 (World Bank 1999c). Agricultural labor productivity in West Africa showed a particularly strong improvement after 1983 (UNCTAD 1998). The use of bovine animal traction has spread in the cotton-maize zones of West Africa, in northern Benin (Brüntrup 1997) and Mali in particular. This was in response to the need for a power source for the profitable cotton-maize technologies being extended. For Africa as a whole there was a dramatic decline in agricultural labor productivity in 1975–84, then a temporary improvement in the mid-1980s followed by fluctuating but generally stagnant levels (UNCTAD 1998).

Export Shares of Several Crops Have Grown, and Diversification Is Starting

Policies clearly matter, even where there are serious physical constraints

Since 1970 Africa has suffered losses in its world market share for agricultural exports—55 percentage points for groundnuts, 27 points for cocoa, and 14 points for coffee (see figure 6.1). But recent trends have been more favorable (table 6.3). The export shares for five of the region's nine main crops (bananas, cotton, sugar, tea, tobacco) rose between 1980–89 and 1990–97, though some increases were small. In addition, many countries in East and Southern Africa (Kenya, Tanzania, Zambia, Zimbabwe) as well as in West Africa (Burkina Faso) have expanded into nontraditional export crops such as horticulture and floriculture.

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POLICIES CLEARLY MATTER, EVEN WHERE THERE ARE SERIOUS PHYSical constraints. That policies in Africa were poor for several centuries suggests huge unrealized opportunities for further growth in agriculture. Even limited and incomplete improvements have had significant effects. Yet many countries have not completed policy and institutional reforms or are experiencing second-generation problems

Table 6.3 Africa's Share of and Change in World Trade for Its Main Export Crops, 1970–97 (percent)

	Share			
Crop	*1970–79*	*1980–89*	*1990–97*	*Annual change, 1970–97*
Bananas	6	3	4	–3.3
Cocoa	59	45	40	–2.0
Coffee	28	22	14	–3.1
Cotton	13	11	12	–0.2
Groundnuts	40	8	5	–10.2
Rubber	6	6	5	–0.5
Sugar	6	6	8	–0.2
Tea	15	15	19	1.3
Tobacco	8	9	12	1.7

Source: FAOSTAT 2000.

associated with the implementation of policy reforms. Private agents have not sufficiently entered input, output, and rural financial markets, and market development and competition remain low. Tariff and nontariff barriers to agricultural and agroindustrial trade continue to be high, and access to OECD markets is still limited. Public spending in rural areas remains inadequate. The privatization of agricultural parastatals is well advanced, but the decentralization of public agricultural and rural development services is proceeding slowly in most countries, with fiscal decentralization still lagging badly.

This section elaborates on key elements of the proposed agenda to capitalize African agriculture, increase its competitiveness, and harness the potential of agricultural growth and rural development. The agenda and business plan must address three key questions: What are the best ways to capitalize agriculture and the rural sector? Where can resources be found to do this? And how can the use of these resources be made more efficient?

Some of the proposed measures consolidate and expand the traditional domestic reform agenda. Others deal with emerging national, regional, and global developments. Many can be undertaken by African countries on their own. Others will have to be taken by their development partners, or in association with them.

All stakeholders need to take part in developing the vision for rural development and agricultural transformation

All stakeholders need to take part in developing the vision for rural development and agricultural transformation and the broad outlines of the business plan. Roles for the public and private sectors and priorities for public action need to be further clarified through a consultative process. The need for consultation and for dealing with development constraints outside agriculture that could have profound impacts on the sector has been vividly emphasized by the Organization of African Unity in a recent position paper on food security and agricultural development (OAU 1996). The OAU states that the actions to be taken for implementation of this position must "ensure the participation of all segments of society in civil life through participatory and stable political institutions" and "mobilize national, regional and international initiatives to prevent conflicts and to resolve emergency crises" (p. 5). The OAU also suggests that to accelerate agricultural and rural development, the objectives must be "(a) to expand the effective participation of farmers and producers in the agricultural and rural development process; (b) to improve self-reliant food security throughout rural areas through increasing rural incomes; and (c) to promote and facilitate broad-based

and more self-reliant rural development, including improvements in infrastructure, better marketing arrangements, access to improved technologies and supporting services and inputs, and more secure land tenure arrangements" (p. 14).

Any business plan for agricultural and rural development must address complex issues. How to strike the appropriate balance between a central vision and detailed, decentralized implementation? How to strengthen capacity and institutions? How to ensure that macroeconomic and agricultural policies do not work at cross-purposes and to devise the appropriate sequencing of reforms? How to implement and finance the plan, dividing responsibilities among development partners (public sector, private sector, producers, and donors)? How to allocate resources within and among sectors and regions, between production types (upstream and downstream), and between economic agents?

Huge investments will be required to accelerate agricultural growth and rural development

Moreover, implementation of a business plan should be continuously monitored and evaluated, and adjusted based on the findings. The assessment should analyze the plan's impact on three sets of impact indicators: agricultural performance (production, productivity, costs, competitiveness, diversification, vertical integration), welfare (food security, nutritional status, poverty reduction, food consumption, consumption of nonfood products, education, health), and sustainability of natural resources (preservation of farmlands, forests, and water). For a recent example of a comprehensive national strategy, consider the development of a framework to modernize agriculture in Uganda (box 6.6).

Huge Investments Are Needed to Capitalize Agriculture

Huge investments will be required to accelerate agricultural growth and rural development. Both the private and public sectors will have to make on-farm, agroindustrial, and infrastructure investments as well as investments in agricultural research, extension, and education (Thirtle, Hadley, and Townsend 1995; Vyas and Casley 1988).[11] Women must be assured access to productive assets and services if the growth potential of these investments is to be realized (box 6.7). On-farm investments include agricultural inputs, livestock, tree capital, soil improvements, irrigation, farm machinery, housing, and human capital. Agroindustrial investments are required for plants, equipment, skills, operating systems, and market development.

Investments will also be required to reverse natural resource and environmental degradation. Agricultural land is becoming extensively degraded, and desertification is on the rise. Soils are continuously being decapitalized. Insufficient investment in soil improvement has led to excessive nutrient extraction through crop production (Scherr 1999). Since World War II degraded soils have caused a 25 percent drop in Africa's cropland productivity (Oldeman 1998). In many countries overgrazing has led to a decline in rangeland quality (Cleaver and Schreiber 1994). In addition, water resources are being depleted and degraded while deforestation continues unabated—with two-thirds of Africa's wildlife habitat already lost (Scheer 1999; Drenge 1990; Sharma and others 1996; World Bank 1996).

Investments will also be required to reverse natural resource and environmental degradation

Why are these phenomena occurring? Many blame Africa's rapid population growth, combined with the slow adoption of more environmen-

Box 6.6 Developing Uganda's Framework for Modernizing Agriculture

UGANDA IS DEVELOPING A SECTORWIDE FRAMEWORK to modernize agriculture. The process has involved workshops held throughout the country to hear from all stakeholders: government ministers, members of parliament, government officials, farmer organizations, training institutions, and district officials. In implementing the plan, the government will:

- Make poverty eradication the overriding objective of agricultural development.
- Transform smallholder farmers from subsistence to producing for the market.
- Reduce public sector activities to the extent possible, and support private sector development in all commercial activities.
- Deepen decentralization of public service provision.
- Support the spread of profound technological change throughout agriculture.
- Address food security issues through trade rather than self-sufficiency.
- Give priority to agriculture as the engine for economic growth and poverty reduction.
- Improve access to productive assets for women and youth and empower them to undertake income-generating economic activities.

The plan for modernizing agriculture has been set within the government's medium-term economic policy framework, which aims at maintaining macroeconomic stability with low inflation, rapid and broadly based economic growth, and a viable external balance of payments. This should lengthen planning horizons for savers and investors, create a climate of trust and enthusiasm in the private business sector, and protect the poor against real income losses that would otherwise result from inflation.

The explicit framework identifies priority actions for the public and private sectors and maps out a five-year plan within the overall macroeconomic framework. A joint product of the Ministry of Agriculture, Animal Industry, and Fisheries and the Ministry of Finance, Planning, and Economic Development, the document not only provides Uganda with a framework for action, it also serves as a useful tool for coordinating donor activities.

Source: Government of the Republic of Uganda 1998.

Box 6.7 Ensuring Gender Equality in Access to Productive Assets and Services

WOMEN PLAY A BIG ROLE IN AFRICA'S AGRICULTURAL production, performing 90 percent of the work of processing food crops and providing household water and fuelwood, 80 percent of the work of food storage and transport from farm to village, 90 percent of the work of hoeing and weeding, and 60 percent of the work of harvesting and marketing (Quisumbing and others 1995). Despite their importance in agricultural production, women face disadvantages in accessing land and financial, research, extension, education, and health services. This lack of access has inhibited opportunities for agricultural investment, growth, and income (chapter 1).

For example, giving women farmers the same agricultural inputs and education as men could increase women's yields by more than 20 percent in Kenya (Saito, Mekonnen, and Spurling 1994). And if Zambian women enjoyed the same level of capital investment in agricultural inputs, including land, as their male counterparts, output could increase by 15 percent (Saito 1992).

Thus more must be done to ensure gender equality in access to productive assets and services. Efforts could include providing clean, accessible water to reduce the time burden of domestic work, investing in girls' education, ensuring gender-neutral land policy and legislation, and building women's skills and capabilities to reduce their "political deficit."

Source: Blackden and Bhanu 1999.

tally friendly technologies and farming practices. The resulting degradation of soils constrains agricultural growth. Lagging agricultural growth perpetuates rural poverty and food insecurity, impeding the onset of the demographic transition to lower fertility rates (Cleaver and Schreiber 1994, p. 198).

Why aren't farmers adopting new technologies and investing in their soils? Why are the normal intensification processes described by Boserup (1965) and Ruthenberg (1980) not occurring, or not occurring fast enough? Farmers will only make these investments and adopt more productive and environmentally benign farming technologies and practices if it is profitable to do so. The central thesis of this chapter is that poor policies and institutional failures have undermined this required profitability. Under favorable policies and institutions, farmers protect natural resources—Kenya's Machakos district is a well-documented example (Monitimore and Tiffen 1994).

In addition to removing poor agricultural and macroeconomic policies, higher profitability will require increasing investments in notoriously weak transportation and communications infrastructure, as well as in food storage and processing facilities. Farmers will have more incentives to invest if input markets are made more efficient, property rights are strengthened (including formal and informal land tenure arrange-

ments; box 6.8), and investments are made in their education and health and in agricultural research and extension (Crosson and Anderson 1995).

HIV/AIDS presents another significant challenge for African agriculture (chapter 4). The disease not only affects the rural population (primarily through increased deaths, lower labor productivity, and higher dependency ratios) but also the trained human capital needed to plan, design, and implement the business plan for agriculture and rural development. This makes the need for action against AIDS all the more urgent (World Bank 1999b).

Box 6.8 Do Indigenous Land Rights Constrain Agricultural Investment and Productivity?

MOST AFRICAN FARMERS STILL HOLD THEIR LAND UNder indigenous, customary, or communal land tenure systems (not to be confused with open access systems or collective farming). In the past these land tenure systems were alleged to provide insufficient tenure security to induce farmers to make necessary investments in land (World Bank 1974; Harrison 1987). Thus it was thought that the systems contribute to land degradation. But research has shown that such systems tend to allocate secure, inheritable land use rights to families and individuals.

Evidence from rainfed cropping areas suggests that indigenous tenure systems have been flexible and responsive to changing economic circumstances (Place and Hazell 1993; Bruce and Migot-Adholla 1994). Where population pressure and commercialization have increased, indigenous systems have evolved from a system of communal property rights toward one of individualized rights (Migot-Adholla and others 1991).

Individualized rights secured by formal title make farmers more creditworthy and so enhance their chances of receiving credit from formal institutions. So why not short-cut the process and replace customary tenure with freehold tenure, combined with large-scale land registration programs providing title to individual holdings? One reason is that modern land administration using formal title is costly to set up and maintain. Moreover, titling does not always result in secure tenure (depending on the quality of the title and respect for law), because national legislation for tenure reform has limited capacity to change behavior where indigenous values on land persist (Bruce, Migot-Adholla, and Atherton 1994).

Migot-Adholla and others (1991) highlight some circumstances where titling may be worthwhile:

- Where indigenous tenure systems are absent or weak. This is often the case in land settlement areas, but it can also occur after major economic or political upheaval, particularly if traditional lines of authority have been severed.
- Where land disputes are common. This may occur in areas where large numbers of migrants have laid claim to land owned by indigenous groups.
- Where major project interventions are planned that require full privatization of land rights for their success or are likely to weaken the land rights of vulnerable groups. Some irrigation and tree crop projects provide good examples.
- Where population growth and market access have led to an intensification of the farming system, to an individualization of communal tenure, and to high demand for credit from existing credit institutions that could be supported through land title (for example, periurban agriculture).

Where Will Resources for These Investments Be Found?

Most of the needed investments will have to be financed from rural incomes

Foreign aid has declined, and most African countries are not considered creditworthy in international capital markets. Rural financial and credit markets are poorly developed and difficult to establish (box 6.9). Even if such markets were well developed, credit cannot finance the constant and prolonged stream of investment required to capitalize Africa's farmers.[12] And central governments all over Africa are overextended and have to concentrate on absolutely essential public services. Central and local governments already partly or fully finance many investments, including transport infrastructure, water supply, electrification and communications, agricultural research and services, and human capital. But as noted, these investments are insufficient. So, where will the additional resources come from? In addition to removing the urban bias in public investment, most will have to come from rural incomes. But development partners should also reverse declining aid levels.

Box 6.9 Poorly Developed Financial Systems and Limited Credit Systems

A WELL-FUNCTIONING RURAL FINANCIAL SYSTEM CAN help manage the savings and the liquidity constraints of agricultural households and of the wider rural economy. But even with successful financial sector reform, creating viable rural financial systems will take a long time in Africa. The difficulty is particularly severe in low-density areas that practice low-intensity rainfed agriculture and where market penetration is limited by high transport costs (Hayami and Platteau 1997). In such areas rural financial systems face high transactions costs and high seasonality in the supply of deposits and demand for credit, as well as covariant risks in their lending portfolios. This suggests that, even with good financial sector policies, the expansion of the formal financial system into rural areas will be concentrated in areas with high population density and high potential. (Chapter 5 provides more discussion on improving access to financial services such as savings and credit.)

In some areas with well-developed cash crops, a credit system, rather than a full financial system, can be supported by linking or interlocking the supply of inputs and the provision and recovery of credit to agricultural marketing (Dorward, Kydd, and Poulton 1998). Most well-performing formal and informal providers of credit in Africa (and many other developing countries) use this approach. These lenders enter a formal or informal contractual arrangement ensuring that they can recover the credit by subtracting it from the payment due to the farmer at the delivery of the harvest. Examples include the cotton parastatals in francophone African countries, contract farming systems in cotton, tea, and many other export commodities, farmer cooperatives in Kenya, tobacco auctioning systems in Malawi and Zimbabwe, and the credit recovery practices of many informal lenders. But such systems usually cannot be applied to food crops, where the farmer has many alternative ways to market the crop, and contract enforcement is difficult for anyone but the local informal lender.

Most resources will have to come from rural agricultural and agroindustrial incomes. Most investment will have to be financed from the savings of rural populations and entrepreneurs, from cost recovery for services, from taxes levied by decentralized local governments and the central government, and from foreign direct investment. When incentives are favorable, even poor farmers are eager to save (Morduch 1999). Most of these savings take place in the form of applying labor to in-kind investments in land improvements, small-scale irrigation and drainage, growing of tree and livestock capital, and building of housing, storage facilities, and other farm structures. In addition, small farmers will use financial savings opportunities if they are available in or close to their villages. Many of the world's well-functioning rural microfinance schemes mobilize far more savings than they provide in credit to their members.

The business plan to make agriculture and agroindustry more profitable must be pursued relentlessly

But farmers and other rural people will not be able to save, pay for services, or pay taxes to local and central governments unless they have high agricultural profits, wage incomes, or other incomes from rural nonfarm activities. Since rural nonfarm activities are driven largely by demands from agricultural enterprises and households, they will thrive only if agricultural incomes and profits are high. And domestic and foreign entrepreneurs will invest in agroindustrial enterprises only if the potential profit from such activities is high.

This is why the business plan to make agriculture and agroindustry more profitable must be pursued relentlessly—through further policy and institutional reforms in input and output markets and better access of agricultural and agroindustrial products to both African and OECD markets. Strengthening tenure security—under customary or modern forms of tenure—will also enhance agricultural investment and productivity (see box 6.8). Agriculture cannot be capitalized without getting tradable agriculture moving, and agricultural and agroindustrial growth cannot occur if producers are confined to narrow local or domestic markets. Only by exporting an increasingly diversified mix of raw and transformed products to cities, neighboring countries, and overseas can producers move beyond the low local demand for basic agricultural commodities.

Implicit taxation of agriculture should be reduced. Macroeconomic and trade policies should seek to reduce implicit taxation from currency overvaluations and high tariff and nontariff barriers to improve agricultural production and investment incentives. Despite reforms, import taxes are still high, levying an implicit tax on agricultural and agroindustrial exports

(Ng and Yeats 1996, 1998). The threat of higher tariffs is also present. Though actual tariffs are much lower, under Uruguay Round commitments most tariffs are bound at 50–100 percent (Ingco and Townsend 1998). This raises risks for investors.

Reducing the implicit taxation of agricultural commodities and the taxation of nonagricultural imports poses a fiscal dilemma because many African countries depend on these revenues. Agriculture remains the dominant sector in most African economies and so will have to continue to contribute to government revenues. The question is, how? The key principles when formulating agriculture taxes should be nondiscrimination, minimization of efficiency losses, effectiveness of fiscal capture, and capacity to implement (box 6.10).

Strategic public investments can crowd in private business

Public investments should stimulate public-private partnerships. Governments can increase private sector activity by providing public goods. Investments in roads (both quantity and quality) will benefit the private sector in all areas of agriculture (export crops, food crops, fertilizers) through better access and lower costs. Providing electricity to rural areas may encourage private millers and processors (Barrett 1997). Providing key market information (prices, volumes) will also encourage faster responses from the private sector (Badiane and others 1997).

Box 6.10 How Should Agriculture Be Taxed?

FOUR KEY PRINCIPLES SHOULD GUIDE AGRICULTURE TAXES.

Nondiscrimination. Agriculture taxes should not be higher than those for other sectors, and should be integrated with general value added, profit, income, and wealth taxes.

Minimization of efficiency losses. Output and input taxes should be minimized. Land taxes have been suggested as a way to minimize efficiency losses. Although such taxes do not exist in many African countries, agricultural land is growing in value and should gradually be included in real estate taxation. Land or real estate taxes should be assigned to local governments (in the context of decentralization). Only local governments have the detailed information on local land ownership and values needed for effective taxation, and only they have a strong incentive to collect the tax. Commodity export taxes can be replaced by consumption taxes (sales or value added taxes) in countries with sufficient administrative capacity.

Effectiveness of fiscal capture. Income and value added taxes are problematic because millions of small farmers do not have the accounting systems or capabilities to comply with reporting requirements. Land taxes require careful design and local government capacity building. Nevertheless, these forms of taxation will become more important.

Capacity to implement. In many African countries the capacity to implement these new systems will have to be built over many years, during which little revenue will be generated. It may therefore be necessary to continue to rely partly on commodity and input taxes for revenue generation. But tax rates should be lower than in the past.

The financing and implementation of many of these services can be enhanced by public-private partnerships involving central, regional, and local governments. Such partnerships should go beyond private individuals and corporations to include producer organizations, as in the case of agricultural services. They can use many mechanisms—ranging from the privatization of some services and investments (including some agricultural research and extension) to formal partnerships, delegation of execution, and contracting, with full or partial cost recovery.

Africa needs better access to OECD agricultural markets as well as development assistance

Development partners should increase aid and improve market access. Recent declines in donor assistance need to be reversed to provide resources for key investments. Given the importance of agriculture to African economies, the decline in research and extension, so central to the green revolution, is particularly disturbing. The decline has been fueled by four factors that suggest a fundamental misunderstanding of the importance of investing in agriculture (Delgado 1996). First, declining world cereal prices have created complacency about food availability. Second, large declines in real prices for Africa's agricultural commodities have cooled enthusiasm for agriculture-led growth strategies. Third, there is fatigue from the lack of a visible green revolution in Africa. Fourth, some think that extensive market reforms in many African countries will somehow solve the problems without further attention from public authorities. These perceptions are misguided. Moreover, aid needs to be provided in the form of program or budget support rather than as balkanized project intervention.

Development partners must also move beyond just providing aid—and improve the access of African countries to OECD markets. OECD and other developed countries have perpetuated trading arrangements that are particularly harmful to African countries, both for exports and imports. These barriers have huge costs (see box 6.2).

OECD countries could take a number of steps to improve market access:

- Vigorously pursuing agricultural reforms and reducing tariffs, nontariff barriers, and export subsidies.
- Reducing tariff escalation, which has seriously hampered vertical and horizontal integration of African agricultural export systems.
- Including agricultural and agroindustrial commodities in future preferential trade agreements with Southern and West Africa.
- Streamlining phytosanitary and sanitary requirements and refraining from their abuse as market barriers.

- Providing technical assistance to public and private sectors in Africa to improve their capacity to apply World Trade Organization regulations and phytosanitary requirements and to strengthen their negotiating skills. African countries must know their rights and defend themselves against external attack. Most African countries cannot afford to take action on unfair trade practices in the World Trade Organization because it is simply too costly. These costs need to be reduced.
- Encouraging foreign direct investment in agriculture and related activities to promote technology and knowledge transfers and make the sector more competitive.

Much attention has to be given to creating representative institutions and transparent financial and political accountability mechanisms

How Can Resources Be Used More Efficiently?

Public investment will continue to be crucial for agricultural and rural development. Poor service delivery and public investment in rural areas have been explained by the urban bias in public spending and by the excessive centralization of the government and parastatal entities responsible for their provision. Many countries (Ethiopia, Ghana, Guinea, Tanzania, Uganda, Zimbabwe) have reintroduced elected councils at local levels. But these local governments need larger budgets for effective decentralized rural service delivery and public investment. The deconcentration of administrative and implementation responsibilities has become a feature of many sector investment programs. But progress in decentralizing and devolving resources and responsibilities remains limited.

Decentralize resources and responsibilities. Improving the fiscal capacity of local governments will require a mix of instruments: the transfer of more elastic tax bases to these jurisdictions, the creation of revenue-sharing funds that transfer funds from better-off to poorer regions and local governments, and the use of cofinancing funds to favor specific investments or groups, such as the very poor. Much of the resource flow should be unified—rather than in the form of balkanized projects—so that local committees and elected councils can allocate among services and investments. For this to work, much attention has to be given to creating representative institutions and transparent financial and political accountability mechanisms.

Improve services for agriculture. Better services are needed for research, extension, transportation, and information on new markets and products—to spur the growth of nontraditional export crops (such as horticulture) and the expansion of exports of value-added products. Some

nontraditional exports require focusing on niche markets where timeliness, freshness, and quality are essential. Removing remaining restrictions on air transport could facilitate this process (chapter 5). Even food staples like cassava, yams, and plantains could become major export commodities if efforts are made to develop market niches in industrial countries. This diversification is essential to deal with the secular decline in world commodity prices. Although real prices for nontraditional export crops have declined, their rate of decline has been slower than that for traditional exports.

Regional and subregional agricultural research partnerships can provide significant benefits

Reduce trade barriers and seek regional approaches to research and development. African countries need to work together to remove trade barriers and consolidate economic, monetary, and trade areas.[13] (Several such areas are already developing.) Doing so can lead to the pooling of their small markets. It can enable more bulk production and purchase of raw materials. And it can facilitate the realization of other economies of scale.

Moreover, large-scale infrastructure development is often a regional affair in Africa. Regional bargaining power is more powerful than that of any single country, and a good regional reputation can attract more foreign investment. The prevention and containment of livestock disease, so prevalent in African countries, is also a regional affair (box 6.11).

The research capacity of African countries differs widely. Some countries (South Africa) have sophisticated research facilities, while others are just starting to develop limited capacity. As with other enterprises, there are significant economies of scale associated with research and technology development. Most African countries are small, and agricultural production is usually not valuable enough to sustain large agricultural research programs. But many African countries face similar constraints and use similar technologies. Thus it would be useful to develop regional and subregional agricultural research partnerships or institutes.

Current regional efforts at cross-border collaboration, spearheaded by regional research organizations and by the Special Program for Agricultural Research, include the Association for Strengthening Agricultural Research in East and Central Africa, the Southern African Centre for Cooperation in Agricultural and Natural Resources Research and Training, and the West and Central African Council for Research and Development. There has been some debate on who will benefit from these regional partnerships—with concerns about losing market share to other African countries—but the regional benefits will likely outweigh the small compromises that some countries have to make. The

Box 6.11 Regional Vigilance against Livestock Disease

LIVESTOCK IS PROMINENT IN MANY RURAL AFRICAN economies—Botswana, Burkina Faso, Cameroon, Chad, Ethiopia, Kenya, Lesotho, Madagascar, Mali, Namibia, Nigeria, Senegal, Somalia, Sudan, Tanzania, Zambia. But diseases continue to threaten livestock production systems and rural incomes. Africa has a much broader spectrum of infectious disease among animals than any other region (Coetzer, Thomson, and Tustin 1994). These diseases can be separated into two broad groups: erosive diseases (such as tick-borne disease) and more serious epizootic or transboundary diseases (such as foot and mouth disease, rift valley fever, lumpy skin disease, rinderpest, and contagious bovine pleuropneumonia, known as CBPP).

Epizootic or transboundary diseases are far more important in terms of threatening large numbers of livestock and thereby livelihoods over wide geographic areas. An outbreak of these diseases can result in explosive losses. Examples include the 1995 CBPP outbreak in Botswana, which spread rapidly throughout the Ngamiland area—resulting in about 300,000 cattle being slaughtered as part of the eradication strategy. CBPP affects 27 African countries, causing losses of up to $2 billion a year (Geering, Roeder, and Obi 1999). Foot and mouth disease outbreaks in Angola, Mozambique, South Africa, and Zimbabwe have caused major production losses through the loss of meat and milk production and draught power. Export revenues have also been lost because markets in Europe, North Africa, and the Pacific Rim are hesitant to import animal products from regions where contagious diseases are prevalent.

The most devastating disease impact in Africa was the rinderpest outbreak in the late 19th century. It spread over almost the entire continent within 10 years, killing an estimated 10 million cattle (Geering, Roeder, and Obi 1999). In South Africa the livestock losses from this disease disrupted agricultural production and transportation. Human malnutrition was widespread and, combined with high levels of malaria, caused thousands of deaths. The effect on the social structures of some rural communities was devastating (Vogel and Heyne 1996).

While earlier outbreaks of epizootic diseases have been contained and in some cases eradicated in Africa, their prevalence and distribution remain a serious concern. Cross-border movements of livestock are common and have caused disease outbreaks in many countries. For example, the 1995 CBPP outbreak in Botswana was said to have come from the cross-border movement of Namibian cattle. Transboundary livestock diseases are thus a regional issue requiring regional cooperation and vigilance.

Consultative Group on International Agricultural Research must also continue to play a significant role in improving agricultural technology in Africa (Anderson and Dalrymple 1999). Finally, biotechnology will inevitably become more important globally, and to maximize the benefits African countries will need to build their capacity to identify opportunities, access appropriate technologies, and evaluate the risks associated with their use (Byerlee and Gregory 1999).

Review procedures that discourage a competitive private supply of agroindustrial inputs. Although input markets are subject to fewer constraints than a decade ago, regulatory problems remain—and the commitment of African governments to stay out of markets is not yet credible. So, private firms are still reluctant to gear up for major investments.

Private intermediaries have been slow to enter the field vacated by parastatals, possibly because of the entry barriers that characterize the business climate more generally. In a recent study 60 percent of African entrepreneurs reported that unpredictable rules and policies have seriously affected their business (Brunetti, Kisunko, and Weder 1997), surely inhibiting private sector development. To attract private investment and foster competition, institutional arrangements need to be developed to foster responsiveness, accountability, and the rule of law. As stressed by the World Bank's *World Development Report 1997* (p. 38), "countries need markets to grow, but they need capable institutions to grow markets."

Unpredictable rules and policies are barriers to private sector development

While there is a lot of potential for agricultural and rural development, realizing it will require learning from failed approaches and building on successes (see Delgado 1998a and Cleaver 1997). African countries must develop and own the agenda and take primary responsibility for conceptualization and implementation. Government commitment to implementing a business plan for agriculture is a prerequisite for its success.

Notes

1. Delgado, Hopkins, and Kelly (1998) add consumption-side linkages that arise from the stimulation of demand-constrained nontradables, finding that they surpass production-side linkages by a ratio of about nine to one. The authors find that growth in household incomes resulting from increased agricultural production is largely spent on nontradable items such as services, perishable foods, and locally produced nonfarm goods. Overall the study finds that adding $1 of new farm income potentially increases total income in the local economy beyond the initial $1 by an additional $1, by stimulating local products and services that would otherwise not have a market.

2. There are exceptions: for example, maize and wheat yields on commercial farms in Zimbabwe are much higher than in the United States.

3. Average yields for cereals, cassava, and plantains are 1.2, 8.2, and 5.4 tons a hectare in Africa—while in Asia they are 2.9, 13.1, and 10.1 tons a hectare and in Latin America they are 2.6, 12.3, and 8.2 tons a hectare (FAOSTAT 2000).

4. Agricultural taxes in African and other developing countries were calculated by Schiff and Valdés (1992). In Côte d'Ivoire, Ghana, and Zambia from the 1960s to early 1980s the average direct taxation was 23.0 percent, indirect taxation was 28.6 percent, and total taxation was 51.6 percent. The indirect component includes the effects of overvalued exchange rates (39.4 percent) and tariffs (25.7 percent). In other developing countries direct taxation was 12.0 percent, indirect taxation was 24.4 percent, and total taxation was 36.4 percent.

Assessing individual commodities and including more African countries, these high taxation rates were corroborated by Nikolaus, Herrmann, and Günther (1996) for cocoa, Herrmann (1997) for coffee, and Pursell and Diop (1998) for cotton.

5. Because these scores are based on analysis of decisionmaking powers at different administrative levels (school, district, administrative region, state, central government), they are free of biases associated with country size.

6. Data for each country are based on the percentage change in the real producer price of export crops. The aggregate price changes were derived as a weighted average of the major export crops. World Bank (1994) included other countries in its analysis, but reliable price data for these other countries were not readily available for 1989–91 to 1995–97.

7. These price trends are largely consistent with those in UNCTAD (1998). The period used by that report in a similar representation of prices (chart 20, p. 164) is from 1981–83 to 1992–94 for individual (mainly food) crops. Much of that report's discussion is based on price trends in three groups of countries: "newly liberalized," "continued intervention," and "continued liberalization." The groupings were based on country status in 1992. Trends in export crop prices are examined for each group from 1970. Interpretation of these trends is difficult because the implicit assumption used is that countries have remained in their 1992 status for more than 20 years, which is not the case. A more instructive method would be to take trends in prices before reforms and after reforms on a country by country basis—a method used by Gardner (1995).

8. A second payment is made based on the difference in weight at purchase and factory, and on primary marketing activities performed by farmer organizations. In recent years additional payments have been made in some countries based on the actual lint export price, or if the parastatal's profits were higher than expected for the season.

9. Explicit fertilizer subsidies were widespread—25 percent in Malawi, 46 percent in Senegal, 50 percent in Cameroon, 60 percent in Tanzania, and 85 percent in Nigeria (in 1982/83 prices; Lele, Christiansen, and Kadiresan 1989). Implicit subsidies were also prevalent because almost all countries had an overvalued currency. The magnitude of these subsides placed huge direct pressure on government budgets.

10. Some of these growth rates may be overestimated due to the extensive drought in 1991/92, which had a significant impact on output, especially in Southern Africa. Agricultural output was thus increasing from a low base.

11. Thirtle, Hadley, and Townsend (1995) show that these investments are significant determinants of output and productivity growth in Africa. Vyas and Casley (1988) suggest the need to also develop technologies, institutions, and

marketing structures appropriate to the development of intensive agricultural production systems.

12. First, in a risky sector such as agriculture, debt-equity ratios have to be quite low, implying substantial investment out of savings. Second, credit has to be repaid, making a strategy based on credit, rather than savings, unattractive given the high real interest rates likely to prevail in most African countries for the foreseeable future.

13. Noxious cereal export bans—slapped on at will by local authorities—are an example of these trade barriers. Such bans are retarding growth in many high-potential but remote areas that have a natural market in another country (Mali, Mozambique, Tanzania, Zambia).