Chapter 6: Sub-Saharan Africa

The approximately forty developing countries of this region form a much more diverse group than the poor countries of Asia in their economic structure, income levels, policies, and performance. Some, like Gabon, Guinea, Liberia, Mauritania, Nigeria, Zaïre, and Zambia, have large reserves of minerals to support their economies; some, like Ivory Coast and Kenya, have successfully developed agricultural exports; others, such as Chad, Mali, and Upper Volta in the Sahel region, are doubly disadvantaged by poor resources and a landlocked location which makes transport costs high. These physical differences are further accentuated by varied colonial and cultural heritages and post-colonial philosophies of economic development.

Within this diversity, however, there are important common elements, many of which distinguish the developing countries of Sub-Saharan Africa from those in other continents. countries, the African Middle Income countries clearly are poorer than most other countries in that group, and at much earlier stages of development.

Also common to the Sub-Saharan countries is their predominantly rural character and their low level of industrial development. Most of the work force (60 to 90 percent) and around half of output usually is in agriculture. These are mainly small, open economies with most of their rural populations engaged in cultivating primary agricultural exports (cocoa, coffee, cotton, oilseeds, palm oil, sisal, and tea). Exports still mainly consist of primary commodities for which demand grows slowly, and amount to over a fifth of GDP in the poorest countries, which have about half the Sub-Saharan population. A major problem for most countries is their vulnerability to changes in the terms of trade.

39. Sub-Saharan Africa: Selected Development Indicators
(Median values)

	Low Income Developing Countries		Middle Income Developing Countries	
	Africa	Other	Africa	Other
Income per Person, 1976 (US dollars)	145	155	390	990
Share of Agriculture in GDP, 1976 (percent)	41	47	28	18
Share of Population in Urban Areas, 1975 (percent)	11	18	24	47
Share of Manufactures in Exports, 1975 (percent)	5	14	5	24
Life Expectancy at Birth, 1975	41	45	44	61
Total Fertility Rate, 1975	6.3	6.2	6.5	5.8
Percentage of Primary School Age Children Attending School, 1975	53	51	79	103
Adult Literacy Rate, 1974	23	22	15	72

Source: *World Development Indicators.*

Almost all of the countries in this region are poor; many have levels of income per person above those of South Asia, but with severe poverty among large parts of the population. In few countries in the region are the numbers in absolute poverty less than a third of the population, and in most of East Africa they run well over half. The figures on income per person in most of the Middle Income countries of Sub-Saharan Africa are deceptive, for with a few exceptions these are actually poor countries with a mineral enclave that employs only a small fraction of the work force. The indicators in the Table above show that while the poorer African countries share characteristics typical of all Low Income

The economic growth rates in the region during 1960-75 averaged about 4 percent a year, or less than 2 percent per person with the increase in population. Agriculture did poorly in this period with annual rates of increase averaging only about 1.5 percent. The growth of agriculture was somewhat better in the 1960s but the entire region, especially the Sahel countries of Chad, Mali, Mauritania, Niger, Senegal, and Upper Volta, was afflicted by severe drought which reduced agricultural growth during the early 1970s. Economic growth rates varied considerably among countries. Apart from the mineral exporters, the fast growing economies were those where agriculture expanded rapidly.

The handicaps in development have been reinforced by failures of economic policy, some of which have their roots in the colonial era. In most countries, agricultural development is hindered, as it has been for many decades, by the inadequacy of research and extension services (except those for tree crops), and insufficient incentives for agricultural investment. The difficulty of making drastic changes in the colonial salary structures in the transitional period has led to severe rigidities and distortions in urban labor markets and excessive growth in bureaucratic employment rather than industrial skills. Many countries have adopted a protective and interventionist policy framework for industry that dampens entrepreneurial initiative, or at least diverts it away from industries and technologies that would help to expand industrial employment quickly.

The great heterogeneity within Sub-Saharan Africa makes it difficult to discuss policy options in general terms. While the analysis of common problems can be helpful, each general issue has its local variation, and policies must be adapted specifically to the needs of countries that are tremendously diverse in environment, resources, and economic performance. Throughout the region, however, development prospects will depend crucially on agriculture. The labor force is still predominantly rural, and even if industry and services grow more rapidly than in the past, they will not be able to provide productive employment for more than a small proportion of the population in the near future. Poverty too is mainly a rural phenomenon. The success of efforts to raise incomes, to improve nutrition, to provide other basic services, and to achieve the widespread economic and social modernization required for self-sustained growth and the eradication of poverty will be problematic at best without a broadly based agricultural development strategy.

The next two sections examine the structural and policy environment for the development of agriculture and industry. They are followed by a discussion of issues in international trade, and demographic trends. The last two sections outline development priorities and some important ways in which external assistance is needed to help overcome the formidable constraints on development.

Development of Agriculture

There are many reasons for the generally backward technology of cultivation in the region: the high incidence of diseases (especially trypanosomiasis) that kill draft animals; the poor soils and scanty and uncertain rainfall that have discouraged land-intensive, settled agriculture in many parts of the region; the abundance of land, that permitted *shifting cultivation* relying on bush fallowing and slash-and-burn techniques to restore soil quality; the importance of root crops and coarse grains in which, unlike wheat, rice, and maize, genetic research has not yet proceeded very far; and the high cost of irrigation because of the scarcity of ground water. The distinctive and varied agroclimatic and socioeconomic environments in Africa make it difficult to introduce agricultural technologies from elsewhere. This applies particularly to the biological and chemical innovations that are needed to increase crop yields, by introducing intensive systems of continuous cultivation and replacing the bush fallow systems with other and more productive ways to maintain soil fertility. Innovations developed in one area may not be transferable on any broad scale, since there are drastic differences in rainfall, soils, and other ecological factors, not to mention cultural diversities, which have produced wide variations in the dominant and secondary food crops of different areas. Hence, research to generate and test innovations in materials and practices must often be tailored to specific locations.

There are also difficulties in identifying and introducing simple, inexpensive mechanical innovations adapted to the needs of African smallholders. For instance, the relative ease with which tractor-based technologies can be transferred, and the weakness in the agricultural extension services in transmitting information on appropriate cultural practices, have encouraged an inappropriate emphasis on capital-intensive equipment. There has been a neglect of mechanical innovations capable of raising the productivity of small farmers who operate the majority of farms.

Adaptive research in agriculture has not received the allocation of money and manpower that is commensurate with the dominant position of agriculture in these economies, or with the potential that exists for obtaining high returns from investments in research. Expenditures on agricultural research are low and the institutional base is weak. Strengthening national and regional research capabilities to evolve an appropriate sequence of feasible and profitable innovations in agriculture is especially crucial to the long-term development prospects of the region.

A large part of Africa's land resources is in semi-permanent or permanent pastures, and

animal products account for an important part of the diet and economic livelihood of smallholders in Africa. Livestock activities are complementary to crop production. They allow idle land to be used productively and provide the draft power for crop production, allowing land resources to be used more fully. The development of livestock (dairy and beef cattle, goats, sheep, and pigs) can play an important role in alleviating malnutrition and rural poverty and, in some cases, can be a source of foreign exchange. The main drawbacks are disease, poor quality of stock, and traditional management systems that have kept animal yields low.

In addition to environmental and technological constraints on agricultural growth, government policy has frequently had an adverse effect. In most countries, colonial policies for agricultural research, transport, and producer and consumer pricing were designed to favor the extraction of primary products for export, correspondingly neglecting the development of food crops. Official marketing boards, which were originally established to protect farmers' interests, were gradually transformed into instruments of agricultural taxation. Much of this policy inclination has continued. In addition, policies concerning exchange rates, taxes, subsidies, and tariffs, along with controls affecting foreign and domestic trade, provided incentives to industrial or commercial, rather than agricultural, activities.

Of course, there are exceptions. Some governments have supported agricultural development and created an environment in which smallholder cultivators have flourished. This is shown by the rapid growth and diversification of agriculture in Ivory Coast (both for export and domestic consumption) and the successful spread of tea and hybrid maize cultivation among smallholders in parts of Kenya. In certain other countries, government efforts to promote development have emphasized large capital-intensive schemes at the expense of broadly based smallholder development. This seems to have been the case, for example, with the state farms in Ghana in the 1960s and the large irrigation schemes in Sudan which have absorbed much scarce capital and skilled manpower. The inefficiency of parastatals and state-sponsored cooperatives acting as marketing intermediaries for farmers has typically been accommodated by widening the transport and marketing margins at the expense of the farmer. Other considerations adversely affecting farm price incentives have been the perennial pressure for cheap food in urban centers, and ambivalence about letting supply respond to changes in international prices, for fear that this might reinforce a pattern of export specialization in agricultural raw materials, a condition that has been identified with colonialism.

Industrialization

Agricultural interests have often been subordinated in the course of widespread attempts to force the pace of industrialization by providing high levels of protection. However, the results of protectionist policies so far, judging from the employment created and the domestic resource costs of import saving, have generally been unsatisfactory. There is very little manufacturing for export outside the region, except for some processing of primary commodities, despite the fact that manufactured products from many of the countries have had preferential access to markets in Europe. Typically, three-quarters or more of industrial value added is in import substitutes, principally in relatively unsophisticated goods such as processed foods and beverages, textiles, garments, wood and leather products, cement, paper, and printing. In some countries, especially where the pace of industrialization has been pressed through government participation and intervention, industrial programs have tended to include capital-intensive projects in fertilizers, metal products and processing, petroleum refining, and rubber, chemical, and electrical products—sectors in which particularly acute transition difficulties have tended to require high effective protection.

The inefficiency of this industrial activity has many causes in addition to the usual "start-up" problems in developing countries. High and sustained levels of protection have removed competitive pressures to improve efficiency. In some countries, the form and extent of government intervention has been an adverse influence. Other disadvantages are high transport costs in such landlocked countries as Mali, Niger, and Upper Volta, and in others where infrastructure is poor; and social pressures to expand employment and share business earnings with members of the extended family or tribe.

A major handicap faced by African industry is the scarcity and high cost of suitably skilled labor and management. In the colonial era, modern industry was exclusively the preserve of non-Africans in East and Central Africa; and even in West Africa, where crafts and simple manufacturing flourished from pre-colonial times, large- and medium-scale enterprises

were dominated by non-Africans. The countries where manufacturing has prospered best are also those where expatriates have continued to play a relatively larger role since independence. No doubt this is a temporary phenomenon and an increasing number of Africans now engaged in commercial activities may be expected to become industrial entrepreneurs, as has occurred in other countries that are further along in the process of industrialization.

One of the most serious obstacles to early industrialization in Africa is the high wage and salary structure. The high salaries in government and in administrative positions generally were derived from the colonial era, and have been sustained by the large role that expatriates have maintained in manufacturing in some countries. These salary levels have fueled a strong demand for secondary education to qualify for such positions. Another effect of this salary and wage structure has been to raise governments' consumption expenditure and thus reduce budgetary savings.

For unskilled workers in industry, wages are high relative to their productivity. The resulting high production costs could only be accommodated by increased protection. This, in turn, has diluted competitive pressures for industrial efficiency. The trend toward high and protected prices of manufactures has also tended to shift the domestic terms of trade against agriculture.

While high wages are available to only a small proportion of the work force, they are more regular and sufficiently above the real earnings of smallholder peasants to draw large numbers to urban centers, where they are prepared to wait long periods for a chance at the relatively few well-paid regular jobs. This, in combination with the natural increase in the urban population, has increased urban unemployment and poverty — both relatively new phenomena in Sub-Saharan Africa.

The allocation of labor has been even more distorted in countries with widespread government ownership of industrial and commercial enterprises. Parastatal enterprises are under pressure to increase their employment and, together with the government, form a large proportion of the "modern" sector. Their employment policies, especially their wage levels and entry requirements, have a dominant influence on the aspirations of job seekers and on the types of skills that are demanded of the educational system.

Trade

For the Sub-Saharan African countries, food, beverages, and minerals constitute a much greater share of exports than for all developing countries as a group, or even for the Low Income countries in Asia. This influences the relative importance of the various international trade issues in the African context. The small share of manufactures is primarily the result of elements of economic structure and policy that have already been discussed: the high wages of unskilled workers in relation to their productivity; the scarcity of managers and skilled workers and reliance on expensive expatriate personnel, which adds significantly to production costs; the weak tradition of African entrepreneurship in manufacturing industry; the high costs of transportation due to the inadequacy of infrastructure and disadvantages of location, especially in landlocked countries; and policy biases against export promotion and in favor of import substitution.

40. Developing Countries: Product Composition of Non-fuel Exports, 1975
(Percentages)

	Food and Beverages	Non-food Agriculture	Metals and Minerals	Manufactures	Total
Sub-Saharan Africa	52	13	26	9	100
Low Income Asia	32	17	9	42	100
All Developing Countries	36	9	12	43	100

In the short run, it will be difficult for countries in Sub-Saharan Africa to overcome the obstacles to expanding manufactured exports. Consequently, their preferential access to industrialized countries' markets, as made available under the Lomé Convention, is of particular importance. While only limited progress has been made so far, development of resource-based manufacturing exports through additional processing of primary products offers potential. African countries are vulnerable to imperfections in primary commodity markets and they depend heavily on commodities with unstable prices—a problem at which the Stabex scheme is specifically directed. In the case of six commodities whose prices fluctuated most (see Table 18), Sub-Saharan African countries supplied over a quarter of the total exports of developing countries; for three of these unstable commodities (cocoa, copper, and sisal), the region's share of exports was over one-half. For countries whose exports are highly concentrated in these commodities, the problem of price instability is even more acute. Copper, for

example, accounted for over 90 percent of Zambia's exports and 69 percent of Zaïre's in 1973-75; cocoa represented 60 percent of Ghana's exports, and around one-fifth of the exports of Cameroon, Ivory Coast, and Togo. With concentrations such as these, a country's balance of payments is severely affected by the international market for specific commodities.

Demography

The slow and uncertain patterns of agricultural and industrial development in Sub-Saharan Africa are made even more serious by the prospect of rising rates of population growth. Such growth, although already high at over 2.5 percent a year, has been checked so far by high mortality rates associated with the high incidence of communicable diseases, especially gastric diseases, malnutrition, and poor traditional midwifery and weaning practices. As health conditions improve, population growth can be expected to accelerate as mortality declines and fertility increases. In addition, pronatal feelings have traditionally been important in Africa and there is no evidence as yet that they have diminished. Ultimately, as child mortality declines and families recognize that they cannot afford to educate large numbers of children, they are likely to decide to reduce their fertility. In the meantime, economic policy must contend with high rates of population expansion.

With the growing demographic pressures, there is increasing reason to question the traditional opinion that land is abundant in Sub-Saharan Africa. There are, of course, many regions where considerable scope still exists for expanding the area under cultivation. However, these usually require expensive roads and other types of infrastructure; and trypanosomiasis often poses a difficult problem until population and cultivation have expanded sufficiently to reduce the tree cover which provides a habitat for the tsetse fly. There are already indications of pressure on the traditional farming systems because of growth in population and extended cultivation. Studies carried out in many localities report that fallow periods have been reduced substantially, leading to a decline in soil fertility, more difficulty in controlling weeds, and consequently declining crop yields. With the rapid rate of population growth, it is not surprising that an increasing number of rural areas are beginning to feel population pressures. Land scarcity and lack of employment opportunities in a number of Kenya's "high potential" agricultural areas are responsible for shifts of population to semi-arid areas where land is still available, even though food production is hazardous because rainfall is limited and erratic. Similar evidence of population pressure has been noted in other African countries, especially in East Africa but also in Ghana and Nigeria.

A dramatic symptom of the growing population pressures in the region is the emergence of large food deficits in some of the more populous

41. Demographic Indicators in Selected Countries in Sub-Saharan Africa

	Crude Birth Rate per thousand	Crude Death Rate per thousand	Total Fertility Rate	Population (millions)	
	1975	1975	1975	1976	2000[a]
Ethiopia	49	25	6.7	29	54
Ghana	49	21	6.7	10	20
Ivory Coast	45	20	6.2	7	14
Kenya	50	15	7.6	14	31
Mali	50	25	6.7	6	11
Nigeria	49	22	6.7	77	154
Senegal	47	22	6.3	5	9
Sudan	49	17	7.0	16	30
Tanzania	47	19	6.7	15	32
Upper Volta	49	25	6.5	6	9
Zaïre	44	20	5.9	25	47
All Sub-Saharan Africa	48[b]	21[b]	6.3[b]	313[c]	604[c]

[a]The assumptions underlying these projections are described in the Notes to Table 16 in *World Development Indicators*.
[b]Median values for countries with populations over one million in 1976.
[c]Total for countries with populations over one million in 1976.
Source: *World Development Indicators*, Tables 15 and 16.

countries. Production of food in Africa has not only failed to keep pace with population growth but has also lagged behind that in other regions. While some of the decline in output is due to the unfavorable weather of recent years, it is clear that the traditional farming systems have been unable to respond adequately to the demands resulting from rapid population growth.

42. Indexes of Food Production per Person, 1966-70 and 1971-76
(1961-65 = 100)

	Average 1966-70	Average 1971-76
Africa	99	96
North and Central America	105	110
South America	104	104
Asia	104	107

Source: United Nations Food and Agriculture Organization.

The food prospects for Sub-Saharan Africa would be gloomy if the past semi-stagnant trends in food production were to continue. Assuming only a small improvement in food consumption per person, the International Food Policy Research Institute (IFPRI) has estimated that the food deficits of the Sub-Saharan deficit countries would rise from 2 million tons in 1975 to about 24 million tons in 1990. Nearly two-thirds of the estimated 1990 deficit would be in Nigeria. IFPRI's estimates are based on the assumption that Nigeria's agriculture will continue to stagnate, as it did between 1960 and 1975 when food production rose by only 0.5 percent annually. This performance could be improved, and the deficits reduced. In any case, the estimates dramatically demonstrate the need for a much more rapid increase in agricultural production in Sub-Saharan Africa in the future.

Strategic Development Priorities

Even more than in Asia, accelerating growth and alleviating poverty in Sub-Saharan Africa will depend primarily on the provision of additional impetus to agriculture, particularly the smallholder sector, and secondarily on the pace of employment creation in industry and direct action to improve the supply of essential public services.

The experience of several countries in the region testifies that smallholder incomes in agriculture could be raised quite rapidly if producers were given more incentives[1] and better support in the form of physical infrastructure, extension services, credit, and market integration. With the emerging demographic pressures, however, it is becoming clear that growth in farm productivity and output cannot be sustained for very long without a large expansion in the use of technologies adapted to African conditions and increased reliance by farmers on productive and appropriate purchased inputs.

There is as yet little of the specific knowledge and guidance necessary to make the transition from a traditional land-intensive system of agriculture to one which uses scientific information to increase yields. The necessary local orientation of research and extension will require more active leadership from governments, but it will also need strong financial and technical support from abroad. The research required to increase agricultural productivity in dry farming conditions should be a major international priority. The development of a new and reliable high yielding millet can contribute as much to raising the living standards of millions of poor people as the changes in structure and policy that are also necessary. Aside from research at international research centers, more emphasis is needed on local adaptive research and on the systematic study of the characteristics of existing farming systems. Research is also required on equipment and tillage techniques for conserving moisture and soil, to replace the still predominant hoe cultivation, and on the means to improve the conditions for rearing livestock. In the longer run, irrigation will have a significant role and collection of the necessary hydrological data for this purpose should be accelerated. But, for the near future, in most parts of the region excluding the Sahel, there is still a large unused potential in rainfed cultivation which should be tapped before major commitments need to be made to expensive and technically demanding irrigation works.

The research base for a modernized agriculture must be accompanied by development of an institutional structure, at present quite weak in most of Africa, to disseminate improved methods and to deliver the necessary supplies and services. Furthermore, the benefits from the adoption of more modern practices must seem attractive enough to induce farmers to pay for these additional supplies and services.

The contention that traditional smallholders are indifferent to price incentives is not supported by a number of empirical studies in Sub-Saharan Africa on such crops as cocoa, coffee, cotton, groundnuts, maize, palm oil, rubber, sisal, and tobacco, which all show that supply

[1]The various sources of bias against agriculture in the system of incentives are discussed at greater length in the next chapter.

responds positively. Failure to recognize this has been one of the serious shortcomings of past agricultural policy in Sub-Saharan countries. There have been many examples of how deficient price incentives have kept production below its potential—among Tanzania's export crops, except tobacco, in the late 1960s and early 1970s; in Ghana with inadequate planting and maintenance of cocoa; in Senegal with reduced groundnut production; and in Guinea with the extensive diversion of farm products from official channels into smuggling and black markets because of price controls. Ivory Coast is one of the few countries to have maintained attractive producer prices, and these have contributed to fairly vigorous agricultural expansion. Several African countries are now showing an increasing awareness of the supply responses that may be expected from generous agricultural incentives and are shifting their policies accordingly.

Another issue of crucial importance is the choice between a development strategy concentrating on small farmers, which would seek agricultural modernization for the mass of the farm population, and an exclusively production-oriented strategy that confined resources and rapid growth of output to large and relatively capital-intensive farm units within a dualistic agricultural structure.

Even if large-scale and highly commercialized farms were more efficient, which is not always the case, there are reasons for preferring a strategy that emphasizes the growth of smallholder agriculture. First, the large farms tend to be highly mechanized. Tractor technologies are attractive because they can be transferred from the industrialized countries with relative ease and tractors tend to be looked upon as symbols of modern agriculture. But while some mechanization of agriculture (not necessarily including the use of tractors) may well be desirable, agriculture for the next decade must be the principal source of employment and incomes for the majority of the population. Second, large commercial farms could capture a large share of the urban market, diminishing the extent to which smallholders can sell their produce for the cash necessary to purchase inputs and upgrade their farming technology. The growth of the cash incomes of small farmers is important in expanding the markets for urban industrial products and promotes a healthy interaction between agriculture and manufacturing.

The argument against letting large-scale farms preempt markets is less applicable for exports than domestic sales, and probably less applicable in countries which are big importers of foodgrains. In the short run, a country might gain foreign exchange by a policy that maximizes agricultural production, even if on large farms. But the resulting dualism could well delay the broadly based improvement in agricultural productivity that is required for sustained development and better rural income distribution.

One of the requirements for efficient growth of manufacturing in the region will be to bring urban wages in the modern sector more closely into line with workers' skills and productivity. The complex set of factors responsible for the present imbalance have been noted. Corrective action will be needed on a wide front, encompassing educational structure, curriculum, and financing; government salaries; industrial wages; and industrial incentive policies. A better adjustment between productivity and wages will be necessary if exports of manufactures are to be competitive in international markets.

Some countries have attempted to disregard internationally competitive efficiency by emphasizing production for the domestic market, but their experience has not been encouraging. Obviously some domestic-oriented manufacturing can be efficient, but the range of industries that can be efficient is likely to be limited by economies of scale and by vocational, technical, and managerial skills and infrastructure. Ghana and Tanzania, for example, have attempted to force the pace of industrialization beyond these economic limits. While failing to accelerate industrial growth significantly, such policies have nurtured inefficient enterprises that make it more difficult to reorient industrial incentives toward competitive efficiency, and thus inhibit future growth. In contrast, countries whose policies did not give primary emphasis to industrialization actually attained relatively rapid industrial growth rates. The share of manufacturing in GDP rose from 7 percent in 1960 to 14 percent in 1974 in Ivory Coast, whereas it stagnated around 10 percent in Ghana.

One of the limitations on African industrial growth has been the relatively small size of the market for industrial products in individual countries. Recognition of this difficulty has spurred numerous schemes for regional economic integration. One scheme, the East African Common Market, comprising Kenya, Tanzania, and Uganda, ran into political and economic difficulties and has since been disbanded. Several schemes now exist in West and Central Africa. Two of these are confined to Francophone countries: the West African Economic Community

(CEAO) of Ivory Coast, Mali, Mauritania, Niger, Senegal, and Upper Volta, and the Central African Customs and Economic Union (UDEAC) comprising Cameroon, the Central African Empire, the People's Republic of Congo, and Gabon. The new sixteen-member Economic Community of West African States (ECOWAS) comprises the members of CEAO plus Benin, Cape Verde, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Nigeria, Sierra Leone, and Togo, making it the most ambitious effort at regional integration in West Africa.

All these schemes aim at establishing common markets with particular emphasis on industrial development. Their members are diverse in their resources and levels of economic development, with comparatively rich coastal countries alongside the landlocked and very poor countries. Each treaty provides for fair sharing in the benefits of regional development, with mechanisms to compensate for losses in revenues due to changes in trade shares as well as development funds to assist the poorer member countries in particular. It is still too early to assess the contribution these schemes could make toward exploiting economies of scale through market integration.

International Assistance

This review of development problems in agriculture and industry in Sub-Saharan African countries has outlined the immense difficulties they face in accelerating their growth. International assistance can speed their development in a variety of ways.

Perhaps most important is financial and technical assistance to increase both the amount of agricultural research and its relevance to the needs of small farmers under various agroclimatic conditions. The international agricultural research centers, such as the International Institute of Tropical Agriculture (IITA), the International Crop Research Institute for the Semi-Arid Tropics (ICRISAT), and the International Maize and Wheat Improvement Center (CIMMYT), are an important response to both those needs. They can provide plant material, ideas, technical assistance, and training facilities to strengthen food crop research programs in individual countries; and IITA and ICRISAT are emphasizing research to guide the evolution of more productive farming systems.

More research with a bearing on livestock development, including livestock diseases, is also needed. In addition assistance is needed to strengthen national research programs, and to bridge the gap between the work of the international centers and the location-specific research required to identify and test innovations suitable for farmers of particular localities. International support for research covering ecological zones common to many countries will be particularly valuable. There is much to be learned from experience with existing regional programs, such as those undertaken with the assistance of the French Government's organization to support research on vegetable oils (IRHO), and the West African Rice Development Association (WARDA).

The requirements for concessional capital assistance in Sub-Saharan Africa will continue to be high. Many of the countries are too poor to finance their needs at commercial terms. Concessional capital may also be increasingly necessary for the Middle Income African countries whose export growth is likely to be modest since it depends heavily on a few primary products, but which still have to undertake large investments in infrastructure—for transport and health services, for example—that are vital to their development. In the emphasis on alleviating poverty, there could be a danger that external financing agencies would neglect these needs in search of projects that "directly" benefit the rural poor. Investment in infrastructure often is an integral part of a poverty-oriented strategy, and in many African countries is a precondition to effective programs for the poor.

The importance to African countries of problems affecting primary commodities has been discussed earlier. In addition to mechanisms for stabilizing prices and earnings from exports, international action can stimulate the growth of earnings from primary commodities by assisting in the expansion of output and market shares. While more investment, improved technology, and better incentives are required to increase supply from Africa, parallel action might be needed to prevent global oversupply of some of the commodities. In several cases—bauxite, phosphates, and timber, for example—international import demand is expected to grow quite rapidly, and a fairly rapid increase in African output could probably be absorbed without disturbing the market and affecting prices. But in other cases, preeminent examples of which are tea and coffee, rapid growth of African output and exports cannot be accommodated unless other nations reduce their shares of the market. This has been happening to some extent. Brazil's share of world coffee exports has fallen from 38 percent to 26 percent between

1961 and 1976, with Africa's share rising from about 19 percent to 27 percent in the same period. The share of India and Sri Lanka in tea exports declined from 73 percent in 1961-63 to 52 percent in 1972-74, while Africa's share rose from 6 percent to 15 percent, the main exporters being Kenya, Tanzania, and Uganda. These trends can be accelerated, to the benefit of the poorer African countries, if assistance can be provided to other major exporters, which have alternative investment opportunities, for diversification into alternative crops. Where diversification appears advantageous, additional finance and other international assistance for projects that would employ displaced workers would benefit both the present exporters and the African countries that could increase their production of these commodities.