Appendix C

"Rural Africa: Modernization, Equity, and Long-Term Development," by Uma Lele; and "Facing Up to Africa's Food Crisis," by Carl K. Eicher

The preceding OTA report is not intended to be a comprehensive treatment of all the issues related to food production and agricultural development in sub-Saharan Africa. Other authors have addressed different sets of issues from their own perspectives.

Two important analyses of the problems faced by Africa follow. Uma Lele's article reflects her perspective as chief of development strategy for the World Bank and as an African. The article by Carl K. Eicher represents the thinking of an American academic with extensive experience in Africa.

Both articles were published in their present form in ***Agricultural Development in the Third World***[1] in 1984. Lele's article first appeared in ***Science*** in **1981.** Eicher's paper was originally published in ***Foreign Affairs,*** also in 1981. Both articles appear with the permission of the authors and publishers.

[1] Carl K. Eicher and John M. Staatz (eds.), ***Agricultural Development in the Third World*** (Baltimore: The Johns Hopkins University Press, **1984),** pp. 436-479.

Rural Africa: Modernization, Equity, and Long-Term Development

UMA LELE

INTRODUCTION

Within less than a decade Africa is facing a second severe food crisis. The poor crop can yet again be explained as a result of drought. But the continent's growing vulnerability to crop failures is by no means unexpected. In most African countries it appears to be part of a long-term trend. Data on African countries, especially for subsistence production, are too poor to permit precise estimates, ' but annual rates of increase of major staple food crops in sub-Saharan African seem to have been about 2 percent during the 1960s and early 1970s, compared with almost 3 percent in Asia and over 3 percent in Latin America.[2] Productivity increases in hybrid maize in some selected areas, such as the highlands of Kenya, have been impressive. However, on the whole, increases in the production of major cereals and root crops—maize, sorghum, millets, and cassava-have come about through increases in the area under cultivation rather than through gains in productivity per unit of input. This is in sharp contrast to even South Asia, which is generally perceived as laggard in development but where substantial productivity gains were experienced in food crop production in the 1970s. Per acre yields of many subsistence food crops appear to have stagnated or even declined in many African countries, as, for instance, in Ghana, Mali, Nigeria, and Sudan.

Because of higher population growth, the annual rates of increase in production required to meet consumption needs by 1990 are also estimated to be higher for sub-Saharan Africa-about 4.4 percent, compared with 4 percent for Asia.[3] If present trends continue, Africa will increase its dependence on food imports both over time and relative to other developing continents. Undernourishment is expected to become far more widespread, even though alternatives to cereals and staples, such as bananas and other fruit, fish, and animal products, have been far more important sources of calories in many parts of Africa than in South Asia, which has a similar per capita income. Indices of ill health and infant mortality in Africa are already among the highest in the developing world and are not expected to decline significantly in the next decade.

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Compared with the poor performance of food **production, export crop production** has been more varied among African countries since independence. Production of cotton, tobacco, cocoa, and coffee rose significantly in some countries until the 1960s, but during the 1970s and early 1980s production of major export crops has either stagnated or declined in many countries.[4] Nigeria, for instance, became a substantial net importer of edible oils, of which it was previously a net exporter. Groundnuts in Mali, cocoa in Ghana, cotton in Sudan, and cotton, sisal, coffee, and cashews in Tanzania all provide examples of stagnancy or decline in production.

Rural-urban income disparities are already high in Africa, the ratios typically ranging between 1:4 and 1:9, compared with many countries in Asia, with ratios between I:2 and 1:2.5. But because agricultural sectors have been stagnant or slow-growing even relative to the poorly performing industry and services sectors, these disparities are worsening in many cases. Kenya, Malawi, and Ivory Coast are the few exceptions where until recently economic growth has been impressive, but the distribution of benefits between agriculture and industry and within agriculture in these countries has been particularly unequal. The World Bank's *World Development* ***Report 1981*** **estimates that per capita** incomes in low-income African countries—countries where the annual per capita income is less than three hundred dollars—decreased 0.4 percent per year on the average during the 1970s, compared with a 1. I percent annual increase in low-income Asia, Even the middle-income African countries experienced per capita income growth rates of only 0.4 percent per annum, compared with 5.7 percent in the corresponding countries in East Asia and the Pacific.[5]

Worse yet, prospects for overall economic growth in low-income Africa appear much poorer than in the rest of the developing world. The *World Development Report* projects the likely average annual growth rates of per capita income for the high case in low-income Africa during the 1980s to be only 0.1 percent, compared with 2.1 percent for low-income Asia. To reverse these long-term trends requires a clear understanding of the causes of poor past performance.

This chapter argues that most African countries are not giving priority to the development of peasant agriculture. There is not even much understanding of what is required to develop it. As a result, the domestic resources that are spent on agruculturc go largely to pay for the growing wage bill of an inadequately equipped and inadequtitely operating public sector or to ineffectivc subsidies. **The** fragmented donor community has focused largcly on project financing, mainly of capital expenditure and technical assistance. Project financing has been rapidly increasing over time, directed mainly toward the rural poor. Current and past donor investments are having little impact, however, not only in the short run but in laying the foundations for long-term development as well. The project approach often results in poor policies, a shortage of maintenance and operating funds, and a shortage of qualified staff, hence often a major depletion of capital.

The Asian experience suggests that agricultural development requires large amounts of resources. Donors should give special attention to broadening their support of education substantially and supporting not just primary but middle- and high-level of training of nationals in technical fields to develop a science-based peasant agriculture. This not only would help to create national policy, planning, and implementin, capacity but would support a diverse network of institutions required for development, in addition to those operated by govern-

ments. Major investments are also needed in transport and communications, many of which will have to be highly capital-intensive. With **such a reoriented emphasis, and guaranteed long-term assistance tied to concrete indications of national commitment, at least long-term prospects** could improve significantly.

THE CRUCIAL ROLE OF PEASANT AGRICULTURE

As in many parts of low-income Asia, such as Nepal, Sri Lanka, India, Bangladesh, and Thailand, in Africa concern for economic development is primarily a concern about agricultural and rural development. Between 80 and 90 percent of the nearly 400 million people in sub-Saharan Africa live in rural areas. Most derive their subsistence from meager crop and livestock production and survive on annual per capita incomes of less than U.S. $150. Although production is geared largely to subsistence, the rural sector is also the major source of food for urban consumption and of raw materials for exports and for domestic manufacturing. Except in a few mineral-producing countries such as Zaire, Zambia, and Nigeria, agriculture constitutes the largest income-generating sector, contributing up to 40 percent of the gross national product of many African countries. Between 70 and 80 percent of the annual export earnings of many countries is derived from three to six agricultural commodities, Direct and indirect taxes on agriculture are the most important source of government revenues. Although the estate sector is an important producer of marketed **surpluses of certain** crops in certain countries, a major share of the total production and marketed surplus nevertheless comes from the smallholder sector. Not only is broad-based agricultural development thus crucial for increasing incomes, employment, and export earnings, but raising the incomes of the rural poor is essential for raising government revenues and creating a domestic market for the goods and services produced in a growing urban manufacturing sector.

POLICIES AND STRATEGIES SINCE INDEPENDENCE

THE "MODERNIZATION NOW" APPROACH

Rhetoric and plan documents in almost all African countries make reference to the key role of the agricultural and rural sector in Africa's modernization. Since the disastrous drought of 1973–74 self-sufficiency in food has become a major objective, often supported by donor-financed projects. The **need** for increasing export earnings is also being recognized more urgently, the balance of payments difficulties having grown with the rising cost of imported energy and manufactured goods. Despite the growing awareness and the increased number of projects, however, unlike in Asia, there is not yet the basic conviction among many African policy makers that the smallholder agricultural sector can and will have to be the engine of broad-based economic development and eventual modernization.

Modernization is taken to mean mainly industrialization and the commercialization of agriculture, largely through mechanized, large-scale farming. The fluctuating prices of primary exports explain the desire to industrialize, as does the relative ease of setting up factories and state farms compared with the organizationally far more demanding development of peasant agriculture. In its broad-

est sense the objective of modernization is, of course, shared extensively throughout the developing world. It is the short time perspective of the African expectations that poses a problem, especially given the much poorer institutional and trained manpower base that Africa inherited at independence. Goren Hyden aptly contrasts the eloquent Tanzanian President Nyerere's slogan ''We must run while others walk' with China's strategy of modernization by the year 2000.[6] The frequently noted perception of peasant agriculture as a "holding sector' is, however, by no means unique to Africa. At an earlier stage, India's first five-year plan (195 I -56) incorporated community development and promotion of cottage and small-scale industry essentially as stopgap arrangements to ensure rural welfare and employment until industrialization could absorb the growing pool of surplus agricultural labor.[7] The more dynamic development strategy, oriented toward small-farmer productivity, which is now being implemented successfully in many parts of India came into ascendancy only in the mid- 1960s, with technological change made possible by the new high-yield cereals. As is argued below, in Africa the view of agriculture as a holding sector and the ' 'Modernization Now' strategy have had many of the same consequences for the development of peasant agriculture in more free-enterprise, growth-oriented Nigeria and Zambia as in Ethiopia and Tanzania, which show greater concern about income distribution and class formation.

GOVERNMENT INVESTMENT IN AGRICULTURE

Planning the use of government finances for agricultural development is, of course, not easy for most African countries becausc of great fluctuatons in their export earnings. Their bureaucracies are less experienced than those of their Asian counterparts, which experience similar fluctuations in earnings. Lately their ability to plan has been further eroded, as has that of other developing countries, by the declining purchasing power of their export earnings, as import prices of oil and industrial goods have soared. In constant dollars, the purchasing "power of exports from fourteen principal countries in Africa fell try about 40 percent from 1973 to 1980.[8]

Even within these all too obvious constraints, however, far fewer resources are plowed back into agriculture by most African countries than would seem justified. lntrrcountry comparisons are exceedingly difficult, owing to definitional, data, and other measurement problems, but in the 1970s around 10 percent or less of the planned development expenditure was allocated to the agricultural sectors in Kenya and Mali, compared with 31 percent in India during its first five-year plan in 195 I and 20 percent of the much larger absolute investment in the subsequent three plans. In Zambia the total agricultural budget may have decreased in real terms by an annual average of slightly over 9 percent in the late 1970s, reflecting general budgetary cuts. Malawi is one of the few exceptions in Africa; it appears to have allocated close to 30 percent of the known planned public expenditures to agriculture. However, even there, because of the more favorable tax, wage, and pricing policies toward the estate sector, large-scale production has grown at an annual rate of close to 17 percent since 1968, with 70 percent of the share in exports. The corresponding production increase in the smallholder sector has been only 3 percent a year, even though services to peasant agriculture generally operate far more effectively in Malawi than in several neighboring African countries.

Large-scale farming per se is far less important a portion of total production or exports in Tanzania than in **Malawi.** However, government policies of "villagization " of peasant producers, combined with pronouncements of the need for cooperative cultivation and actual haphazard attempts (o introduce it, have had an adverse effect on smallholder incentives and production. Several other seemingly well-motivated government initiatives to raise peasant productivity have ended up being poorly implemented. These have led, for instance, to unrealistically high production and input-use targets, the consequent indiscriminate promotion of fertilizer use, and discouragement of interplanting of crops (which is traditionally done by peasants to reduce risks of crop failure) as not being ''modem. " These government initiatives, combined with unreliable provision of agricultural extension, credit, and output marketing, rather than enabling producers to raise overall agricultural productivity, have resulted in producers' responding mainly to changing relative prices of food and export crops. The failed government initiatives have in turn led to an increased official tendency to look toward large-scale mechanized and irrigated production to guarantee food and export **surpluses.** Like Tanzania, many other countries have already invested or have plans to invest substantial resources in large-scale state farms, but the record of public-sector farming is very poor throughout Africa, and large **subsidies are required** for these operations.

Irrigation will have to become important ultimately, as the vast, less costly possibilities of increasing production under rain-fed conditions begin to be exhausted. For the short run, however, in most of Africa there is not the complex institutional and managerial capacity to operate irrigation systems indigenously. The frequently costly rehabilitation (at five thousand to fifteen thousand dollars per hectare) being undertaken in many of the existing schemes illustrates the problem.

Incentives to Peasant Producers

Peasant agriculture is highly taxed by fixing low prices for its products and by overvaluing the national currencies vis-à-vis those of importing countries. **Agricultural taxation** helps keep urban food prices low and finances modernization through many capital-intensive investments, such as construction of new capital cities, stadiums, manufacturing and processing plants, and airports. Agriculture is, of course, the most important sector and hence has to be the major source of revenue. However, traditionally it was taxed because peasants were perceived as irrational, lazy, and unresponsive to price incentives. The resulting tax practices were inherited by independent governments from colonial administrations. Evidence of producer response has mounted, however. In turn, relative official producer prices of food and export crops have been changed in many countries in the last decade, first in order to achieve food self-sufficiency and more recently to promote exports. Relative prices have in fact been easier for governments to influence than technology or quality of services. Thus, while the composition of food and export crops has changed, overall productivity has stagnated. The producer's share in the total net market value of the output has frequently remained very low. In Sudan, the rate of taxation on cotton farmers reached 35 percent in the late 1970s; in Mali it ranged from 36 to 69 percent on cotton, 52 to 65 percent on groundnuts, and 23 to 63 percent on sorghum and millets. Even after allowance is made for the subsidies received by farmers on fertilizer and

credit, the effective rate of taxation amounted to 24–61 percent for cotton and 48-65 percent for groundnuts in Mali.

Again, the inadequate recognition of producer incentives is by no means confined to Africa. Theodore W. Schultz's *Transforming Tradiliona/ Agriculture,* which included examination of the peasant irrationality hypothesis, was prompted by similar observations in developing Asia in the early post-independence period. [9] In Asia these attitudes, trends, and perceptions have been muted, however. In fact, an articulate pro-agriculture lobby has been created within most governments in Asia. What accounts for these differences? In comparison with Africa (with a few exceptions, such as Kenya), in most of Asia there has been greater overt discussion of policy issues, both domestically and between domestic and outside scholars. More widespread formal education and training of policy makers and administrators in Asia has been helpful, as has their greater exposure to the farming communities through longer practical work experience.[10] New technological possibilities and increased use of purchased inputs have also changed the'perspective on price incentives. Now several rural development projects in Africa have gradually begun to produce a similar cadre of knowledgeable Africans in several countries, but their numbers arc small because of government and donor policies to be described later.

A large part of the agricultural budget in many countries is spent on subsidies-over 70 percent in Zambia. But contrary to general opinion, many of the subsidies provided in the agricultural sectors in the hope of increasing overall peasant production do not compensate effectively for high rates of taxation. For instance, fertilizer subsidies frequently only help alleviate the high cost of production of inefficient domestic fertilizer plants or the high cost of their local distribution. General subsidies on interest rates and inputs largely benefit the already better-off commercial farmers. [11] A policy followed in many African countries of uniform pricing of output, involving complex cross-subsidies of transport and other handling costs across regions, has achieved regional equity, especially where few attractive enterprises exist, but has discouraged crop specialization to exploit different natural resources among regions.

INPUT AND OUTPUT MARKETING

Input and output marketing and processing facilities are almost always operated by semiautonomous government or parastatal agencies or by largely government-initiated cooperatives on a monopoly basis. Public marketing agencies tend to be high-cost operations because of overstaffing, poor financial control and accountability, and inexperienced management. If an informal traditional market operates, it is only tolerated rather than helped to improve. [12] Frequently it is actively discouraged. The eviction of largely Asian-dominated trade through Operation Maduka in Tanzania and the massive expulsion of Asians in Uganda illustrate the point. A strong desire to abolish exploitation of nationals by other races is understandable, even if such exploitation is imputed rather than real. But even Nigeria, which has a buoyant, largely indigenous small-scale traditional trading sector, adopted a policy of public-sector monopoly of the distribution of fertilizer. Tanzania has similarly discouraged its own enterprising tribes from trading, among other things by instituting some four hundred parastatals and over eight thousand village cooperatives, which are expected to provide most of the public services.

Some of these same policies are followed for almost the same political and bureaucratic reasons in most **Asian countries, but the consequences there are far** less severe. The degree of government control is more limited, there is greater administrative capacity to exercise it, and there has been more development of private institutions and transport and communication networks. In Africa, inputs are more frequently late, inadequately labeled and packaged, and in wrong combinations. Marketed surpluses are often not picked upon time, first payments to farmers are inordinately late, promised second payments rarely materialize, and damages to crops in storage and handling are extensive. Discouragement of private retail trade has affected rural supply of even the most basic day-to-day necessities in some countries, thus further reducing incentives for producers to consume, save, or invest. Institutional pluralism needs to be given major consideration as an element of development strategy in Africa.

AGRICULTURAL RESEARCH, EXTENSION, TRAINING, AND SOCIAL SERVICES

Whereas there is indiscriminate government intervention in some areas of policy, there is neglect of others, for instance, agricultural research, extension, and development of trained manpower. This neglect is due partly to inadequate recognition of the importance of these services and of the time required to establish effective institutions and delivery systems and partly to preoccupation with politically more expeditious short-run objectives. The role of donors in this regard should not be underrated and is discussed later. The diversion of scarce financial and manpower resources to purposes that the private sector could well be allowed to serve is also a handicap.

Because of the inadequate provision of recurrent resources, the research, extension, and training facilities that do exist are frequently underfinanced and poorly maintained. As President Nyerere observed in his famous speech "The Arusha Declaration: Ten Years After, " the pressure to maintain and even expand public-sector employment is so high that the wage bill is difficult to control. [13] Consequently, there are not enough public funds for transport allowances for field staff to carry out research trials and extension demonstrations nor for spare parts, maintenance and operation of stores, processing facilities, research stations, vehicles, and roads. The general situation is one of ill-trained, unmotivated, unsupervised, and demoralized field staff in many sectors. Of course there are notable exceptions, **such as the Kenya Tea Development Authority and the Agricultural Marketing Corporation in Malawi. Inadequacy and depletion of capital and government** services over time are far more severe in areas where donor projects do not exist, inasmuch as these areas do not benefit from priority budgetary allocations. But the implementation of budgets also needs to be improved, as frequently even the resources allocated are not spent.

Social services suffer from many of the same problems. For example, lack or poor **quality of water supply in many rural areas of Africa leads to ill health.** Time spent in fetching water reduces time available for agricultural activities. **lack** of health facilities similarly reduces labor productivity in agriculture. Absence of primary education results in limited access to services and employment opportunities in towns. Demand for social services is therefore widespread throughout Africa. On the other hand, public resources to pay the recurrent costs of providing social services are generally too limited to permit blanket coverage.

Either a high degree of selectivity or greater direct cost recovery is therefore required in the provision of such services. As many harambee("self-help") schemes in Kenya illustrate, rural people are glad to contribute their own resources, provided the services are responsive to precise local demands and reliable, low-cost delivery is assured. Tanzania's example indicates, however, that for a combination of welfare and political reasons, governments refrain from cost recovery and genuine local involvement in planning and implementation. Tanzania's policy of universal provision of services through central financing has undoubtedly achieved results in some areas. According to official data, the proportion of the eligible population enrolled in primary schools went up from 28 percent in 1960 to over 90 percent in the late 1970s. The ratio of population with access to safe water has gone up from 13 percent in 1960 to about 40 percent in the 1970s. To a lesser extent, most African countries have expanded coverage of social services in a similar way, but the overall result is still inadequately financed services, with substantial demands on government resources.

Government objectives of modernization also exacerbate manpower shortages in the traditional sector. The low status of the traditional rural sector and the unattractive living conditions and facilities, in contrast to the urban or the large-scale agricultural sector, often deter qualified nationals from serving the needs of peasant agriculture. On the other hand, demand for education in Africa is one of the strongest in the developing world. The governments have allocated substantial portions of their own resources to education, with different emphases on primary and higher education, depending on their ideology. Because Tanzania has largely emphasized primary education, the enrollment ratio in secondary schools in Tanzania only went up from 2 percent at independence to 4 percent by the late 1970s, and from nearly zero to 0.3 percent in higher education. The shortage of middle- and higher-level technical and administrative manpower is consequently extremely severe. In Kenya, budgetary allocations to secondary and higher education have been expanding more rapidly, and private-sector expansion is permitted more liberally. As a result, 18 percent of the eligible population is enrolled in secondary schools and 1 percent is in higher education. Even then, middle- and higher-level manpower shortages are considerable, especially in technical fields such as accountancy, financial aid and physical resources management, agronomy, plant breeding, and mechanical and civil engineering. On a unit basis, skilled labor in African countries typically costs between three and ten times as much as in many Asian countries. The average annual salary of a research scientist in the 1970s was below ten thousand dollars in Asia, compared with thirty-four thousand dollars in East Africa. [14] And, of course, not nearly enough scientists are available even to rehabilitate, let alone to expand, the national research systems in Africa.

To summarize, the "Modernization Now" objective and the consequent national policies, investment priorities, and attitudes toward smallholder agriculture explain the poor performance of the agricultural and rural sectors in many African countries. In contrast, the Asian and, to a very limited extent, the African experience indicate that greater trained manpower, combined with longer developmental experience by nationals, leads to a better time perspective on modernization and, more support of peasant agriculture.

AFRICA'S SPECIAL CHALLENGES

The frequent comparisons with low-income Asia in the previous discussion should not lead one to overlook the problems peculiar to Africa. Low rainfall, poor soils, and the highly diverse ecological conditions within individual countries make raising agricultural productivity much more difficult in many parts of sub-Saharan Africa than in Asia, with its extensive scope for small- and medium-scale irrigation and its more fertile soils.

Several seemingly favorable natural features of Africa, such as the low density of population, pose difficult rural development problems in the short run. In the late 1970s, population densities ranged from 6 persons per square kilometer in Somalia and Sudan to 90 in Nigeria. This is in contrast to a density of 155 in the Philippines, 200 in India, and 620 in Bangladesh. Farms are considerably larger and landlessness is less prevalent in Africa than in most Asian countries. However, extensive land use is itself a result of the unreliable and low rainfall and poor soils referred to above, which lead to shifting cultivation and widespread nomadism in many parts of Africa. Low density also makes for much higher per capita costs of providing roads, schools, and agricultural services in Africa than in Asia.

There are also apparent contradictions. In the African farming system seasonal labor shortages are a far more limiting factor in increasing productivity than in Asia, especially in view of the low level of African agricultural technology. Thus, selective use of mechanization in the private sector may be economically justifiable. And yet unemployment and underemployment of rural labor are also increasing, particularly where population pressure on land is rising rapidly. With rising fuel costs, mechanization—now often operated through the public sector—is frequently highly uneconomical. The more intermediate forms of technology that are used extensively in Asia, such as the ox plow, would be far more efficient where the tsetse fly has been controlled. [15]

Cattle are an important element of Africa's agriculture. The tradition of individual ownership of cattle, combined with communal grazing rights, has resulted in overgrazing and declining productivity. For decades technicians have stressed the need for restocking and pasture improvement, but these have proved elusive because of the complex sociocultural and environmental factors that operate in nomadic social systems and the absence of more profitable and less risky ways of investing the surplus resources of cattle owners.

Low population density also explains the extreme inadequacy of roads, railways, and waterways, although even in this respect there is considerable diversity. Small countries with greater population density, such as Kenya and Malawi, are less hampered by inadequate transport than are large countries such as Sudan, Somalia, Ethiopia, and Tanzania. And yet investments in the road system have also been greater in Kenya and Mulawi than in many other African countries. Road mileage per square mile of land area is only 0.02 in Sudan, 0.1 in Zambia, and 0.15 in Zaire, compared with 0.23 in Kenya and 0.31 in Malawi.

Limited growth of sedenary cultivation has also meant more limited evolution of indigenous technology and skills in blacksmithing, carpentry, crafts, manufacturing, and trading than is typical of most Asian countries, though there are distinct differences between the more developed West African societies and those of East Africa. The range of farm implements, ox plows, and animal-driven modes of transport used extensively in other parts of the developing world

are not prevalent even today in much of traditional rural Africa. on the contrary, with the advent of colonialism there was a ''technological leap' toward tractors, combine harvesters, and modern means of transport, so that at independence Africa was left with greater technological dualism than was prevalent in most of colonial Asia.

For these various reasons, the challenges to agricultural research systems in Africa are by far the greatest in the world, combining constraints posed by ecological, demographic, technical, and institutional factors. [16] International agricultural research institutes such as the International Institute of Tropical Agriculture in Nigeria and several others, financed by the Consultative Group on International Agricultural Research, have already begun to address some of these problems. However, substantial additional investment is required in scientific research at the national and regional levels to develop profitable technological packages to suit the highly diverse conditions and reduce the risks now encountered in their adoption by low-income farmers. In some extremely marginal areas, such as parts of the Sahel in the north and Lesotho in the south, it may not be possible to increase productivity in present subsistence crops enough to make them a primary source of livelihood. Alternatives, including migration to more productive areas where labor-intensive, high-value horticultural crops can be produced, may have to be examined. These are costly options demanding considerable organization.

The situation with respect to trained manpower can be best appreciated by some comparisons with Asia at the time of independence. In 1960 even the educationally most advanced African countries, Ghana and Nigeria, had only 4 percent of the population of secondary-school age enrolled in school, compared with 8 percent in Bangladesh, 10 percent in Burma, 20 percent in India, and 26 percent in the Philippines. By the late 1970s the percentage in Nigeria had gone up to 13; by then it was 23 for Bangladesh, 22 for Burma, 28 for India, and 56 for the Philippines.

However, as may be *seen* in Ghana, Uganda, and Ethiopia, which have been better endowed with trained manpower than other African countries, without a conducive political environment little development is possible even with trained manpower. Many African countries have not yet fully achieved national unity or gained domestic political stability, the colonial powers having established national borders without regard to traditional land rights and tribal cohesion. Resources and attention sorely needed for rural development have often been diverted to internal conflicts, border wars, and maintenance of domestic political control.

Development of administrative capability will also take a long time. At independence, often there was a virtual absence of strong national, regional, and local government administrations of the types that existed in South Asia. Colonial agricultural development policies were geared almost exclusively to the expansion of export crop production for the metropolitan countries. Research was largely concentrated on export crops. [17] Agricultural extension, input supply, credit, and marketing and processing facilities were also highly fragmented. Recent efforts-for example, in Tanzania and Kenya-to decentralize administrative systems to make them more responsive to rural people's needs, while justified in the long run, have only exacerbated administrative weaknesses in the short run because the existing administrative manpower has had to be spread

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thinly between the central ministries of agriculture and transport and [he provincial administration.

Africa thus starts with considerable odds against development. And yet there is immense potential for productivity increases, not simply in Sudan and the highlands of eastern and southern Africa, where it is commonly recognized, but in much of the rest of Africa, in the humid and semihumid tropics and the parts of the savanna that receive adequate rainfall.

THE DONOR'S ROLE

The experience of Asian countries indicates that in addition to providing direct financial support, international assistance can play an important role in the long run by increasing national consciousness about peasant agricultural development, by improving the rationale for policies, by making the effect of alternative policy options on different sectors or income groups more explicit, and by gradually strengthening those national forces that can lobby for policy changes. Changing the distribution of basic assets or political power so that, for instance, cooperatives will effectively include the poor and subsidies will not go to the rich is far more difficult to achieve from outside. National will and capacity are needed to this end.

Concern and debate about the equity issue in the international donor community have been extensive since the "green revolution' and the perceived failure of the trickle-down approach to reach the poor. [18] Since the world food crisis of 1973-74 the objective of national self-sufficiency in food, and subsequently a broader set of issues such as assurance of basic needs, environmental protection, and women's rights, have begun to receive international attention. The seemingly long time required to achieve the green revolution in Asia has created impatience in the donor community to achieve results, and with the widening scope of the development debate, the areas for achieving results have broadened.

Aid in the form of grants and low-interest loans has increased substantially over time in Africa. For the late 1970s, aid ranged between $20 and $40 a year per capita in Sudan, Kenya, Tanzania, Burundi, Ivory Coast. Mali, Cameroon, Zambia. and Malawi to as high as $50 to $120 in the smaller countries of Botswana, Lesotho, and Swaziland. In many countries it constitutes a quarter or more of the total annual investment and over half the investment in agriculture and rural development. Even Bangladesh, which is one of the largest recipients of aid in Asia, received only about $10 of concession] aid a year per capita in the late 1970s.

Large numbers of aid agencies are involved in assistance to Africa, with relatively little coordination as to objectives, strategy, degree of continuity, and areas of assistance. Coping with the complex and differing procedures and large flows of aid is exceedingly difficult for the inadequately staffed bureaucracies of most African countries. [20]

Apart from targeting more donor-financed projects toward the rural poor, there has been much evolution in the concept of project assistance in recent years, [21] Projects no longer focus solely on export crops, but are increasingly concerned with development of food crops for domestic consumption. They are more strongly geared to institution building, such as strengthening the project-planning and implementing capacity of the national ministries of agriculture, of the

provincial, regional, district, and local administrations, and of the financing and marketing entities that provide field services. This is in contrast (o the earlier approach of "enclave" projects, which were implemented mainly through separate autonomous entities created for the purpose. The new projects also show greater concern for employment, training of local staff, and the use of local materials and techniques. They also anticipate more explicitly the need for recurrent financing and for financing of several time phases . They are also more likely now to include support for policy units and monitoring and evaluating to ensure greater flexibility and learning by doing.

Despite these major improvements, donor-financed projects are having a very limited impact, especially in light of the resources expended. This holds irrespective of whether their achievements are judged by inputs, such as numbers of local and expatriate staff recruited, research trials carried out, amounts of fertilizer and other inputs distributed, vehicles purchased, buildings and roads constructed or maintained, or amount of data collected or analyzed by evaluation units; or by the end results, such as increases in yields, numbers of staff trained, or administrative and financial procedures instituted.

What explains the limited impact'? The gulf between the donors' largely equity-oriented objectives and the national government's goal of modernization has remained wide in Africa. Instead of examining the actual policies, strategies, and institutional frameworks of national governments and assessing the extent to which they are conducive to rural development, donors have largely taken government rhetoric and plan documents as indications of national commitment and priorities. Donors have concentrated on project aid as a way of influencing these priorities; in so doing, they frequently have exacerbated the problems of Africa's rural development in a variety of ways.

First, the simultaneous shift by much of the international community to the alleviation of rural poverty, in the face of obvious shortages of national manpower, resources, and institutional capacity, has led to underutilization and poor maintenance of donor investments. For a variety of reasons, donors have generally preferred to finance mainly capital expenditures, that is, equipment and civil works, rather than the recurrent expenditures required to maintain or operate these and other related investments.

Second, despite much evolution in the right direction, the need for assistance in increasing national capacity for policy development has been underrated. In addition, a number of questionable showpiece investments by governments have been made possible by generous financial support from the donor community. There are a number of reasons for such assistance: a wish to respond to national desires; an expectation of quick, visible results; the promotion of exports from donor countries; the vying among donor agencies to finance projects likely to appeal to their own domestic constituencies; the donors' need to meet their own quotas of assistance; and some understandable errors in judgment. However, there are other factors: the first relates to the provision of technical assistance in the short run, the second to the expansion of secondary and higher-level education to help broaden the capacities of nationals over the long run.

According to some estimates. as much as 75 percent of the technical assistance used in the developing world is used in Africa. In the short run. technical assistance has permitted the planning and implementation of development projects on a scale that would not have been possible otherwise. However, expatriates are becoming less acceptable in sensitive managerial or policy-making posi-

tions in most African countries. Their numbers have been growing for more than a decade since independence, mainly in technical and advisory Positions. Their high salaries and benefits create resentment among nationals. Even when highly qualified in their specialties, they are not generally effective in working in an alien environment.

Increasing high-level education and training of nationals is therefore critical for augmenting Africa's managerial and policy-making capacity, even though the results will take a long time to achieve. Expansion of basic, primary, vocational, and adult education has been supported strongly by donors as a way of increasing the supply of field staff, meeting the basic-needs objectives, and increasing the receptivity of rural populations to agricultural and other innovations. Some high-level technical training of Africans is also being undertaken by several bilateral donors, such as the U.S. Agency for International Development and the British Overseas Development Ministry, which have traditionally supported this activity. But on the whole, expansion of secondary and higher education has not received the priority it requires from donors. Frequently the shortage of people with the necessary educational qualifications is so great that even those funds that are provided by donors for higher-level on-the-job training remain unused.

The gains to be had from basic, adult, and primary education are undoubtedly considerable, as evidence from Asia indicates. It is also clear, however, that in Africa at present the shortage of educatcd and technically trained cadres of nationals who can devise effective national strategies and policies is a far greater constraint to the alleviation of rural poverty than is the illiteracy or lack of receptivity of the rural population. Once again, the question is one of balance and priorities at a given stage of development. Evidence, mainly from Asia and Latin America, has also led to anxiety about increasing the ranks of the educated unemployed in developing countries. The perceived indifference of some of the educated urbanites to the largely rural needs of their own countries has led the international community to a general disenchantment with higher education. Perhaps implicit in this is the feeling that in comparison with the need to train lower-level staff, expanding the supply of high-level educated personnel is unnecessary or antithetical to the egalitarian objectives of rural poverty alleviation.

Contrary to these perceptions, an increase in the **supply of educated personnel** would not only improve national systems but also reduce salaries of the educated, including those of teachers, thus reducing income inequalities as well as the cost of further investment in education and a range of other development activities. By far the most unquestionable though unquantifiable benefit of higher education to Africa **would be that of learning** by doing, which is now lost to the ever-growing and changing expatriate technical community. It is ironic that most African countries do not have the capacity to propose alternative plans to those presented by donors for using aid funds—plans that would reflect the countries' own long-term needs for higher education.

The need for substantial investment in physical infrastructure in larger countries such as Sudan and Tanzania and in landlocked countries such as Zambia also requires critical examination by donors. Maintenance of past infrastructure has frequently been neglected, and not enough resources have been devoted to development of trunk roads, railways, and waterways by national governments and donors. Feeder-road development has received considerably more support, but the lack of an effective national transport network makes investment in feeder

roads ineffective. Again, some of [he same reasons that apply to education and training explain this neglect, in particular the perception that capital-intensive infrastructure is not so necessary for reaching the poor, especially in the short run. A more appropriate balance between the objectives of immediate alleviation of poverty and the long-term development needs of more resource-intensive investments is required.

IMPLICATIONS FOR LONG-TERM DEVELOPMENT

The problem of Africa's rural development is not one of not knowing in broad terms what needs to be done to support peasant agriculture. The prospects for turning the present gloomy trends around are considerable. At the national level, the most fundamental problems are attitudes and vested interests. The subsistence rural sector must be seen as critical for economic development and must be given the priority that it urgently requires. At the international level, it is evident that current donor approaches of project aid, although perhaps far more essential in Africa than in many countries in Asia, are by themselves not enough to deal with Africa's complex developmental needs. A major reconsideration of the balance of assistance, including the donors' role in education, infrastructure, and long-term policy planning and implementation, is required. Only then can there be a useful discussion of development priorities with nationals. The question of reordering priorities will require a major review by the donor community as a whole, and even if the question is resolved adequately, the reordering of priorities will take at least a decade to show major results. But the prospects for the 1990s will then be considerably better than those for the 1980s. It is also the only way to reduce Africa's growing dependence on outside aid.

NOTES

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1. Uma Lele and Wilfred Candler, "Food Security in Developing Countries: National Issues," chapter 14 in this book; International Food Policy Research Institute, *A Comparative Study of FAO and USDA Data on Production, Area, and Trade of Major Food Staples,* Research Report no. 19 (Washington, D. C., October 1980).

2. International Food Policy Research Institute, *Food Needs of Developing Countries: Projections of Production and Consumption to 1990,* Research Report no. 3 (Washington, DC., December 1977), table 3, p. 33.

3. Ibid., table 1, p. 22.

4. K. Anthony; B. F. Johnston; W. O. Jones; and V. Uchendu, *Agricultural Change in Tropical Africa* (Ithaca: Come]] University Press, 1979).

5. World Bank, *World Development Report 1981* (New York: Oxford University Press for the World Bank, 1981), table 1.1, p. 3.

6. Goren Hyden, in *Papers on the Political Economy of Tanzania,* ed. K. S. Kim, M. Mabele, and M. J. Schultheis (Nairobi: Heinemann, 1979), 5-14.

7. See Holdcroft, chapter 3 in this volume.-ED.

8. The countries are World Bank members with populations over two million, plus Mauritius.

9. T. W. Schultz, *Transforming Traditional Agriculture (New* Haven: Yale University Press, 1964). [See also the discussion of Schultz's work in chapter 1 of this book.-ED. 1

10. Journals such as the *Economic and Political Weekly* have provided an important forum for a vigorous domestic discussion of planned priorities in India in which innumerable external analysts have participated.

11. Uma Lele, "Cooperatives and the Poor: A Comparative Perspective," *World Development 9 (1981): 55-72. [See* also Adams and Graham, chapter 21, and Gonzalez-Vega, chapter 22, in this volume.—ED.]

12. "There is no official policy towards the unofficial market," a comment of a senior official of one of the African ministries of agriculture, states the problem well.

13. Goren Hyden, *Beyond Ujamaa in Tanzania: Underdevelopment and an Uncaptured Peasantry* (Berkeley and Los Angeles: University of California Press, 1980), 133; Uma Lele, *The Design of Rural Development: Lessons from Africa*. 2d ed. (Baltimore: Johns Hopkins University Press, 1979).

14. P. Oram, *Current and Projected Agricultural Research Expenditures and Staff in Developing Countries*, International Food Policy Research Institute Working Paper, no. 30 (Washington, D.C., 1978), 6.

15. The tsetse fly is the vector of trypanosomiasis, or sleeping sickness, which is endemic in many pans of sub-Saharan Africa.—ED.

16 H. Ruthenberg, *Farming Systems in the Tropics* (Oxford: Clarendon, 1976). See also Schultz, chapter 23; Evenson, chapter 24; and CIMMYT Economics Staff, chapter 25. in this volume.

17 See Evenson, chapter 24 in this volume.—ED.

18. See chapter I in this volume.—ED.

19. World Bank, *Accelerated Development in Sub-Saharan Africa: An Agenda for Action* (Washington, D. C., 198 I)

20. See Eicher, chapter 31 in this volume.—ED.

21. Lele, *The Design of Rural Development*

Facing Up to Africa's Food Crisis

CARL K EICHER

The most intractable food problem facing the world in the 1980s is the food and hunger crisis in the forty-five states in sub-Saharan Africa—the poorest part of the world. Although the crisis follows by less than a decade the prolonged drought of the early 1970s in the Sahelian states of West Africa, weather is not the main cause of the current dilemma.[2] Nor is the chief problem imminent famine, mass starvation, or the feeding and resettling of refugees. Improved international disaster assistance programs can avert mass starvation and famine and assist with refugee resettlement. Rather, Africa's current food crisis is long-term in nature, and it has been building up for two decades; blanketing the entire subcontinent are its two interrelated components—a food production gap and hunger. The food production gap results from an alarming deterioration in food production in the face of a steady increase in the rate of growth of population over the past two decades. The hunger and malnutrition problem is caused by poverty: even in areas where per capita food production is not declining, the poor do not have the income or resources to cope with hunger and malnutrition.

Twenty of the thirty-three poorest countries in the world are African (World Bank 1982).[3] After more than two decades of rising commercial food imports and food aid, the region is now experiencing a deep economic malaise, with growing balance-of-payment deficits and external public debts. The world economic recession has imposed a severe constraint on Africa's export-oriented economies. Prospects for meeting Africa's food production deficit through expanded commercial food importsthus appear dismal. Donors have responded to these difficult problems by increasing aid flows to the point where African countries now lead the list of the world's aid recipients in per capita terms.[4] Furthermore, the World Bank report *Accelerated Development in Sub-Saharan Africa (* 1981)5 advocates **a doubling of aid to Africa in** real terms by the end of the 1980s. But the crisis cannot be solved through crash food production projects or a doubling of aid. Sincc the food and hunger crisis has been in the making for ten to **twenty years, solutions to** the crisis cannot be found without facing up to a **number of difficult political, structural, and technical problems over the next several decades.**

Key questions and policies that must be examined include: What is the record of agrarian capitalism and socialism? Why did the green revolution by-pass Africa'? What **lessons have been learned from crash food production projects in**

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the Sahel and the development strategies of the 1970s—integrated rural development, helping the poorest of the poor, and the basic needs approach? Are technical packages available for small farmers to step up food production in the 1980s? Can foreign aid assist in the alleviation of the food production crisis and economic stagnation?

OVERVIEW OF AFRICA'S ECONOMY

Despite the fact that Africa is an extremely diverse region, several common features frame the boundaries for addressing its food crisis. First, population densities in Africa are extremely low relative to those in Asia. The Sudan, for example, is two-thirds the size of India, but it has only 18 million people as compared with 670 million in India. Zaire is five times the size of France and has only a small percentage of its arable land under cultivation. But some countries are near their maximum sustainable population densities, given present agricultural technology and available expertise on soil fertility. Much of the arable land in Africa is not farmed because of natural constraints such as low rainfall and tsetse flies, which cause human sleeping sickness and virtually preclude the use of approximately one-third of the continent, including some of the best-watered and most fertile land.[6]

Second, most of the economies are open, heavily dependent on international trade, and small: twenty-four of the forty-five countries have fewer than 5 million people, and only Nigeria has a gross domestic product larger than that of Hong Kong (World Bank 1981, 2). Small countries have special problems in assembling a critical mass of scientific talent and in financing colleges of agriculture and national agricultural research systems,

Third, all but two African states—Ethiopia and Liberia-are former colonies.[7] The colonial legacy is embedded in the top-down orientation of agricultural institutions and the priority given to medicine, law, and the arts rather than agriculture in African universities and partially explains the low priority that African states have assigned to agriculture and to increasing food production over the past twenty-five years.

Fourth, Africa is an agrarian-dominated continent where at least three out of five people work in agriculture and rural off-farm activities. Moreover, since agricultural output accounts for 30–60 percent of the gross domestic product in most countries, the poor performance of the agricultural sector over the past two decades has been a major cause of poverty and economic stagnation.

Fifth, Africa's human resource base is extremely weak relative to those of Asia and Latin America. In most countries, even after twenty years of independence, there are still only small pools of agricultural scientists and managers because of the token priority that colonial governments gave to educating Africans.

PROFILE OF AFRICAN AGRICULTURE

Although there are more than one thousand different ethnic groups in Africa and wide differences in farming and livestock systems by agroecological zones, the following overview pinpoints the major features of African agriculture and some of the d inferences between it and agriculture in Asia and Latin America. [8]

For the most part, land ownership in Africa is remarkably egalitarian as contrasted with that in Latin America. The uniform agrarian structure is partially a function of colonial policies that prohibited foreigners from gaining access to land in some parts of the continent, such as West Africa. But in Zambia and Zimbabwe, colonial policies promoted a dual structure of large and small farms (Blackie 1981).

Empirical research has shown that African farmers, migrants, and traders are responsive to economic opportunities. Although custom, local suspicions, jealousies, ignorance, and fatalism can play a role in inhibiting the introduction of change in a particular situation, these variables do not serve as a general explanation of rural poverty (Jones 1960).

Africa is a region of family-operated small farms, in contrast to Latin America, where land ownership is highly concentrated. The typical smallholder has five to fifteen acres under cultivation in any one year and frequently has as much or more land in fallow in order that soil fertility can be gradually restored. Thus, it is more accurate to describe most African farming systems as land-extensive farming systems rather than land-surplus systems. The typical smallholder gives first priority in terms of land preparation, planting, and weeding to growing staple foods (such as millet, sorghum, yams, cassava, white maize, and beans) to feed his family and second priority to producing cash crops such as coffee, cotton, and groundnuts for the market.

Family labor supplies the bulk of the energy in farming, unlike in Asia, where the main energy source is oxen. The short-handle hoe and the machete are the main implements used in land preparation and weeding. Rural nonfarm activities account for 25–50 percent of the total time worked by male adults in farm households over the course of a year in Africa. Unlike in Asia, there is no landless labor class in most African countries because of the presenceof idle land.

Land tenure in Africa can be characterized as a communal tenure system of public ownership and private use rights of land (Cohen 1980). The combination of private use rights and communal control over access to land allows families (u) to continue to farm and graze the same land over time and to transfer these use rights to their descendants and (b) to have the right to buy and sell rights to trees (such as oil palm and cocoa) through a system of pledging. There is no active rural land market in most countries. Land tenure and lurid use policy issues will be of strategic importance in the 1980s and 1990s as the frontier phase is exhausted, land markets emerge, irrigation is expanded, and herders shift from nomadic to semi nomadic herding and sedentary farming systems that integrate crops and livestock.

Unlike in Asia, where two or three crops are grown sequentially over a twelve-month period, most African farmers produce only one crop during the rainy season and engage in some form of off-farm work during the dry season. irrigation is a footnote in most countries because farmers can produce food and cash crops more cheaply in rainfed farming systems.

Rural Africa is at a crossroads. Farming and livestock systems are complex, heterogeneous, and changing. African villages are experiencing major changes in response to the penetration of (he market economy, drought, explosive rates of population growth, and the oil boom in countries such as Nigeria and Gabon. For example, the oil boom in Nigeria has escalated rural wage rates, induced migra-

tion from northern Cameroon and Niger, and provided a market for livestock and food crops from neighboring countries.

The subsistence farmer producing entirely for his family's consumption is hard to find in Africa today except in special cases where inadequate transport, rebellion, or political unrest have forced farmers to withdraw from the market and produce for their subsistence needs (such as in Uganda and Guinea in the 1970s and in Tanzania in the early 1980s). In the 1980s and 1990s, village institutions will be under pressure as rural Africa shifts from extensive to intensive farming and livestock systems in response to the decline in the ratio of land to labor. Inequality between countries—for example, Upper Volta and the Ivory Coast—and within countries-for example, southern and northern Sudan—willlikely increase in the coming decades.

UNDERDEVELOPED DATA BASE

Africa has a weak and uneven data base, and there is a need to interpret official statistics with caution. For example, accurate data on acreage under cultivation and yields are available for only a handful of counties. Estimates of land under irrigation vary from 1 percent to 5 percent. Estimates of the size of national livestock herds are notoriously suspect because of cattle tax evasion. Even trade data must be carefully examined. For example, official data on cocoa exports from Togo in the 1970s included a large volume of cocoa from Ghana which was smuggled into Togo. Data on rural income distribution are available for only a few countries. Agricultural statistical agents in most countries rely heavily on guesstimates from extension agents, and they have been known to revise their figures to bring them into line with published estimates from international agencies. The combination of underdeveloped data and the case study nature (village studies, for example) of much of the research in the past decade makes it difficult to generalize about the sources of agricultural output and the causes of poverty, malnutrition, and lagging food production.

There is also a need to beware of the pitfalls of studies [hat present the results of survey research, such as farm management and nutrition surveys, in terms of averages. For example, data showing that farmers produce enough food to feed each family member an average of two thousand calories a day during a given year are meaningless if some family members do not have enough food to survive during the ''hungry season. Moreover, the use of averages promotes the view that there is a homogeneous or classless rural society and that interventions designed to improve the average incomes in an area will automatically improve the incomes of all people, including those on the lower end of the income scale. Numerous researchers have shown that rural inequality is an integral part of Africa's history, that inequality may increase as a result of technical change, and that assistance to particular groups of people will have to be carefully targeted.

In summary, although a few scholars talk glibly about average sorghum yields for a country, the "African case, " and uncritically use Africa-wide figures (for example, that women produce at least 80 percent of the food in Africa), serious scholars wisely eschew generalizing about even a subregion such as West Africa-an area as large as the continental United States.

FOOD AND POPULATION TRENDS

Looking at Africa's food production trends, population growth, food imports, and poverty, the overriding pattern emerges clearly: since independence Africa's historical position of self-sufficiency in staple foods has slowly dissipated (FAO 1978). Over the 1960-80 period, aggregate food production in Africa grew very slowly—by about 1.8 percent per year, a rate below the aggregate growth rate of Asia or Latin America. However, **the critical numbers are not statistics on total food production but per capita** figures. The U.S. Department of Agriculture (1981) statistics show that sub-Saharan Africa is the only region of the world where per capita food production declined in the 1960-78 period, In addition, the average per capita calorie intake was below minimum nutritional levels in most countries. [g]

The per capita figures reflect the fact that Africa is the only region of the world where the rate of growth of population actually increased in the 1970s. The annual population growth rate in Africa was 2.1 percent in the mid 1950s and 2.7 percent in the late 1970s and is projected to increase throughout the 1980s until it levels off at about 3 **percent** by the 1990s (United Nations 1981). Underlying the upward population trend is a young age structure. The average African woman produces six living children in her reproductive years.

There is little hope for reducing fertility levels in the 1980s because of a complex set of factors, including the economic contribution of children to farming and rural household activities, the pro-fertility cultural environment, the failure of family planning programs to date, the pro-natal policies of some states, such as Mauritania, and the indifference of most African heads of state and intellectuals to population growth in what they consider to be a land-surplus continent. But explosive rates of population growth cannot be ignored much longer. For example, Kenya's annual rate of population growth of more than 4 percent implies a doubling of population in about seventeen years (Kenya 1981). In Senegal, where 95 percent of the population is Muslim and the Muslim leaders have great political **power, the government is** moving gradually on population intervention as it expands demographic research and quietly opens child and maternal health **clinics** in urban areas. In sum, for a variety of reasons, it is almost certain that most states will move slowly on population-control policies during this decade. As a result, population growth will press hard on food supplies, forestry reserves, and livestock and wildlife grazing areas throughout the 1980s and beyond.

Food imports are another important dimension of the critical food situation. Many countries that were formerly self-sufficient in food significantly increased their ratio of food imports to total food consumption in the 1960s and 1970s. According to USDA figures, food imports are dominated by grain imports-especially wheat and rice-which have increased from 1.2 million tons a year in 1961 –63 to 8 million tons in 1980, at a total cost of $2.1 billion. Significantly, commercial **imports** of food grain grew more than three times as fast as population over the 1969–79 period. Rising food imports are attributed to many factors: lagging domestic production; structural and sectoral shifts arising from such factors as the oil boom in Nigeria and the increase in minimum wages in Zimbabwe following independence; increasing urbanization; the accompanying shift of consumer tastes from cassava, yams, millet, and sorghum to rice and wheat; availability of food aid on easy terms; and overvalued foreign exchange rates,

which often make imported cereals cheaper than domestic supplies. Although data on food aid are imprecise, food aid represented about 20 percent of Africa's total food imports in 1982. Wheat, wheat flour, and rice dominate overall imports.

Given the intimate linkage of hunger and malnutrition to poverty, economists, nutritionists, and food production specialists are coming to agree that food and poverty problems should be tackled together. For if rural and urban incomes are increased, a large increment of the increased income of poor people (50–80 percent) will be spent on food. [10] Unless food production is stepped up, an increase in rural and urban incomes will simply lead to increased food prices and food imports and a hardship on families in absolute poverty. Conversely, while expanded food production should be the centerpiece of food policy in Africa in the 1980s, food policy strategies must go beyond crash food production campaigns to deal with poverty itself because expanded food production by itself will not solve the basic problem of poverty.

Africa's food and poverty problems should not be allowed to overshadow some impressive achievements of the continent over the past twenty-five years. Foremost is the increase in average life expectancy-from an estimated thirty-eight years in 1950 to almost fifty years in 1980. This 30 percent increase is often overlooked by those who are mesmerized by rates of economic growth. Moreover, the achievements in education have been impressive in some countries, and there has been a vast improvement in the capacity of countries such as Nigeria, Kenya, the Ivory Coast, Cameroon, and Malawi to organize, plan, and manage their economies.

HISTORICAL ROOTS OF POVERTY AND THE NEGLECT OF AGRICULTURE

From this overview, one can see that while most Africans are farmers and Africa has enormous physical potential to feed itself, there are substantial barriers to tapping this potential. Experts from academia, donor organizations, and consulting firms emphasize post-independence corruption, mismanagement, repressive pricing of farm commodities, and the urban bias in development strategies. Year after year, African heads of state point to unfavorable weather in their appeal for food aid. In fact, the food production crisis stems from a seamless web of political, technical, and structural constraints which are a product of colonial surplus extraction strategies, misguided development plans and priorities of African states since independence, and faulty advice from many expatriate planning advisers. These complex, deep-rooted constraints can only be understood in historical perspective starting with the precolonial and colonial periods (Eicher and Baker 1982).

The colonial period formally began when the colonial powers met at the Berlin Congress in 1884 and decided how Africa should be partitioned among the main European powers. Until the past decade, much of the literature by economists on the colonial period has been pro-colonial. For example, Bauer boldly asserts that "far from the West having caused the poverty in the Third World, contact with the West has been the principal agent of material progress there" (Bauer 1981, 70). But empirical research over the past two decades has shown that colonial approaches to development created a dual structure of land ownership in some countries and facilitated the production and extraction of surpluses--copper,

gold, cocoa, coffee, and so on—for external markets while paying little attention to investments in human capital, research on food crops, and strengthening of internal market linkages. For example, colonial governments gave little attention to the training of agricultural scientists and managers. By the time of independence in the early 1960s, there was only one faculty of agriculture in French-speaking tropical Africa. Between 1952 and 1963, only 4 university graduates in agriculture were trained in Francophone Africa, and 150 in English-speaking Africa (McKelvey 1965). In 1964, 3 African scientists were working in research stations in Kenya, Uganda, and Tanzania (Johnston 1964).

Many colonial regimes focused their research and development programs on export crops and the needs of commercial farmers and managers of plantations. In fact, Evenson (1981) points out that in 1971 cotton was the only crop that enjoyed as much research emphasis in the Third World as in industrial countries.[11] The mosest investment in research on food crops could be defended during the colonial period because the rate of population growth was low—l percent to 2 percent per annum-and surplus land could be "automatically" brought under cultivation by smallholders. But with annual rates of population growth now approaching 3–4 percent in some countries, researchers must devote more attention to food crops and the needs of smallholders and herders. Although the debate on colonialism will continue for decades, we have established the simple but important point that contemporary agricultural problems can only be understood by serious analysis of colonial policies and strategies.

FIVE DEBATES ON FOOD AND AGRICULTURE IN THE POST-INDEPENDENCE PERIOD

Africa's food and poverty problems are also a product of misguided policies, strategies, and priorities over the past two decades. In the post-independence period since 1960, African states have engaged in five key debates on food and agriculture. The first was over the priority to be given to industry and agriculture in development plans and budget allocations, As African nations became independent in the late 1950s and early 1960s, most of them pursued mixed economies with a heavy emphasis on foreign aid, industrial development, education, and economic diversification. For example, the late President Kenyatta promoted capitalism and encouraged investors "to bring prosperity" to Kenya. A small number of countries such as Mali, Ghana, and Guinea shifted abruptly to revolutionary socialism in the early 1960s. But whether political leaders were espousing capitalism or socialism, they generally gave low priority to agriculture. African leaders, like former colonial rulers, thought agricultural development would simply reinforce dependency. They tended to view agriculture as a backward sector that could provide surpluses-in the form of taxes and labor-to finance industrial and urban development. Agricultural policies in many capitalist and socialist countries supported plantations, state farms, land settlement schemes, and the replacement of private traders and moneylenders with government trading corporations, grain boards, and credit agencies. The effects of these policies on agricultural production were typically inhibiting, in some cases highly so.

The second debate was over the relevance of Western neoclassical models versus the "political economy" (stressing dependency and class structure) and radical models of development. As Western economists assumed important roles

in helping to prepare development plans and served as policy advisers in the early 1960s, Western modernization and macroeconomic models were introduced into Africa. The dominant neoclassical models emphasized the industrial sector as the driving force of development and the need to transfer rural people to the industrial sector. These models had three major shortcomings. First, they assumed that one discipline—economics — could provide answers on how to slay the dragons of poverty, inequality, and malnutrition. As Hirschman (1981) reminds us, development is a historical, social, political, technical, and organizational process which cannot be understood by means of a single discipline. Second, the cities were unable to provide jobs for the rural exodus because of trade union pressure that elevated minimum wages in government and in industry and capital-intensive techniques in the industrial sector (Byerlee et al. 1983). Third, the neoclassical growth models were unable to provide a convincing micro understanding of the complexity of the agricultural sector—the sector that employs 50–95 percent of the labor force in African states. Although these models were technically elegant. they seem remarkably naive today because they assigned a passive role to the agricultural sector.

The vacuity of the Western neoclassical models of development and their failure to come to grips with the broad social, political, and structural issues, as well as the complexities of the agricultural sector, opened the door for the political economy and dependency models to emerge in the 1960s and gain a large following among African intellectuals. [12] The models that emerged in Africa were greatly influenced by Latin American dependency writers. Samir Amin, an Egyptian economist, has been the preeminent proponent of the dependency and underdevelopment paradigm of development in Africa over the past two decades. 13 The political economy literature attempts to link rural poverty and underdevelopment to historical forces, world capitalism, and surplus extraction. The political economy models have made a valuable contribution in stressing the need to understand development as a long-term historical process, the need to consider the linkages between national economies and the world economic system, and the importance of structural barriers (for example, land tenure in Zimbabwe and Zambia) to development. But there is little empirical support for many of the assertions made by some of the political economy scholars.

The question remains, Can political economy and dependency scholars move beyond their abstract models to develop models based on studies of the behavior of African farmers and herders, on African institutions, and on micro/macro linkages in order to provide policy guidance in a continent in which the majority of the people are farmers?

The third debate---over agrarian capitalism versus socialism-has been one of the most emotional topics over the past thirty years; it will continue to dominate discussions on politics, development strategies, and foreign aid in the 1980s. Even though it is difficult to define African socialism, about one-fourth of the states now espouse socialism as their official ideology. The experiences of Ghana and Tanzania are well documented. Four years after Ghana became independent, President Nkrumah abruptly shifted from capitalism to a socialist strategy that equated modernization with industritilization and large-scale farming and state control over agricultural marketing. Ghana was unable to assemble the technical and managerial skills and incentive structure to operate its vast system of state farms, parastatals, and trading corporations. The failure of agrarian

socialism has imposed a heavy toll on the people of Ghana (Nweke 1978; and Killick 1978).

Tanzania's shift to socialism in 1967 produced a voluminous literature, international press coverage, massive financial support from international donors-especially Scandinavian countries and the World Bank—and attention from political leaders and intellectuals throughout Africa.[14] The vision of agrarian socialism is set forth in President Nyerere's essay "Socialism and Rural Development. But after seventeen years of experimentation, it seems fair to examine the balance sheet on socialism in a country where 80 percent of the population live in rural areas. The Tanzanian experiment is floundering in part because of the quantum jump in oil prices in the mid 1970s and the conflict in Uganda but basically because of the sharp decline of peasant crop production[15] and production on government-managed coffee, tea, and sisal estates. one cannot overlook Tanzania's gains in literacy and social services, but one may legitimately worry about their sustainability over the longer term without increased rural incomes or exceptionally heavy foreign aid flows. There are many unanswered questions about Tanzania's experiment with agrarian socialism, such as why President Nyerere authorized the use of coercion to round up farmers living in scattered farmsteads and forced them to live in villages. Many pro-Tanzania scholars avoid this topic. But the failure of Tanzania to feed its people explains why Tanzania is no longer taken seriously as a model which other African countries want to emulate.[16]

Agrarian socialism is now under fire throughout Africa: after twenty years of experimentation, presently no African models are performing well. Even Benin, Mozambique, and Guinea are silently retreating from some of the rigid orthodoxy of socialism. What are the reasons for the failure of agrarian socialism to date'? First, and most important, socialist agricultural production requires a vast amount of information and managerial and administrative skills in order to cope with the vagaries of weather, seasonal labor bottlenecks, and the need for on-the-spot decision-making authority. In most African countries. the critical shortage of skills and information is the biggest enemy of agrarian socialism. No amount of socialist ideology can substitute for the lack of soil scientists, managers, bookkeepers, mechanics, and an efficient communication system. Second, many parastatals, state farms, and government-operated grain boards have been plagued with overstaffing, corruption, mismanagement, and high operating costs. Because these constraints cannot be easily overcome, it is unlikely that Africa will make much progress with socialist agriculture in this century.

As the pendulum swings from socialism to private farming and private traders in the 1980s, it is important to stress that to put all or most of the weight on ideology— capitalism or socialism—is to ignore an important lesson learned over the past thirty years in the Third World, namely, that ideology is but one variable influencing the outcome of agricultural development projects. The ''correct' choice of ideology cannot in and of itself assure successful development. Examples of failure under both capitalist and socialist models are too numerous to conclude otherwise.

The fourth debate was over the use of pricing and taxation policies to achieve agricultural and food policy objectives. The first issue here is whether Africans are responsive to economic incentives. Empirical research has produced a consensus that African farmers do respond to economic incentives as do farmers in high-income countries but that Africans give priority to producing enough food

for their families for the coming one to two years (Helleiner 1975). The next question is whether African states have pursued positive or negative pricing and taxation policies for agriculture. [17] Numerous empirical studies across the continent have provided conclusive evidence that many countries (both capitalist and socialist) are maintaining low official prices for food and livestock in order to placate urban consumers. The impact of these negative policies dampens incentives to produce food and livestock for domestic markets and encourages black market operations and smuggling across borders.

For example, starting in the mid 1960s Tanzania paid farmers throughout the country a uniform price for maize in order to achieve equity objectives. But this policy discouraged regional specialization, increased transportation costs, and encouraged smuggling across borders. In Mali, the government pricing policy for small farmers in a large irrigated rice production scheme in 1979/80 could be labeled "extortion." A meticulous two-year study has shown that it cost farmers 83 Malian francs to produce a kilo of rice but that the government paid farmers only 60 Malian francs per kilo (Kamuanga 1982), Does it seem irrational that farmers smuggled rice across the border into Senegal, Niger, and Upper Volta, where they secured 108–28 Malian francs per kilo?

Not only food crops are subjected to negative pricing policies; export crops are also heavily taxed. In an analysis of pricing and taxation policies for major crops in thirteen countries over the 197 1–80 period, the World Bank concluded that, taking the net tax burden and the effect of overvalued currency into account, producers in the thirteen countries received less than half of the real value of their export crops (World Bank 1981, 55). These examples and other studies carried out over the past two decades provide solid evidence that African states are using negative pricing and taxation policies to pump the economic surplus out of agriculture. [18] A simple but powerful conclusion emerges from this experience: African states should overhaul the incentive structure for farmers and livestock owners and adopt increased farm income as an important goal of social policy in the 1980s. Moreover, increasing incentives to farmers and herders is a strategic policy lever for attacking poverty and promoting rural employment,

The fifth debate—about the green revolution and the African farmer+ oncerns what can be done to increase the low cereal yields in Africa. A dominant cause of rural poverty is the fact that 60-80 percent of the agricultural labor force is producing staple foods at very low levels of productivity. While foodgrain yields in Latin America and Asia have increased since 1965, those of Africa have remained stagnant. Over the past twenty years, the green revolution debate has focused on whether African states could import high-yielding foodgrain varieties directly from International Agricultural Research Centers in Mexico, the Philippines, and other parts of the world or whether improved cereal varieties could be more efficiently developed through investments in regional and national research programs in Africa.

Twenty years ago, foreign advisers were optimistic about transferring green revolution technology to Africa, but after two decades of experimentation the results are disappointing. In fact, the green revolution has barely touched Africa. For example, ICRISAT's transfer of hybrid sorghum varieties from India in the late 1970s to Upper Volta, Niger, and Mali was unsuccessful because of unforeseen problems with disease, variability of rainfall, and poor soils. [19] Moreover, the green revolution crops—wheat and rice-that produced 40–50 percent increases in yields in Asia are not staple foods in most of Africa .*" Knowledgeable

observers agree that African farming systems are extremely complex and that the development of suitable technical packages requires location-specific research by multidisciplinary research teams supported by strong national research programs on the staple foods of each country (Norman 1980).

These five debates illustrate the complex set of problems that have preoccupied African states over the past two decades as they have tried to find a meaningful role for their agricultural sector in national development strategies. Throughout much of the post-independence period, most states have viewed agriculture as a backward and low-priority sector, have perpetuated colonial policies of pumping the economic **surplus** out of agriculture, and have failed to give priority to achieving a reliable food surplus (food security) as a prerequisite for achieving social and economic goals. The failure of most African states to develop an effective set of agricultural policies to deal with the technical, structural, institutional, and human resource constraints is at the heart of the present food crisis. Part of the failure must be attributed to the colonial legacy and part to the hundreds of foreign economic advisers who have imported inappropriate models and theories of development from the United States, Europe, Asia, and Latin America. In the final analysis, agricultural stagnation in capitalist Zaire and Senegal, socialist Tanzania and Guinea, and many other countries must also be placed before heads of state and planners who have promoted premature industrialization, built government hotels, airlines, and large dams with negative internal rates of return, [21] and spent tens of millions of dollars building villas for heads of state for the **annual meetings** of the OAU. Moreover, most African political leaders have also exhibited a fundamental misunderstanding of the role of agriculture in national development when 60-80 percent of the people are in farming. Unfortunately, these mistakes in dealing with agriculture over the past twenty years cannot easily be overcome through crash production projects and doubling of aid over the 1980-90 period.

POLICY DIRECTION FOR THE 1980s AND 1990s

Africa's inability to feed itself amid vast amounts of unused land and record levels of foreign aid is, on the surface, one of the major paradoxes in Third World development. What should be done? While the several notable recent reports **on** Africa's food and economic problems agree on the severity of the food and hunger crisis, each of these assessments underemphasizes the mistakes of African states and in a somewhat self-serving fashion overstresses the need for more foreign aid. Almost all of the reports implicitly ***assume*** that capital, rather than human resources, is the most pressing constraint in rural Africa. This preoccupation with capital is understandable because foreign aid institutions such as the International Fund for Agricultural Development (IFAD) and the World Bank have a fixation on capital transfers. Moreover, Third World countries have focused on capital transfers and the need to increase aid in the north/south dialogues, and many donors and African heads of state equate a doubling of aid with an attack on poverty in Africa. The Lagos *Plan of* ***Action,*** which was adopted by the heads of state and government in Lagos in April 1980, has little new to say about agricultural development except that food production should be **accelerated with the** aim of achieving self-sufficiency (OAU 1980). The World Bank's report *Accelerated Development in Sub-Saharan Africa (1981)* correctly

singles out domestic policy issues as the heart of the crisis, but it also advances an unsupported appeal for donors to double aid to **Africa over the 1980-90 period. Further, while the World Bank report criticizes large-scale irrigation projects, it does not report the** Bank's own difficulties **(and those of most of the other** donors) in designing sound livestock projects. The World Food Council's (1982a) report on the African food problem correctly notes the overemphasis on project-type aid, the excessive number of foreign **missions (for example, Upper Volta received 340 official** donor missions in 1981), and the small percentage of aid funds for food production projects, but it skirts **many of the political and structural** barriers to change. The World Food Council's (1982b) report by the African ministers of agriculture avoids the topic of population growth, the empirical record of agrarian socialism, and the disastrous performance of state grain boards. New approaches are needed. The following discussion spells out a comprehensive approach for the 1980s and 1990s.

STEPS TO MEET THE CRISIS

Solutions to Africa's food and poverty problems must, first of all, be long-term. Second, they require a redirection in thinking about agriculture's role in development at this stage of Africa's economic history and about the need for a reliable food **surplus** as a precondition for national development. Third, there is a need for both African states and donors to admit that the present crisis is not caused by a lack of foreign aid. In fact, in many countries current aid flows cannot bec absorbed with integrity. Hence, donors are part of both the problem and the solution. The Berg report underplays these issues in its unsupported case for doubling aid to Africa by the end of the 1980s (World Bank 1981). Fourth, there is a riced to recognize that the lack of human resources is an overriding constraint on rural change in Africa. In fact, the human resource constraint severely limits the amount of aid that can be effectively absorbed in the short run. In order to buy time to lay a foundation for long-range solutions, it will be necessary to rely on a number of holding actions. Examples include expanded commercial food imports, food aid, and promoting seasonal and international migration until more land is brought under irrigation and higher rainfall areas can be cleared of tsetse flies and river blindness. But these holding actions must not be allowed to substitute for efforts towards long-range solutions.

Three steps should be taken now to start the process of formulating longer-term approaches. First, African states, donors, and economic advisers should jettison the ambiguous slogans such as "National Food Self-Sufficiency, " ''Food First, ' and "Basic Needs."[22] Although these have a powerful emotional and political appeal, they offer little help in answering the key question: What blend of food production, food imports, and export crops should be pursued to achieve both growth and equity objectives'? The concept of national food self-sufficiency should be scrapped as a rigid target because it promotes autarchy and ignores the historical and the potential role of trade in food and livestock products between African states. In summary, there is a need to return to the basics of agricultural development: investments in human resources and agricultural research, policy and structural reforms that will help small farmers and herders, revamping the incentive structure, changing the role of the state,[23] and strengthening the administrative capacity to design and implement projects and programs.

The second immediate step should be the phasing out or restructuring of some of the crash food production projects—that is, seed multiplication, irrigated wheat schemes, livestock schemes, and integrated rural development projects—that are floundering. Many of these crash projects were hastily assembled over the past decade without a sound technical package and without being tested in a pilot phase. These unproductive projects consume scarce high-level manpower, perpetuate recurrent cost problems, and create a credibility problem for both African policy makers and international donors. Particularly important is the reassessment of integrated rural development IlRD) projects. The weakness of most IRD projects—their lack of emphasis on food production and income-generating activities-can be corrected by restructuring some of the projects rather than phasing them out. Other projects that have been implemented in advance of a sound knowledge base, like those in livestock, should be either phased out or scaled down and continued as pilot projects for a five-to-ten-year period. A five-to-ten-year pilot phase is unheard of in Africa, but in projects like those in livestock it is a necessary period for solving technical problems and developing appropriate local institutions to solve such key issues as over-stocking.

The third immediate step is to scale down the state bureaucracy, the state payroll, and state control over private farmers and private traders. After twenty years of experience with parastatals, the record is clear: parastatals (public enterprises) are ineffective in producing food, are no more efficient than private traders in foodgrain marketing, are almost all overstaffed,[24] and serve as a sponge for foreign aid. As the number of parastatal employees increases, the pressure intensifies for donors commensurately to increase their contributions to meet the payroll of the expanded bureaucracy. The parastatal disease is well known, but it is not given much attention in the reports cited above, except in the World Bank's *Accelerated Development* report, which should be applauded for its candor on this topic.

The fourth step is to realize that a food policy strategy cannot be pursued in isolation from livestock and export crop policies nor in isolation from policies to deal with rural poverty. A food policy strategy should not rule out the expansion of export crops, because expanded farm income, through food sales, export crops, and off-farm income, and productive rural employment are prerequisites for solving rural poverty problems. Moreover, although food aid can help the rural poor in the short run, the expansion of productive rural employment is fundamental to coping with rural poverty in the long run.

FOOD POLICY STRATEGIES

The starting point for food policy analysis in each country should be the development of a food policy strategy with two goals in mind: achieving a reliable food surplus (based on domestic production, grain storage, and international trade) and reducing rural poverty by focusing on measures to help small farmers produce more food for home consumption and more food, cash crops, and livestock for the market so that they can purchase a better diet.[25] But a word of caution is in order: food policy analysis is every bit as complex and as delicate as family planning.[26] The rice riots in Monrovia, which left more than one hundred dead in 1979, and the sugar riots in Khartoum and other major cities in

the Sudan following the doubling of sugar prices in 1981 are reminders of the narrow range of options for policy makers on food policy issues. Consequently, as experiences from the Sudan, Zimbabwe, Nigeria, and Kenya (outlined below) illustrate, most countries will move very slowly on policy reforms **unless spurred by famine, a reduction in foreign-exchange earnings from petroleum,** or coordinated donor leverage to link long-term food aid with policy reforms.

The Sudan provides a conspicuous example of the difficulty of mobilizing the agricultural sector as an engine of growth and expanded food production. In the mid 1970s the international press frequently asserted that the Sudan could become the ''breadbasket of the MiddIe East' by drawing on several billion dollars of OPEC loans and gifts to develop its vast reserve of idle land. The issue today, however, is not one of exporting food to the Middle East but one of the Sudan's inability to feed its 18 million people. The Sudan was forced to rely heavily on food aid in the early 1980s in order to cope with severe balance-of-payment problems and inflation. Although the Sudan has historically excelled in cotton research, it has devoted only token attention to research on food crops. As long as the Sudan continues to receive food aid and has hopes of striking oil in the southern part of the country, there is little likelihood of policy reforms.

In Zimbabwe, the legacy of the colonial policy of promoting a dual structure of large farms for white farmers and small farms for Africans in poor natural resource regions presents a classic efficiency/equity dilemma for the Mugabe government (Zimbabwe 1981). In the early 1980s Zimbabwe was a significant maize exporter based largely on the **surpluses** produced by its thirty-five hundred large farmers. But the maize exports were heavily subsidized, and in 1982 the government reconsidered its role as a food security safety net for the southern African region. In 1982 Zimbabwe increased price incentives for soybean oil relative to maize in order to meet the domestic shortage of cooking oil. Although Zimbabwe gains political prestige by exporting maize to black Africa, it realizes that it cannot continue to subsidize maize exports at a time when it is facing large budget deficits.

On the eve of independence in 1960, Nigeria was a net exporter of food, mainly oil palm and groundnuts. But during the 1960s Nigeria pursued import-substituting industrialization, taxed its farmers heavily through export marketing boards, experimented with land settlements, and promoted government plantations. In 1970, ten years after independence, Nigeria was importing food, and by 1981 food imports from the United States alone totaled more than $1 billion. Petroleum exports have enabled Nigeria to pay for food imports and buy time. Although Nigeria is far ahead of most Francophone African countries in trained agricultural manpower, Idachaba (1980) reported that more than 40 percent of the positions for senior agricultural researchers in the eight major research stations were vacant in 1978. The government recently concluded that it will take ten to fifteen years to achieve self-sufficiency in food production. Nigeria has now formed a high-level Green Revolution Committee to address its food problem (Abalu 1982).

Although Kenya is widely regarded as an agricultural success story of the 1960s and 1970s, Kenya was confronted with food shortages in 1980 and 1981 and was forced to import maize, wheat, and milk powder. Although adverse growing conditions contributed to the food shortages of the early 1980s, the National Food Policy paper (Kenya 1981) reveals that other factors were undermining Kenya's capacity to feed itself. These included the unprecedented 4

percent rate of growth of population, the decline in wheat production following the transfer of large farms to smallholders, and a smallholder credit repayment rate of 20 percent. The message of the National Food Policy paper is clear: Kenya has a major food production constraint that cannot be overcome except through large investments in agricultural research, irrigation, and land reclamation in the 1980s and 1990s. But one wonders why the National Food Policy paper paid lip service to population growth.

These case studies illustrate the complexity of Africa's food problems and the need to analyze each country's problems on a case-by-case basis. Moreover, food policy analysis requires more than the preparation of a National Food Policy strategy paper over a two-to-six-month period. Food policy analysis is an ongoing process that will undoubtedly occupy the attention of policy makers and researchers throughout the 1980s and 1990s.

Food Aid Leverage

A major issue in achieving policy reforms is whether donor agencies and countries can or should use food aid leverage to promote the required changes. In existence for almost thirty years, food aid is now a topic of growing interest in Africa. Although there is unanimity on using food aid for humanitarian purposes-for example, feeding refugees-food aid for development is more controversial. The opposition to this sort of food aid-where food is sold at concessional terms and extended as grants for food-for-work programs-comes from evidence that food aid (1) can reduce the pressure on recipient countries to carry out policy reforms; (2) can depress farm prices; (3) is unreliable;[27] and (4) can promote an undesirable shift in consumption patterns that will increase rather than reduce dependency or require subsidies (such as wheat production in West Africa) to maintain the Western-acquired consumption pattern.[28]

Food aid programs are firmly institutionalized with donors. Food aid accounted for approximately 40 percent of all U.S. economic assistance to Africa over the 1970–80 period. Even Japan started to dispose of some of its surplus rice in Africa in the early 1980s. To date, there has been little solid academic research on the role of food aid for development purposes in Africa. Moreover, the evaluation of food aid is usually assigned to junior officers in many bilateral agencies. Hence, evaluation studies of food aid by donors should be taken with a grain of salt. The food aid experience in Asia and Latin America, however, shows that the availability of food aid can take the pressure off recipient nations to carry out internal policy reforms.

A compelling case can be made for linking food aid with policy reforms in major food-deficit countries in Africa through the development of food policy reform packages. These reform packages will be useless, however, unless there is an agreement by donors to make three- to five-year forward food aid commitments in exchange for internal policy reforms. Countries such as Mali and the Sudan would be good test cases for linking food aid to tough domestic policy reforms. But unless donors agree to meet minimum forward food aid levels, African states can easily postpone policy reforms and continue to rely on a patchwork of bilateral food aid programs.

Agricultural Research

Beyond policy reforms, a long-range solution to food and hunger problems will depend, to a large degree, on achievements in agricultural research. Authorities on food production and livestock projects in the field now commonly bemoan the lack of proven technical packages for small farmers in dry-land farming systems throughout Africa and the uniformly unfavorable technical conditions (low rates of growth, disease) for livestock production. Significant increases are needed over the next twenty years in research expenditures on dry-land farming systems with emphasis on food crops (white maize, yams, cassava, millet, and sorghum) and on livestock.

An expanded research program on food and livestock should be viewed in a twenty-year time frame because problems such as low soil fertility and livestock diseases cannot be resolved through a series of short-term, ad hoc research projects. The U.S. experience, wherein forty years (1880– 1920) were spent developing a productive system of federal and state research programs, should be heeded by donors who are likely to expect major results in three to five years from new research projects in Africa.

Research on irrigation is particularly important and should be accelerated in the coming decades. The knowledge base for irrigation in Africa is meager. Irrigation has played a minor role in Africa except in large-scale projects in the Sudan and in Madagascar, where there is a history of irrigation by small farmers. The cultivated land under irrigation is probably less than 5 percent in most other countries (as compared with an estimated 30 percent in India). Following the 1968–74 drought in the Sahel, there was considerable optimism about the role of irrigated farming in "drought-proofing" the region. Due to numerous technical and administrative problems and human resource constraints, however, the projected expansion of irrigation in the Sahel is behind schedule, and it is certain that irrigation will not play a significant role in the Sahelian states until early in the next century.

Although research on the economics of irrigation is fragmentary, the limited results provide support for a smallholder irrigation strategy in the 1980s, with priority given to ground-water development with small pumps, land reclamation through drainage and water control, and an increase in small-scale projects that are developed and maintained by groups of farmers with their own family labor. **A** small-scale irrigation strategy is advocated because the cost of bringing more rainfed land under cultivation is substantially less than the cost of leveling and preparing land for large-scale irrigation. For example, recent irrigation projects in Niger, Mauritania, and northern Nigeria each had costs of more than ten thousand dollars per hectare at 1980 prices (World Bank 1981, 79). On the other hand, farmers in Senegal have cleared and prepared their own land for irrigation, expending several hundred hours of family labor per hectare. Although irrigation will not be a panacea for the recovery of the Sahel nor for feeding Africa in the 1980s and 1990s, a long-term research program on the human, technical, and institutional dimensions of irrigation should be initiated in the immediate future.

It remains to be seen whether donors will have the courage to view research and graduate training within Africa as a long-term investment and whether they will provide guaranteed funding for a minimum of ten years. Another important issue is whether country priorities of bilateral donors will remain stable enough to assure African countries of continuity in funding over a ten-year period. A rule

of thumb is that an African country should never embark on a long-term program to upgrade its national agricultural research system with major support from only one bilateral donor. But as we point out below, co-financing by six to eight donors can create as many problems as it solves.

Investment in Human Resources

A third essential component of a long-range strategy is massive investments in human capital formation, including graduate training of several thousand agricultural scientists and managers. This is necessary to replace the foreign advisers, researchers, managers, and teachers in African universities and to meet the needs of a science-based agriculture in the next century. Since it takes ten to fifteen years of training and experience beyond high school to develop a research scientist, the investments in human capital will not produce payoffs for Africa **until the 1990s.**

Building graduate agricultural training programs within Africa necessitates a reexamination of the role of the African university in national development and the relevance of some of the present undergraduate degree programs. For example, in **1982** the Faculty of Law and Economics in the Universityof Yaounde in Cameroon was turning out graduates with degrees in law and economics who ended up on the unemployment lines in Yaoundé. The time is propitious for African universities to move from undergraduate to graduate training programs in science and agriculture. Before graduate education is expanded, however, some questions should be raised about priorities in undergraduate education and the relevance of the curriculum. Undergraduate degree programs in agriculture in many universities are still embarrassingly undervalued and underfunded when compared with programs in law, medicine, and history. For example, the University of Dakar in Senegal was formally established in 1957, and in 1960 the Senegalese assumed its administration. In 1982 there were approximately twelve thousand students in the University of Dakar, of whom several thousand specialized in law and economics. Not until 1979 was a National School of Agriculture established at Thies, near Dakar, to offer undergraduate training in agriculture. That university-level teaching of agriculture was not initiated until nineteen years after Senegal's independence reflects an enduring colonial legacy as well as the government's ambivalence about agriculture's role in national development.

Although the structural reforms entailed in redesigning African universities to serve rural Africa will require decades to resolve, it is time for donors to stop merely paying lip service to African universities. Whereas donors embraced African universities in the 1960s, they generally withdrew their support in the 1970s as they promoted crash food production and IRD projects and invested heavily in international agricultural research centers. Money saved ($ 100 million to $200 million) from phasing out the floundering crash projects cited above can be reallocated to selected African universities with emphasis on faculties of agriculture. Donors should press for long-term structural reform of the **curricu-**lum in universities in exchange for long-term aid commitments of ten to twenty years.

In 1982 graduate-level education for African students in the United States cost $1,850 per month, or $39,000-$55,000 for a Master's degree over a twenty- to thirty-month period. **Donors should gradually phase out Master' s-level training**

programs in agriculture and related fields in the United States. Instead, U.S. faculty members should be sent to Africa to help develop regional centers of excellence in graduate training in eight to ten African universities over the next ten to fifteen years. In order to achieve this goal, donors will have to give greatly increased priority to aiding African universities, including ten-year authorizations to foreign universities to provide teachers for graduate instruction and research. In the final analysis, the initiative for this second phase—graduate training in agriculture in African universities—will have to come from within Africa.

DEALING WITH RURAL POVERTY

The fourth component of a long-range solution to Africa's food crisis will be an ongoing **effort to address the hunger/malnutrition/poverty problem. Rural poverty is potentially a much** more difficult problem to solve than the food production gap, but self-sufficiency in food production will be a bogus achievement if the poor do not have access to a decent diet. A society cannot expect to move from a low- to a middle-income stage of development if two-thirds of its population are producing millet, sorghum, maize, and yams at stagnant levels of output. Agricultural research on foodgrain production is a prerequisite to increasing food production. Moreover, since jobs cannot be created in urban areas for all the unemployed, a rural investment strategy should also facilitate the expansion of rural small-scale industries that are labor-intensive and can provide jobs .29

IMPLICATIONS FOR FOREIGN AID

The implications of all this for the foreign assistance community flow quite clearly from the foregoing analysis. Currently, forty donors are moving funds and technical assistance through a patchwork of several thousand uncoordinated projects in support of agricultural and rural development throughout Africa. In turn, African states are allocating a high percentage of a scarce resource—trained agricultural professionals—to meet the project reporting requirements of donors, and African governments are asking donors to pay the recurrent costs—salaries, petrol—of the aid-funded projects. In short, both donors and recipients are prisoners of projects and slogans, and they are caught in a vicious circle. Should aid to Africa be doubled in real terms during this decade? The answer depends on whether donors and African states can replace the short-term approaches with long-term investments and address the following in a consistent manner:

1. Food ***security policies and strategies.*** Donors should urge African policy makers to focus on policies and strategies to achieve a reliable food surplus (food security) based on local production, storage, and international trade. Despite the pleas of international journalists who urge donors to increase the number of food production projects, a single food policy reform in Mali—raising official farm prices-may be more effective than twenty new food production projects. Donors should concentrate their resources on helping-local professionals develop an improved micro foundation for food policy analysis that addresses the constraints on achieving a reliable

food surplus, with emphasis on food production, storage, and international trade.

2. *Long-term investments.* Emphasis should be placed on reducing the number of tiny projects (such as producing visual aids for the livestock service in a Sahelian country), increasing the lifetime of aid projects, and increasing the volume of aid in program grants that are tied to policy reforms. Long-term investment programs like ten-year research projects, five-to-ten-year pilot livestock projects, twenty-year programs to develop colleges of agriculture, and five-year food aid/policy reform packages should be perceived not as luxuries but rather as prerequisites to solving Africa's technical, structural, and human capital constraints.
3. ***Technology generation within Africa.*** Professional agriculturalists in most donor agencies privately concede that there is currently an excess of donor funds in search of agricultural production projects supported by agricultural research findings that have been tested and proven on farmers' fields. In short, the international technology transfer model has failed in the direct transfer of foodgrain varieties from Mexico or India to Ghana, Lesotho, and Upper Volta. What can be done? In my judgment, donors should *(a)* admit that the international technology transfer model is not producing the expected results, (b) maintain but not increase investments (in real terms) in the four International Agricultural Research Centers (IARCs) in Africa, and (c) increase the level of financial assistance to national agricultural research systems and to faculties of agriculture in African universities.

   Although the U. S., Mexican, and Indian foodgrain varieties are not directly transferable to Africa, some of the processes these countries used to generate technology appropriate to the needs of their farmers in dry-land areas are applicable in helping to strengthen faculties of agriculture in African universities and national agricultural research services. For example, the U.S. dust bowl crisis in Kansas and Oklahoma in the 1930s gave rise to the U.S. Soil Conservation Service, research on new varieties, **irrigation, and other techniques which transformed the dust bowl into a highly productive area of American agriculture over a thirty-year period. In** this process, U.S. colleges of agriculture played a strategic role, in cooperation with local and state organizations and with the U.S. Department of Agriculture.
4. *Co-financing.* Co-financing of aid projects by donors is a growing problem in Africa because typically six to eight donors each underwrite a piece of an agricultural project. Co-financing is attractive because it spreads the risk for donors and reduces the dependency of African states on one donor. But co-financing is proving to be a liability for institution-building projects such as research institutes and extension schools. The recipient institutions are caught in a cross fire of imported perspectives from technical advisers, a hodgepodge of buildings. and dubious gifts of equipment from around the world. Moreover, the administrators of these Iocal institutions are overwhelmed by the administrative and reporting requirements of the donors. At most, two donors--me for infrastructure and one for technical assistance and training—should be allowed to assist any one institution. But African states will have trouble getting weaned away from co-financing because they are using this device to pay for part of their recurrent budget deficits and the payroll of the state bureaucracy. [so]

5. ***Foreign private investment.*** A major topic of debate is whether foreign private investment, especially multinational firms, can contribute to the resolution of Africa's food and poverty problem. A related question is whether bilateral aid should assist foreign private firms in establishing fertilizer plants, processing plants, and in some cases large-scale food production projects. Just as the roles of women in African development cannot be analyzed in isolation from those of men, the role of the private sector can only be analyzed in relation to public investments. The poor record of food and livestock production projects throughout Africa over the past ten years provides ample proof that many of these projects fail because public-sector investments were not made in agricultural research to develop profitable packages for rainfed farming, prevention and control of animal disease, rural roads, and schools to train agricultural managers. Public-sector investments can either facilitate or destroy the conditions for capitalists to function in a market-oriented economy.

   In general, inadequate infrastructure, local managerial skills, and technical constraints severely limit the scope for foreign private investment in food production projects and in agroindustries in Africa. Although some foreign firms prospered in colonial periods, when they were given choice land and protected markets, since independence there have been many failures, including the recent efforts of U.S. firms to produce food in Ghana, Liberia, and Senegal. As a rule of thumb, if foreign private firms engaged in food production projects do not receive special subsidies, they cannot compete with African smallholders who have a knowledge of local climate, pests, and soils and are willing to produce food on their own land at rates of return of seventy-five cents to three dollars per day for family labor. Moreover, the large capital-intensive plantations and ranches emphasized by foreign private firms should be questioned on social grounds because they do not produce the badly needed jobs in an area of the world where seasonal unemployment is widespread. Foreign private enterprise, however, can contribute to Africa's food system in countries such as Cameroon, Kenya, the Ivory Coast, and Zimbabwe, which have a good infrastructure and need international managerial skills and capital for investments in food processing plants and in fertilizer and agricultural input industries. But in the final analysis, the focus of foreign aid should be on making public investments in roads, universities, and research stations to help African capitalists—small farmers and herders-produce food for their families and for urban and rural people.

Aid flows to Africa have grown dramatically in recent years: net official aid in 1980 was $13.70 per capita in Africa, compared with an average of $9.60 for all developing countries. In the Sahelian region of West Africa per capita aid was running from $35 to $50 per person in 1982. In many circles in Africa there is a feeling that the continent is already' too heavily dependent on aid and foreign transactions relative to the scarcity of African professionals to implement the projects. In fact, in many countries the critical constraint is not land or capital but human resources. This simple fact is overlooked by many donors-including the World Bank. The World Bank, under Robert McNamara, dramatically increased lending in the 1970s, and it has appealed to donors to double lending to Africa in the 1980s. The unsupported case for doubling aid to Africa in the 1980s, in the

light of the acute lack of human resources, is, in my judgment, a major flaw in the Berg report (World Bank 1981). If, however, donors take a broad view of the need for massive, long-term public investments in agricultural research, roads, faculties of agriculture in African universities, and land transfer funds (for example, for Zimbabwe) and if African countries change their agricultural development strategies and priorities and introduce policy reforms, then it may be desirable for donors to double aid to Africa in real terms over the 1980–90 period.

SUMMARY

To sum up, agricultural development is a slow and evolutionary process, and it is up to African states and donor agencies to jettison the crash project approach and start now to lay the foundation for long-term investments to solve the food production and poverty problems over a ten-to-twenty-year period. Unless steps are taken in the 1980s to overcome these basic technical, political, structural, and policy constraints, many African states may end up in the 1990s as permanent food-aid clients of the United States, the European Economic Community, and Japan,

NOTES

1. Africa is defined here to include all states in sub-Saharan Africa except the Republic of South Africa

2. Low and unstable rainfall is a common problem in the Sahelian region of West Africa, parts of the Sudan, Ethiopia, Somalia, Kenya, Tanzania, Zimbabwe, and Botswana But erratic rainfall, like any other single factor, cannot explain the steady erosion in Africa's capacity to feed itself.

3. Per capita GDP ranges from $120 in Chad to $1,150 in the Ivory Coast. Although per capita income is an imperfect measure that is not well suited to international comparisons, there is no question that rural poverty is a major problem throughout Africa. But because of access to land and the absence of a landless labor class, one does not witness in Africa the grinding poverty that is so pervasive in Haiti, Bangladesh, and India,

4. The average aid flows in the eight Sahelian countries was about $50 per capita in 1982 (USAID 1982, 5). Kenya received $450 million of foreign assistance in 1982, or about $25 per person.

5. Commonly known as the Berg report because Elliot Berg was the study coordinator.

6. Tsetse control is a long-term and costly activity that includes clearing of vegetation that harbors flies, spraying, release of sterile male flies, and human settlement.

7. But Ethiopia was under Italian occupation from 1936 to 1941.

8. For more information see Ruthenberg 1980; and Eicher and Baker 1982.

9. The USDA figures on per capita food production trends in Africa over the past two decades (USDA 1981) should be treated as rough estimates because population and production data for two of the large countries-Nigeria and Ethiopia-m open to question. Since Nigeria and Ethiopia together have about one-third the population of Africa, data distortions in these countries could affect the overall averages for Africa.

10. See Mellor, chapter 10 in this volume.

11. See Evenson, chapter 24 in this volume.

12. For an assessment of the modernization, dependency, and political economy models see Young 1982 and Leys 1982.

13. See the discussion of Amin's work in chapter 1 of this volume.

14. Tanzania received $2.7 billion of Official Development Assistance—a record in Africa—over the ten-year period 1973-82.

15. The sharp decline in real producer prices in the 1970s was undoubtedly an important contributor to the decline in output, Ellis (t982) reports a 35 percent decline in the price- and income-terms of trade of peasant crop producers over the 1970–80 period.

16. Tanzania is slowly dismantling its state control over agriculture following the 1982 Task Force Report (Tanzania 1982) and pressure from donors. The new agricultural policy (Tanzania 1983) has reintroduced cooperatives, turned some government estates over to village cooperatives. and encouraged foreign private investment in tea and sisal production.

17. Positive and negative pricing and taxation policies are shorthand references to the internal terms of trade between agricultural and nonagricultural products. Negative pricing and taxation policies mean that the terms of trade of agriculture are deliberately depressed by government policies (see Krishna, chapter 11 in this volume).

18. The following political constraints are partially responsible for the negative policies towards export crops: need for foreign exchange, politically powerful trade unions and urban groups, the demands of the military, and the absence of alternative ways to tax agriculture when land is not registered and the government does not have enough skilled people to collect land or incomes taxes. The net result of these constraints is that African political leaders have little room to maneuver on pricing policies for export crops. Hence, the neoclassical economist who argues that "getting prices right' is the core of the development problem is overlooking the imperative of political survival in Africa.

19. The International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) has its headquarters in Hyderabad, India. Recently, ICRISAT made a major policy decision to reemphasize the direct transfer of cereal varieties from Asia to the Sahelian countries and to construct a Sahelian research center on a five-hundred-hectare site near Niamey, Niger. The scientific staff of the Sahelian center will carry out long-term (ten-to-twenty-year) research on cereal production in the Sahel. This is further evidence that agricultural development is a slow and evolutionary process.

20. But wheat and rice consumption are increasing in urban areas throughout Africa.

21. For example, the $900 million Diama and Manantelli dams along the Senegal River are projected to have negative internal rates of return.

22. Although the World Bank was a staunch advocate of basic needs strategies in the late 1970s, it has recently abandoned its support for this dubious concept. Still the International Labour Office continues to confuse African states with recent basic needs missions to Zambia, Tanzania, and Nigeria (ILO 1981).

23. The state should play a less direct role in agricultural production and marketing and emphasize indirect approaches such as agricultural research, extension. credit, and educational programs to help small farmers and herders.

24. Although the government of Senegal dissolved its grain board—ONCAD—in 1980, a large percentage of the employees were transferred to other government agencies.

25. See Timmer, chapter 8 in this volume.

26. Food policy analysis requires a large amount of micro information on production, consumption, nutrition, and the functioning of markets, but this information is not ● vailable in most African countries. Although the World Food Council reported that nineteen African countries were preparing national food strategies in 1981, many of these exercises were prepared in capital cities in three to six months, and many of them are likely to be forgotten in three to six months.

27. For example, U.S. food aid to Mozambique was cut off for six months in 1981 (see Anderson 1981).

28. The bulk of U.S. food aid-60 percent to 70 percent—is in the form of wheat and wheat flour even though wheat is not a staple food in most of rural Africa.

29. For empirical support showing that a rural investment strategy for smallholders and small-scale industry can achieve both growth and employment objectives see the results of a nationwide survey in Sierra Leone (Byerlee et al. 1983).

30. For example, the government agency responsible for the development of the Senegal River Valley—SAED—was assisted by thirteen donors in 1982. SAED employed one thousand workers and encountered an $8.5 million recurrent budget deficit in 1982. SAED asked the thirteen donors to pay two-thirds of the cost of the deficit.

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