Carl K. Eicher
FACING UP
TO AFRICA'S FOOD CRISIS

The most intractable food problem facing the world in the 1980s is the food and hunger crisis 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, the current dilemma is not caused by weather. 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—i.e., 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-two of the 36 poorest countries in the world are African. 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 imports thus appear dismal. African heads of state have held summit meetings to examine their economic, food, and hunger problems, and the Food and Agriculture Organization (FAO), Organization of African Unity (OAU), U.S. Department of Agriculture (USDA), World Bank, World Food Council, and Afri-

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can Ministers of Food and Agriculture agree on the alarming magnitude of the problem.

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. Furthermore, the 1981 World Bank report, *Accelerated Development in Sub-Saharan Africa*, 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. Since the food and hunger crisis has been in the making for 10 to 20 years, viable 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 which must be examined include: Why did the Green Revolution bypass Africa? What lessons have been learned from food production projects in 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? What is the record of agrarian capitalism and socialism? Can the Reagan Administration’s foreign aid emphasis on private enterprise, technology transfer, institution building, and manpower development contribute to the alleviation of the food production crisis and economic stagnation in Africa?

Despite the fact that Africa is an extremely diverse region, several common features frame the boundaries for addressing its food crisis.\(^1\) First, population densities in Africa are extremely low relative to 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 only has a small percentage of its arable land under cultivation.

Second, most of the economies are small: 24 of the 45 countries have fewer than five million people and only Nigeria has a gross domestic product larger than that of Hong Kong.\(^2\) Small countries

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\(^1\) Before examining the causes of the food crisis, it is important to remember the complexity of the region and the fallacy of advancing Africa-wide strategies to deal with problems of food and hunger. Sub-Saharan Africa is composed of 45 countries with variable endowments of resources, colonial histories, and opportunities for development. Although a few scholars still discuss the "African case," most researchers wisely eschew generalizing about even a subregion such as West Africa—an area as large as the continental United States.

\(^2\) Africa has a shaky data base and there is a need to interpret official statistics with caution.
have special problems in assembling a critical mass of scientific
talent and in financing colleges of agriculture and national agri-
cultural research systems.

Third, the colonial legacy is embedded in the structure of
agricultural institutions, the curricula of African universities, and
how African policymakers view the role of agriculture in national
development. All but two African states—Ethiopia and Liberia—are
former colonies.

Fourth, Africa is an agrarian-dominated continent. In most
countries, at least three out of five people work in agriculture. For
the most part, land ownership is remarkably egalitarian as con-
trasted with Latin America. Thus, almost all farms are small,
with 5 to 15 acres under cultivation by family members. The
performance of these small farms (smallholders) is the key to
African agricultural development. Moreover, since agricultural
output accounts for 30 to 60 percent of the gross domestic product,
the poor performance of the agricultural sector over the past two
decades has been an overriding constraint on development in the
non-petroleum and non-mineral exporting countries.

Fifth, although more than half of the arable land that is idle in
the world is in Africa, the land area in some countries is near
maximum population density given present agricultural tech-
ology and available expertise on soil fertility. Much of the arable
land in Africa is not farmed because of natural constraints such as
tsetse flies which cause human sleeping sickness and virtually
preclude the use of approximately one-third the continent, includ-
ing some of the best watered and most fertile land.

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. Over the 1960–80 period,
aggregate food production in Africa grew very slowly—about 1.8
percent per year—a rate below the aggregate growth rate of Asia

Accurate data on yields and acreage under cultivation are available for only a handful of
countries
3 The uniform agrarian structure is partially a function of colonial policies which prohibited
foreigners from gaining title to land in some parts of the continent, such as West Africa. But in
some countries such as Zambia and Zimbabwe, colonial policies promoted a dual structure of
large and small farms. In Zambia, 400 large mechanized farms produce an estimated 40 percent
of the maize surplus—the staple food—while an estimated 545,000 subsistence farms produce
the balance. Zimbabwe is a significant maize exporter following last year’s record harvest. But
the irony of Zimbabwe’s maize surplus is that the bulk of it is being produced by 5,000 large
farmers who control approximately one-half of the land at a time when there is political
pressure to distribute land to the landless.
4 Tsetse control is a long-term and costly activity which includes clearing of vegetation
which harbors flies, spraying, release of sterile male flies, and human settlement.
or Latin America. However, the critical numbers are not statistics on total food production but per capita figures. The U.S. Department of Agriculture statistics in Figure 1 below show that sub-Saharan Africa is the only region of the world where per capita food production declined over the past two decades. In addition, the average per capita calorie intake was below minimum nutritional levels in most countries.

**FIGURE 1**

*INDEX OF FOOD PRODUCTION PER CAPITA*

(percentage of 1961-65 average)

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*SOURCE* USDA, *Food Problems and Prospects in Sub-Saharan Africa*, 1981
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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. Recent reports show that the annual population growth rate in Africa was 2.1 percent in the mid-1950s, 2.7 percent in the late 1970s, and as Figure 2 shows, is projected to increase throughout the 1980s until it levels off at about 3 percent by the 1990s. Underlying the upward population trend is a young age structure. The average African woman produces six living children in her reproductive years.

**FIGURE 2**

**POPULATION GROWTH RATES, 1950–2000**

![Graph showing population growth rates](image)

**Source**: USDA Food Problems and Prospects in Sub-Saharan Africa, 1981

There is little hope for reducing fertility levels in the 1980s because of a complex set of factors, including: 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 growth of population cannot be ignored much longer. For example, Kenya is reported to have the highest rate of annual population growth in the world—more than four percent—implying a doubling of population in about 16 years. Encouragingly, Kenya is launching an Integrated Rural Health and Family Planning Program, a
major multi-donor effort budgeted at $120 million, and the effects of rapid population growth are moving to the center of its debates on land use. On the other hand, in Senegal, where 95 percent of the population is Muslim, 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, 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 which 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 1961–79 period. Rising food imports are attributed to many factors: lagging domestic production; increasing urbanization; the accompanying shift of consumer tastes from cassava, yams, millet and sorghum to rice and wheat; availability of food aid; and overvalued foreign exchange rates which often make imported cereals cheaper than domestic supplies. Although data on food aid are imprecise, food aid represents about 20 percent of total food imports. 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 to 80 percent) will be spent on food. Unless food production is stepped up, an increase in rural and urban incomes will simply lead to increased food imports, possibly inflation, and an increase in hunger and malnutrition. Conversely, while expanded food production should be the centerpiece of food policy in Africa in the

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5 Africa’s food and poverty problems should not be allowed to overshadow some impressive achievements of the continent over the past 25 years. Foremost is the increase in average life expectancy—from an estimated 38 years in 1950 to almost 50 years in 1980. This 30 percent increase is often overlooked by those who are mesmerized by rates of growth of gross national product. Moreover, the achievements in education have been impressive in Tanzania and Somalia. Another unheralded achievement is the vast improvement in the capacity of countries such as Nigeria, Kenya and the Ivory Coast to organize, plan and manage their economies.
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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 hunger problem.

III

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 the unfavorable weather in their appeal for food aid. In fact, the 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.

Colonial approaches to development facilitated the production and extraction of surpluses—copper, gold, cocoa, coffee, etc.—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 college of agriculture in French-speaking tropical Africa. Between 1952 and 1963, only four university graduates in agriculture were trained in francophone Africa and 150 in English-speaking Africa. By 1964, there was a total of three African scientists working in the research stations in the East African countries of Kenya, Uganda and Tanzania.

Moreover, the effects of colonial policies on contemporary land ownership patterns and agricultural research and training institutions are important contributors to the current food production and poverty problems. Many colonial regimes focused their research and development programs on export crops and the needs of commercial farmers and managers of plantations. The modest investment in research on food crops could be defended during this period because the rate of population growth was low—one

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to two percent per annum—and surplus land could be “automatically” brought under cultivation by smallholders. But with annual rates of population growth now approaching three to four percent in some countries, research institutions must be restructured to devote more attention to food crops and the needs of smallholders and herders.

The current crisis has also resulted from the low priority that independent African states have assigned to investments in agriculture and to increasing food production over the past 25 years. In that period 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 all gave low priority to agriculture. African leaders tended to view agriculture as a “backward” sector which could provide surpluses—in the form of taxes and labor—to finance industrial and urban development, and thought agricultural development would simply reinforce dependency. Agricultural policies in many countries (both capitalist and socialist) supported plantations, state farms, land settlement schemes, and the replacement of private traders and money lenders with government trading corporations, grain boards, and credit agencies. The effects of these policies on agricultural production were typically inhibiting, and in some cases, highly so.

The second debate was over the relevance of Western 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 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 Albert Hirschman reminds us,
development is a historical, social, political, technical and organizational process which cannot be understood by means of a single discipline.\(^7\) Second, the cities were unable to provide jobs for the rural exodus. Third, the macro models were unable to provide a convincing understanding of the complexity of the agricultural sector—the sector which employs 50 to 95 percent of the labor force in African states. Although these models were technically elegant, they seem remarkably naïve today because they assigned a passive role to the agricultural sector.

The vacuity of the Western 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 models of development and underdevelopment to emerge and gain a large following among African intellectuals. Samir Amin, an Egyptian economist who has specialized in African development problems for the past 20 years, has been the preeminent proponent of the dependency and underdevelopment paradigm of development. 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 (e.g., land tenure) to development. But the Achilles' heel of the political economy models is their failure to provide a convincing understanding of the motivations of rural people, and the role of technological change. Furthermore, many political economy scholars have tended to spend more time commenting on the failure of market economics than in generating empirical evidence on farms and in villages in order to verify and refine their models.\(^8\)

The third 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 Africansrationally give priority to producing enough food for their families for the coming one to two years. The next question is whether African states have


\(^8\) For a recent assessment of the modernization, dependency and political economy models, see Crawford Young, Ideology and Development in Africa, New Haven: Yale University Press (for the Council on Foreign Relations), 1982.
pursued positive pricing and taxation policies for agriculture. Numerous empirical studies across the continent have provided conclusive evidence that many countries (both capitalist and socialist) are pursuing negative pricing policies which dampen incentives to produce food and export crops and encourage black market operations.

For example, Tanzania has paid farmers throughout the country a uniformly low price for maize, encouraging the sale of maize in black markets. In Mali, the government pricing policy for small farmers in a large irrigated rice production scheme can be labeled as “extortion.” A meticulous two-year study in 1980-81 has shown that it costs farmers 83 Malian francs to produce a kilo of rice but that the government paid farmers only 60 Malian francs per kilo.\(^9\) Does it seem irrational for the rice farmers to smuggle rice across the border into Senegal, Niger and Upper Volta where they can secure 108 to 128 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 13 countries over the 1971–80 period, the World Bank concluded that, taking the net tax burden and the effect of overvalued currency into account, producers in the 13 countries received less than half of the real value of their export crops.\(^10\) 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. A simple but powerful conclusion emerges from this experience—African states must overhaul the incentive structure for farmers and adopt increased farm income as an important goal of social policy in the 1980s. Moreover, increasing incentives to farmers is a strategic policy lever for attacking poverty and promoting rural employment.

The fourth debate—agrarian capitalism or socialism—has been one of the most emotional topics over the past 30 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 which equated modernization with industrialization and large-scale farming. Ghana was unable to assemble the technical and managerial skills and incentive structure to operate its vast system of state farms, parastatals (state corporations) and trading corporations. The failure of agrarian socialism has imposed a heavy toll on the people of Ghana.

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. The vision of agrarian socialism is set forth in President Nyerere’s essay “Socialism and Rural Development.” But after 15 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. Knowledgeable observers conclude that Tanzania is in deep financial difficulty in part because of the drought in the mid-1970s, the quantum jump in oil prices, and the conflict in Uganda, but basically because of the stagnant performance of its agricultural sector under socialism. One cannot overlook Tanzania’s important 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.

Agrarian socialism is now under fire throughout Africa: after 20 years of experimentation, there are presently no African models which are performing well. 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. Second, government-operated grain boards have been plagued with overstaffing, corruption, mismanagement and high marketing costs. Because these problems 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 remind the reader
that to put all or most of the weight on ideology—capitalism or socialism—is to ignore an important lesson that has been learned over the past 30 years in the Third World—namely, 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 fifth debate—about the Green Revolution and the African farmer—concerns what can be done to increase the low cereal yields in Africa. There is growing evidence that a dominant cause of rural poverty is the fact that 60 to 80 percent of the agricultural labor force works at very low levels of productivity. As Figure 3 indicates, while yields in Latin America and Asia have increased since 1965, those of Africa have remained stagnant. Over the past 20 years, this debate has focused on whether African states could make use of high-yielding food grain varieties developed in 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 research programs in national and regional research stations in Africa.

**FIGURE 3**

CEREAL YIELDS

![Cereal Yields Chart]

*Source: USDA, *Food Problems and Prospects in Sub-Saharan Africa, 1981*

Twenty years ago, foreign advisers were optimistic about transferring the 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,
hybrid sorghum varieties from India have not been successful in Upper Volta, Niger and Mali because of unforeseen problems such as disease, variability of rainfall, and poor soils. Moreover, the Green Revolution crops—wheat and rice—that produced 40 to 50 percent increases in yields in Asia are not staple foods in 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, which are supported by strong national research programs on the staple foods of each country.

These five debates illustrate the complex set of problems that have preoccupied African states over the past two decades as they tried to find a meaningful role for the agricultural sector. 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 as a prerequisite for basic national, 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 socialist Tanzania must also be placed before heads of state and planners who have promoted premature industrialization and have exhibited a fundamental misunderstanding of incentives, the motivations of their own rural people, and the necessity to overcome technical constraints and restructure agricultural institutions.

IV

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 overestresses
the need for more foreign aid. For example, the World Bank’s *Accelerated Development* report 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 1980–1990 period. Further, while the report criticizes large-scale irrigation projects, it neglects the Bank’s own difficulties (and those of most of the other donors) in designing sound livestock projects. The recent World Food Council report 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 report by the African ministers of agriculture at their recent meeting in Nairobi avoids the topic of population growth, the empirical record of agrarian socialism, and the disastrous performance of state grain boards.

Solutions to these problems must, first of all, be long term. Secondly, they require a redirection in thinking about agriculture’s role in development and the need for a reliable food surplus as a precondition for national development. 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 toward long-range solutions.

Two steps should be taken now to start the process of formulating longer term policies. First, African states, donors, and economic advisers should jettison the ambiguous slogans about food self-sufficiency, food first, and basic needs. Although these have a powerful emotional and political appeal they offer little help in answering the key question—what blend of food production, food

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12 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 Labor Office continues to confuse African states with recent basic needs missions to Zambia, Nigeria and Tanzania. Is it surprising that African states have so little faith in donors?
imports, and export crops should be pursued to achieve both growth and equity objectives?

The second immediate step should be the phasing out or restructuring of some of the crash food production projects—i.e., 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 policymakers and international donors. Particularly important is the reassessment of integrated rural development (IRD) projects. The weakness of most IRD projects—their lack of emphasis on food production and income-generating activities—can be corrected by restructuring the projects rather than phasing them out. Other projects which have been implemented in advance of a sound knowledge base, like those in livestock, should either be 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 overstocking.

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 hunger.

Looking toward policy reform, a word of caution is in order. Food policy is every bit as delicate as family planning. The rice riots in Monrovia, which left more than 100 dead in 1979, and the sugar riots in Khartoum and other major cities in the Sudan following the recent doubling of sugar prices, are reminders of the narrow range of options for policymakers on food policy issues. Consequently, as experiences from the Sudan, Zambia and Nigeria illustrate, African 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 to policy reform.

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 Middle 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 of the Sudan’s inability to feed its 18 million people. The Sudan imported $30 million in U.S. P.L. 480 subsidized food last year and it is now facing 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.

Zambia is importing large quantities of maize, its staple food. In Zambia, about 400 commercial farmers produce an estimated 40 percent of the marketable maize, yet the Ministry of Agriculture does not have proven maize varieties for its half-million small farmers. Should Zambia press on with efforts to achieve self-sufficiency in maize via commercial farmers or small farmers? In any case, the survival of President Kaunda’s government will be in doubt if it does not address the most basic policy issue—the achievement of a reliable food surplus.

In the early 1960s, Nigeria was a net exporter of food—mainly oil palm and groundnuts—but by the early 1970s, Nigeria was importing food. Several authoritative reports commissioned by Nigerian policymakers recommended that immediate steps be taken in order to avert Nigeria’s impending food crisis. Petroleum exports, however, have enabled Nigeria to buy time. In 1981, Nigeria imported more than one billion dollars of food from the United States. Although Nigeria is far ahead of most francophone African countries in trained agricultural manpower, a 1978 study reported that more than 40 percent of the positions for senior agricultural researchers in the eight major research stations were vacant. The government recently concluded that it will take 15 years to achieve self-sufficiency in food production. Nigeria has now formed a high-level Green Revolution Committee to address its food problem.

Turning to policy reform itself, scaling down the state bureaucracy, the state payroll, and state control over private farmers and private traders are central problems for most African states. After 20 years of experience with parastatals, the record is clear: parastatals are ineffective in stimulating the production of private farmers, are no more efficient than private traders in food grain marketing, and moreover, become a sponge for foreign aid. As the number of parastatal employees increases, the pressure intensifies
for donors to commensurately 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.

A food policy strategy must tackle the crucial need to raise prices for both food and export crops. Although one cannot generalize for sub-Saharan Africa, donors should withhold project aid unless there is a favorable incentive structure for farmers. In addition, 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 is a prerequisite for solving the poverty and hunger problems.

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 30 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) depresses farm prices; (3) is unreliable;¹³ and (4) promotes an undesirable shift in consumption patterns (i.e., the bulk of U.S. food aid—60 to 70 percent—is in the form of wheat and wheat flour even though wheat is not a staple food in Africa).

Food aid programs are firmly institutionalized with donors. As far as the United States is concerned food aid has accounted for approximately 40 percent of all U.S. economic assistance to Africa over the 1970–80 period. African states find themselves in a strong position to bargain for food aid this year because of large U.S., European Community and Japanese surpluses, and falling international wheat and rice prices.

To date, there has been little solid research on the role of food aid for development purposes in Africa. 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. Linking food aid with policy reforms in major food deficit countries in Africa would require the develop-

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ment of food policy reform packages for countries such as the Sudan, Mali, Senegal and Tanzania, and agreement by donors to make three- to five-year 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 (which is not used to feed refugees) to tough domestic policy reforms. But unless donors come together and agree to meet minimum forward food aid levels, African states may postpone policy reforms as they continue to rely on a patchwork of bilateral food aid programs.

Beyond policy reforms, a long-range solution to food and hunger problems will depend, to a large degree, on achievements in agricultural research. Significant increases are needed over the next 20 years in research expenditures on dry land farming systems with emphasis on food crops (white maize, yams, cassava, millet and sorghum) and on livestock. 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 coefficients (e.g., low rates of growth, disease) for livestock production.

An expanded research program on food and livestock should be viewed in a 20-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 40 years (1880–1920) were spent developing a productive system of federal and state research programs, should be heeded by U.S. congressmen who are likely to expect major results from the U.S. Agency for International Development financed research projects in Africa in five to ten years.

Research on irrigation is particularly important, and should be accelerated in the coming decades. The knowledge base for irrigation in Africa is meagre. 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 five 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, 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 which 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, World Bank data show that recent irrigation projects in Niger, Mauritania and northern Nigeria each had costs of more than $10,000 per hectare at 1980 prices. 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 (2.47 acres). 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.

An encouraging development on the research front is the recent formation of an informal working group of seven major bilateral donors to plan a long-term program for strengthening national agricultural research systems throughout Africa, with emphasis on food and livestock research. This shift to coordinate bilateral support for research is a welcome innovation, but it remains to be seen whether donors will have the courage to view research as a long-term investment and to provide guaranteed funding for a minimum of ten years. One refreshing change introduced this year by W. Peter McPherson, the Administrator of the U.S. Agency for International Development, is the flexibility to authorize ten-year rather than five-year projects. For example, AID recently authorized funding for a ten-year centrally funded, worldwide water research project and a nine-year tropical soils project.

The question is whether AID's country priorities will remain stable enough to assure African countries of continuity in U.S. funding over a 10- to 20-year period. For example, the proposed allocation to the eight Sahelian states will be slightly reduced in real terms in Fiscal Year 1983 even though Congress had earlier endorsed a 20-year recovery program for the Sahel following the drought. On the other hand, U.S. economic assistance to the Sudan has been dramatically increased this year to over $100
million, exceeding the total U.S. aid for the Sahel. 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.

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 10 to 15 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. 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 must be raised about priorities in undergraduate education. Undergraduate degree programs in agriculture in many universities are still embarrassingly undervalued and underfunded when compared with law, medicine and history. For example, in Senegal, the University of Dakar was formally established in 1957, and in 1960 the Senegalese assumed its administration. Today, there are approximately 12,000 students in the University of Dakar, of whom several thousand specialize in law and economics. Not until 1979 was a National School of Agriculture established at Thies, north of Dakar. Students take their first year science courses at the University of Dakar and the initial group of undergraduates will graduate from the Thies school in 1984-85. That university-level teaching of agriculture was not initiated until 1979, 29 years after 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 suit their country's needs 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, IRD projects, and international agricultural research institutes. Money saved ($100 to $200 million) from phasing out the floundering crash projects cited above can be reallocated to selected African univer-
sities with emphasis on faculties of agriculture. Donors should press for long-term structural reform of the universities in exchange for long-term aid commitments of 10 to 20 years.

Currently, graduate-level education for African students in the United States costs $1,850 per month, or $35,000–$45,000 for a Master’s degree over a 24- to 30-month period. AID 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 10 to 15 years. In order to achieve this goal, AID will have to give greatly increased priority to aiding African universities, including ten-year authorizations to U.S. universities to facilitate this type of training program. In the final analysis, the initiative for this second phase—graduate training in agriculture in African universities—will have to come from within Africa.

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 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 stagnant food grain production is a prerequisite to solving rural poverty and hunger problems. Moreover, since jobs cannot be created in urban areas for all the unemployed, there must be created in rural areas opportunities in food and cash crop agriculture and rural small-scale industry.

The implications of all this for the foreign assistance community flow quite clearly from the foregoing analysis. Currently, 40 donors are moving funds and technical assistance through a patchwork of several thousand uncoordinated projects in support of agricultural and rural development throughout Africa. Furthermore, donors are continuing to transfer models and slogans—basic needs, appropriate technology, and food first—to 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. In short, both donors and recipients are prisoners of projects and slogans. Should aid to
Africa be doubled in real terms during this decade? The answer depends on how these problems and others are resolved:

1. *Long-term Planning.* Emphasis should be placed on increasing the lifetime of projects, reducing the number of tiny projects (e.g., producing visual aids for the livestock service in a Sahelian country) and increasing the volume of aid in program grants which are tied to policy reforms. Long-term programs like ten-year research projects, five- to ten-year pilot livestock projects, 20-year programs to develop colleges of agriculture, and five-year food aid/policy reform packages—should not be perceived as luxuries, but rather as prerequisites to solving Africa’s technical, structural and human capital constraints.

2. *Aid Coordination.* The lack of aid coordination is especially acute in Africa as donors phase out assistance to Latin America and smother Africa with project aid. Most African states have been able to resist the establishment of a formal Consortium of Donors. Such a consortium should be established for large recipient countries such as the Sudan, Senegal, Kenya and Tanzania. Moreover, a strong case could be made for donors to declare a two-year moratorium on certain kinds of projects with poor track records—e.g., livestock projects—in order to sort out the lessons to be learned from the failures over the past two decades.

3. *Developing Food Policy Strategies.* Despite the pleas of journalists who urge donors to increase the number of food production projects, the professional agriculturist knows that a single food policy reform in Mali—raising official farm prices—may be more effective than 20 new food production projects. Donors should concentrate their resources on helping local professionals develop food policy strategies which identify the constraints on achieving a reliable food surplus, with emphasis on food production, storage and international trade.

4. *Technology Transfer.* Analysis of the Green Revolution has shown that donors should shift their emphasis to helping African institutions generate technology within Africa through strengthened national and regional research programs. Although the U.S. and India’s food grain varieties are not directly transferable to Africa, some of the processes the two countries used to generate technology appropriate to the needs of their farmers in dry land areas are applicable. 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. In this 30-year process U.S. colleges of
agriculture played a strategic role, in cooperation with local and state organizations and with the USDA. The U.S. and Indian experiences in the process of building research programs, colleges of agriculture, and new institutions such as a Soil Conservation Service can contribute to African agricultural development.

5. Foreign Private Enterprise. The Reagan Administration has identified the promotion of foreign private investment as one of four areas of concentration in its foreign assistance program. Can foreign private investment contribute to the resolution of Africa’s food and poverty problems? 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 production projects in the Sahel in the past seven years provides ample proof that many of these projects fail because public sector investments are 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. Professional agriculturists know that public sector investments can either facilitate or destroy the conditions for private African capitalists to function in a market-oriented economy. It would be unwise if the Administration pursued a dogmatic private enterprise approach at the expense of public sector investments.

In general, inadequate infrastructure and technical constraints presently limit the scope for foreign private investors. 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 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 75 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 sector in countries such as Kenya and Zimbabwe which have a good infrastructure and require international managerial skills for investments in food processing plants, and in fertilizer and agricultural input industries. But in the final analysis, the focus of U.S. foreign aid should
be on making public investments in roads, universities and research stations to help African capitalists—small farmers and herdsmen—produce food for their families and for urban 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 many circles in Africa, there is a feeling that the continent is already too heavily dependent on aid and foreign transactions. The technical specialists in most donor agencies will privately concede that there is currently an excess of donor funds in search of technically sound agricultural production projects. However, if donors take a broad view of the need for massive, long-term public investments in roads, faculties of agriculture in African universities, and land transfer funds (e.g., for Zimbabwe), and if African countries shift 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.

To sum up, agricultural development is a slow and evolutionary process and it is up to African states and donor agencies to lay the foundation for solving the food production problem over a 10- to 20-year period. Unless steps are taken in the 1980s to solve 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.