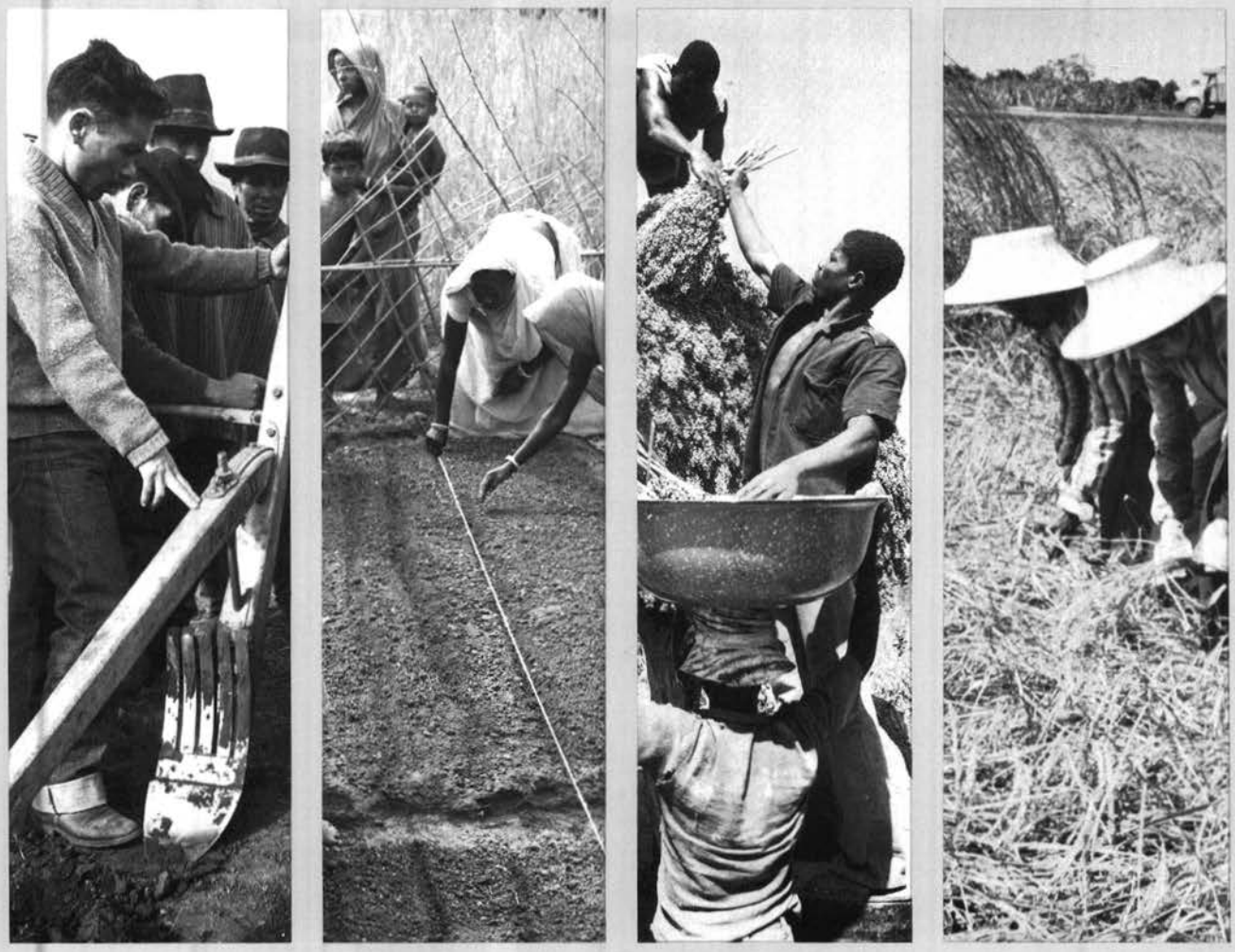

A POLICY AGENDA FOR FAMINE PREVENTION IN AFRICA

JOACHIM VON BRAUN

FOOD POLICY REPORT
THE INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE

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CONTENTS

PREFACE

The research on which this report is based was initiated in 1986 in the aftermath of severe famines in several African countries in 1985. It was prompted by the desire to prevent the reoccurrence of famines of comparable magnitude by better understanding the problem from within the famine-stricken countries and elsewhere in Africa. It is ironic that this research has culminated at a time when some countries in Africa are again experiencing severe famine. Nevertheless, solutions for preventing and mitigating famine in Africa need to be identified and available for the time when the political will and resources exist to finally permit action. This research is an important element of that process and solution.

Many colleagues and partners contributed to the research effort. The field research and country studies were guided by Tesfaye Teklu in Sudan and by Patrick Webb in Ethiopia. Other important contributors were Elsayed Zaki, Mohammed Babiker Ibrahim, Yisehac Yohannes, Graciela Wiegand-Jahn, Tesfaye Zegeye, and many others acknowledged in the research documents on which this paper builds. Committed field survey teams and the survey respondents in the famine-stressed areas have contributed to the essential new insights. This attempt at a simplified synthesis and agenda for action builds on the comprehensive reports referenced throughout the paper.

IFPRI gratefully acknowledges major funding for the research by the Federal Republic of Germany, as well as support from the Rockefeller Foundation and the United Nations Children's Fund (UNICEF).

FAMINE IN AFRICA: A SPECIAL CASE?

Famine--the human tragedy that was prevalent in all hemispheres earlier in this century--is nowadays confined to Africa. Countries in the rest of the world have found ways to deal with the problem, but Africa has not. Is this a research issue? Can the lessons for proper policy action that were learned elsewhere simply be applied in Africa now? Research at IFPRI conducted during the past four years using household surveys in two of the most famine prone countries of today--Sudan and Ethiopia--concludes that learning from famine prevention and mitigation efforts in Africa is at least as important as learning from outside experience. Subsistence-oriented agriculture (which is regressing rather than progressing), constraints in transport infrastructure, and weak popular participation, especially at the local level--and not simply wars and drought--are the main reasons for the special situation in Africa that makes famine prevention a continuing challenge.

This report examines the characteristics of long-term and emergency food insecurity as well as famine in Ethiopia and Sudan, two of the poorest countries in Africa, in an effort to understand what causes famines today, how households cope with them, and how their coping mechanisms can be strengthened through public policy.[1]

FRAMEWORK TO EXAMINE FAMINE

Famine is the presence of large shortfalls in food consumption that are regionally concentrated and the consequent extreme food insecurity that results in widespread undernutrition and a rising death rate. Food insecurity is the risk of an ongoing lack of access by people to the food they need to lead healthy lives.

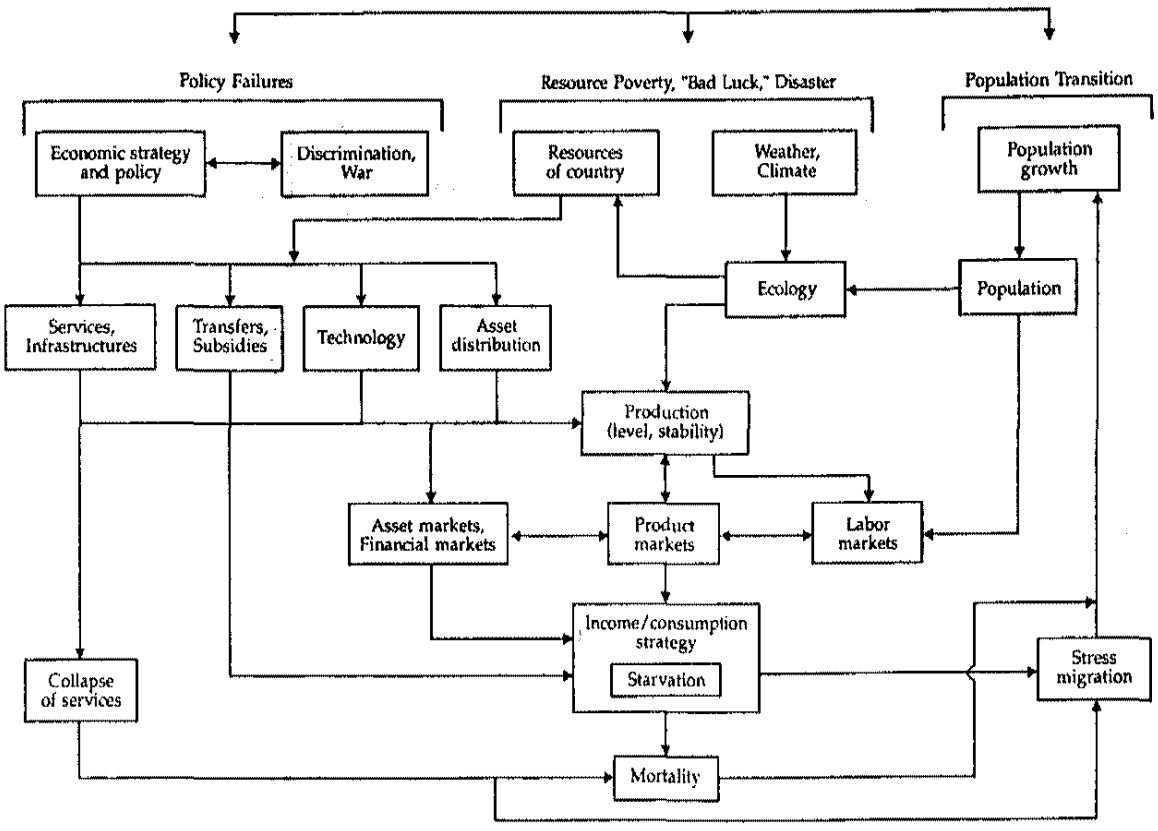
The immediate causes of famine may be regional shortages of food or inaccessibility to available food due to droughts, floods, military or economic disruptions, or massive income decline as a result of reduced employment or market disruptions. Most frequently, famines are a result of complex combinations of more than one of these causes. Famines are mainly rural and occur in areas where chronic undernutrition is often observed. For a schematic depiction of the causes and relationships of famine, see Figure 1.

The close relationship between food production, food prices, wages, and employment in countries with relatively large agriculture and food sectors compared to other economic activities is critical when looking at household responses to famine in Africa. Households adjust to fluctuations in food production, prices, and wages by changing their cropping patterns, intensifying their work in off-

farm activities, and compounding their income through remittances or food aid. They make income adjustments--drawing down savings, selling assets, or borrowing money. They also make consumption adjustments by changing their nutritional intake and purchases of nonfood items. Households also adapt their strategies according to community-level responses.

The literature on the effects of famine and on the means adopted by households to minimize these effects has become increasingly complementary and convergent in the 1980s. Reviews of existing research on household famine responses arrive at the broad conclusion that while conditions vary by locality, there are identifiable behavior patterns associated with the onset, progression, and climax of crises.[2] These responses are largely determined by the nature of the crisis--its speed, intensity, and linearity--as well as by the varying abilities of households to cope. This variability in coping capacity is widely believed to hold the key to an effective design of famine early warning systems and appropriate interventions.[3]

Figure 1--Determinants of and relationships in famines



DIMENSIONS OF THE FAMINE PROBLEM IN ETHIOPIA AND SUDAN

The number of food-insecure people and the intensity of food insecurity has increased in many African regions during the 1970s and 1980s and under likely scenarios will continue to rise in the 1990s (Table 1). The Horn of Africa was particularly hard hit by famines that claimed millions of lives. The intervals between famine events have become too short to permit reconstruction of the rural economies. Most survivors have been left with fewer assets, and with an increasingly risky agricultural income base that offers little buffer against future crises. In such circumstances, food insecurity is endemic.

Table 1--Trend projections of consumption and production of major food crops in Sub-Saharan Africa to the year 2000

Country Group	Consumption	Production	Surplus/ Deficit
		(million metric tons)	
Sub-Saharan Africa	161	110	-51
West Africa	76	42	-34
Central Africa	24	19	-5
Eastern/Southern Africa	61	49	-12

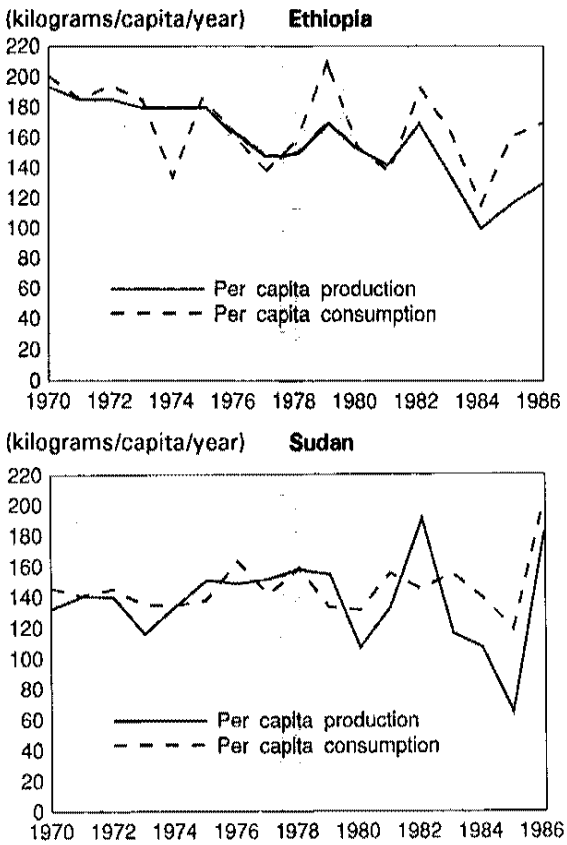
Sources: Leonardo Paulino, *Food in the Third World: Past Trends and Projections to 2000*, Research Report No. 52 (Washington, D.C.: IFPRI, 1986); FAO, "Production Yearbook Tape, 1986," Rome, 1987; UN, *World Population Prospects* (New York: UN, 1986).

There are a number of economic indicators that are important to the problem of food insecurity in Ethiopia and Sudan. Per capita incomes and average daily per capita consumption of calories are very low. During the last two decades, economic growth has been zero in Sudan and negative in Ethiopia. Food production in Ethiopia and Sudan in the late 1980s remained below 1979-81 levels and this showed up in decreased food availability (Figure 2). When availability drops below 150 kilograms of staple food per capita per year, famine prevention can no longer be a matter of better distribution of food.

In Ethiopia, the worst of the famines have been concentrated in the structurally food-deficit regions of the north, east, and south. In these regions, net annual incomes are among the lowest in the world (less than US$100 per capita), sources of off-farm income are few, credit markets are almost nonexistent, and average calorie consumption was less than 1,500 kilocalories (kcals) per capita per day during recent years.[4] The death toll from famine has been great. An estimated half a million people died in these areas during the 1968-75 crisis, and another 1 million people died from 1983 to 1986. Armed conflict in some of the famine areas prevented effective famine mitigation.

Although famine has occurred repeatedly in a limited number of locations, food insecurity affects most regions of the country. During the 1980s, at least 2 million people were officially classified as food insecure in each year, a figure that rose to more

Figure 2--Per capita cereals production and consumption in Ethiopia and Sudan, 1970-86



Source: Ethiopia, Central Statistics Authority, and Sudan, Ministry of Agriculture and Natural Resources.

than 8 million during peak famine years such as 1985 and 1991.[5] Fifty to 60 percent of the severely food insecure are located in the famine-prone provinces with the remainder spread over other parts of the country, even in provinces that had nominal surpluses of food. Despite recent political changes and an end to military conflict, vulnerability to famine is likely to remain very high in much of the country through the 1990s because the drain on household resources was so great during the past decade.

The same may be said of Sudan, which suffered loss of livestock and agricultural output, but hardly any loss of human lives, during the droughts of the 1970s, and then faced large-scale famine mortality in the 1980s. More than half a million people are believed to have died from famine conditions between 1984 and 1990, particularly in the western, north-central, and southern regions.[6] In the south, armed conflicts disrupted effective famine mitigation. The food situation has worsened again in 1991. Those populations who are food insecure are now found not only in the famine-prone regions, but increasingly in the central and eastern regions as well, and most recently in major towns.

CAUSES OF FAMINE

The genesis of food crises cannot be understood with a focus on climatic and production variables (supply-side factors) alone. However, a sole focus on economic conditions and political crises does not comprehensively address causation either. The role played by economic variables at national and household levels (demand-side factors) has gained increasing prominence in recent years.[7] Food insecurity, with its severest expression in famine, is the outcome of an interaction between environmental and socioeconomic factors, both in the short and the long terms, and a failure

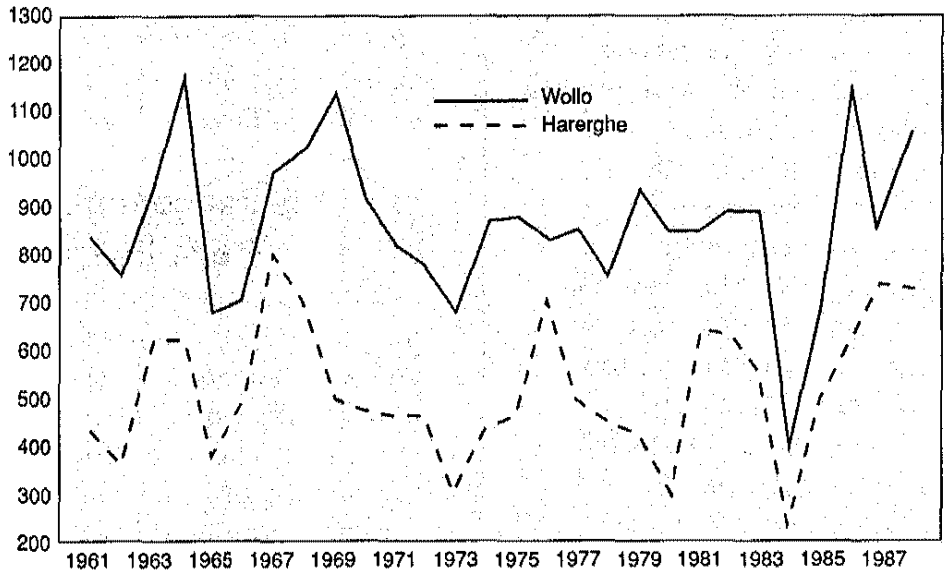
of policy to deal with them. Those factors are described below.

Drought is a primary agent of famine in Africa today. The agricultural production environment is under increased stress from drought. For instance, in western Sudan, mean annual rainfall declined by 7 percent from the 1960s to the 1970s and by a further 18 percent from the 1970s to the 1980s. At the same time, variability of annual rainfall around the trend increased from 16 percent in the 1960s to 32 percent in the 1980s.[8]

Food consumption in Ethiopia and Sudan is closely correlated to domestic production, which in turn is closely linked to rainfall. In 1984 average rainfall in Ethiopia was 22 percent below the long-term national average; in the worst-affected regions it was more than 50 percent below average. In Sudan, it was more than 50 percent below the long-term average in most of the country.[9] In Ethiopia and Sudan drought is strongly associated with food production decline. In Ethiopia, a 10 percent decline in rainfall below the long-term average results in a 4.4 percent fall in national production,[10] and in Sudan, a 10 percent decline in rainfall is associated with a 5 percent fall in national production.[11]

Famines are rarely caused by a single year of drought. Ethiopia and Sudan experienced two or more years of below-average rainfall prior to major famines. Thus household vulnerability to famine had already increased during several years of drought and a progressive depletion of food stocks and capital assets that resulted from these conditions. Indeed, the worst of Africa's recent droughts (1973, 1978, and 1984) have all been the culmination of a number of years of poor rainfall (see Figure 3 for an example from Ethiopia).

Figure 3--Mean annual rainfall from 1961 to 1988 for Wollo and Harerghe, Ethiopia



Source: Ethiopia, National Meteorological Services Agency.
Notes: In the 1968-75 crisis, an estimated half a million people died in all Ethiopia.
In the 1983-86 crisis, an estimated one million people died.

However, it is important to remember that in the future, famines in these countries may be triggered by single year droughts because households have not been able to rebuild their resources in these famine-prone regions. In North Kordofan, Sudan, for example, the asset base of households declined by about 80 percent during the 1983-85 period, but recovered by only about 20 percent in the next three years, leaving a much more vulnerable population. The sequences of famines established a fundamentally different situation: individuals who were farmers and pastoralists before the crises became dependent on the labor market.

Deficiencies in Public Policies

Production failures caused by drought, even those lasting several years, do not translate into famine unless other socioeconomic conditions are prevalent. Such conditions are a result of deficiencies in public policy, which impair the growth of households out of poverty. These conditions include:

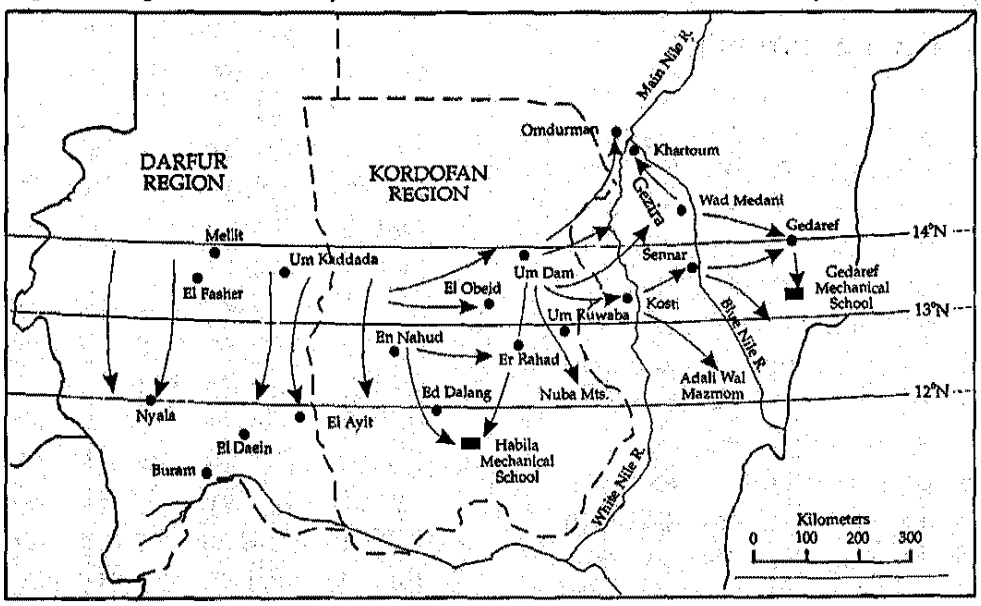
- lack of improved seeds, fertilizers, other inputs, and training associated with improved agricultural technology;
- extensive environmental degradation--partly because the poor lack alternative production technologies--which limits the sustainability of any gains in productivity that are achieved;
- lack of rural and urban nonagricultural employment opportunities, which limits nonfarm incomes;
- lack of integrated markets due to poor roads and transportation facilities and state-controlled marketing policies that impair incentives for farmers;
- limited access to education, which contributes to a low labor productivity and rising birth rates;
- financial markets that do not promote savings and prevent borrowing in times of need; and
- poor health and sanitation conditions due to lack of services and investment in health infrastructure.

Prohibitions on domestic trading and migration in Ethiopia prevented market integration during times of drought. Ethiopia experienced more regionally concentrated severe shortages.[12] This was not the case in Sudan, where market integration in cereals existed and helped spread scarcity widely, affecting the poor in all parts of the country. Huge migration flows to urban centers but also to more stable rural production environments, such as the Jebel Mara areas of Darfur, provided escape from even greater hardship in Sudan, an option much less available in Ethiopia (see Figure 4).

Macroeconomic and Trade Policies

In both Sudan and Ethiopia, inherent food insecurity due to recurring droughts has been exacerbated by macroeconomic policies and excessive state interference in economic activity. Exchange rate regulations and export taxes historically have adversely affected the rural economies. Such policies not only undermine general rural growth prospects but can also

Figure 4--Migration trends of peasant farmers in the semi-arid and central parts of Sudan



Source: Based on Mohammed Babiker Ibrahim, "Drought, Famine, and Disaster Management in Darfur, Sudan," Famine and Food Policy Discussion Paper 4 (IFPRI, Washington, D.C., 1990, mimeo).

have other specific effects. A striking example is the taxation in Sudan of gum arabic, an environmentally friendly export crop (the gum tree) grown in the desert and famine-prone provinces of Darfur and Kordofan. Similarly, incentives in western Sudan for producing sesame, an important cash crop when millet fails during times of drought, have been impaired.

Lack of Infrastructure

In both Ethiopia and Sudan there is a deficit of rural roads, transportation facilities, and the like. This lack of infrastructure makes a market-oriented response to food scarcity and an efficient famine relief response very difficult. The long-term neglect of rural infrastructure and the focus on isolated "projects" rather than on broad-based rural growth in the 1960s and 1970s have led to major problems in the 1980s for both countries.

Armed Conflict

Long-term armed conflicts in Sudan and Ethiopia are also a root cause of food insecurity and famine. Their impact is felt not only in the areas of conflict but throughout the economy due to the drain on national resources. In Sudan, production and employment opportunities were lost in the late 1980s, when cultivation in large areas of the sorghum belt in South Kordofan was impaired by war activities. In Darfur, armed forces, including those from neighboring Chad, engaged in large-scale livestock stealing, which prevented villagers from livestock restocking after the 1984 drought and thereby increased their vulnerability to future drought, as currently observed. Still, it is noteworthy that in both countries the majority of the severely affected population lived outside the war zones.

Participation in Political Decisionmaking

The participation of the people of Ethiopia and Sudan in transparent political decisionmaking processes was much impaired at both central and local government levels. Investigative free media that could generate pressure for needed action against food insecurity were suppressed. Public institutions that normally would have responded to the growing crisis did not receive sufficient support or were frequently utilized as instruments for short-term political purposes. In both countries people working with organizations involved with relief and rehabilitation, despite very committed staffs, could no t deal effectively with the famines. Clearly, political reform and reform of economic policies would go a long way toward famine prevention and take some of the coping pressure off the vulnerable, mostly rural, households.

Poverty

Famine is principally caused by low and variable incomes of the poor. This is because when food supplies are low, for whatever reason, it is the purchasing power of the poor that is most seriously impaired (due to the reinforcing effects of the other conditions outlined above), and it is therefore they who suffer first and most intensely.

If poverty lies at the root of food insecurity, with other more temporal problems contributing to its escalation to famine, then it must be recognized that policy failure has a lot to answer for. The famines of the 1970s and 1980s have pushed food security to the forefront of the political agenda in many countries. The proliferation of agencies, such as the Relief and Rehabilitation Commissions (RRCs) in both countries, Intergovernmental Authority on Drought and Development (IGADD), and Desert Locust Control Organization (DLCO), underscores the more concerted national and international efforts under way to prevent the suffering associated with hunger. Yet, real progress has been slow, and famine continues to threaten many millions of lives.

HOW THE FOOD INSECURE COPE

Even in famine-prone regions where average per capita incomes are low, the impact of food insecurity varies across agro-ecological zones and socioeconomic groups according to the depth of poverty. Since the poorest in any locality face long-term constraints to their domestic food production, as well as in their access to education, health care, markets, credit, improved inputs, and information and participation, such constraints place them at an even greater disadvantage during times of crisis when their access to food is more impaired than usual.

Links Between Production and Consumption

Drought affects crop production through reduced yields. If farmers are poor, they are doubly affected because their yields are typically already lower. A survey conducted in the highland regions of Ethiopia found that households with incomes in the top third had cereal yields during a drought year that were 60 percent higher than those with incomes in the bottom third.[13] Differential yields of milk from cows were also observed by income levels in Ethiopia. Milk yields obtained by households with incomes in the top income tercile were 5.2 liters per day in drought and nondrought years alike. However, milk yields of households in the bottom tercile dropped from 4.8 to 1 liter per day during the drought year.[14] This lower income group also lost considerably more livestock to disease and starvation than did the wealthier group--88 percent of total herd for the former versus 23 percent for the latter. The poor were not able to purchase fodder and vaccines to keep their livestock alive.[15]

These variations in the impact of drought by income status were translated into similar differentials in food consumption. One consumption response to drought is to cut back the number of meals eaten by households each day. In Ethiopia, for instance, 63 percent of the households with average annual incomes of only US$42 per capita (poorest tercile) reduced their consumption during the famine to one meal or less per day, while 47 percent of households with incomes of US$100 per capita (top tercile) dropped their consumption to this level as indicated below.[16] A similar pattern

Household Income Terciles	Meals/Day During Famine Peak, Ethiopia		
	≤1	2	3
Top	47	41	12
Middle	56	33	11
Poorest	63	35	2

emerged in northern Kordofan, Sudan, where a survey found that although 43 percent of households in the bottom third cut their food consumption to one meal per day during the famine, only 26 percent of households in the top third did the same.[17] Cutting back the number of meals eaten has particularly severe consequences for children's nutrition. Analyses showed that when other factors were controlled for, children's mean weight-for-age was reduced by 17 percent in Sudanese households that consumed less than three meals per day.[18]

What people eat also changes in times of famine. Those affected are forced to eat leaves and other wild plant products that they would normally not consume. Research indicates that in Ethiopia wealthier households also changed the composition of their diets less than did poorer households because the poorer were forced to change sooner to such foods.

Identifying the Food Insecure

These findings suggest that even in situations in which almost everyone is poor, the depth of poverty determines the impact of famine. The effects of

food shortages and the loss of purchasing power are felt least in households with higher incomes and sound asset bases. This finding underlines the importance of combating the root causes of poverty in any famine prevention strategy and confirms the need for effective targeting of the absolute poor by relief interventions.

Food insecurity is not limited to the long-term absolute poor, although they find it hardest to obtain adequate food during a normal production year, especially during the preharvest "hungry" season. Wealthier households are also vulnerable when crises escalate into famines, as suggested by the data above.

Preventing food insecurity and developing effective famine relief efforts requires understanding who the food-insecure are and how they are able to cope as individuals, households, and communities. Their locations, resource endowments, employment categories, and demographics are helpful criteria for vulnerability identification and mapping. Famine events have been concentrated to a certain extent in specific regions within countries, for example in the Darfur, Kordofan, and Red Sea Provinces in Sudan; and Wollo, Tigre, Eritrea, Harerghe, and Sidamo regions in Ethiopia. The poor agro-climatic conditions, lack of infrastructure, and high levels of poverty have made these regions particularly vulnerable. Location-specific preparedness is needed.

The resource base of a household and its sources of income relate closely to food security risks. Households that have assets and diversified sources of income are usually better off than those that do not and are better able to cope with drought. Typically, the vulnerable are resource-poor farmers, pastoralists, and informal sector/services employees.

Coping Mechanisms

There are also different coping mechanisms within households, where differences in vulnerability are complex and related to location, household resources, and employment. Typically, however, young children, women, and the elderly are among the most affected by food insecurity.

Understanding the strategies adopted by households as they attempt to deal with seasonal and interannual food crises has increased considerably during the past two decades. As empirical evidence has mounted, two important findings have emerged. First, the social and economic resources mobilized to offset the impact of production shortfalls and market uncertainties are many and varied; there is no one universal response. Second, although the details of response strategies vary from one region to another, broad commonalities emerge in the type and sequence of responses adopted across most localities. Knowledge about these responses is critical for effective public policy for famine prevention. The pattern of household response generally involves a succession of stages along a continuum that runs from long-term risk management, to crisis damage containment, to the extreme instance of household collapse.

Risk Management

This first stage involves ensuring against risk in a precrisis period in an environment of limited credit and insurance markets. It incorporates the measures of saving, investment, accumulation, and diversification. There are four key elements of this stage:

1. Resource-poor farmers try to protect minimum farm productivity through inter-cropping, spatial dispersal of fields, and use of multiple seed varieties; pastoralists try to hold mixed-species herds and keep last resort grazing grounds;
2. Households store food, save money, and invest in valuable disposable goods such as jewelry, farm equipment, and household goods;
3. Households establish credit through social support networks based on gifts, food-sharing, and providing loans; and
4. Households diversify their incomes locally or by having some members migrate to other areas and send wages back.

Success in pursuing and attaining these goals plays a large role in determining the outcome of subsequent crises. For example, income diversification is found to contribute greatly to food security. In villages of Kordofan, Sudan, in 1988, households in the top income tercile obtained 31 percent of their income from remittances and transfers, whereas only 16 percent in the bottom tercile did so.[19] In Ethiopia, households in the highland region with incomes in the top tercile had higher nonfarm incomes than households in the lowland region.[20] In Sudan, incomes of households in Kordofan villages were lowest when the adult-to-family ratio was low, the head of household did not have any formal education or was female, livestock capital was low, and the household had no access to remittances.[21]

Damage Containment

The second stage of coping involves disaccumulating previous investments, calling in of loans, and searching for new credit. As capital for investment dries up, food and nonfood consumption is restricted, stores of food are drawn down, and the number and variety of potential income sources that are available become crucial to survival. The opportunity cost of protecting future income streams from past investments rises. Access to credit to stabilize consumption and protect against having to sell assets is crucial at this stage for quick recovery after food crises. The absence of efficient financial systems forces households to dispose of productive assets.

Relatively wealthier households carry through this stage of food crisis better than poorer households because they generally have more assets (equipment, durables, livestock) that they can part with and, moreover, they can better afford to wait for more favorable market conditions. In Ethiopia, somewhat wealthier households earned an average of US$15 per capita from asset sales during the 1980s famine, compared with only US$5 per capita earned by

the poorest households. Wealthier households in Ethiopia also had greater access to credit and social support networks. Twenty-five percent of wealthier (top tercile) households borrowed food during the crisis, but only 16 percent of bottom tercile households were able to do so. Furthermore, 43 percent of the wealthier households obtained nonfood support from their extended family, compared with only 29 percent of the poor.

In Sudan, community-support networks were more effective for the wealthier than for the poor. In Kordofan, a cooperative credit system was largely used for consumption stabilization purposes. Seventy-three percent of loans given by it were used for food purchases in 1988/89.[22] Traditional self-help mechanisms such as the *sanduq khairi* (emergency village funds) and *zaqhat* (alms) systems that normally support the poor during crises broke down under the stress of the famine in the worst-hit villages, although, in the generally better-endowed villages, *sanduq khairi* funds were used to support survival strategies.[23]

A household's capacity for coping is not just a function of its asset base, it is also a function of education levels. For instance, in Sudan in the aftermath of the 1985 famine, rural children whose parents had visited schools, and, more so, whose mothers had received some school education, were significantly better off nutritionally than other children, holding other factors constant. In the population under food security stress, a mother's education was twice as effective in maintaining a child's nutrition level as a father's education.[24]

The coping path of households was usually accompanied by disappearance of basic rural services, both public and private. At an early stage of food emergencies, schools closed because teachers left and health posts were vacated by essential personnel. Traders did not reach out any more into remote famine-prone regions.

Household Collapse

In the final stage the diets of most households are dominated by foods like roots, leaves, and rodents not normally eaten, and households sell their remaining assets, including homes, fields (for which there is often no market), and clothes. This stage may be inescapable if famine conditions persist in the absence of external aid. If able to do so, many households leave their villages in search of assistance from distant relatives or at a relief camp. Large-scale migration to camps occurred in Ethiopia and, to a lesser extent, in Sudan.

These three stages indicate the irreversibility of actions taken, and at the same time, the increasing vulnerability to a continuation of the crisis. Each response, at best, delays the onset of the next stage, unless conditions change or external help arrives. As households proceed along this path, it becomes increasingly difficult to differentiate between a "coping" response, which implies a conscious choice between alternatives, and a "suffering" response. Not all of

the actions undertaken by households to cope at each stage of the crisis are beneficial, either to the household or to its environment. Cutting basic food intake to minimal levels, or breaking up a family to enhance chances of survival of individual members entails suffering. Vulnerable groups within households, that is, women and children, usually suffer first and most.

POLICIES AND PROGRAMS FOR REDUCING FOOD INSECURITY

What, then, have been the main policies and programs initiated to prevent famine? Why has progress been slow? What approaches seem promising?

Changing National Food Policies

The economies of Ethiopia and Sudan are dominated by agriculture, but the treatment of the agricultural sector has differed in each country, which has had important implications for their food security status. Prior to the mid-1970s both invested in agriculture mainly to raise exports through mechanized and irrigated farming. However, after the 1973/74 food crisis, they reoriented their priorities toward increasing domestic food supply.

The Sudanese government implemented a "breadbasket" strategy in the late 1970s specifying the goal of national self-sufficiency in wheat and sorghum. In the early 1980s, the government advocated the key role of smallholder rainfed agriculture. Although these plans were never fully realized, the goals remained highly visible in the public policies of subsequent governments. A combination of monetary, fiscal, exchange rate, and institutional reforms were brought to bear on the problems of low agricultural productivity, marketing constraints, and declining export revenues. However, widespread food insecurity deepened into famine in the mid-1980s and early 1990s. The government employed an extensive, largely urban-focused food subsidy system for bread and a rationing scheme for sugar to assure basic access to food. The system became unsustainable during the foreign exchange and food crises of the late 1980s.

Macroeconomic reforms that were associated with frequent shifts in government priorities, partial programs, and piecemeal measures, together with the debilitating effects of several years of continuous drought and war in the south, contributed to poor performance of the agriculture and food sector. Current needs are so extreme that the food security policies now in place will have to be totally redesigned in the context of comprehensive macroeconomic reform.

In Ethiopia, the 1974 famine was responsible for reorienting policy away

from irrigated export farming toward smallholder agriculture. There were fundamental changes in land tenure, asset ownership, and labor laws, but agricultural investment remained concentrated in the capital-intensive state farm and cooperative sectors. Although an extensive procurement and distribution system of basic staples existed to assure access to food, the new policies proved incapable of forestalling either a continued decline in domestic cereal production (which has fallen at an annual rate of 4 kilograms per capita from the 1960s), or the 1984/85 famine. The policies based on centralized planning and mass ownership of assets were abandoned, and liberalization of trade, price, and ownership laws were pursued in 1989/90. But as in the case of Sudan, such changes could only have a medium-term effect and came too late to prevent renewed famine in 1991. The new government of Ethiopia is in the process of redefining its food security agenda.

Programs and Projects to Improve Food Security

In addition to public manipulation of prices, markets, and capital investments, the overall policies outlined above were also pursued through the implementation of numerous food security projects and programs. A selection of these are considered below, grouped according to their primary objectives.

Production Enhancement Projects

The generation and dissemination of improved agricultural technology is key to sustainable long-term food security in the two countries, both through the potential of the technology to enhance productivity and through its related capacity to increase rural employment and income. Innovations have to some extent been promoted in Ethiopia and Sudan. These innovations include advanced irrigation technology (Ethiopia), genetically-improved livestock (Ethiopia and Sudan), improved animal traction (Ethiopia), and greater use of chemical fertilizers and higher-yielding cultivars (Ethiopia and Sudan).

In Sudan, for example, the Jebel Mara Rural Development Project in Darfur is a long-term rural development project that has an agricultural technology promotion component. The project provides participants with access to improved cultivars, fertilizers, animal traction, and extension advice. The project is located in a relatively high potential area, given the conditions of Darfur. During the 1984/85 crisis, villages participating in the project and thus having access to modern inputs through extension services were better able to cope than nonparticipating villages (Table 2). Furthermore, within the participating villages, households that participated in the project had higher grain production per capita and enough to meet calorie needs, which meant that fewer household members were forced to migrate in search of food. In households with no access to the improved crop technology, twice as much migration out of the area occurred and the proportion of female-headed households doubled to 47

Table 2--Grain production before, during, and after 1984/85 drought by participation in Jebel Marra Project, Sudan

Year	Grain Production Per Household			
			Within Participating Villages	
	Participating Villages	Nonparticipating Villages	Participating Households	Nonparticipating Households
	(kilograms)			
1982/83	980	520	1,148	779
1983/84	973	449	1,361	785
1984/85	624	220	867	544
1985/86	1,844	1,568	2,082	1,745

Source: Tesfaye Teklu, Joachim von Braun, and Elsayed Zaki, *Drought and Famine Relationships in Sudan: Policy Implications*, Research Report 88 (Washington, D.C.: IFPRI, 1991).

percent in the crisis year. The proportion of female-headed households remained constant at 10 percent among farm households with access to improved crop technology.[25] A concentration of technological change in a comparatively high potential area provided respite for drought refugees from a large surrounding area.

The success of this project in coping with the 1984/85 drought highlights the key role that improved agricultural technology can play in famine prevention and mitigation. To rebuild productive capacity of households, nonfood emergency relief included sometimes the distribution--often on credit--of oxen, cows, goats, seeds, farm equipment, and other like assets. The distribution of such assets is designed to accelerate post-famine rehabilitation of the rural economy, and, therefore, shorten the period of food insecurity. Although distribution of assets has been useful in reducing suffering, the long-term impact has been limited. In Ethiopia, many animals died quickly due to diseases and a lack of fodder, and many of the poorest households were forced to sell their assets before the next cropping season because their immediate need for food was so great. To protect such long-term assets requires short-term support packages of food or cash.

Income and Employment Projects

Agricultural production promotion is vital but not sufficient for famine prevention because households that have been displaced and have lost productive assets become increasingly vulnerable and dependent on the labor market. Public works projects that are labor intensive can play a vital role in supporting the purchasing power of the poor. Such projects, which involve the building of infrastructure such as roads and bridges upon which further development depends, prevent migration away from the area to camps or cities. Such projects have been used as a tool for food and/or income relief in both Ethiopia and Sudan.

Ethiopia has an unusually rich experience with public works programs dating back to the 1960s. Attempts have been made to mobilize labor for

environmental conservation and enhancement activities (mainly soil and water conservation and afforestation), and at the same time to improve the food security of the poor. Participants of most projects have been paid in food. The World Food Program (WFP) operates the largest food-for-work program in Africa in Ethiopia. It provides 27 million workdays of employment per year and 250,000 tons of food.[26] Participating households are paid a standard ration of 3 kilograms of cereal per day. The United Nations Children's Fund (UNICEF) has also operated similar projects that pay wages in cash.[27] A recent survey of several such projects found that when local and regional markets functioned effectively, most participants favored wages in cash.[28] Project evaluations of public works have generally been satisfactory, but concerns remain about post-project asset deterioration due to insufficient maintenance and poor technical standards (see Table 3).[29]

Table 3--Selected public works programs, Ethiopia

Objectives/ Functions	Years	Area Covered	Workdays Created ('000)	Output Created	Project Type[a]	Assessment
Conservation	71-74	Tigre province	300	Erosion control, waterworks, reforestation	F/C	Mixed
Conservation	80-87	Country	?	Erosion control, reforestation	F/V	Mixed
Reforestation	83-88	Eritrea, Tigre provinces	20,000	254,000 kms terracing, 163 micro-dams, 821 kms roads, 232 million trees	F	Positive
Irrigation	85-87	Drought zones (14 provinces)	?	770,000 trees, 1,065 kms bunds, 464 kms roads, 12 kms irrigation	C/V	Positive
Conservation, roads, forestation	85-88	North Shewa province	4,708	250 kms roads, 13 million trees, 2,500 kms terracing	F	Positive
Conservation	87-90	Country	100,000	2.6 million hectares erosion control, 20,000 kms roads, irrigation, bridges	F/V	Mixed
Conservation	90-93	Eritrea, Tigre provinces	5,000	Erosion control, roads, tree planting, dams	F/C	---

[a] F = food wage; C = cash wage; V = voluntary participation (no wage); S = self-help (cash to support private initiatives).

Source: Patrick Webb, Joachim von Braun, and Yisehac Yohannes, "Famine in Ethiopia: Policy Implications of Coping Failure at National and Household Levels" (International Food Policy Research Institute, Washington, D.C., 1991, mimeo).

Although public works have not been as widely used in Sudan, experience in this country dates back to employment programs for famine prevention in the 1920s that were modeled along the lines of successful Indian programs.[30] In 1984, a large project in White Nile Province came into operation that combined irrigation, erosion control, and road building works. This project has provided wage employment of more than 300,000 man-days between 1984 and 1988.[31] Wages were paid in a combination of food and cash.

It should be noted that during the 1984/85 famine, most food-for-work projects, when most needed, came to a standstill because of logistical and administrative problems. Indeed, both Sudan and Ethiopia are a long way from being able to expand their public works rapidly during crises (as India has been able to do), and, thereby, capitalize on the potential of this tool to mitigate famine.

Labor-intensive public works programs have a great deal of potential for addressing food insecurity, providing direct and sustainable poverty alleviation, and strengthening self-help capacities. In addition, they can be designed to reach the neediest: when wage rates are set properly, they attract only the poor. The lack of adequate institutional capacities is a real constraint, but one that can be overcome. Food security issues need to enter more fully into policy formulation. Similarly, public works programs need to be integrated into the national planning system for infrastructure and other public goods provision to ensure useful and sustainable asset creation. Especially where whole communities get involved, community participation in setting priorities needs to be strengthened to encourage commitment to maintenance.

Storage and Distribution Policies

One of the immediate responses to the droughts of the late 1960s and early 1970s was a move toward improving the domestic cereal stocks, both as a way to stabilize prices and to establish security reserves for future production shortfalls.

Community-level grain storage is rare in Ethiopia and Sudan, but attempts were made in both countries in the 1970s to establish national food security reserves that would contribute to price stabilization and timely food aid distribution. In Ethiopia, the RRC, founded in 1974, is responsible for monitoring and alleviating the effects of drought. While the RRC has received much praise for its early-warning and aid coordination activities, its success in establishing a food reserve has been limited because donors have preferred to keep aid stocks under their own control. As a result, strategic reserves have never reached planned levels, and the drawing down of stocks has had little effect on reducing the gap between production shortfalls and need.

In Sudan, the Agricultural Bank of Sudan has maintained cereal buffer stocks in an effort to stabilize prices since the 1960s. Capital and storage constraints have limited the size of such stocks to less than 10 percent of total domestic production in any one season.[32] The tardy and ineffectual role

played by the government in distributing food during 1984/85 was at least in part due to such constraints on the system.

There is little doubt that both Ethiopia and Sudan would benefit from effectively managed grain reserves placed near high-risk areas under the control of local authorities. The drawing down of such reserves would have to follow clear guidelines regarding eligibility, timing, and mode of distribution, for instance in the context of labor-intensive public works programs. In the food-deficit regions of the worst famine-prone countries, this remains an important responsibility of the public sector that the private sector will not be assuming in the foreseeable future.

Early Warning Systems

A precondition for effective emergency relief is the operation of appropriate early warning systems. Much effort has been put into the development and fine-tuning of information systems relevant to crisis prediction and prevention in the study countries.

Ethiopia set up Africa's first early warning system in 1977 and in 1980 extended this with an Early Warning and Planning Service operated by the RRC. Sudan established an RRC in 1985 and in 1986 it established an early warning unit of agencies that assemble and distribute information relevant to crisis prediction. However, the lack of financial or administrative capacity for responding to warning signals reduces the relevance of these agencies. Neither country systematically monitors nutrition indicators within these systems. In 1991, there was even less information available about the nutritional situation of the population, particularly children, in the affected areas of western Sudan than there was during the 1985 famine, when some monitoring took place. But early warnings have not proven to be sufficient for preventing famine. In both Ethiopia and Sudan, there was plenty of information warning of the 1984/85 famine long before it assumed unmanageable proportions. Thus, the success of famine prevention or mitigation rests on political will and financial and bureaucratic capabilities, which in both countries have been poor.

Food Aid

Ethiopia and Sudan have become highly dependent on food aid during the past 10 years. There were major waves of food aid into Sudan in 1984/85, 1988, and 1989. While the food arrived too late to prevent mass migration from the western and central parts of the country, it did serve to prevent deaths on an even greater scale than what occurred.

Ethiopia has received even more food aid than Sudan since 1984, with imports exceeding 1 million tons in 1988 and again in 1991. IFPRI surveys suggest some effectiveness in targeting the most needy. Households consuming only 1 meal per day during the famine received more food aid than households consuming 3 meals, and women-headed households received at least as much food as those headed by men.[33] However, universal eligibility also diluted the amounts available, and

an average of only 180 kilograms was received per household during the worst year--sufficient to maintain a family of six for only two months.

Health and Sanitation

Food emergencies in Ethiopia and Sudan have often been accompanied by health service emergencies. Not only does reduced dietary intake lead to increased health risks but, at the same time, health services and--in drought-prone areas--access to safe water are also reduced. Analyses explaining nutritional status (weight-for-age) of preschool children in Sudan find that after access to food, the prevalence of diarrhea and distance to a health center are the most powerful explanatory variables.[34] The prevalence of diarrhea was found to be much influenced by the access to piped water.

Public action groups can play a key role in preventing these adverse health effects. And, in Ethiopia and Sudan, United Nations agencies and NGOs have stepped in to fill the gaps during times of crisis. Maintaining and enhancing the response capabilities of health services to food emergencies is as important for preventing deaths as is responding to the food crisis.

POLICY CONCLUSIONS AND RECOMMENDATIONS

The outcomes of many projects and programs aimed at strengthening household and national capacity for preventing and mitigating famine have been positive. There is, however, a deficiency in systematic assessment of experience that constrains learning and institutional strengthening. Although projects that fail often attract more attention than successful ones, valuable insights have been gained from recent operations, and these provide a foundation for improved operations in the future. There is noted progress in key areas.

- There now exists a better understanding of the key role of employment in famine prevention: knowing when and where to initiate labor-intensive public works projects, paid in cash or food, depending on local market conditions, is critical.
- The scope for and type of agricultural technology to prevent food insecurity in famine-prone zones has been improved through a greater understanding of the coping strategies used by smallholder farmers.
- Refinements in the targeting mechanisms of food aid distribution programs show that research into the characteristics and immediate needs of food-insecure households is paying off.
- The good performance of early warning systems also shows the benefits of this research on households.

The evidence suggests that:

1. Food insecurity and famine are inseparable from poverty. Although famines differ in both countries, the underlying conditions that contribute to famine are quite similar: climate-driven production fluctuations; lack of employment opportunities; limited assets of households; isolation from major markets; low levels of farm technology; constraints to improvement in human capital; and poor health and sanitation environments. While factors such as political and military conflict and drought contribute to famine, they do so mainly where people are very poor in the first place.
2. Famines do not happen suddenly. They are an accumulation of events and policies that progressively erode the capacity of poor households to deal with short-term shocks to the local economy. These shocks often take the form of environmental extremes, but the conditions that promote household vulnerability to such extremes develop over long periods. A misguided macroeconomic and trade policy has been part of the problem in both countries. However, conditions have been established by past policy failures that cannot be rectified in the short run. The coping capacity of poor households in the famine-prone countries of Sudan and Ethiopia have substantially declined in the 1980s. This suggests a limited scope for private (market oriented) solutions alone and a need for increased public action--outlined below--now.
3. Famines, as well as food insecurity, are preventable. The fact that famines continue to be a threat to life in the 1990s must be ascribed to a failure of policy; that is, a failure to give priority to the conceptualization, analysis, preparation, and implementation of preventive measures. In these countries with a relatively large agricultural sector, a key contribution to famine prevention is to come from an employment-creating rural growth strategy. Overcoming the constraints to achieve food security and famine prevention in these countries requires a comprehensive development strategy that places the greatest emphasis on a narrow set of public policy priorities, including:
    - promoting agricultural growth, both in subsistence food crops and crops for sale;
    - improving rural infrastructure through labor-intensive employment programs;
    - providing basic health and sanitation services; and
    - providing education.
4. One of the main constraints of turning knowledge into action is a lack of political and financial commitment to the creation and maintenance of the legal and administrative frameworks essential to timely and efficient

interventions. No long-term progress can be made against food insecurity without the machinery in place to record and diagnose stress signals and to organize swift and effective response to such signals. The relief and rehabilitation agencies in famine-prone countries need to be strengthened, their independent operation ensured, their links with local governments emphasized, and their coordination with nongovernmental organizations streamlined.

5. Progress has been made during the 1980s in the search for a better understanding of the causes of food insecurity and of the private and public actions required to prevent it.[35] Yet progress in initiating such action has been poor. Much of the blame must rest with the armed conflicts that have plagued the poor famine-prone countries for many years. There is no doubt that little progress can be made in famine relief, and even less in prevention while conflict continues to drain human and capital resources. A lasting peace and improved rural participation in governance are the basis for eliminating famine. That said, neither military conflict nor complaints of "famine fatigue" in the donor community should be used to justify public inaction. An end to the armed conflict in the two countries will not by itself end the risk of famine.

NOTES

1. Rajul Pandya-Lorch, research analyst in IFPRI's Food Consumption and Nutrition Division, provided much appreciated research support and editorial assistance for this paper.

2. See Jean Drèze and Amartya Sen, *Hunger and Public Action* (Oxford: Clarendon Press, 1989) and Parker Shipton, "African Famines and Food Security: Anthropological Perspectives," *Annual Review of Anthropology* 19 (1990).

3. William Torry, "Famine Early Warning Systems: The Need for an Anthropological Dimension," *Human Organization* 47 (No. 3, 1988).

4. Patrick Webb, Joachim von Braun, and Yisehac Yohannes, "Famine in Ethiopia: Policy Implications of Coping Failure at National and Household Levels" (IFPRI, Washington, D.C., 1991, mimeo).

5. Famine Early Warning System, *Vulnerability Assessment* (Washington, D.C.: Published for USAID by FEWS Project, Tulane/Pragma Group, 1991); Webb, von Braun, Yohannes, "Famine in Ethiopia."

6. Tesfaye Teklu, Joachim von Braun, and Elsayed Zaki, *Drought and Famine Relationships in Sudan: Policy Implications*, Research Report 88 (Washington, D.C.: IFPRI, 1991).

7. Amartya Sen, *Poverty and Famines: An Essay on Entitlement and Deprivation* (Oxford: Clarendon Press, 1981).

8. Teklu, von Braun, and Zaki, *Drought and Famine in Sudan*.

9. Webb, von Braun, and Yohannes, "Famine in Ethiopia;" Teklu, von Braun, and Zaki, *Drought and Famine in Sudan*.

10. Webb, von Braun, and Yohannes, "Famine in Ethiopia."

11. Teklu, von Braun, and Zaki, *Drought and Famine in Sudan*.

12. Webb, von Braun, and Yohannes, "Famine in Ethiopia."

13. Patrick Webb and Thomas Reardon, "Drought Impact and Household Response in East and West Africa" (IFPRI, Washington, D.C., 1991, mimeo).

14. Ibid.

15. Webb, von Braun, and Yohannes, "Famine in Ethiopia."

16. Ibid.

17. Tesfaye Teklu, "Household Responses to Declining Food Entitlement: The Experience in Western Sudan" (IFPRI, Washington, D.C., 1991, mimeo).

18. Teklu, von Braun, and Zaki, *Drought and Famine in Sudan*.

19. Ibid.

20. Webb and Reardon, "Drought Impact and Household Response in East and West Africa."

21. Teklu, von Braun, and Zaki, *Drought and Famine in Sudan*.

22. Ibid.

23. Tesfaye Teklu, "Household Responses to Declining Food Entitlement."

24. Teklu, von Braun, and Zaki, *Drought and Famine in Sudan*.

25. Graciela Wiegand-Jahn, "Famine Experience in a High-Potential Area in Sudan: Village and Household Information from the Jebel Marra Area in Darfur," Famine and Food Policy Discussion Paper 2 (IFPRI, Washington, D.C., 1990, mimeo).

26. Webb, von Braun, and Yohannes, "Famine in Ethiopia."

27. Patrick Webb, "Baseline Survey of Doma Peasant Association" (Report prepared for UNICEF/IFPRI, Washington, D.C., 1989, mimeo).

28. Webb, von Braun, and Yohannes, "Famine in Ethiopia."

29. Joachim von Braun, Tesfaye Teklu, and Patrick Webb, *Labor-intensive Public Works for Food Security: Experience in Africa*, Working Papers on Food Subsidies 6 (Washington, D.C.: IFPRI, 1991).

30. Andrew Shepherd, "Case Studies of Famine: Sudan," in *Preventing Famine--Policies and Prospects for Africa*, ed. D. Curtis, M. Hubbard, and A. Shepherd (London: Routledge, 1988).

31. Von Braun, Teklu, and Webb, *Labor-intensive Public Works for Food Security: Experience in Africa*.

32. Teklu, von Braun, and Zaki, *Drought and Famine in Sudan*.

33. Webb, von Braun, and Yohannes, "Famine in Ethiopia."

34. Teklu, von Braun, and Zaki, *Drought and Famine in Sudan*.

35. Drèze and Sen, *Hunger and Public Action*.

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