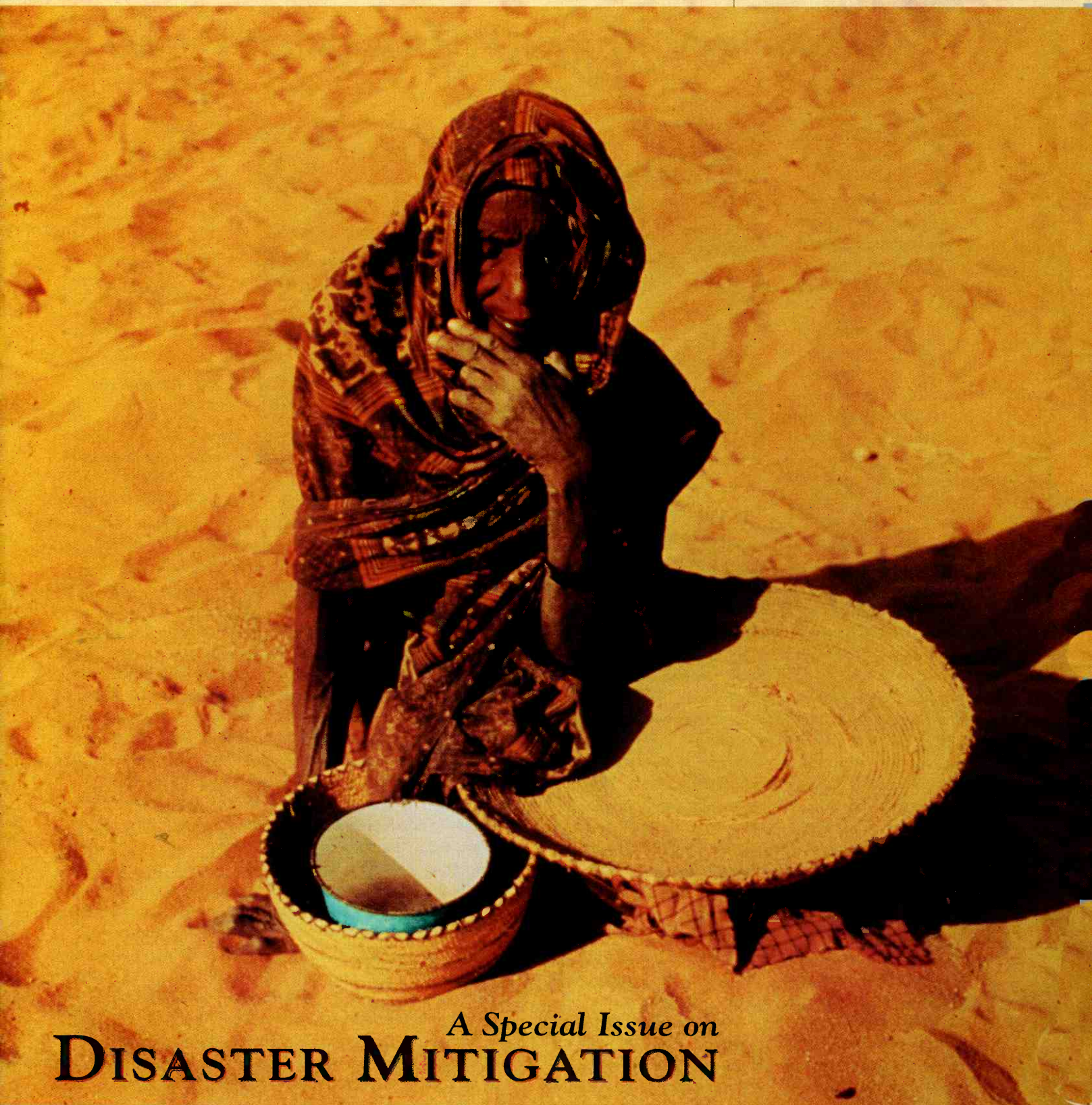
ARID LANDS
NEWSLETTER

Fall/Winter 1993, Volume 34



A Special Issue on

DISASTER MITIGATION

SPONSORED BY THE WORLD FOOD PROGRAMME

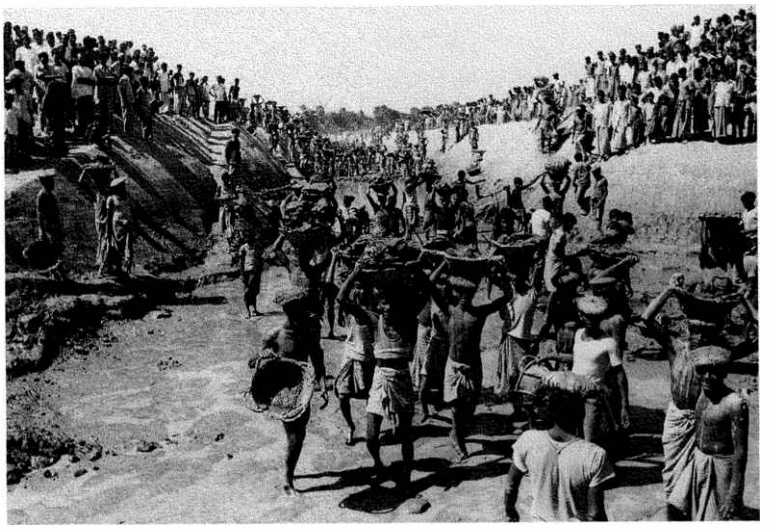
OFFICE OF ARID LANDS STUDIES
THE UNIVERSITY OF
ARIZONA
TUCSON ARIZONA

World Food Programme

30 Years in the Service of Poor and Hungry People

D. John Shaw

The World Food Programme (WFP) began operations 30 years ago to combat hunger and promote economic and social development among poor people in poor countries.



World Food Programme food-for-work projects in Bangladesh have improved irrigation capabilities and flood control.

The past 30 years have seen WFP grow from an idea shared by a small group of countries to one of the world's largest development and relief agencies. When WFP started as a three-year experimental program (1963-65), it had less than US$100 million of resources. For the 1991-92 biennium, WFP had total pledges and contributions—all voluntary—worth nearly US$3 billion.

WFP faces two main challenges: providing life-sustaining food and building self-reliant families and communities. As more people become the victims of natural or man-made disasters, WFP is increasingly called on to provide fast, efficient relief assistance. However, development programs remain the foundation of WFP's work. They are the means by which WFP helps poor people become more self-reliant. WFP has developed a three-pronged approach to poverty alleviation and food security: (1) promoting the productive use of the employment of poor people to increase their incomes and assets; (2) supporting and sustaining basic social services in nutrition, health, education, and training, and (3) providing safety nets for the poor in times of emergencies and during structural adjustment.

As the food aid organization of the United Nations system, WFP is now the principal international channel for the provision of relief food aid and a major supplier of food in support of development activities. In playing this dual role, WFP is the largest source in the United Nations system for the transfer of grant resources to developing countries. Its annual turnover in 1992 was nearly US$1.7 billion. Priority is given to supporting low-income, food-deficit countries, and especially the poorest among them, where over 42 million of the world's poorest people were reached last year.

With its dual role of providing emergency relief and development assistance, WFP is the front line of the United Nations' attack on poverty and hunger. In carrying out that role, WFP now accounts for about half of total United Nations grant expenditures for operational activities in Africa, is the largest source of assistance within the United Nations system to development projects involving and benefiting poor women in developing countries, is the largest provider of grant assistance for environmental preservation activities in developing countries, and is the largest purchaser of food and services in developing countries among United Nations agencies and a major supporter of South-South trade.

Food aid should have as its basic objective its own elimination—to help countries and people toward self-reliance. That objective was reflected in the experimental nature of the program when it was first set up and has continued to the present. The need for food aid has increased, rather than decreased, as man-made disasters have multiplied, poor countries have become desperately in debt and must adjust their economies, and environmental degradation reduces harvests. The need for WFP and the support it gives to poor people in development and relief will, therefore, continue. Ultimately, however, the program's work should not be viewed only in terms of the volume of food shipped or the number of people fed, but in terms of the number of people who, over time, are able to feed themselves.

Among the events to mark WFP's thirtieth anniversary, a major photographic exhibition is being mounted, telling the WFP story through emergency operations and development projects. It is planned to show this exhibition at a number of locations in the developing and developed world in the coming months. The photographs in the show were made over the years by Trevor Page, who contributed the image on the cover of this special issue of the *Arid Lands Newsletter*.

D. John Shaw is Chief of WFP's Policy Affairs Service in Rome.

ARID LANDS
NEWSLETTER

Fall/Winter 1993, Volume 34

Editor
John M. Bancroft

Contributing Editors This Issue
D. John Shaw
Barbara Hutchinson

Design
Sonia Telesco

Circulation
Robert S. Breckenridge
Sydney Hutchinson

Publisher
Office of Arid Lands Studies
College of Agriculture
The University of Arizona
Tucson, Arizona 85719 USA

The *Arid Lands Newsletter* is published semiannually by the Office of Arid Lands Studies, The University of Arizona, and is distributed worldwide without charge. The purpose of the *Arid Lands Newsletter* is to inform readers of current activities of interest to arid lands researchers worldwide. When quoting items from the Newsletter, we would appreciate appropriate recognition.

We'd like to hear from you. Address letters of comment, requests for future mailing, and items about projects that may be of interest to our readers to:

Editor, *Arid Lands Newsletter*
Office of Arid Lands Studies
University of Arizona
845 North Park Avenue
Tucson, Arizona 85719 USA

Printed on 50% waste paper.

On the cover: Chad Emigré. Photo by Trevor Page.

CONTENTS

DEPARTMENTS

DISASTER

in the Emergency-Development Continuum

TIMOTHY R. FRANKENBERGER AND D. JOHN SHAW

Concern has mounted over the past decade regarding the increasing number of people adversely affected by natural and man-made disasters, particularly in Africa. This has led the international community to reconsider policies and programs related to the continuum of disaster mitigation, rehabilitation, and development aimed at poverty alleviation and promotion of food security. Two major international conferences held in 1992 provided opportunities to take stock of the issues involved. These were the United Nations Conference on the Environment and Development (UNCED) in Rio de Janeiro and the International Conference on Nutrition (ICN) in Rome.

There is a growing consensus on the need to strike a balance between the immediate needs of the afflicted population exposed to disasters and their longer-term development requirements. This calls for coherent policies and programs that support disaster prevention, preparedness, mitigation, and rehabilitation measures and support and fortify the interrelationships between emergency and development assistance.

This view is justified when one takes into account the growing cost of emergency assistance and the negative economic impact it is having on governments in the developing world and on donors' aid allocations. Drought, war, and civil strife, resulting in chronic food shortages, have forced many governments and aid donors to mount massive food transfers for many years since the 1970s. To cite just one indicator, the net value of food aid to Africa from 1985 to 1990 averaged US$1 billion a year, about the same as the net transfers to the region by the World Bank and the International Development Association. During the decade of the 1980s, cereal food aid accounted for between 20 and 44 percent of annual cereal imports to sub-Saharan Africa. During the height of the food crises of the mid-1980s and since the start of the present decade, more than half of cereal food aid has been in the form of emergency relief assistance. These food transfers have been at the expense of development assistance and disaster mitigation programs. While providing vitally required life-sustaining food, they have not contributed to building self-reliant families and communities or to preventing the depreciation of capital stock. There is a close and growing convergence between poverty and vulnerability to recurring emergencies, particularly to those caused by drought.

The scale of human misery in Africa caused by drought-related disasters has been considerable. Estimates of deaths caused by the mid-'80s drought range as high as 3 million; in addition is the much larger impairment of human potential and the human dislocation, particularly among women and children. Drought-related disasters in Africa have entailed high economic costs in terms of lost production, misused inputs, diversion of development resources and aid (The cost of external relief efforts for the mid-'80s drought is estimated to have exceeded US$2 billion.), and loss of capital and physical assets. Direct damage caused by drought in Africa in the 1980s has been estimated conservatively at US$5 billion. Costs rise further when people exhaust their traditional coping strategies and migrate in search of food and water. Droughts have imposed wide-scale disruption on longer-term development of African countries. Agricultural production has declined sharply and appreciably, leading to a drop in export earnings at the same time that food import requirements have increased. Employment and income opportunities also have fallen, especially for the poor.

The Emergency-Development Interface

Traditional assistance to areas prone to disasters has been divided between relief and development. Relief has concentrated on the alleviation of emergency conditions through the provision of food or cash to the most needy segments of the population. The effective time frame for relief activities is measured in weeks or months, so that there is little possibility of having a long-term sustainable impact on the affected population after the emergency has passed.

Development generally focuses on long-term projects with time frames measured in years or decades. It is not necessarily geared to address emergency situations. Often, these activities involve large, capital-intensive works or institution building. The long-term objectives of these types of interventions have been to increase productivity or to enhance general household income.

In an address to World Food Programme staff in April 1993, the Secretary-General of the United Nations, Dr. Boutros Boutros-Ghali, put it this way:

> Emergencies require immediate action. Food security must be a priority. But beyond the urgent demands of the moment, we must look to the longer term. Food for humanitarian assistance must over time become food for development. And this must be followed by self-sustaining food production in time of peace. Understanding this continuum and making it work is one of the most physical and intellectual projects of our time. You who are working on food for development are peacemakers for the future.

Between these two ends of the continuum is mitigation. The major objectives of mitigation efforts are not only to abate the impacts of the current emergency but also to shorten the period of recovery and, in the long term, to reduce vulnerability to future food emergencies.

Different Types of Mitigation for Different Disasters

The appropriate mitigation response will be related to the type of disaster that is causing the emergency and to the kind of people affected. There are significant differences in emergencies caused by man (war, civil conflict), cataclysmic natural events that occur with little warning (earthquakes, floods), and slowly maturing natural disasters (crop losses caused by drought, pest and disease attacks). In man-made disasters, peacemaking and peacekeeping operations, linked to humanitarian assistance operations, may be required to assure that food and other essentials reach afflicted populations, who might be entirely dependent on outside aid. Prevention and preparedness measures may be difficult and complex, and rehabilitation leading to development more protracted. Mitigation responses for cataclysmic events would focus on improving prediction and preparedness. If the disaster is drought-induced, mitigation responses would be aimed at timely detection of vulnerable areas, short-term livelihood protection through food or income transfers, and long-term livelihood promotion through sustainable development interventions. In both man-made and drought-induced emergencies, a broad-based area approach to prevention, rehabilitation, and development should be adopted that takes into account the needs of the entire population—refugees, displaced, returnees, and indigenous—and the totality of resources available in comprehensive and integrated programs. These aims require a considerable measure of organization to achieve. They are difficult to pursue in the pressure of sudden emergencies. And they are a formidable challenge for governments in poor countries faced by economic crises. A key to success is advance preparation, coupled to national and local capacity-building.

A Strategic Framework for Disaster Mitigation and Rehabilitation

Disaster mitigation involves both detecting populations that are vulnerable to the disaster and carrying out appropriate interventions to lessen the severity of household food insecurity. Household food security is defined by IFAD as the capacity of a household to procure a stable and sustainable basket of adequate food. (FAO has expanded this definition to include three parts: increased food production, stability of supplies, and access by the poor to their food requirements.) This food must be both nutritionally adequate and culturally acceptable. Stable access is assured through various mechanisms that enable the household to procure food supplies across seasons and transitory shortages. Sustainable access requires that the long-term means of food procurement are consistent with: (1) sustainable resource use and management; (2) maintenance of productive assets; (3) self-reliance and human dignity, and (4) overall livelihood needs. Disaster mitigation improves food security in the long run by promoting sustainable agriculture and resource management and by enhancing local capacity to cope with disasters. Local participation is essential in the design, implementation, and evaluation of these interventions if they are to have a chance to succeed. In addition, interagency collaboration is critical if the disaster mitigation activity is to have a significant measurable impact.

Vulnerability Mapping

The capacity to detect changes in food security at an early stage and to respond in a timely fashion could reduce the costs of dealing with a full-blown emergency. In countries where national early warning systems already exist (e.g., crop forecasting, food balance sheets, and nutritional surveillance), information supplied by these systems can be used to develop vulnerability maps for various regions. Vulnerability maps (also known as risk maps) are those that identify the areas and sectors of the population most vulnerable to food insecurity. These maps highlight the regions that need to be monitored more closely, help governments, donors, aid agencies, and NGOs to target food and other forms of aid more effectively, and identify factors to consider when designing interventions for vulnerable areas. In the absence of reliable data, rapid food security assessment techniques are used to establish the parameters for targeting. This targeting is even more finely tuned through the operation of intervention programs. Several aid agencies have identified vulnerability mapping as a useful planning and operational tool for focusing actions on people and areas most in need, for determining quickly the type and amount of assistance needed when disasters strike, and for assessing the most appropriate programs for sustainable development.

Contingency Plans

For areas that are prone to disasters or other food security risks, contingency plans can be developed to improve the timeliness of response. Such plans involve a set of predetermined responses that would be implemented when food security conditions worsen and safety nets are warranted. Such changes would be captured by a decentralized food security monitoring system based on location-specific indicators that detect significant changes in food entitlements. The types of mitigation responses would be selected and implemented by the community itself. The primary aim of the interventions would be to enable households to retain their productive assets and existing entitlements (entitlement protection) and to enhance the longer-term viability and resilience of the communities.

The advantage of contingency plans is that they help link development investments with emergency interventions. These plans help strengthen the response side of drought preparedness.

In a WFP project in Niger, most of the workers are women, who often are most at risk of food vulnerability.

Promoting Resilient, Sustainable Livelihoods

The best way to promote food security in areas that are prone to recurring disasters is to improve the viability of the local production systems and to

Food for humanitarian assistance must

over time become food for development. . . .

You who are working on food for development

are peacemakers for the future.

—Dr. Boutros Boutros-Ghali

improve the income-earning opportunities of vulnerable populations. Examples of these types of interventions would include: (1) improving yields through diversification and through soil and water conservation measures; (2) reinforcing economically and environmentally sustainable coping strategies; (3) improving on-farm storage capacity to increase the availability of buffer stocks; (4) fostering property rights and credit programs; (5) improving common property management through community participation, and (6) strengthening the links between drought-prone and non-drought-prone areas to improve the terms of trade for those who repeatedly purchase food.

If the household food security of the most vulnerable people could be improved at the household and community level through development projects and programs, the continued need for emergency assistance would be reduced. This is why there is a need to develop coherent policies that support disaster prevention and preparedness, mitigation, and rehabilitation and the interrelationships between emergency and development assistance.

The Articles in this Issue of ALN

The articles in this special issue of the *Arid Lands Newsletter* address each of the important aspects of disaster mitigation. The primary purpose of this issue is to provide a series of cases and conceptual tools upon which to build a strategic framework.

In the first article following this introduction, Shaw and Crawshaw outline the types of mitigation activities being implemented by WFP in Africa. Four case studies—from Ethiopia, Niger, Bangladesh, and Bolivia—come next, providing examples from the field of these various approaches to famine mitigation.

The next set of articles deals with the role of early warning systems and vulnerability mapping in detecting food insecure populations to enable timely response. The article by Buchanan-Smith, Davies, and Petty outlines the use and abuse of early warning systems and suggests steps that can be taken to tie information to response. The articles by Hutchinson and Caldwell provide case examples of the use of vulnerability maps for food aid targeting and development assistance. These articles are followed by one in which Frankenberger offers a strategy for promoting sustainable livelihoods in areas prone to drought.

The issue concludes with an overview of documentation produced through USAID, Office of U.S. Foreign Disaster Assistance, and IDS in support of these efforts.

Disaster Mitigation And Rehabilitation In Sub-Saharan Africa:
A World Food Programme Perspective

D. John Shaw and Bruce Crawshaw

Background

The pressing and multiple problems of sub-Saharan Africa have led donors and organizations of the United Nations system to give special consideration to that region in the allocation of their aid. Acute economic stress, associated with adverse balance of payments, high debt servicing, and structural adjustment, has been compounded by long and widespread drought of unprecedented dimensions and by civil war and unrest that have resulted in large-scale displacement of people and extensive hunger and malnutrition.

The World Food Programme (WFP) gives the highest priority to Africa in the allocation of its development resources. That region received the highest share of WFP development assistance of all developing regions during the decade of the 1980s—$2.2 billion—a sum amounting to more than one-third of the value of its total commitments for development activities.

Nevertheless, the continuing and growing problems of sub-Saharan Africa call for additional efforts and new approaches by governments, donors, and aid organizations. African countries are very diverse but they share important characteristics. Four issues deserve particular attention:

1. **The dimensions of hunger.** The continued high level of undernutrition, food insecurity, and morbidity related to food deficiency, and the projected growth of these problems in the 1990s, are basic reasons for an expanded program of well-targeted food aid. As part of their global assessment in preparation for the International Conference on Nutrition held in Rome in December 1992, FAO and WHO estimated that the number of chronically undernourished had increased by two-thirds over the past two decades, totalling 168 million people in 1988-90[1], and that number is projected to increase significantly by the end of the decade. At the same time, the food gap is expected to widen. Even the most optimistic assumptions about food production and the most pessimistic assumptions about food consumption leave no doubt that the need for food imports in Africa will grow rapidly. Projections made by the World Bank, FAO, and the International Food Policy Research Institute (IFPRI) suggest that food imports to sub-Saharan Africa may realistically be expected to at least double during the 1990s.[2] Since many African countries are too poor to pay for their food imports commercially, a substantial portion of those imports will need to be provided by concessional aid.

2. **Emergency conditions in Africa** resulting particularly from civil war, unresolved long-term refugee situations, and drought. Some 40 million people in sub-Saharan Africa required disaster relief assistance during 1992. Drought has been a recurring phenomenon throughout much of Africa. Of the natural disasters that afflict the region, drought has caused the greatest human suffering and economic loss. War and civil strife in a number of countries already afflicted by drought have worsened the plight of refugees, displaced people, and returnees, as well as those who have remained at home. Emergency food aid has been the primary response to disasters in Africa. In 1992, food aid in cereals reached a record 5.7 million tons, over 40 percent of global deliveries, 58 percent of which was provided as relief assistance.

3. **The macro-economic changes** being brought about by structural adjustment and economic reform, which have significantly favored labor-intensive rather than capital-intensive programs, particularly in the agriculture and infrastructure sectors, creating additional scope for food-aided projects with partial payment in food.

4. **A shift in the policy environment** toward more people's participation, greater concern for human development, and the demand for food security as essential elements of an equitable and sustainable economic development and growth process.

The condition of many African countries, and in particular the poorest among them, calls for a program of WFP assistance with two central features: (1) support for activities contributing to disaster prevention, preparedness, mitigation, and rehabilitation, and (2) cooperation with other agencies, as no single aid agency has all the resources, abilities, and expertise needed to address the situation.

It is increasingly being recognized that while *ad hoc* relief is necessary in the short run, other measures are required that address the root causes of recurring emergencies. Many donors and aid agencies are therefore focusing on disaster mitigation and rehabilitation activities as major elements of their assistance programs to Africa. These activities are often carried out in food-deficit areas. Food aid is therefore a particularly suitable form of assistance where labor needs to be mobilized or income provided.

In November 1992 the governing body of WFP, the Committee on Food Aid Policies and Programmes (CFA), unanimously endorsed the systematic application of WFP assistance to support disaster prevention, preparedness, mitigation, and rehabilitation measures, especially in Africa, and urged donors to provide additional resources to WFP for that purpose. The main thrusts of this approach are:

(a) examining on a regular basis how WFP-assisted development projects might be used to better meet disaster mitigation and rehabilitation objectives;

(b) using, where feasible and appropriate, WFP-provided relief assistance for disaster mitigation or rehabilitation as well as relief, and

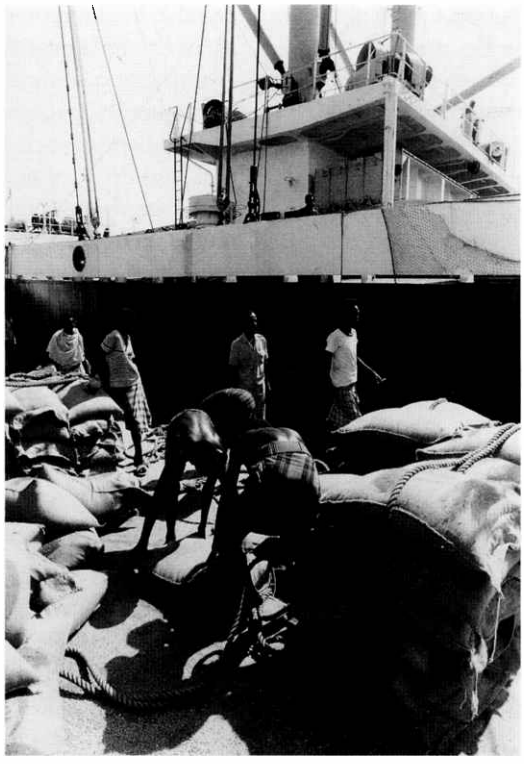
(c) linking up with other funding agencies that have specific programs of assistance for Africa (e.g., the International Fund for Agricultural Development [IFAD], the United Nations Development Programme [UNDP], and the World Bank) to increase the impact of WFP assistance.

3. **Appraisal missions**, in conjunction with other donors as appropriate, would, *inter alia*, assess the potential for, and roles of, food aid to support such activities and prepare detailed assistance projects, in consultation with the governments concerned.

Development Projects

There is a close and growing link between poverty and vulnerability to recurring emergencies, particularly those caused by drought. If the food security of the most vulnerable people could be improved at the household and community level through development projects, the continued need for emergency assistance could be considerably reduced.

To achieve this goal, a major focus would be on supporting national disaster mitigation and rehabilitation programs through labor-intensive works that simultaneously provide: (a) immediate employment and income, thereby alleviating poverty and strengthening self-help capacity, and (b) construction and improvement of the infrastructure needed, particularly to increase agricultural production, stimulate rural development, and strengthen protective measures against drought and other disasters. Together with these labor-intensive works programs, targeted food, income, and health interventions could improve the well-being of the poor and help them withstand future food shortages.



WFP has financed port improvement in many areas of Africa in order to speed up loading, unloading, and delivery of food aid supplies.

The needs of Africa considerably exceed the current level of WFP's aid resources. WFP will therefore concentrate initially on the worst-afflicted countries. This is not to suggest, however, that assistance to those countries should be provided at the expense of aid to countries in other regions facing similar problems. The needy, wherever they are, will receive help. Some donors have already made additional resources available as part of this new initiative; others have indicated their willingness to do so.

A basic three-stage approach will be followed:

1. **Initial identification of population groups** in areas most vulnerable to food shortages through vulnerability mapping. Where such mapping exercises have already been conducted by other agencies, WFP will draw on their results. Where they do not exist, WFP will commission vulnerability mapping exercises, where possible in partnership with other aid organizations.

2. Once the most vulnerable groups have been identified, **WFP will field special missions** to identify ways in which they can be effectively helped to avoid or withstand future food shortages.

Several development activities that help reduce vulnerability to natural disasters have proved particularly successful in Africa and elsewhere and may be replicated more widely. These may be summarized briefly as follows:

Water management. Several WFP-assisted development projects in west African countries, including Burkina Faso, Chad, Mali, and Senegal, have involved the construction and extension of irrigation infrastructure and improved water harvesting for rainfed farming, which have served to increase agricultural production as an essential element of disaster mitigation and rehabilitation measures. WFP has cooperated with other aid agencies providing financial and technical assistance. WFP assistance has supported labor-intensive activities, accelerated the progress of work, and helped to keep people on their farms during times of drought and food shortages. There is considerable scope to expand assistance in this field.

Environmental protection. Disaster-mitigation and rehabilitation features have been built into WFP-assisted projects—such as reforestation in Ethiopia and Guinea, anti-desertification measures in the Sudan and Mauritania, and land reclamation in Niger—to guard against the ravages of natural disasters.

Transportation infrastructure. Improvement of the transportation network is vital for disaster mitigation and rehabilitation, as well as for effective emergency operations. WFP has been a major contributor to the development of the rural road network in Lesotho since the early 1970s; more than half of this network has been built under a food-for-work program that employs mainly women. Other examples could be drawn from Central African Republic, Chad, Kenya, Mozambique, Sierra Leone, and Sudan, among others. In Mozambique, WFP rations have been provided to workers at the ports of Beira and Maputo and to workers engaged in the rehabilitation and expansion of railways to enhance productivity and reduce absenteeism. In Chad, WFP managed a fleet of 251 trucks provided by donors for emergency relief operations. When the emergency ended, the trucks were sold at auction and the private sector was used to transport WFP food aid for development projects. By the end of 1991, a competitive private transport system had emerged. In western Sudan, WFP fostered the creation of a private transport industry where none existed before.

In Lesotho, WFP school feeding projects encourage parents to send their children to school, while at the same time improving nutrition.

Food security. WFP has assisted a number of development projects with the aim of improving household and community food security in ways that support disaster mitigation and rehabilitation. In supporting a food security and social action program in Rwanda, WFP food is provided to vulnerable groups as part of a package of nutrition activities (including education, monitoring, and micronutrient supplementation) financed by the United Nations Children's Fund (UNICEF) and World Bank sector loans. In a household food security and nutrition intervention project for vulnerable groups in Malawi, WFP assistance is provided to female-headed households with less than half a hectare of land to sustain them while waiting for their first harvest of hybrid maize or soya seeds.

Market restructuring, pricing policy, and food reserves. A number of African countries are restructuring their cereal markets and establishing food reserves. These measures are designed to stimulate increased food production and more efficient distribution and to provide food security in times of emergency. A major dilemma is how to implement food pricing policies that provide incentives for producers without pricing poor consumers out of the market. Food aid, and funds generated from food aid sales, can be used during an interim period of market and price adjustment to take account of both producers' and consumers' needs and to help establish food reserves nationally and locally.

An example might be taken from Mali. Following a government commitment to liberalize the cereal market and restructure the parastatal marketing organization, a group of food aid donors, including WFP, together with the World Bank and FAO, provided combined food aid and technical assistance. A common fund of local currency was established from food aid sales to ease the process of reform, increase cereal production, improve farmers' income, and reduce the budget deficit of the parastatal marketing organization. A recent evaluation of the program concluded that increased production by farmers was due to improving their access to markets along with liberalizing pricing systems, in contrast to the previous state monopoly and low official prices that often resulted in reducing the cultivated areas and hence low production, even after good rains.

As part of its increased emphasis on disaster mitigation and prevention, WFP will examine its current portfolio of development projects in sub-Saharan Africa from three perspectives:

1. **Can additional activities be undertaken that will help to lessen vulnerability?** For example, WFP recently began to provide direct support to AIDS victims and their families in a number of countries in Africa where the epidemic has reached major proportions. As many AIDS-afflicted households have few sources of income, WFP food aid is an important additional resource for identification and treatment programs sponsored by other agencies. WFP also has been paying more attention to the needs of poor people in urban areas, since they often are the first to suffer from the effects of disruption of food supplies or rising food prices.

2. **Can current activities in sub-Saharan African countries be refocused to ensure that the most vulnerable people receive the most appropriate assistance?** For example, for more than 25 years WFP has been supporting a school feeding program in Lesotho. The meals provided have helped improve children's alertness, attention span, and eventual learning capacity. The school meals also act as an incentive for parents to send their children to school and keep them there. Since 1990 WFP has concentrated its assistance on the poorer rural areas of the country, helping

There is a growing link between poverty and vulnerability to recurring emergencies. If the food security of the most vulnerable could be reduced, the continued need for emergency assistance could be reduced.

more than 800 schools in the mountain and foothill areas. At the same time, WFP is gradually phasing out its assistance to primary schools in the less needy lowland areas.

3. **Can WFP-assisted development projects be redesigned to incorporate disaster mitigation or prevention activities?** For example, in a number of countries WFP has responded to the need for emergency food by enlarging on-going food-for-work development programs, thereby providing people in need with both food and work. This approach was particularly successful in Chad during the drought in the mid-1980s. A major food-for-work, multipurpose rural development project was expanded to include ten times the number of beneficiaries originally planned. This expansion of project activities was not simply a matter of finding things for people to do. It was a major part of a strategy for addressing the needs of displaced people. Emphasis was placed on increasing the provision of emergency water supplies and on enabling displaced people to grow food in river beds outside the normal rain-fed agricultural season. In Burkina Faso and Ghana, WFP responded to the need for rapid food relief in 1991 by enlarging ongoing food-aided development projects, rather than by providing emergency food aid. Following the loss of 75 per cent of the crop in the Upper East Region of Ghana early in 1991, increased WFP development food aid enabled the government immediately to open new supplementary feeding centers to cope with the additional number of malnourished children and mothers. In Burkina Faso, crop failure was caused by adverse climatic conditions during the 1990-91 agricultural season. WFP quickly increased food-for-work in on-going development projects for an additional 600,000 people in the stricken areas.

Disaster Relief

In appropriate circumstances, WFP relief interventions are being adapted to facilitate development initiatives. In the Special Emergency Programme for the Horn of Africa (SEPHA) appeal in 1992, for example, WFP collaborated with other donors in a preliminary identification of areas where, with recipient governments' agreement, emergency food aid could be joined with other technical and capital inputs in food-for-work activities.

In countries where food shortages are acute but purchasing power exists, distribution of free emergency food aid is not always appropriate. In such situations, WFP has agreed, on a pilot basis, to sell emergency food aid through the market. This approach can help meet food needs, restrain price inflation, encourage the revitalization of market institutions, and generate local currencies that can be used for humanitarian or reconstruction purposes. A key factor in such sales is to recycle the funds through development activities in the community where food aid is being sold; otherwise, the food aid sales merely drain money out of the community, further impoverishing those who have retained resources. For example, in Liberia, money from the sale of relief food aid is being used to fund the repair of houses damaged by fighting.

Many of the Liberian refugees who sought sanctuary in Cote d'Ivoire, Guinea, and Sierra Leone are engaged in a wide range of productive self-employment and income-generating activities, including agricultural development, water-supply systems, small-scale livestock raising, trading, and employment in transport activities. The WFP ration scale of basic food commodities to these refugees is being gradually reduced as they work toward relative food security and economic self-sufficiency, in order to avoid creating disincentives to local agriculture. Supplementary feeding for vulnerable groups provides a necessary safety net against possible deterioration in refugees' nutritional status. While WFP food assistance has been reduced, assistance provided by other agencies and bilateral donors has helped both refugees and the host population improve their economic situations.

In Mozambique, years of civil strife have devastated the country and displaced about six million people from their villages. About half of them are completely dependent on food aid, either as displaced people within Mozambique or as refugees in neighboring countries. WFP emergency food aid not only has provided relief but has also abetted rehabilitation and reconstruction activities. In collaboration with the International Labor Office (ILO) and UNDP, WFP food commodities have been used in pilot projects to rehabilitate roads in food-deficit areas. Logistics and management problems continue to affect food distribution in the countryside, and because there was little food for sale in the project areas workers were reluctant to stay even though salaries were remunerative. The availability of WFP food has helped retain the work force. The food has been sold to the road workers at a subsidized rate, and the generated funds used to purchase local equipment such as wheelbarrows,

picks, and shovels. The roads have improved villagers' access to markets for their agricultural products in the provincial capitals.

In meeting urgent disaster relief needs, WFP also is mindful of the importance of trying to deal with the causes of disasters, as well as to undertake activities that reduce the impact of future disasters. Since the mid-1980s, WFP has supplied the Eritrean ports of Assab and Massawa with equipment and spare parts to increase the offloading of relief food aid; since 1991, the Programme has helped finance rehabilitation of the ports, which were largely destroyed by war, and plans a comprehensive port training program. WFP has built, improved, and repaired bridges and airstrips in Ethiopia, Kenya, Sudan, and elsewhere in Africa as part of its logistics assistance to expedite the delivery of relief food aid.

In ensuring the smooth delivery of food aid for the millions of drought victims in southern Africa in 1992, WFP's assistance also served to strengthen local transport links to cope with the influx of food into the region. This work should help to mitigate the effects of future disasters while also facilitating rehabilitation and development.

Coordination with Other Agencies

Experience has shown that to be fully effective in Africa, as elsewhere, WFP must coordinate its food aid with other forms of assistance provided by development agencies. WFP has been a strong supporter of the need to improve strengthened coordination and cooperation within and outside the United Nations system. Cooperation with other agencies is necessary to ensure that adequate financial and technical assistance is available and to increase the quality and effectiveness of all aid.

Significant advances already have been made to ensure a fully coordinated response in relief operations. For example, within a collaborative framework agreement, the United Nations High Commissioner for Refugees (UNHCR) and WFP undertake joint activities in refugee-feeding operations, including missions to assess the assistance required and to plan the programming and management of the logistics of such operations. WFP has become the principal channel for, and coordinator of, food aid commodities in refugee-feeding operations managed by UNHCR and involving more than 1,000 beneficiaries. Since mid-1992, responsibility for delivery of basic food to refugee camps in recipient countries has been progressively transferred from UNHCR to WFP on a case-by-case basis. As a result, food aid handled by WFP for refugees has increased by some 50 percent over the past two years to 1.9 million tons in 1992.

WFP also has pursued coordination and cooperation in development assistance. A number of WFP-assisted development projects in Africa have benefited from financial and technical assistance from other aid agencies, both within and outside the United Nations system and from non-governmental organizations (NGOs). The member agencies of the Joint Consultative Group on Policy (JCGP)—UNDP, UNICEF, UNFPA, IFAD, and WFP—have agreed to strengthen their collaborative efforts with a focus on poverty alleviation and human development. In Malawi, for example, a WFP-assisted project for household food security and nutrition intervention for vulnerable groups forms part of a JCGP initiative and is integrated with assistance provided by UNICEF, UNDP, and the World Bank. A WFP-supported institutional feeding project in Sierra Leone is another JCGP initiative and has been designed in close cooperation with UNICEF and UNDP.

More needs to be done, however, to ensure that WFP assistance in Africa supports co-funded development projects. WFP intends to pursue that objective more systematically than in the past and will work in close cooperation with other aid organizations, especially those that have set up special programs of assistance for Africa.

Conclusions

The WFP approach to disaster mitigation and rehabilitation is composed of four basic elements:

1. **A strengthened disaster mitigation focus for WFP development assistance for Africa.** As ongoing WFP-assisted projects in Africa come to an end, new projects with a special disaster mitigation and rehabilitation focus could be taken up as collaborative undertakings with other aid agencies, as described above.

2. **Efforts to achieve more long-term effects from emergency food aid.** A part of the considerable emergency food aid being provided to Africa might be used for disaster mitigation and rehabilitation objectives, as appropriate and feasible, rather than being used solely as relief feeding.

3. **Increased cooperation with other organizations.** Cooperation with other organizations might be enhanced so that a high proportion of WFP assistance would go to co-funded development projects in Africa. Some resources, including services such as needs assessment, project appraisal, and implementation and monitoring work, might be made available through increased collaboration with NGOs.

4. **Additional resources.** Some donors have announced additional resources in support of WFP's disaster mitigation and rehabilitation in Africa; others have indicated that they might make available additional commodities, cash from food aid budgets, or financial and technical assistance from regular foreign aid budgets.

Notes

1. FAO and WHO (1992). *Nutrition and development: a global assessment.* Rome, p. 7.
2. World Bank (1989). *Sub-Saharan Africa: from crisis to sustainable growth.* Washington, D.C., Table 3.2, p. 73; N. Alexandratos (ed.) (1980). *World agriculture towards 2000: an FAO study.* Belhaven Press, London, Table 3.7, p. 86; Joachim von Braun and Leonardo Paulino (1990). Food in sub-Saharan African countries: trends and policy challenges for the 1990s. In *Food Policy* 15(6):505-17.

D. John Shaw and Bruce Crawshaw *are staff of the Policy Affairs Service, Policy and Public Affairs Division, World Food Programme, the food aid organization of the United Nations system, and are based in Rome. The views expressed do not necessarily represent those of their organization.*

ETHIOPIA

A pilot program underway in Ethiopia illustrates the various elements that could be incorporated in a national relief-development strategy. WFP has strongly supported the Ethiopian government's efforts to move from relief distribution to achieving improved food security, and in so doing has taken advantage of the resource, logistic, and managerial strength of the Ethiopian Relief and Rehabilitation Commission (RRC). WFP is using a study it commissioned in 1989-90 to identify strategies for the better integration of emergency and development food aid to improve overall food security. The report suggested two main approaches:

Ethiopian farmers and their families dig terraces and build stone walls, thus strengthening the agricultural infrastructure, in return for food aid.

1. **Establishment of employment-based "safety nets"** at *awraja* (local government) level in order to prevent famine from affecting groups vulnerable to either chronic or transitory food insecurity; and

2. **Establishment of multi-donor counterpart funds,** derived from the sale of food aid, to permit flexibility between food and cash in employment programs and to finance other disaster prevention and food security measures.

Under the "safety nets" scheme, food aid will support public works activities, providing employment for anyone who is prepared to work for food rations. Payment levels will be sufficient to provide a safety net for those who otherwise would sink into destitution, but not so high as to attract workers away from other activities, such as farming. Payment for work probably would be made in food rations in food-deficit areas, although there also is the flexibility to pay in cash. Thus, assistance would be provided on the basis of need. The time frame for the completion of work targets, though important, would be secondary to providing improved food security.

One pilot project well under way generates income and employment for slum dwellers in Addis Ababa; it is being implemented by Concern, an Irish NGO. WFP food is used as part payment for unskilled and semi-skilled workers to carry out self-help activities to improve sanitation and housing in their neighborhoods and as an incentive for mothers with children under five to attend MCH centers regularly for health monitoring and education. Food also constitutes a dietary supplement for malnourished children.

A 1992 review of this work noted that child malnutrition in the project area had sharply declined. The construction and rehabilitation of housing was much appreciated by beneficiaries, although the review suggested alternative local construction techniques should be investigated in an effort to ensure more durable structures with reduced maintenance requirements.

A second pilot project is being implemented by OXFAM, a British NGO, in close collaboration with the Ethiopian Ministry of Agriculture. WFP food is used to encourage farmers to participate in food-for-work programs to rehabilitate degraded agricultural land and to create basic rural infrastructure. This assistance is intended to be expanded during periods of emergency to offer more jobs to food-insecure households in the project area. In years of good harvests, about 1,500 food-insecure households would participate in the project, while in years of regional food shortages food-for-work employment opportunities would be offered to up to 3,000 households.

In another awraja, WFP is exploring the potential for implementing employment-based safety nets in conjunction with the Ethiopian government. Food aid will be used to support soil and water conservation, micro irrigation works, road construction, reforestation, and horticultural development. Flexible operation of food-for-work activities in the area is expected to help people cope with transitory food insecurity caused by severe and frequent droughts.

The lessons from these pilot projects will help design new projects with development-relief linkages in other parts of Ethiopia and other sub-Saharan African countries. It is hoped that measures taken to reduce the extent and severity of future disasters in Africa will reduce the necessity and the cost—in lives as well as money—of emergency responses in the long term.

NIGER

Niger is a land-locked country in West Africa, encompassing more than 1,267,000 square kilometers of desert or semi-desert. The Sahara extends over 80 percent of the country and the rest lies almost entirely within the Sahelian belt. Rainfall is scarce, ranging on average from less than 250 mm to between 250 and 750 mm per year.

In Niger, plantings of the gao tree help to fertilize the soil and provide shade; the tree's deep root system does not interfere with the growth of crops.

The country therefore is prone to periodic droughts, notably those of 1973-74 and of 1984-85, both of which had serious social and economic impacts. This environmental problem is compounded by an annual population growth rate of 34 percent, which is expected to increase the present population of 7.4 million to more than 10 million by the year 2000, producing notable demographic pressure on urban areas. Since 90 percent of the population currently is involved in agriculture or cattle breeding, government priorities, as identified in the national development plan for 1987-91, focus on the fight against desertification and land erosion, management of water resources, and soil conservation, all with a view to agricultural land rehabilitation so as to achieve food self-sufficiency.

What makes the Niger experience unique, however, is that these interventions are framed within the concept of social development set forth in the five-year plan for the period 1979-83, which took as its goal the fostering of greater popular participation in the institution-building process so as gradually to transfer such responsibility from the government to local communities.

At ground level, the community approach has been translated into identifying "basic territorial unities" (BTU), which combine both human and physical factors, such as villages and watersheds.

It is within this framework that an integrated agricultural development project, co-financed by Niger and Italy and with the technical assistance of FAO and food assistance from WFP, has been operated since 1984 in the *arrondissement* of Keita in the central Sahelian department of Tahoua.

Under this integrated approach, a wide range of activities has been undertaken, such as development of the cooperative system and of the credit and marketing sector, and construction of school buildings, village warehouses, mills, and so on. However, the most impressive efforts have been concentrated in highly labor-intensive interventions with a view to a better management of the environment.

This is where food aid plays a major role, in the form of food-for-work assistance to volunteers involved in such project activities as afforestation to fix shifting sand dunes, produce firewood, and protect streambanks; land rehabilitation through the establishment of bench terraces to control soil erosion and recover agricultural land; construction of small dams to regularize the water supply and increase water availability, and construction of feeder roads to open up the project area to commercial and social exchanges.

The daily distribution of balanced and locally accepted food rations (at present, 2250 grams of cereals, 75 grams of vegetable oil, 150 grams of canned fish or meat, 200 grams of pulses, and 50 grams of sugar) acts as an incentive to mobilize the necessary labor force and to ensure revenue transfer to the households, as well as providing additional nutritional support to an area where the food deficit ranges from 15 to 50 percent, depending on the season and the year.

Most project participants—as many as 60 to 70 percent—are women, since the men traditionally have migrated to neighboring countries in search of work. However, although at the outset of the project male participation was only 5 percent, by 1989, as a result of food incentives provided by WFP and owing to the success of the project itself, that figure had risen to 35 percent.

Because of the widely recognized importance of the project's food component, WFP assistance has increased as the project has grown, from a value of US$2.6 million during the period 1984-89 to US$4.3 million for 1989-91. Under a new phase covering the period 1992-96, 18,440 metric tons of food commodities are being allocated at a total cost (food plus sea and land transport) of more than US$10 million. With a view to further alleviating the expense being incurred by the Nigerian government, WFP also will support up to 88 percent of the costs for storage and internal transport to beneficiary sites.

Depending on availability and with a view to promoting agricultural production within the country, local purchases and/or exchanges for WFP commodities may be undertaken, especially in the case of cereals such as sorghum or millet and local pulses such as niebe.

This increase in WFP assistance was justified by a joint WFP/FAO technical review mission that visited the Keita project in April and May 1991 and recommended the extension-in-time and geographical expansion of the project.

The mission found that the project's successes have been both quantitative and qualitative. During the period 1984-91, 9,950 hectares (96 percent of the initial target) of agricultural and pastoral land was recovered, 4,521 hectares (99 percent of target) were forested, 700 hectares (74 percent of target) of dunes were fixed, and 104 kilometers of feeder roads were built (32 km had been envisaged). At the same time, the close coordination among multilateral agencies and bilateral donors has built up a sound basis for effective participation of local rural communities in their own development, since each Village Development Committee (VDC) takes part in the decision-making process by highlighting the real needs of the population.

The VDC also manages the turnover of volunteer workers—and, therefore, distribution of food assistance—as well as the sharing-out of the overall results of their labor (for example, the redistribution of reclaimed land among villagers: at the end of the first phase of the project in 1991, 5,243 hectares of arable land, estimated to produce 2,900 tons of cereals per year, had been shared out among 4,768 farmers.

Consequently, the area of intervention under the current phase of the project has been expanded to cover two other Tahoua arrondissements, Bouza and Tchintabaraden, bringing the area covered by the project from the original 4,800 square kilometers to the present 13,160. The three arrondissements total 81,989 square kilometers, with a population of 420,000 living in 445 villages.

The project will employ, on average, 3,900 village workers daily, but the number of direct beneficiaries, thanks to the turnover system of work, will total almost 19,000, who, when their families are included, represent an estimated population of 110,500. Nevertheless, the main challenge the project will face is not only an increase in numbers, but also development of the social basis for its overall intervention. Bouza and Keita are similar in terms of sedentary populations and agricultural activities, while the larger Tchintabaraden accounts for more than 70 percent of the three districts' nomadic population, even though a settling process has started since the 1984 drought.

The only way of reconciling the often conflicting interests and priorities of farmers and stock breeders will be to rely on the same participatory model that has proved to be the hallmark of the Keita experience.

The environmental problem is compounded by a population growth rate of 34 percent, which is expected to increase the population to 10 million by the year 2000.

BANGLADESH

The whole of Bangladesh may be characterized as a delta. The country is located on the Bay of Bengal, a body of water infamous for its frequent and violent cyclones. For these reasons, natural disasters occur so often in Bangladesh that they generally are not treated as emergencies, as such, but are coped with as a matter of routine.

In Bangladesh, a woman tends seedlings to be used in a reforestation project.

The WFP-assisted project in Bangladesh covers the entire country. Its emphasis is on rehabilitation of river and coastal embankments damaged by the yearly monsoons in order to prevent flooding of agricultural lands, a goal essential to this structurally food-deficit country. The current phase of the project runs from October 1992 to September 1994. At a cost to WFP of US$57 million, some 247,000 tons of wheat and 12,500 tons of vegetable oil will be supplied. (Some of the oil will be exchanged locally for wheat; the balance will be provided to the government and will be monetized to defray 50 percent of the cost of internal transport, storage, and handling of the wheat.)

WFP involvement in the country dates to its 1974 response to an emergency created by civil war in combination with severe flooding. WFP's efforts initially were concentrated in two relief operations; in one, destitute women were provided with food rations, and in the other food was provided as payment to manual laborers working to rehabilitate damaged structures. Both operations eventually evolved into programs for sustainable improvement of the country's development potential and of living conditions, and both targeted the poorest segment of the population.

The program's emphasis on food-for-work grew out of an evolving belief among several donors, led by WFP, that most donated food resources should be directed toward sustainable development rather than toward mere short-term relief. As a result of a seminar on food-assisted development held in Dhaka in January 1988, a joint government/donor task force was formed and given the acronym SIFAD (Strengthening the Institutions for Food-Assisted Development). The task force's recommendations, submitted in July 1989, were instrumental in redirecting the thrust of the food aid program for Bangladesh.

Our focus here is the program for water and land development. This project is part of a nationwide food-for-work program that covers several sectors of the rural economy. Its major immediate objective is to avoid the loss of agricultural lands to floods, largely by rehabilitating river and coastal embankments. During the 1992-93 work season, this sector of the project received 40 percent of all resources contributed jointly to the program by WFP and the bilateral donors on whose behalf WFP monitors the program. (Some thirty NGOs also are involved in implementation of the program.) An emergency reserve is built into the program to cope with the aftermath of disasters and is used to rehabilitate structures damaged by floods.

Manual labor is the most important input in all sectors of the program, under which work necessarily is done during the dry season, which also is the agricultural lean season. The program thus provides food-for-work employment to agricultural laborers who otherwise would be without food, and in this way contributes to food security for a large number of the rural poor; in all, the program creates some 70 million workdays. The payment of wages in food guarantees that only the poorest workers apply, making the program self-targeting.

Tentative distribution of resources among the program's various sectors now is planned by the Bangladesh government and WFP a year before the work season begins. When disasters occur—which in Bangladesh is a question of *when* rather than *if*—an "emergency window" mechanism kicks in to facilitate rehabilitation of damaged embankments. The significance of this mechanism was demonstrated dramatically in the aftermath of the cyclone that struck Bangladesh in April 1991. The cyclone, which packed winds of up to 230 km/h, torrential rains, and a tidal surge of between 6 and 7 meters, caused an enormous loss of life, seriously damaged about 640 km of embankments, and destroyed another 372 km. This damage, in turn, left a vast area of cultivable land vulnerable to further flooding and seawater intrusion, threatening the next crop, the most important of the agricultural year. Under the emergency window provision of the WFP project, some donors increased their food contributions and some 35,000 tons of wheat was distributed as wages to laborers engaged in embankment rehabilitation—while the monsoon continued.

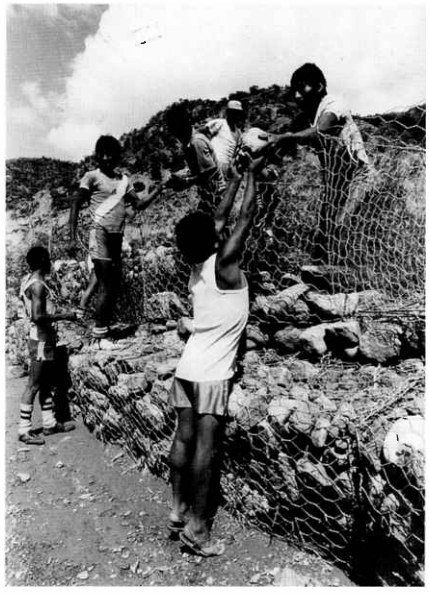
Thanks to the emergency provision, 123,000 ha of land were restored to usefulness and produced some 173,000 tons of rice.

BOLIVIA

In a Bolivian rural development project known as Chuquisaca Norte, WFP food aid has been successfully used in food-for-work schemes designed to build *gaviones*, or riverbank stabilization works. The implementing agency is the Chuquisaca Development Corporation, which receives financial support from IFAD.

In a testimonial video produced by the project in 1990, one local farmer summed up the success of the project by observing, "Now we receive respect from the river."

It was not always so. The video traces the history of some 50 peasant communities with a combined population of about 6,500. Although these people live in a relatively fertile zone, they had no lands to cultivate owing to the losses imposed by flooding along the Rio Chico. The project's target during the period 1985-91 was to reclaim 800 ha of agricultural land and to protect another 200 ha. Although this might appear a modest goal in comparison with other projects, the land involved represents the main source of livelihood for more than 6,000 people.



In Bolivia, project participants build stone gaviones to protect adjacent agricultural lands from flooding.

By early 1987, only a dozen gaviones had been built. The project was reoriented at that point, and between then and 1989 output was doubled, enabling the project to complete 40 gaviones. All told, the project reclaimed 703 ha (88 percent of goal) and protected 160 ha (84 percent of goal).

Funds invested totaled US$1.9 million, yielding a per-hectare project cost of approximately US$2,280. The direct costs are high, but the increased productivity and increased income the project yielded were of great value to the local agricultural community.

Costs for similar projects might be reduced by introducing certain changes, including increased use of food rations in payment for labor. WFP food rations were not delivered as direct "payment" for a day's labor in this project, but instead were used as an "incentive" and accounted for only 7 percent of project outlay.

Of the 703 ha reclaimed, 562 ha (80 percent of total) have been distributed among families holding fewer than 5 ha; the remaining 20 percent of the land still is in the process of formation. All of the reclaimed lands incorporate *acequias*, or permanent micro water channels, guaranteeing regular year-round irrigation.

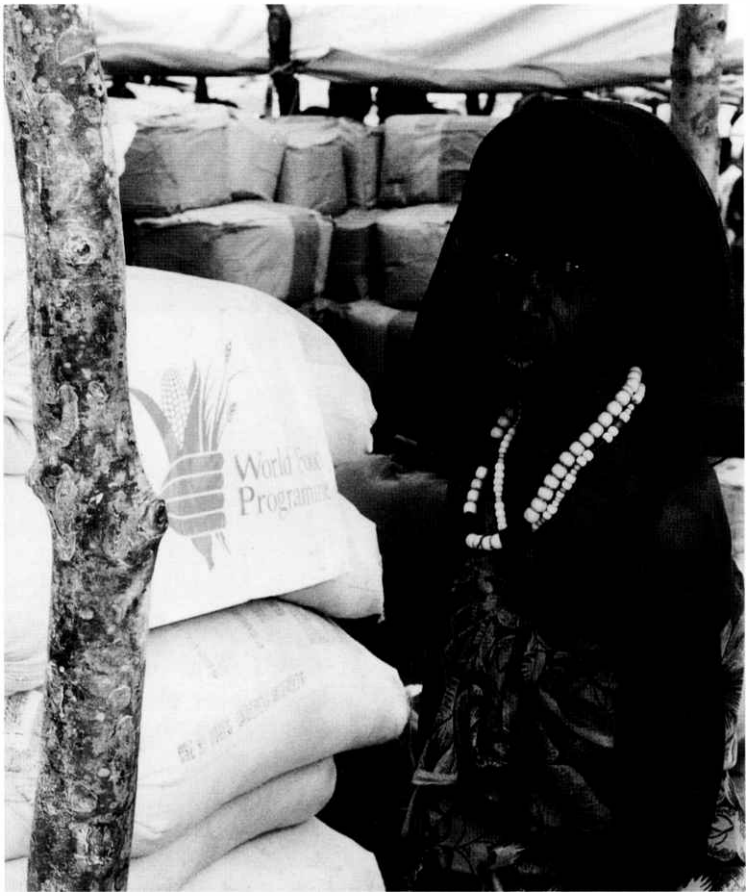
In addition to standard crops like tomatoes and tree fruits for the markets in Sucre, the capital of Chuquisaca Province, several new uses are being made of the reclaimed land, including increased dairy production under a modular system promoted by WFP and the local Planta Industrializadora de la Leche (PIL) project.

In a testimonial video produced by the project in 1991, one local farmer summed up the success of the project by observing, 'Now we receive respect from the river.'

The Use and Abuse of Early Warning Information

Margaret Buchanan-Smith, Susanna Davies, and Celia Petty

Since the mid 1980s, famine early warning systems (EWS) for Africa have proliferated at international, national, and local levels; most countries in the Sahel and Horn of Africa now have their own EWS. Many were set up in the wake of the widespread famines of 1984-85 and were intended to provide early warning of the impact of future episodes of drought. Many EWS have achieved this objective. Predictive capabilities have improved enormously during the last eight years. National governments and international donor agencies rarely can claim now that they are taken by surprise by this type of slow-onset disaster.



In 1992 alone, 40 million people in Africa required disaster relief assistance.

Nevertheless, the record of preventing drought-triggered food crisis or famine in Africa still is very poor. Why has success in famine prediction not led to parallel improvements in famine prevention? This question has been the subject of a study carried out in five countries in Africa: Sudan, Ethiopia, Mali, Chad, and Kenya (focusing on Turkana District).[1] These case studies looked at a range of different types of vulnerability to famine and food crisis (e.g., whether war is a contributing factor and the frequency of risk), and at differing early warning and response capacities. The broad characteristics of the five studies are summarized in Table 1.

The aim of the study was to understand how early warning information is used—or not used—in decision-making by different actors in the early warning/response process, particularly donors[2] but also national governments; 1990-91 was chosen as the case study year because it was a year of drought across much of the Sahel and Horn of Africa. Many EWS were being put to the test for the first time. The results of the study clearly show that the central policy issue is no longer the development of ever more sophisticated early warning indicators. Instead, constraints on the response side of the equation must be tackled, to realize the benefits of the *early* warnings which are now widely available when drought threatens to undermine food security.

The Significance of Formal EWS

As "outsiders' " understanding of the causes of food insecurity has advanced from a preoccupation with food supply factors to a greater recognition of factors associated with access to food, the design of formal EWS has been modified and improved. Marked progress has been made in developing multi-indicator EWS that are more sensitive to, and therefore better able to monitor, impending food crises. Over the last eight to ten years a range of different indicators has been developed and incorporated into international, national, and local level EWS. For example, traditional dependence of many EWS on the food balance sheet to indicate overall food availability has been broadened to include a range of other socioeconomic indicators, providing information about who has *access* to that food. Measuring the vulnerability of different population groups to food crisis or famine is now central to a number of EWS, such as USAID's Famine Early Warning System (FEWS). Monitoring the sequence of people's coping strategies in the face of drought, as an indicator both of how seriously they are affected and of how they attempt to alleviate its consequences, has also become integral to a number of EWS.

Unfortunately, the practice of famine response decision-making rarely does justice to the developments and improvements that have been made by, nor to the resources invested in, formal EWS. An EWS may warn in its bulletin of deteriorating food insecurity using regular market, nutritional, and other indicators. Rather than triggering action, frequently this triggers only a high profile "disaster tourism" type of assessment. At best, this confirms the warnings of the formal EWS and endorses its recommendations, albeit a few weeks—or even months—later. At worst, it takes a small subjective snapshot of what is happening on the ground, which may not be representative, and may therefore contradict or distort the picture painted by the detailed and more systematic monitoring of the EWS. North Sudan in 1990-91 is a case in point: two different donor agencies fielded assessment missions to Darfur state in July and August 1991. One returned with alarming reports of a serious famine; the other with the very different impression that conditions were not a cause for alarm.

Partly in response to criticisms of the ability of formal information systems to provoke public action, it frequently is argued that there is no better form of EW than the media (Dréze and Sen 1989). A free press can perform the functions of a formal EWS much more effectively. India is an example of a country where the record of famine prevention is strong, and where there is a history of unfettered press coverage. Since 1984-85, when the western media exposed the horrors of famine in Ethiopia, western donors have become much more sensitive to the threat of media coverage in their own countries, which may chastise them for failing to respond early enough and embarrass them once again. But the role of the media as a form of EW should not be exaggerated. Only full-blown famines are newsworthy, when visual images are guaranteed to shock and crisis is sufficiently widespread to merit international news coverage. The media can be very effective at triggering response when it is too late, but it plays a very partial role in genuine *early* warning. During 1991 there was some coverage in the western media of the food crisis in North Sudan, focusing especially on the fraught political negotiations that surrounded the relief operation. Putting western and Sudanese politicians on the spot, in radio and television interviews, exerted some pressure to speed up the delayed relief operation. But relief was not mobilized until well into 1991, after the end of the Gulf War, which had dominated the media for months, and long after the food relief should have been dispatched to Sudan if it was going to arrive in time to make any difference in alleviating food insecurity before the next harvest.

The challenge currently facing formal EWS, which have been built on years of experience and continuous monitoring, is to ensure that they are at the center of the decision-making process and are not replaced by second-best alternatives, such as the one-off rapid assessment, which inevitably is *ad hoc* and subjective, or media coverage, which invariably is late. There is no alternative to a well-founded and long-running formal EWS in terms of continuity, geographical coverage, and objectivity. In short, EWS are a necessary but, as argued below, an insufficient precondition for preventing famine.

Common Patterns In How Early Warning Information Is Used

1. The Predominance of a Handful of Crisis Indicators

Developing multiple indicators of food insecurity has been a mark of progress in early warning monitoring and methodology. But this progress has not been mirrored in how the information is used. Information users still tend to base their decisions and actions on a very limited number of indicators, thereby failing to exploit the full potential of information generated by most EWS.

Despite early warnings of increased vulnerability, alarming market signals, and other socioeconomic indicators, the trigger to start the response process usually is the harvest assessment (carried out by FAO). While this provides an important point of comparison with previous years for the anticipated deficit/surplus, it says little about who is food insecure and why and whether they will be able to survive a period of dearth. Such questions are beyond its remit. In the Sahel and Horn of Africa the harvest assessment usually is conducted at the end of the year. The problem is that information from the national EWS

Characteristic	Ethiopia	Sudan	Chad	Mali	Turkana /Kenya
Avalibility of EW information					
a) nationally/ in-county	†	(†)	†	†	†
b) internationally	†	†	†	†	†
Significance of informal information channels	††	††	‡	†	‡
Significance of 'disaster tourism' assessments	†	††	†	‡	‡
Predictive capabilities of EWS	†	†	†	(†)	†
Single(s) vs. Multiple(m) indicator use:					
a) in EWS	m	m	m	m	m
b) in decision-making	s	s	s	s	m
Transparency of decision making	‡	‡	†	†	†
Parallel donor decision-making system to government system	‡	‡	†	†	†
Existence of programmed response options	‡	‡	‡	†	†
Geared to free food aid distribution response	†	†	†	†	‡

Table 1: Characteristics of EWS and desision making system in each case -study country. Key: †-affirmative; ‡-negative

The results of the study clearly show that the central policy issue is no longer the development of ever more sophisticated early warning indicators.

often is held in abeyance until the harvest assessment is completed and agreed. This was the case in Chad in 1990. The national Systeme d'Alerte Precoce (SAP) had recommended a relief operation be launched in October 1990; SAP even quantified relief needs. However, these recommendations were not accepted until late November when the harvest assessment had been completed, which simply confirmed the earlier predictions of the SAP. Valuable planning time was lost, which contributed to the extremely late arrival of international relief food in Chad. (In one case it arrived a year late, just as the country was on the brink of a bumper harvest).

Exacerbating this process is the exaggerated influence of crisis indicators on donor decision-making, over and above genuine early warning indicators. Evidence shows that the urgency with which response is treated is contingent on signs that a crisis already is underway. Human stress is most influential as a crisis indicator, usually expressed in terms of high rates of malnutrition or increased mortality. This defeats the object of early warning. Crisis indicators are signals of the *failure* to respond in time. Donor decision-making seems to be driven by downstream rather than upstream events.

This scenario is most common in countries where relations between donors and national governments are strained. In North Sudan in 1991, only the most shocking predictions of "mega deaths" were able to inject a sense of urgency into flagging relief efforts and were sufficient to override the inherent reluctance to respond when donor/government relations are tense. The danger is that a vicious circle is set in motion. As donors respond only to crises, those trying to trigger donor response may bid up the severity of the situation to provoke action. This can backfire if the exaggerated prophecies are not fulfilled. This was indeed the case in Sudan. At the end of 1991, when the relief operation had failed to meet its targets, donors were looking for confirmation of the mega-death syndrome. While this exaggerated prophecy had achieved its short term aim of speeding up the relief effort, in the long term it served as a distraction. Donors were skeptical about the accuracy of the early warnings they had received at the beginning of the year. In looking for evidence of "mega deaths" they missed what had really been happening as a result of the failure to provide adequate relief: a continuous undermining of people's ability to feed themselves and increasing vulnerability to the next drought.

2. Who Owns Early Warning Information?

Who "owns" an EWS is critical to how the information is used. An EWS that is entirely "owned"—that is, conceived, staffed, and funded—by a national government is unlikely to hold sway with international donors. This is especially the case where donor/government relations are strained: data provided by the national EWS usually is discounted, regardless of the quality of the information. This has been the case in Ethiopia for years, particularly under the Mengistu regime. The EWS of the Relief and Rehabilitation Commission was treated with skepticism by the international donor community who more or less ignored it. The information on which they depended had to have the international imprimatur of FAO or WFP to be credible. The irony is that the UN agencies' assessments usually are based on information provided by national government departments: assessment teams do not have the time or resources to do their own detailed and entirely independent surveys. In Ethiopia during 1990-91, the FAO and WFP assessments differed very little from the government's assessments. Elsewhere, however, wide disagreement in differing estimates became a source of delay or a reason for doing nothing. The overriding importance of who owns the EWS as a determinant of its credibility implies that it is unrealistic for international donors to withdraw financial and technical support from a national EWS and still expect it to be regarded as reliable and unbiased by the international community.

Weak Links Between Information Providers & Users

1. The Limited Role of Early Warning Practitioners

The role of an EWS usually is restricted to collecting, analyzing, and disseminating information. It is not expected to take part in the decision-making about how to respond. Sometimes EWS do not even have the chance to justify or defend their analysis face-to-face with information users. In a few cases, like USAID's FEWS, the EWS's mandate is limited strictly to providing information.

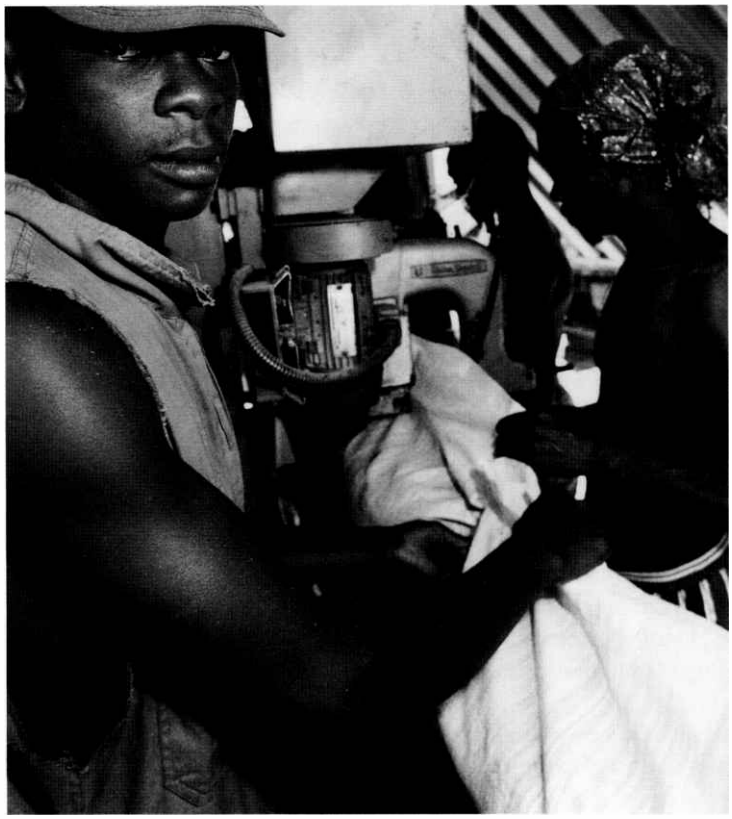
In the five cases studied during 1990-91, only the local-level EWS in Turkana engaged in response planning and coordination. Their mandate since has extended to the drawing up of district drought contingency plans (recently completed, although not yet put into practice) designed to provide a direct and explicit link between information and action. In the other cases, the full potential of EW practitioners' experience is not used. People who have collected information usually are those who understand it best and are in the strongest position to identify an appropriate response, especially where they have been in direct contact with local people, a contact most decision-makers rarely make (and, indeed, some early warners). Those EW practitioners who do work on the ground have to justify their continuous information-gathering to people who

may be inconvenienced by intrusive questioning month after month and who rightly demand results. EWS personnel have a vested interest in making sure their product is reliable and used: there are definite advantages in involving them in the decision-making and planning process where they can put pressure on decision-makers to use the information they produce.

2. Lack of Synchronization Between Early Warning and Donor Bureaucracies

Despite reasonably accurate predictions from formal EWS in most countries in the Sahel and Horn of Africa, international relief response—usually food aid—almost always arrives at its final destination after long delays. All too often, relief food simply arrives too late to reduce significantly the costs of famine to vulnerable people. The experience of the Chad relief operation in 1991, where most imported food aid arrived a year after the need had been identified, illustrates this clearly. The pattern was repeated in Sudan: only 50 percent of the recommended relief requirements for North Sudan had been delivered and distributed by the end of 1991. In the westernmost state of Darfur, the record was worse. Barely one-fifth of estimated requirements had been delivered by the end of the year. In the weeks when it was most needed, at the beginning of the "hungry season" in July, only 5 percent of relief requirements had been delivered. Meanwhile, in Ethiopia during the same period, only one-third of estimated relief requirements had been delivered to the country by the beginning of July, and only two-thirds by the end of the year.

The politics of relief explain some of the delays, especially in Sudan, as discussed below. However, these excessive time lags frequently are owing to the inappropriate timing of decisions about relief allocations that take place in the headquarters of the main international donor agencies and bear little or no relationship to the seasonality of relief needs of the hungry and food insecure in Africa. The current timetable of decision-making and delivery schedules for most donor agencies fundamentally undermines the purpose of *early* warning. For the Sahel and Horn, most relief allocations are decided by donors in January for the coming year and are triggered by the harvest assessment, which usually is completed by the end of December. This presupposes that the time to respond once decisions have been taken is less than six months, as the food aid has to be shipped and distributed in-country by June/July, the start of both the hungry season and the rainy season, when transport becomes hazardous and sometimes impossible. Records show that in practice the response time is much longer, especially where beneficiaries have to be reached far inland. Relief resources are committed too late, usually months after the first warning bells have been sounded, taking little account of actual delivery times from North to South or of the seasonality of food shortages in Africa. The result is that most of the food relief simply is arriving too late to fulfill the role of preventing famine.



WFP has found it cost-effective to ship grain for disaster relief in bulk and to bag it at the port of arrival.

3. The Tendency toward Centralization

The inappropriate timing of current procedures to release international relief resources is not helped by the centralized nature of most early warning and response systems. Decisions about relief and mobilization of resources often take place hundreds or even thousands of miles from where help is needed, by people who are far removed from what is happening on the ground. It is not surprising that they are most geared to getting the food in-country and that they take inadequate account of how long it takes to reach beneficiaries, often in remote rural areas. A highly centralized early warning and response system is not conducive to a good understanding of local food economies, of local people's coping strategies, and, therefore, of appropriate relief responses. Nor is it likely to instill into busy decision-makers in distant countries a sense of urgency about launching a relief operation.

Of the five cases studied, the most rapid relief response was generated where resources were pre-positioned, whether at national or subnational level, in Mali and Turkana District of Kenya, respectively. The decentralized early warning and response system of Turkana recorded the shortest time lag between recommendations and firm decisions: a maximum of one month.[3] Mali also showed a very rapid response time, owing to the pre-positioning of stocks in-country and to a well-developed system of programmed response.

The Politics of Famine Prediction & Prevention

The political context is all important to how early warning information is used. An EWS cannot be the silver bullet that cuts through political reluctance to acknowledge a food crisis or through existing antagonistic relations between national governments and donors. Rather than guaranteeing a timely response, EWS become pawns in political controversy and negotiation. Sudan in 1990-91 is a classic example. The Sudanese government was not prepared to admit the scale of the food crisis nor the need for international relief until well into 1991. Such an admission would have undermined their policy of food self-sufficiency and increased their dependence on western food donors from whom they were trying to distance themselves. Meanwhile, western donors were reluctant to provide resources to a government to which they were ill-disposed and which was supporting Iraq in the Gulf War. Donors, therefore, stipulated certain conditions upon which the provision of relief depended. For example, the government of Sudan had to admit that there was an emergency, a condition which was unacceptable to a regime unwilling to countenance the terminology of famine. Much wrangling ensued as to whether there was a food gap, or whether famine threatened, resulting in stalemate in the response planning process for a number of months, despite the warnings of imminent food crisis as early as July 1990.

The counter-example is Mali, where a solid base of donor/government coordination had been forged throughout the 1980s in the context of restructuring the cereal marketing sector, part of the structural adjustment process. A coordinated group of donors, supporting both the EWS and the national food security stock, has developed a programmed response mechanism with the government that more or less guarantees that the EWS's recommendations for food aid distributions are heeded and implemented. Timely response reinforces wider political interests to reinforce structural adjustment policies. There are other factors contributing to this success story, not least that the scale of the required response was relatively small. Despite this, targeting of relief in Mali is fraught with inconsistencies, and evaluations at local level showed that much of the food was absorbed along the route to vulnerable people. Nevertheless, despite a violent change in government in 1991 (the overthrow of the Traoré regime), albeit one broadly supported by donors, the early warning/response mechanism of the old regime was able to withstand political upheaval.

Conclusions

Formal EWS are essential prerequisites for effective famine prevention. But technical improvements in the quality and quantity of data have far outstripped the capacity of bureaucracies and decision-makers within them to exploit this information. The challenge no longer is solely to predict famines—or even to rely on other sources such as the media to advertise them—but rather to identify obstacles to information use, from which a number of policy implications arise.

1. **The first step is to reprogram donor bureaucracies**—and the western media that watch over them—to focus on saving livelihoods, not lives. Visually undernourished children are not an early warning of famine. The information exists to predict this; bureaucratic procedures must be redesigned to react to predictive, not concurrent, signals.

2. **Information is but one tool in the negotiating process leading to famine relief.** It can never be entirely neutral or comprehensive. Mutual suspicion between donors and governments regarding estimates of relief needs is more likely to be minimized if both have a stake in the provision of that information, for example by joint funding of an EWS.

3. **Excluding early warning practitioners from decision-making** and, at times, from identifying appropriate responses engenders opportunity costs that early warning/response systems can ill-afford. Involving practitioners in the response process assists in the interpretation of EW signals and identification of timely and appropriate response.

4. **The seasonality of donor decision-making** and bureaucratic procedures is out of synch with the seasonality of food insecurity in Africa. This is due in large measure to the over-reliance on final harvest assessments as triggers for response. If *early* warning is to be used to trigger timely response (taking into account the time to deliver food), donor agencies must be willing to respond as soon as harvest failures are indicated (often during the rainy season, or immediately thereafter). This means taking due account of *predictive* indicators and developing a phased response capability.

5. **Decentralization** of both EWS and the capacity to respond to their warnings is likely to facilitate more reliable warnings and more effective exploitation of them. Control over resources to respond also needs to be decentralized. Where access is especially difficult, there is a strong case for pre-positioning a safety net of stocks.

EWS and response cannot be divorced from the political context within which they operate. It is tempting to argue that good political relations between government and donors are an essential prerequisite for effective early warning and response. But this view is utopian given the current climate of political instability in much of the Horn of Africa and the Sahel; the immediate need is to find pragmatic solutions to the problem of emergency response—hence, the policy options outlined in this paper. We have considered early warning of and response to drought-induced famine, although war increasingly is associated with famine and especially with the failure to react in time. The politics of early warning and response thus are the central challenge, which better information alone can do little to

tackle. Nonetheless, changing perceptions of what constitutes an *early* warning, sharing the responsibility for information provision, incorporating EW practitioners into decision-making, synchronizing the seasonality of response with the seasonality of need, and decentralizing the whole process and moving it close to where the action is will all help to strengthen the context within which decisions to respond are made, however politically charged that context may be.

Notes

[1] A separate report has been written for each case study, as detailed in the list of references.

[2] See Petty and Buchanan-Smith 1992.

[3] It should be noted that in 1990-91, Turkana District experienced only small-scale and localized pockets of acute food insecurity, which could be managed by the authorities within the district. In 1992, the combined effects of drought and raiding created a crisis that was beyond the capabilities of the district authorities. An international relief response was launched, repeating many of the mistakes encountered in the other countries in the study in 1990-91: belated decisions to respond, a relief operation seriously delayed, and the food finally arriving too little and too late. This occurred within the context of a domestic political environment where there was reluctance to admit the scale of the drought and food insecurity threatening large parts of Kenya.

References

Buchanan-Smith, M. 1992a. Famine early warning and response: the missing link? Case study no. 3, Chad. Paper presented at the conference Predicting and Preventing Famine: An Agenda for the 1990s, held November 4-6, 1992. IDS, Brighton, and SCF, London; mimeo.

—. 1992b. As above: Case study no. 5, Turkana District, Kenya.

Buchanan-Smith, M., S. Davies and C. Petty. 1992. Famine early warning and response: the missing link? Summary of findings and conclusions. Paper presented at the conference Predicting and Preventing Famine: an Agenda for the 1990s, held November 4-6, 1992. IDS, Brighton, and SCF, London; mimeo.

Buchanan-Smith, M., and C. Petty. 1992a. Famine early warning and response: the missing link? Case study no. 2, Sudan. Paper presented at the conference Predicting and Preventing Famine: an Agenda for the 1990s, held November 4-6, 1992. IDS, Brighton, and SCF, London; mimeo.

Buchanan-Smith, M., and C. Petty, 1992b. As above: Case study no. 1, Ethiopia.

Davies, S. and M. Buchanan-Smith, 1992. As above: Case study no. 4, Mali.

Davies, S., M. Buchanan-Smith, and R. Lambert. 1991. Early warning in the Sahel and Horn of Africa: the state of the art: a review of the literature (vol. 1). *IDS Research Report* No. 20.

Dréze, J. and A. Sen. 1989. *Hunger and public action*. Oxford: Oxford University Press.

Petty, C. and M. Buchanan-Smith. 1992. Famine early warning and response: the missing link? Donor case studies. Paper presented at the conference Predicting and Preventing Famine: an Agenda for the 1990s, held November 4-6, 1992. IDS, Brighton, and SCF, London; mimeo.

***Margaret Buchanan-Smith** is a Research Fellow at the Institute of Development Studies (IDS), specializing in food security issues in Africa. **Susanna Davies** is Deputy Director of IDS; her work includes research in famine early warning systems and famine mitigation. **Celia Petty** is a member of the Policy Development Unit of the Save the Children Fund (UK); she currently is working in food security and risk mapping.*

Famine Vulnerability Assessment:
The First Step in a Preemptive Strategy

Charles Hutchinson

Conventional famine *relief* seeks to save lives through food aid. Famine *mitigation* seeks to conserve productive capacity, especially at the household level, and thereby both to reduce the likelihood of future emergencies and to shorten the period of recovery from those that occur. Famine mitigation, then, is preemptive, while famine relief is reactive.

WFP-assisted food-for-work projects in Bangladesh not only feed the famished but also provide badly needed employment for the poor and mitigate the effects of future floods.

Famine mitigation should be conducted in four broad steps: (1) **early warning and vulnerability assessment** identifies areas and groups that might be at risk and establishes consensus among donors and other interested parties about that risk; (2) **rapid food security assessment** verifies the findings of the vulnerability assessment, establishes which groups are at greatest risk, determines the level of vulnerability, and identifies the types of interventions that might be appropriate; (3) **intervention** translates the findings of the rapid food security assessment into action and establishes criteria for determining success; (4) **monitoring and outcome assessment** documents project progress, undertakes changes in response to performance, and determines whether project goals have been achieved.

This article addresses the first of these steps and outlines a strategy for early warning and vulnerability assessment as they apply to famine mitigation.

Early Warning and Vulnerability Assessment

Any strategy designed to deal with famine, whether relief or mitigation, is based on five assumptions: (1) famine does not affect all areas, groups, or households equally; (2) famine is a process rather than a catastrophic event; (3) famine has observable precursors, or indicators; (4) there is a general progression of indicators that reflects the severity of an emergency as it unfolds, and (5) some indicators will appear early enough to permit effective relief or mitigative steps to be planned and taken (Fig. 1).

It follows from these assumptions that coping strategies observed within a region, nation, state, district, or community indicate the level of the emergency and suggest appropriate interventions.

During the past 15 years, a number of early warning systems (EWS) have been developed for *monitoring* potential food security emergencies so that an *alert* might be issued. These systems have focused on the gathering and interpretation of data that describe food balance (estimates of production, stocks, and imports against consumption), food access (e.g., dietary change and livestock sales), and outcome or well-being (e.g., food consumption and health status). However, monitoring data alone do little to inform of the severity of current conditions. In response, recent attention has focused on *vulnerability assessment*, the purpose of which is to identify those areas and populations that might be at greater relative risk. Vulnerable populations are judged to be more likely to be exposed to the risk of food insecurity and less able to cope with its consequences. Determining relative vulnerability allows more attention to be paid to susceptible areas and permits analysts to place monitoring data in a historical and situational context.

Fundamental differences between relief and mitigation are reflected in the ways they use early warning. In relief, the objective is to save lives through the provision of emergency food aid, medicine, and emergency shelter. Thus, relief is concerned with one primary tool (food aid) and deals with conditions that come relatively late in the famine process. In mitigation, the objective is to conserve productive capacity using whatever tools are deemed appropriate. Mitigation, then, encompasses a wider range of interventions, but it must be set in motion earlier than relief because it addresses conditions that appear early in the famine process.

Mitigation Strategy

The objectives of this approach to early warning and vulnerability assessment for mitigation, are: (1) to identify groups that might be at food security risk and to estimate the type and magnitude of risk; (2) to determine the nature and

sources of famine vulnerability as it varies among groups and through time, and (3) to suggest appropriate mitigative actions based on the assessments; these actions may or may not involve food aid.

Vulnerability is not easily defined and cannot be measured in absolute terms. However, there is general agreement as to its existence and value. Thus, the approach proposed here is relative and is based on expert opinion.

Indicator selection and rankings are based on consensus among a panel of experts drawn from key parties involved in food security within the host country. This approach will yield: (1) the most accurate possible assessment of vulnerability, (2) agreement among all concerned parties regarding the nature and location of vulnerable groups, as well as the source(s) of their vulnerability, and (3) a framework for response.

A mapping approach is appropriate because famine has a spatial dimension in addition to its temporal one. Although manual analysis is possible, a digital approach enables management and analysis of a wide variety of tabular, map, and satellite image data.

This approach has three steps:

1. **Indicator selection** is best performed in-country using a panel of experts convened for the vulnerability assessment (e.g., USAID, FAO, other donors, and host country ministries of agriculture, meteorology, and environment, in addition to NGOs and PVOs operating in the country). Through consensus, the panel can assemble a list of socioeconomic groups, as well as indicators of risk and coping ability, by group where possible. Subsequently, availability of data describing these indicators will be determined and a final selection and evaluation will be made.

2. **Data preparation** involves the entry of tabular and statistical data into a spreadsheet or database system, the digitization of map data, and the entry of satellite image data in a geographic information system (GIS).

3. **Vulnerability assessment** can be performed in two parts. First, the *baseline vulnerability* assessment attempts to describe, in general, relative conditions that existed prior to the current situation. Second, *current vulnerability* will be determined by examining the current growing season (compared with the past) and combining that result with the baseline vulnerability assessment to identify those areas and groups that currently are most vulnerable. Both parts should be based on consensus among the panel regarding the relative importance of each indicator; the Analytic Hierarchy Process, in which all indicators are compared in pairs to establish relative weights for each, is recommended. By proceeding in this stepwise consensus fashion, all biases must be made explicit and either removed or explained to the satisfaction of the panel.

Although the emphasis here is on vulnerability assessment at the national level, other assessments can be performed at provincial or lower levels. Data availability, however, will be a consistent constraint. If the initial vulnerability assessment is well-received, it is likely that lower level assessments will be necessary in subsequent years to improve accuracy. The whole process is intended to be iterative and should be performed regularly.

Finally, vulnerability assessments produced by this method will have several possible uses:

Direction for immediate action. The purpose of the vulnerability assessment is to determine where relief or mitigation is most urgently needed and to suggest the types of activities that are most appropriate and the level of effort they will require. Moreover, because it is based on consensus, coordination should be made simpler by the panel serving as a mechanism to divide tasks according to spheres of responsibility (both topical and geographic) and to distribute them among participating parties according to their respective resources and skills.

Framework for future relief/mitigation. Vulnerability assessments can serve as the framework for allocating food aid on a prescribed formula basis, allowing attention to be paid to staging and delivering relief rather than negotiation.

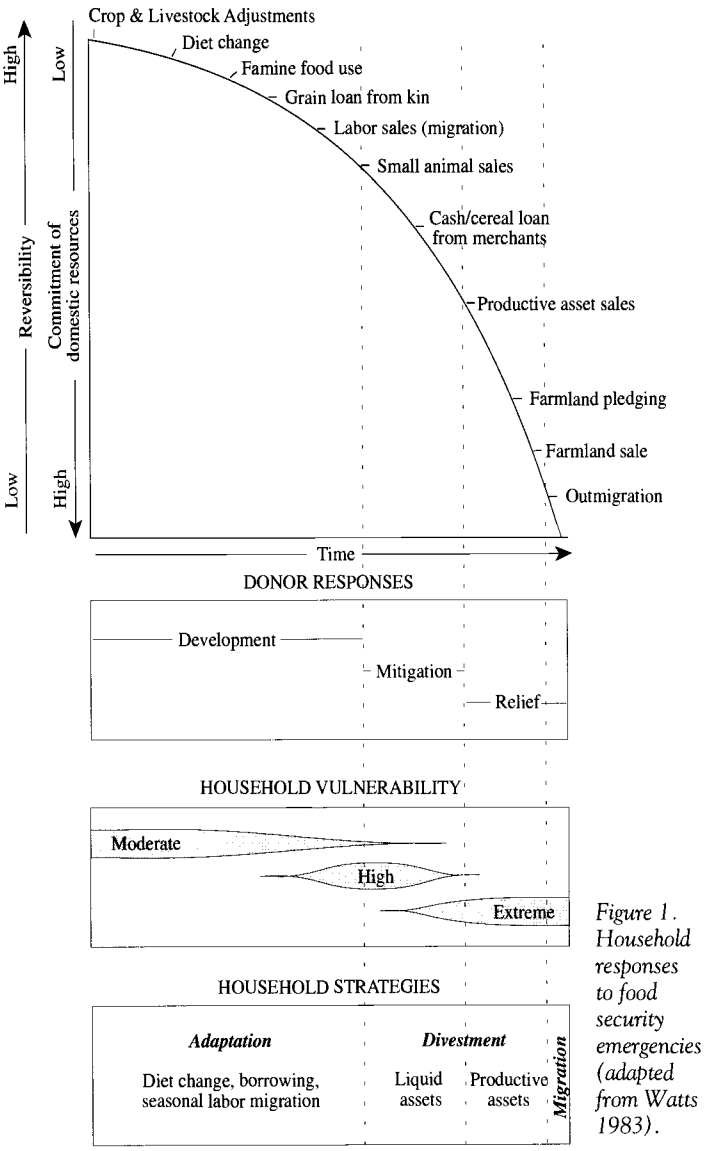


Figure 1. Household responses to food security emergencies (adapted from Watts 1983).

Conventional famine relief seeks to save lives through food aid. Famine mitigation seeks to preserve productive capacity and thereby both to reduce the likelihood of future emergencies and to shorten the period of recovery from those that occur.

With this end in mind, it has been suggested that baseline vulnerability assessments be performed routinely (every five years) to update the framework.

Guidelines for development. If one objective of development is to help the poorest of the poor, the vulnerability assessment establishes who they are and the sources of their vulnerability. This, in turn, can serve as a guide for development. For example, if isolation or distance to roads is identified as a critical factor in determining the vulnerability of a particular population, then the vulnerability assessment provides a literal map for a program of road construction. Moreover, if baseline vulnerability assessments are performed regularly (every five years), they also can identify trends or future vulnerability that can be used to adjust policy. More important, periodic assessments can be used to gauge the effectiveness and long-term impacts of mitigation and development efforts.

Conclusion

Although there is no single, generally accepted methodology, vulnerability assessment and mapping together are emerging as an important tool not only for famine early warning and relief but also for activities with longer-term objectives, such as famine mitigation and development. Moreover, as new data sources and analytical tools (i.e., remote sensing and GIS) become available, our ability to perform these types of analysis also improves (see Hutchinson et al. 1992; Hutchinson 1992). As a consequence, we expect the use of vulnerability assessments to accelerate quickly in the very near term.

References

Hutchinson, C.F. 1992. *Early warning and vulnerability assessment for famine mitigation: a strategy paper for the U.S. Office of Foreign Disaster Assistance, U.S. Agency for International Development, and the Office of International Cooperation in Development, USDA.* Tucson: Office of Arid Lands Studies, The University of Arizona.

Hutchinson, C.F., P.T. Gilruth, R.A. Hay, S.E. Marsh, and C.T. Lee. 1992. *Geographic information systems applications in crop assessment and famine early warning: a technical report to the Food and Agriculture Organization of the United Nations.* Tucson: Office of Arid Lands Studies, The University of Arizona.

Watts, M. 1983. *Silent violence: food, famine and peasantry in northern Nigeria.* Berkeley: University of California Press.

Charles Hutchinson *is Director of the Arizona Remote Sensing Center at the Office of Arid Lands Studies, The University of Arizona.*

MAPPING VULNERABILITY
in Zambia and Zimbabwe

RICHARD CALDWELL

Which groups are most vulnerable to food shortages and, therefore, most susceptible to loss of lives and livelihoods? What are the most appropriate interventions to reduce food-aid dependency? Where should such interventions be targeted?

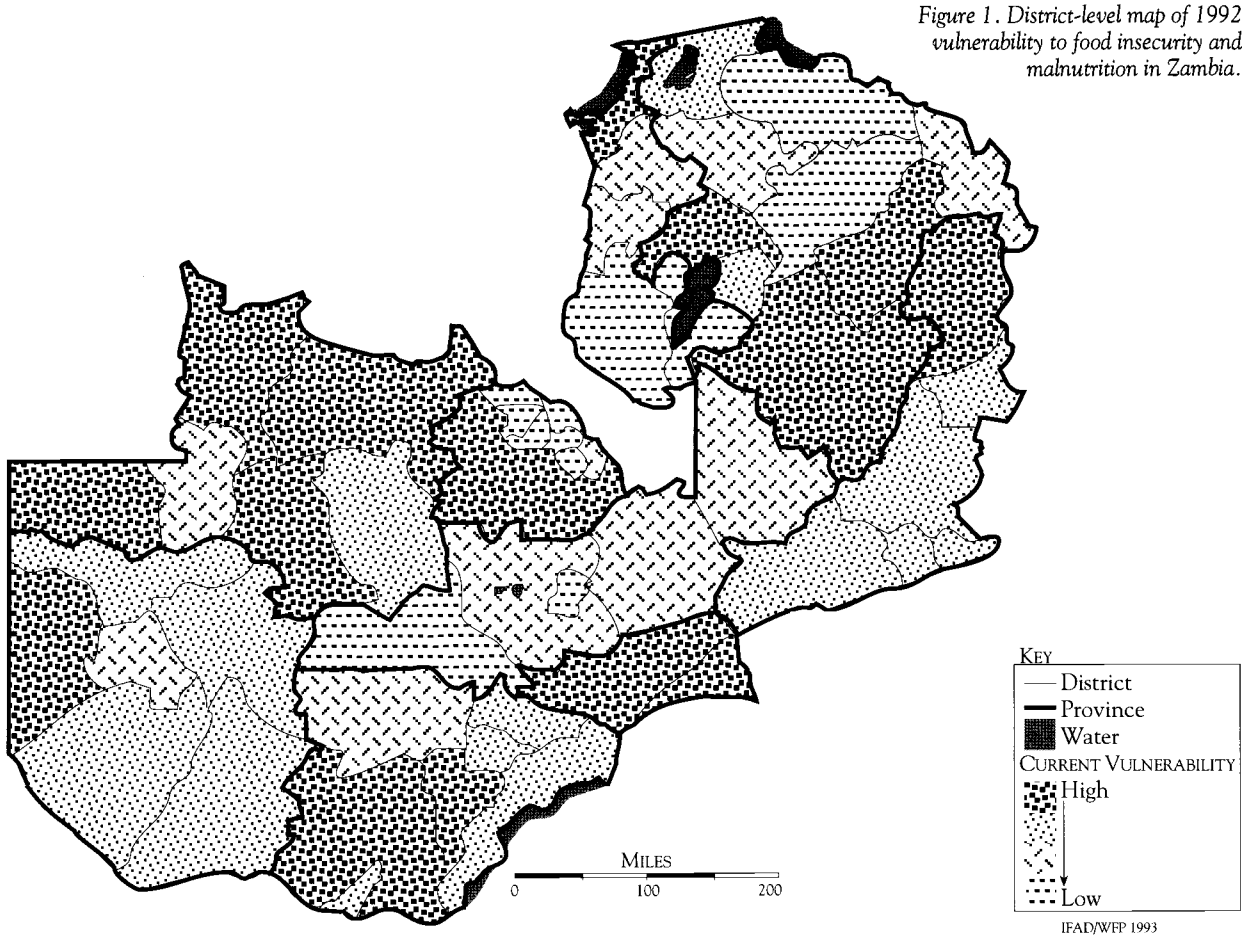
Answers to these and other questions related to food security are being sought with the help of vulnerability mapping, a technique that offers new and valuable insight into risk assessment.

Mapping is an ancient practice, dating back more than four thousand years to a time when the Mesopotamians used clay-tablet maps to show land features (Campbell 1991). Today there are a variety of maps and mapping techniques in use, including thematic maps showing select features over a base map, topographic maps depicting shape and elevation of terrain, planimetric maps displaying a variety of simple features, and virtual maps incorporating digital data that can be processed and displayed on computers. Only recently have maps been used to display information related to food availability and famine risk.

Vulnerability assessment is a new and emerging approach in the simultaneous evaluation of factors that contribute to food security. It has two ultimate uses: (1) increasing the efficiency of resource allocation by identifying relative vulnerability of regions and groups to food security emergencies, and (2) providing additional information for designing appropriate interventions that focus on factors directly impacting local areas and socioeconomic groups. Mapping vulnerability employs indicators, such as physical and social parameters, which can be measured and which have some bearing on access to resources. Much of our knowledge of food security indicators has been developed through work in famine early warning systems (EWS) and in studies of household responses (or coping strategies) to food shortages. Because of the diverse nature of food security, a number of indicators commonly are considered in assessing vulnerability.

Vulnerability mapping is made possible through the use of analytic tools expressly designed to relate, compare, and contrast diverse data relating to any geographic area (GIS) (FEWS 1993). Data are derived from a variety of sources,

Figure 1. District-level map of 1992 vulnerability to food insecurity and malnutrition in Zambia.



including government agencies, special in-country studies, and satellite platforms.

Food Aid Targeting in Zimbabwe

Southern Africa experienced one of its most serious and widespread droughts of the century during the 1991-92 cropping season. As a result, more than 10 million metric tons of corn and other food commodities were imported into the region, ultimately benefiting an estimated 100 million people. Zimbabwe, normally a food exporting country, experienced critical food shortages. In an average production year, free food is provided for about 600,000 persons. As a result of the drought, enrollment lists for food aid swelled to nearly 5.4 million by October 1992. USAID's Famine Early Warning System (FEWS) Project was asked to help the Zimbabwe government target its limited food aid resources by identifying those communal lands that were most vulnerable to food shortages.

The need for more refined food aid targeting was particularly clear. Nationally, Zimbabwe's estimated food import needs for January 1992 through May 1993 totaled 2,425,000 metric tons (MT). Zimbabwe's Department of Social Welfare (DSW) was able to distribute 30,000 MT/month through its Drought Relief Programme. This amount of food aid allowed for only 5 kilograms per person each month, or one-third the amount generally considered adequate for meeting minimum nutritional requirements. Thus, it was essential to have better information for deciding where the real food emergencies were most critical and how many potential victims would be found at each location.

The FEWS Project, working in full partnership with the DSW, established a reliable method for assessing the relative vulnerability of those living on Zimbabwe's rural communal lands. There are a number of methods by which relative and absolute levels of food security can be determined. Perhaps the most straightforward manner is to collect information at the household level using intensive rapid appraisal or other survey or questionnaire methodology. The results of such surveys, if properly designed, can then be used as a guide for determining how households are coping with food deficits. Another way to assess needs is to require households to enroll on a needs list. Both of these methods are useful, but on the scale of a country the size of Zimbabwe they can quickly become very expensive, time-consuming, and, in certain cases, subject to local distortion.

The mapping effort began by identifying the major socioeconomic groups living on rural communal lands: farmers with livestock (defined as a household owning six or more head of cattle) and farmers without livestock (fewer than six head). These two groups have livelihoods dependent, to varying degrees, on a combination of crop production (primarily maize), forage production for livestock, and off-farm income earnings; both were considered to be highly vulnerable to food shortages as a result of the drought.

Targeting was achieved by selecting indicators to assess both current and chronic vulnerability of these two groups. Current vulnerability is a function of both past and present access to, and availability of, food and other resources. Current access determines whether people have enough to eat now. Conversely, a household's ability to endure a period of food shortage depends greatly upon their historic access to resources and on the coping strategies that have been developed over time to handle food-deficit periods. Thus, it is important to assess not only current vulnerability but also historic vulnerability. Such a two-step process of analysis was conducted for each of the two functional groups.

Indicators

The indicators used for assessing vulnerability of farmers and livestock owners on communal lands are summarized in Table 1. The use of other indicators in the analyses was considered; in all cases, however, data for other potential indicators were unavailable during the short period of the exercise, were incomplete, or were of poor or questionable quality. Similar

Chronic		Current	
Farmers	Livestock-holders	Farmers	Livestock-holders
Low Birth Weight[1]	Low Birth Weight[1]	Chronic Vulnerability Score	Chronic Vulnerability Score
Population Density per Hectare[1]	Population Density per Hectare[1]	Nutritional Status Trend[2]	Nutritional Status Trend[2]
	1990/91 Livestock Units(animals/hectare)	1991/92 per Capita Food Production	1991/92 per capita Food Production
1990/91 per Capita Cash Crop Production	1990/91 per Capita Cash Crop Production		
1990/91 per Capita Food Crop Production	1990/91 per Capita Food Crop Production		
% of Food Crops in drought-resistant cereals			

Table 1. Indicators of chronic and current vulnerability.

[1] Population and health data were often collected at spatial scales greater than the communal lands delineated on the final maps. In these cases, spatial modeling techniques were used to distribute these data gathered from larger units, district councils and administrative districts, to the smaller communal land unit.

[2] Nutritional status is a three-month average of growth monitoring data for April-June 1991 compared to April-June 1992.

assessments of vulnerability have employed a variety of additional indicators, such as market price data, clinical malnutrition, soil resources, NDVI (a satellite-derived index of vegetation status), distance to roads or other infrastructure, and climatic variables such as rainfall.

Findings

The vulnerability maps produced in this exercise provided critical information to the Zimbabwe government and to donors on the relative levels of risk experienced by farmers and livestock-holders on communal lands. National- and provincial-level maps were produced that ranked communal lands, by socioeconomic group, into four classes of vulnerability. Twenty-seven communal lands were classified in the highest level of current vulnerability for farmers, and twenty-six for livestock-holders. For chronic vulnerability, twenty communal lands for both farmers and livestock-holders were classified as highly vulnerable. Initial feedback from local officials in Zimbabwe familiar with household food security indicated a general agreement with established perceptions about where the drought had the most impact and where chronic conditions of food insecurity are found. The maps reinforced these opinions and conveyed the same knowledge to a much broader audience.

In Zimbabwe, the vulnerability maps are serving several useful purposes. First, they are playing an important role in the initial targeting of relief food delivery. Several groups, including nongovernmental organizations (NGOs), have used the maps to decide where to direct their resources first. Second, the vulnerability maps will be used to plan and program post-drought assessment activities and intervention design. Third, the exercise has helped the DSW define its data needs and has increased its data-analysis capabilities. Production of the vulnerability maps has increased the awareness among government agencies in Zimbabwe of the need for reliable and timely data collection and management. It is expected that future monitoring of communal lands will include more systematic data collection and incorporation of important food security indicators. Development activities targeted for communal lands also will factor in the results of the assessment.

Assessment in Zambia

A vulnerability assessment based on available food security and nutrition indicators was conducted for Zambia, using AtlasPro mapping software. Currently available district-level data were combined to characterize the relative degrees of chronic and current (1992) vulnerability among Zambia's administrative districts. The resulting vulnerability maps depicted food security as characterized by cereals production and nutrition. While all geographic areas within Zambia experience periodic rainfall deficits, the most recent drought episode of the 1991-92 cropping season was particularly severe and covered large, contiguous areas of the country. The impact of this drought on human livelihoods, animal survival, and resource availability was explored on a large scale by examining differences at the district level.

Food security is a concern for many rural regions of Zambia where households depend largely on subsistence production. Seasonal and/or annual fluctuations in food production, coupled with inequitable entitlement to food, has resulted in varying levels of vulnerability among geographic regions and socioeconomic groups. Vulnerability mapping is to be used, in part, for determining where contingency plans need to be developed for safety net operations and for stimulating discussion and actions concerning the mitigation of food shortages. Contingency plans and mitigation interventions will be designed in advance for geographic regions or socioeconomic groups identified as particularly at risk.

The results of the vulnerability assessment conducted for Zambia have contributed to three broad objectives:

1. identifying chronic and current vulnerability among geographical areas (districts) with respect to available food security and nutrition indicators;
2. highlighting districts, areas, and provinces that warrant close monitoring based on their identified level of vulnerability, and
3. identifying key indicators for which data are available and assessing the degree to which these indicators contribute to low levels of food security in vulnerable areas.

The maps generated by this assessment were reviewed and used by a joint IFAD/WFP project identification mission to Zambia. Field-level observations, along with data and analysis provided by the preliminary vulnerability assessment, should contribute to allocating resources where they are most appropriate. The level of disaggregation and the reliance on available, off-the-shelf data imposes certain boundaries on analysis and interpretation. The purpose here is not to explore the full range of factors contributing to household food security, but rather to enhance our ability to stratify Zambia so that resources, both human and financial, are allocated efficiently.

A much broader objective of this effort was to demonstrate the viability and utility of spatial analysis and presentation of data for project planning, monitoring, and identification of indicators for vulnerability, environmental assessment, and so on.

The data available for Zambia were adequate for a preliminary assessment of vulnerability and included baseline administrative boundaries, district-level census and population growth projections, select agricultural statistics from 1979 to 1992, district-level health information, and results of recent surveys or studies disaggregated to the district or provincial level. From these data, six key indicators were developed to model, in general terms, baseline (chronic) and current (1992) vulnerability.

The **current vulnerability model** reflects present conditions at the district level. It makes use of the same indicators used to assess chronic vulnerability (see below), but with two important differences:

1. Instead of using historic production data directly, current vulnerability is characterized by the degree to which the most recent cropping season (1992, in this case) deviates from a "normal" cropping season. This is measured by comparing the level of last season's production to the variance within the

Vulnerability mapping—which is made possible through the use of analytic tools expressly designed to relate, compare and contrast data on a given geographic region—is a technique that offers new and valuable insight into risk assessment.

historic production data. The result, measured in standard deviations from the mean, is a measure of the magnitude of change from normal. Thus, it provides a reasonable measure of food resources available.

2. The period of food aid required for the current drought was used as a fifth indicator for current vulnerability. Information on food aid requirements provides additional district-level data on food security.

The chronic vulnerability model is generated using the following four indicators:

1. Historic per-capita cereals production (in maize equivalents) by district. Nine years of production data (1981-90) were summarized to characterize an "average" level of production for each of the major cereals: maize, millet, sorghum, rice, and wheat. These data then were added in order to derive a cereals production figure. Per-capita data then were generated by dividing district-level production by district census data for each year. Production data were made available through the National Early Warning System and from the USAID-sponsored Famine Early Warning System (FEWS) Project.

2. District-level data on the percentage of underweight individuals. These data are recent and provide an adequate indication of both historic and present access to basic nutritional resources.

3. District-level data on access to health services. Vulnerability is conditioned, in part, by the ability of individuals to seek adequate health services. A measure of access is the percentage of a population that is within 12 km of a health unit.

4. Provincial-level data on access to roads. Roads are perhaps the most important component of infrastructure, giving households easier access to markets, increased opportunities to reach areas where off-farm employment is available, and greater access to expanded social networks.

The primary product of the assessment is the mapped output of chronic and current vulnerability (Fig. 1). In addition to current and chronic vulnerability, maps of selected variables were produced for other available data (such as average yields of the major cereal crops by district), which provided additional information for the identification mission to Zambia and for future planning exercises. Summaries of indicators and ranking data also were included as tabular information and as database files.

Chronic Vulnerability

Chronic vulnerability includes data on historic per-capita cereal production by district, percentage of district populations underweight, percentage of the population with access to health facilities, and percentage of the population living within 12 km of an all-weather road. The results classify twelve of Zambia's districts in the highest level of vulnerability. Scores for the highest vulnerability districts ranged from 28 to 36. In general, average per-capita cereals production was low and the percentage of population underweight was high for vulnerable districts. However, the impact of combining indicators becomes apparent by examining the variation among districts. For example, Sesheke has relatively high average per-capita cereals production (103.2 kg/person), yet 28 percent of the population is underweight and access to health care and roads is poor. So, despite relatively strong agricultural production, Sesheke ranks among the most vulnerable districts. The combination of these indicators, or the convergence of evidence, makes this district highly vulnerable relative to other districts ranked below it. For each district it is possible to determine the influence of the indicators by studying the table.

The highly vulnerable districts are scattered throughout the country but are concentrated in Western and Luapula provinces. All of Luapula's districts are in the highest and second highest vulnerability classes. Most northwestern provinces are in the second highest vulnerability class, as are most northern provinces. Average per-capita cereals production in these regions is low and the percentage of the population underweight is relatively high. Cassava is an important drought crop in these provinces and the absence of cassava data may bias the vulnerability rankings of these districts. Nonetheless, the nutrition indicator matches well with the other indicators in defining chronic vulnerability: districts with poor access to health facilities and roads and with low cereals production have the highest percentage of underweight population.

Current Vulnerability

Current vulnerability employs data on 1992 cereals production deviation from average production, along with data on food aid requirements by district. These two indicators, in addition to those on nutrition, access to health, and access to roads, characterize conditions as they now exist. Sixteen districts were included in the highest vulnerability class (see Fig. 1). The first five districts are all located in the Eastern province, reflecting extremely poor agricultural production in

1992. Districts in this province normally experience much higher production, and interannual variations in production there usually are small compared to other areas of Zambia. Thus, farmers in these districts experienced a production year very different from what they are adjusted to. These districts also have a high percentage of their population underweight. Four western and four southern districts also were included in the highest vulnerability class.

Conclusion

Vulnerability mapping has proved to be a useful tool in both Zambia and Zimbabwe, where production of these maps has stimulated interest in data collection, analysis, and display; efforts are underway to provide additional training to local experts in these skills. The use of a color-mapped product to display vulnerable regions has increased interest and dialogue among agencies, donors, and nongovernmental agencies. In the future, vulnerability maps may be systematically updated by local agencies for a variety of purposes.

Women take their children with them while working on a road project in Lesotho.

References

Caldwell, Richard M. 1993. *A district-level food security and nutrition-based vulnerability assessment for Zambia*. Prepared for The World Food Programme and The International Fund for Agricultural Development.

Campbell, John. 1991. *Map use and analysis*. Dubuque: Wm. C. Brown Publishers.

Famine Early Warning System (FEWS). 1992. *Towards the development of a methodology for food aid targeting in Zimbabwe*. A report by the Famine Early Warning System (USAID), in association with the Ministry of Public Service, Labour and Social Welfare, Government of Zimbabwe.

Richard Caldwell, *formerly with the Office of Arid Lands Studies at The University of Arizona, is Regional Director for Africa for the Consortium for International Development (CID) in Tucson.*

PROMOTING SUSTAINABLE LIVELIHOODS
in Areas Prone to Recurrent Drought

TIMOTHY R. FRANKENBERGER

The effects of drought are enduring and, as such, they pose both short-term consumption and long-term development questions. The widespread and devastating drought in Southern Africa in 1991-92 has drawn attention to the possible severity of droughts at both the micro and macro levels. In areas where drought is a recurring phenomenon, their impact on household production decisions, resource use, and consumption extend far beyond the current production season. The consequences of droughts include not only their immediate impact upon family consumption, but also their differential impact on productive assets, which are crucial to future production and consumption. This asset erosion will influence a household's ability to recover from a drought.

In many African countries, women are the farmers. WFP projects help them increase production.

Droughts also can have important impacts upon national economic performance. Major resources can be diverted from development expenditures to emergency relief involving food imports; food aid requirements may drastically affect a country's ability to follow through on structural adjustment measures.

It is becoming increasingly clear that drought is both an emergency and a development issue. The expectation of drought among farmers triggers complex strategies of risk aversion, many of which may hinder investment in long-term, productive capital development. Drought episodes also can involve serious liquidation of productive assets, particularly among smallholders.

Not only can the impact of drought be reduced, but investments in drought-prone areas can offer extremely high return, in terms both of the avoidance of costs of emergency interventions and of returns to production. In order to build resilience to drought among households and to enhance the sustainability of their livelihoods, one must first understand the contextual factors that have contributed to the increased vulnerability. The goal is to make drought something that is systematically and rationally planned for in the context of development.

BACKGROUND

The food situation in Africa has deteriorated seriously over the last 15 years. Many Africans are worse off today than they were a decade ago. Sub-Saharan Africa produced considerably less food per capita at the end of the 1980s than it did at the beginning (Pinstrup-Andersen 1993). Coupled with this decline in production was a downward trend in overall economic performance, with an annual decrease of 1 percent in per capita incomes in the 1980s (Pinstrup-Andersen 1993). Population growth rates have accelerated from 2.7 percent to 3.1 percent in the last 10 years. Declining production and rural economic activities have led to rapid urbanization. This could have profound implications for food security because an ever-growing portion of the population is not producing its own food. Urbanization also has led to a rise in female-headed households. Population pressure, declining yields, and recurrent droughts also have accelerated human-induced soil degradation, to the extent that 22 percent of Africa's vegetated land now suffers from such patterns (Pinstrup-Andersen 1993). Although this degradation often is reversible, its current impact is significant.

These negative trends have come about as a result of poor land use practices, high population growth rates, recurrent droughts, civil wars, inappropriate economic and political policies pursued by national governments, inappropriate development policies pursued by foreign governments and non-governmental organizations (NGOs), and declining terms of trade for African exports (Payne et al. 1987). For example, the terms of trade for African exports are at their lowest level in three decades, reflecting the world recession and increasing protectionism in industrial countries (UNSO

Asset erosion will influence a household's ability to recover from a drought.

1992). Economic stagnation has been accompanied by rising debt, so that many countries owe debts that are greater than their GDP (UNSO 1992). In 1986, the IMF alone took out US$1 billion more than it put back into Africa. African countries have had to rely more and more on foreign aid to make up foreign exchange deficits, decreasing their control over their own development initiatives.

As a result of these trends, the number of poor people in Africa and the incidence of poverty are growing; 180 million people (47 percent of the population) were poor in the mid 1980s and 120 million were extremely poor (Pinstrup-Andersen 1993). Thirty percent of the pre-school children were underweight, which is 10 million more than in 1980. It is estimated that by the year 2000, 30 percent of the Third World's poor will be living in sub-Saharan Africa, compared to only 16 percent in the mid 1980s (Pinstrup-Andersen 1993). This rise in poverty is particularly high in the arid and semiarid regions.

Dryland Environments

The dominant characteristic of dryland environments is not so much limited water availability as it is variability of water availability (Hutchinson et al. 1992). The persistent risk of drought is the most important feature of arid areas that affects the livelihoods pursued by the people who live there. Food insecurity induced through inter-annual variation in agricultural output may be of greater importance than that induced by a persistently low level of agricultural output and incomes (Maxwell 1993).

In addition to sparse, irregular, strongly seasonal rainfall, dryland environments are characterized by sharp differences in productivity between watered and unwatered sites (UNSO 1992). The spatial heterogeneity of the landscape means that stress and shocks affect the environment unequally, with each ecosystem having different production potential, depending on the rainfall pattern and soil type (Drinkwater and McEwan 1993). For example, during wet periods, low-lying areas often are flooded and may have limited production potential. However, during dry periods, these same areas act as traditional safety nets because their productivity is higher in comparison to adjacent dry areas. It is this mosaic of exploitable potentialities, or "patchiness," that gives these environments their resilient[1] quality, which allows food systems operating within them to adapt to variable resources with great flexibility (Davies 1993). However, this environmental resilience and the resilience of the livelihoods within them have been systematically eroded, making them less able to withstand transitory disturbances. Although this increased vulnerability is owing to the interplay of a number of factors, one of the key factors has been recurring drought and subsequent resource degradation.

Household and Community Livelihood Strategies in the Face of Recurrent Drought

The convergence of household food security[2] and environmental interests has come about mainly through a focus on vulnerable groups experiencing food shortages during the drought that plagued much of Africa in the 1980s (Davies et al. 1991). By focusing on the way households procure food and cope with shortages, it became apparent that during food deficit periods these households relied heavily on natural resources outside their usual production system or intensified the exploitation of resources already in use. This is especially true for households headed by women, which tend to be the most food insecure. Thus, the link between household food security and the environment is made explicit by focusing on the livelihood systems employed by local populations and their ability to adapt to changing resource conditions resulting from recurrent drought.

A livelihood is defined by Chambers (1988) as adequate stocks and flows of food and cash to meet basic needs. Livelihoods are secure when households have secure ownership of, or access to, resource and income-earning activities, including reserves and assets to offset risks, ease shocks, and meet contingencies (Chambers 1988). Food security is a subset of livelihood security; food needs are not necessarily more important than other basic needs or aspects of subsistence and survival within poor households. Food insecure households juggle among a range of requirements, including immediate consumption and future capacity to produce (Davies 1993). Livelihoods are sustainable when they are able to maintain or enhance resource productivity on a long-term basis through a range of on-farm and off-farm activities that provides a variety of procurement sources for food and cash (Drinkwater and McEwan 1993).

Many parts of Africa that have experienced recurrent drought have suffered severe rural impoverishment, making it difficult to guarantee secure livelihoods. Thus, people not only are suffering from food insecurity, their livelihoods are threatened as the basis of their subsistence is progressively eroded. To understand how recurrent drought increases the structural vulnerability of livelihood systems, it is important to understand how food entitlements or procurement strategies have changed through time.

In drought-prone dryland areas, uncertainty is the norm. Diversification is the key to food and livelihood strategies in semiarid areas. Entitlements to food are gained through a combination of sources, including production, exchange (market and non-market transfers), and sale of labor and assets (including investments, stores, and claims). The food security of a household will be determined by the balance between the sources of entitlement and demands placed on these resources to meet household needs and debts. Davies (1993) refers to these demands as "calls on entitlements." Such calls include consumption (both of food and of other goods), claims (payment-in-kind of food or cash to neighbors, debts to traders, taxes or fines to the government), and investments in livelihood protection (investing in education or foregoing consumption to preserve productive assets). Such calls on entitlement rarely are considered in food security assessments.

Three principal livelihood systems are found in dryland areas: those practiced by cultivators, agropastoralists, and transhumant pastoralists. Different livelihood systems exhibit different degrees of vulnerability to food insecurity. Those livelihood systems that are primarily agriculturally based could be more vulnerable to recurrent droughts. For example, livelihood systems in higher rainfall zones that are primarily dependent upon agricultural production to meet consumption needs may be more vulnerable to food insecurity resulting from a drought than are those systems found in lower rainfall zones that are more diversified (Statz et al. 1990).

To weather transitory disturbances to their livelihoods, people in drought-prone areas have developed self-insurance coping strategies to minimize risks to their household food and livelihood security. Examples of such strategies are dispersed grazing, changes in cropping and planting practices, migration to towns in search of urban employment, increased petty commodity production, collection of wild foods, use of inter-household transfers and loans, use of credit from merchants and money lenders, migration to other rural areas for employment, rationing of current food consumption, sale of possessions (e.g., jewelry), sale of firewood and charcoal, consumption of food distributed through relief programs, sale of productive assets, breakup of the household, and distress migration (Corbett 1988). In general, coping strategies are pursued by households to ensure future income-generating capacity (i.e., livelihood) rather than simply to maintain current levels of food consumption (Corbett 1988; DeWaal 1989; Haddad et al. 1991). These strategies will vary by region, community, social class, ethnic group, household, gender, age, and season (Chambers 1989; Thomas et al. 1989). The types of strategies employed by households also will vary with the severity and duration of the potentially disruptive conditions (Thomas et al. 1989).

Recent studies have found that the range of coping strategies pursued by farm families in drought-prone areas may be changing over time (Frankenberger and Goldstein 1992). Three major trends appear to be developing. First, risk- minimizing agricultural strategies appear to be narrowing in some locations (e.g., Kenya), as repeated sales and reacquisitions have depleted domestic and productive asset levels. In these areas, agricultural coping strategies are being replaced by strategies that diversify income sources through off-farm employment and nonagricultural production. In an attempt to generate income to secure market purchases, many erosive strategies are being pursued that may be environmentally damaging, such as the collection of firewood or of wild food sources. Second, strategies that relied on social support and reciprocity for overcoming food deficits are eroding owing to recurrent droughts, which have depleted local surplus food stocks. Claims on food stocks are becoming more difficult to meet. The integration of individual households into the market system also has decreased the dependence on reciprocal exchanges. Third, a shift in the responsibility for coping with drought—from the individual household and local community toward the national government and non-governmental organizations through food relief programs—has been observed. This trend is owing, in large part, to the reduction in response flexibility of small farm households.

Increasing Structural Vulnerability of Livelihood Systems

Recurring drought and the resulting degradation have contributed significantly to the erosion of livelihood systems in the arid and semiarid regions of sub-Saharan Africa. These livelihood systems are structurally vulnerable because the primary and secondary activities can no longer guarantee annual food needs in most years (Davies 1993). A structural food gap exists almost every year; households headed by women are particularly vulnerable to such gaps. These systems have become less resilient and more sensitive to recurring shocks (Davies 1993). The capacity of livelihood systems to accumulate surpluses in good years, and to rely on buffers in dry years has been replaced by a cycle of subsistence and coping in every year. Coping strategies that were employed in the past only during periods of food stress now have become adaptive strategies and have been incorporated into the normal pattern of activities of local livelihood strategies (Davies 1993). These systems are less flexible and highly susceptible to livelihood failure. Even those livelihood systems that have become more diversified to spread risk are vulnerable because the diversification is becoming less effective. Buffers against periods of stress are starting to disappear. This explains why each successive drought may develop into a crisis, leading to greater and greater dependence on food aid (see Hutchinson: Fig. 1, page 23 this issue). The costs associated with such food transfers are becoming more and more difficult for governments to absorb.

The factors that have contributed to the worsening structural vulnerability of livelihood systems include: (1) lower rainfall and flood levels (increasing frequency of droughts and desiccation); (2) a declining natural resource base resulting from population pressure and inappropriate land use practices (increasing desertification); (3) greater

exploitation of traditional safety net areas (e.g., wetlands in dry areas) during dry seasons and dry years, and (4) inappropriate and extractive government policies (Davies 1993).

Desertification most often is found where livelihood systems converge in the Sahel. The continual expansion of arable land into areas normally used for pastoralism has led to severe dryland degradation (UNSO 1992). This is primarily owing to the fact that stock densities are higher in this area because of supplemental feeding and that herds are much more stationary because animals have access to feed other than the range.

People living in vulnerable livelihood systems are less likely to incur debt to acquire productivity-enhancing inputs if they view the investment as a risk to their strategies aimed at maintaining resilience in a fluctuating climate. For example, investments in long-term productive capital development aimed at increasing agricultural productivity may reduce a household's flexibility to respond in the event of a drought.

In summary, livelihood systems in the drought-prone areas of Africa are becoming more vulnerable with each cycle of drought and failure to recover from it. Thus, a number of communities are experiencing a progressive erosion of their basis of subsistence, resulting in further degradation of their natural resource base to compensate for these shortfalls. This process of impoverishment also has drastically affected the allocation of government resources, diverting development capital into emergency relief.

The Macro Economic Impacts of Droughts

Droughts coupled with chronic food shortages have forced many governments to mount massive food transfers almost every year since the mid 1970s. Although food aid accounts for less than 10 percent of all aid to sub-Saharan Africa, it still provides a net transfer of about US$1 billion per year (Maxwell 1993). This is equivalent to the total net transfers to the region by the World Bank and the IDA (World Bank/WFP 1991). One-third of this food aid is provided as emergency assistance, but two-thirds is used to meet Africa's large and growing food gap (Maxwell 1993). In Zimbabwe, for example, the government has spent, on average, Z15 million over each of the past three years to provide drought relief (ACC-SCN 1992).

In many African countries, governments are providing funds for drought relief, supplementary feeding and recovery at the same time that they are attempting structural adjustment. These food transfers are diverting limited government resources to non-development expenditures, further decreasing the chances for the governments to reduce their debt burdens. Not only are the food transfers costly, but the lack of tax revenue generated in the areas subject to recurring drought and degradation imposes additional costs on the governments (Davies 1993). Thus, investments in such drought-prone, degraded areas to improve livelihood security may be justified by the revenue foregone, the diversion of limited government resources into costly food transfers, and the depreciation of capital stocks (e.g., forest reserves, fertile soils), as well as the positive global justification of maintaining biodiversity.

In Burkina Faso, communities join together to build stone bunds to control soil erosion.

Enhancing Household Drought Resilience

It is important to recognize that livelihood systems in drought-prone areas of sub-Saharan Africa are becoming more structurally vulnerable with each subsequent drought, that degradation is likely to increase as these systems are unable to fill food gaps through primary and secondary production activities, and that governments cannot afford to absorb the costs of massive food transfers or of the revenue and capital stocks foregone. To enhance livelihood security in the face of recurrent drought, interventions can be aimed at increasing the resilience of the household economy, meso-level development, and reducing the impact of drought through timely detection and contingency planning.

Increasing the Resilience of Local Production Systems in Drought-Prone Areas (Entitlement Promotion)

Interventions aimed at reducing the structural vulnerability of livelihood systems in drought-prone, degraded areas should focus on: (1) improving production to stabilize yields through diversification into drought-tolerant crops and through soil and water conservation measures ; (2) reinforcing coping strategies that are economically and environmen-

tally sustainable (e.g., seasonally appropriate off-farm employment, especially for women) (Davies 1993); (3) improving on-farm storage capacity to increase the availability of buffer stocks, and (4) improving common property management through community participation.

Meso-Level Development

In addition to micro-level investments to deal with the effects of drought and desertification, the structural vulnerability of livelihood systems can also be reduced by investments in regional infrastructure and market organization. For example, during food deficit periods resulting from drought, the terms of trade for the poor worsen because food prices increase at the same time prices for goods traded by households to purchase food decline. This is especially true for more isolated areas, where market infrastructure is not well developed and food stuffs have to be imported from considerable distances. This can amplify the effect of drought by reducing food access and the erosion of capital stocks.

The terms of trade could be improved by strengthening the links between droughtstricken and non-droughtstricken areas within the same region. Investments in transport connections between these areas could lower the cost of food purchased in the droughtstricken area, which would have a positive impact on the poor, since a large percentage of the smallholders are net purchasers of grain. For example, the poorer households in Zimbabwe's semiarid areas are only self-sufficient in staple grains for six months of the year; grain purchases may account for 40 percent of their total expenditures. A similar situation can be found in the semiarid regions of Mali (Statz et al. 1990; Reardon et al. 1988). Improving local food availability and lowering food prices may also be facilitated through investing in food production in the more favorable ecological zones close to drought-prone, degraded areas and by encouraging intraregional trade. Approaching structural vulnerability of livelihoods and food insecurity from a regional food systems perspective will enable planners to determine the best investment alternatives to pursue.

Reducing the Impact of Drought (Entitlement Protection)

The impact of drought can be reduced by timely detection of where droughts are likely to occur and by establishing contingency plans prior to the onset of drought, so that those plans can be implemented before a significant erosion of household assets occurs and other erosive coping strategies are activated.

The capacity to detect changes in food security at an early stage and to respond in a timely fashion could considerably reduce the costs of dealing with a full-blown emergency. To prepare adequately for future droughts in order to lessen their impact on food consumption and farm asset depletion, two complementary approaches can be pursued. First, a mechanism (vulnerability maps) should be established nationally or regionally for systematically predicting where the effects of drought are likely to have the most severe impact, in order to plan for timely responses and to concentrate resources in those areas prior to drought's onset. Second, in areas of chronic or recurring transitory food insecurity, decentralized, community-based vulnerability monitoring systems using location-specific indicators can be developed to ensure timely and appropriate mitigation responses.

For areas that are prone to drought episodes or other food security risks and that are comprised of structurally vulnerable livelihood systems, contingency plans can be developed to improve the timeliness of response. Such plans involve a set of predetermined responses that would be implemented when food security conditions change and safety nets are warranted. Such changes would be captured by the decentralized food security monitoring system, which is based on location-specific indicators that detect significant changes in food entitlements. The responses would be designed in non-crisis years and would encompass (1) mitigation-type interventions that enable households to retain their productive assets and existing entitlements (entitlement protection) and (2) relief-type interventions if immediate food aid distribution is warranted (entitlement provision). Many of these interventions would include infrastructural improvements, carried out through food-for-work or other means, to enhance the longer-term viability and resilience of the communities. The types of interventions pursued would be selected and implemented by the communities themselves. Responsibilities for the various actions will be negotiated and assigned to government agencies, donors, and local NGOs operating in the area prior to the onset of the drought to improve response timing (Frankenberger 1992).

The advantage of contingency plans is that they help link development investments with emergency interventions, striking a balance between entitlement promotion and entitlement protection. Recognizing that households in drought-prone, degraded areas are exposed to periodic climatic risks that could jeopardize their livelihood security, development activities must seek to improve the resilience of livelihood systems as well as to protect those systems in crisis years to enable quick recovery. Thus, contingency plans help

Because drought poses both short-term consumption and long-term development questions, our goal should be to make drought something that is systematically and rationally planned for in the context of development.

strengthen the response side of drought preparedness. Vulnerability maps can help determine where such contingency plans should be developed.

Summary

Livelihood systems in the drought-prone areas of sub-Saharan Africa are becoming more structurally vulnerable with each cycle of drought and the failure to recover from it. A number of communities are experiencing a progressive erosion of their basis of subsistence, resulting in further degradation of their natural resource base to compensate for these shortfalls. Buffers against periodic stress are beginning to disappear, which accounts for why each successive drought develops into a crisis. This process of impoverishment has drastically affected the allocation of government resources, diverting development capital into emergency relief. The costs of such food transfers are becoming more and more difficult for governments to absorb.

Steps can be taken to enhance livelihood security in the face of recurrent droughts. First, interventions can be aimed at increasing the resilience of the household economy and meso-level development to strengthen and diversify household entitlements (entitlement promotion). Second, the impact of drought can be reduced through timely detection and contingency planning (entitlement protection). These interventions should be targeted to those areas where livelihood systems are structurally vulnerable. Vulnerability maps can be used in the first stages of targeting to improve the cost effectiveness of resource allocation. Once an area has been designated, decentralized community-based vulnerability monitoring systems using location-specific indicators and contingency plans can be developed to ensure timely and appropriate mitigation responses.

Notes

[1] An environment that is resilient is able to withstand wide-ranging and irregular fluctuations in rainfall and other disturbances. Livelihoods are resilient if they can quickly recover from shocks such as droughts.

[2] Household food security (HFS) is defined as the "capacity of a household to procure a stable and sustainable basket of adequate food" (IFAD 1993). This food must be nutritionally adequate and must be culturally acceptable. Stable access is assured through various mechanisms that enable the household to procure food supplies across seasons and transitory shortages. Sustainable access requires that the means of food procurement in the long run are consistent with: (1) sustainable resource use and management; (2) maintenance of productive assets; (3) self-reliance and human dignity; and, (4) overall livelihood needs (IFAD 1992).

References

ACC-SCN. 1992. *Nutrition-relevant actions in Zimbabwe, 1980-1992*: Part 1, December.

Chambers, R. 1988. Sustainable rural livelihoods: a key for people, environment and development. In *The greening of aid*, edited by C. Conroy and M. Litvinoff. London: Earthscan.

——. 1989. Introduction: vulnerability, coping and policy. *IDS Bulletin* 2(2):1-7.

Corbett, J. 1988. Famine and household coping strategies. *World Development* 16(9):1009-1112.

Davies, S. 1993. Versatile livelihoods: strategic adaptation to food insecurity in the Malian Sahel. Brighton: Institute of Development Studies, University of Sussex.

——, M. Leach, and R. David. 1991. *Food security and the environment: conflict or complementarity?* Brighton: Institute of Development Studies, University of Sussex.

DeWaal, A. 1989. *Famine that kills: Darfur Sudan, 1984-1985*. Oxford: Clarendon Press.

Drinkwater, M. and M. McEwan. In press. Household food security and environmental sustainability in farming systems research: developing sustainable livelihoods. *Journal of Farming Systems Research-Extension*.

Frankenberger, T. 1992. *Indicators and data collection methods for assessing household food security*. *In Household food security: concepts, indicators, and measurements: a technical review*. New York: UNICEF and IFAD.

Frankenberger, T. and D. Goldstein. 1990. Food security, coping strategies, and environmental degradation. *Arid Lands Newsletter* 30:21-27.

——. 1992. The long and the short of it: relationships between coping strategies, food security, and environmental degradation in Africa. In *Growing our future*, edited by K. Smith. New York: Kumarian Press.

Haddad, L., J. Sullivan, and E. Kennedy. 1991. *Identification and evaluation of alternative indicators of food and nutrition security: some conceptual issues and an analysis of extant data*. Washington: International Food Policy Research Institute.

Hutchinson, C. F., P. Warshall, E. Arnould, and J. Kindler. 1992. Development in arid lands: lessons from Lake Chad. *Environment* 34(6):16-20, 40-43.

International Fund for Agricultural Development. 1993. *Toward a strategy for improving nutrition though rural investment projects*. Executive Board Paper, Forty-eighth Session, April.

Maxwell, S. 1993. *Response to drought and famines in Sub-Saharan Africa: a new agenda*. Paper presented to NRI/IFPRI Symposium on Critical Food Policy Issues for Sub-Saharan Africa.

Payne, R., L. Rummel, and M. Glantz. 1987. Denying famine a future: concluding remarks. In *Drought and hunger in Africa: denying famine a future*, edited by Michael H. Glantz. Cambridge: Cambridge University Press.

Pinstrup-Andersen, P. 1993. *The food situation in sub-Saharan Africa and priorities for food policy research and donor assistance*. Paper presented at the NRI/IFPRI Symposium on Critical Food Policy Issues for Sub-Saharan Africa.

Reardon, T., P. Matlon, and C. Delgado. 1988. Coping with household-level food insecurity in drought-affected areas of Burkina Faso. *World Development* 16(9):1065-74.

Statz, J. V. D'Agostino, and S. Sundberg. 1990. Measuring food security in Africa: conceptual, empirical, and policy issues. *American Journal of Agricultural Economics* December:1311-17.

Thomas, R., S. Paine, and B. Brenton. 1989. Perspectives on socio-economic causes of and responses to food deprivation. *Food and Nutrition Bulletin* 11:41-54.

United Nations Sudano-Sahelian Office. 1992. *Assessment of desertification and drought in the Sudano-Sahelian region: 1985-1991*. New York: UNSO.

World Bank/World Food Programme. 1991. *Food aid in Africa: an agenda for the 1990s: a joint study*. Washington and Rome: World Bank and WFP.

Timothy R. Frankenberger *is Farming Systems Research Specialist with the Office of Arid Lands Studies at The University of Arizona.*

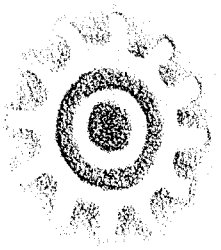
In Bolivia, women wash vegetables before taking them to market. WFP projects emphasize strengthening local economies.

PUBLICATIONS

FAMINE MITIGATION DOCUMENTATION AT THE ARID LANDS INFORMATION CENTER

As part of a 1991 cooperative agreement, arranged through the U.S. Department of Agriculture's (USDA) Office of International Cooperation and Development (OICD) between the U.S. Agency for International Development's (USAID) Office of Foreign Disaster Assistance (OFDA) and the University of Arizona's Office of Arid Lands Studies (OALS), the Arid Lands Information Center has been developing a special document collection and ProCite database related to famine mitigation activities in Africa. Initial collection efforts focused on three target countries (Sudan, Ethiopia, and Angola) and covered nine topics: early warning systems, rapid assessment, gardening strategies, cropping systems, livestock preservation, water resources, cash- and food-for-work programs, marketing interventions, and conflict modification. Subsequent efforts centered on southern African nations and, specifically, on issues related to household food security.

Many of the approximately 2,500 documents in the collection are nonconventional in format, including technical and field reports, project papers, and reports from NGOs and PVOs involved in food relief programs. Documents were identified by searching on-line databases such as CAB ABSTRACTS, AGRIS, and AGRICOLA and through visits to libraries and information centers in the United States and the United Kingdom and to various United Nations libraries in Rome. Besides the original bibliography listed below, a second annotated bibliography on food security in Southern Africa will be available in late 1993. For further information about the famine mitigation collection, bibliographies, database, or other publications produced by OALS and others for the Famine Mitigation Activity, contact: Director, Arid Lands Information Center, 845 North Park Avenue, Tucson, Arizona 85719 USA. Prices quoted below include postage.



OFFICE OF ARID LANDS STUDIES

Agpaks As a Famine Mitigation Intervention. 1992. By R.M. Caldwell. Prepared by the Office of Arid Land Studies for the USAID/OFDA through the USDA/OICD, Washington. US$7.40.

Agpaks are consolidated sets of agricultural and livestock inputs designed to improve the productive capacity of populations impacted by famine, war, and other events that upset the normal functioning of lives and livelihoods. Seeds, tools and implements, fertilizer and pesticides, livestock, veterinary medicines, credit, and services are common components in an agpak intervention. Three strategies for designing and implementing agpak intervention to facilitate mitigation efforts are discussed: maintenance, rehabilitation, and diversification/risk reduction. Each strategy represents a different temporal phase of the famine process and a varying degree of vulnerability within the target group. Designing agpak interventions requires that adequate information be available and that local participants are fully engaged in the process. Issues on design strategy and key information needs for agpak interventions are discussed.

• • •

Baseline Vulnerability Assessment for Haiti. 1993. By C.F. Hutchinson and R.E. Hall. Prepared by the Office of Arid Lands Studies for the USAID/OFDA through the USDA/OICD, Washington. US$7.75.

In November of 1992, a prefeasibility assessment was conducted in Haiti to develop preliminary recommendations for food security monitoring based on the current situation in the country, the information needs and resources of USAID and cooperating sponsors, and opportunities for improving the quality and flow of information. The prefeasibility assessment resulted in a recommendation for a baseline food security, or vulnerability, assessment as the next step in developing an enhanced food security monitoring system. This report describes that process and its findings.

• • •

Country Experiences in Famine Mitigation. 1992. By R. Longhurst. Prepared for the USAID/OFDA through the USDA/OICD, Washington. US$6.95.

The famine mitigation strategies employed in eight countries are reviewed in this paper, with India being most prominent among them, owing to the fact that "famine codes" have been in place there for more than 100 years. The codes constitute a program of action for local governments, organization of relief works, wages, and rations, and measures relating to cattle and forests, among which public works are the most important element. Experiences related to the interventions associated with the codes in Bangladesh, Botswana, Kenya, Cape Verde, Zimbabwe, Ethiopia, and Sudan, as well as India, are reviewed and assessed here.

• • •

A District-Level Food Security and Nutrition-Based Vulnerability Assessment for Zambia. 1993. By. R.M. Caldwell. Prepared by the Office of Arid Lands Studies for the World Food Programme and the International Fund for Agricultural Development, Rome. US$28.95 (includes 15 maps in color).

AtlasPro mapping software was employed in preparation of this assessment. Available, district-level data were combined to characterize relative degrees of chronic and current (1992) vulnerability among administrative districts in Zambia. The resulting maps depict vulnerability as defined by food security (characterized here by cereals production) and nutrition. See Caldwell's article ("Mapping Vulnerability in Zambia and Zimbabwe") in this issue of ALN for details.

• • •

Early Warning and Vulnerability Assessment for Famine Mitigation. 1992. By C.F. Hutchinson. Prepared by the Office of Arid Lands Studies for the USAID/OFDA through the USDA/OICD, Washington. US$17.25 (includes 5 maps in color).

This strategy paper first draws a distinction between conventional famine relief, which seeks to save lives through the provision of food aid, and famine mitigation, which seeks to preserve productive capacity, and then outlines a four-step process for conducting famine mitigation, with particular emphasis on the first step in that process: early warning and vulnerability assessment. For a fuller discussion of the concepts on which this strategy paper is based, see Hutchinson's article ("Famine Vulnerability Assessment: The First Step in a Preemptive Strategy") in this issue of ALN.

In Mauritania, project participants build windbreaks to retard desert encroachment.

◆ ◆ ◆

Enabling Resilience and Enhancing Assets: Famine Mitigation from a Seeds and Tools Perspective. 1993. By J. Worstell and B. Colley. Prepared for the USAID/OFDA through the USDA/OICD, Washington. US$8.00.

The authors argue that to design sustainable interventions for a given famine-prone area, a local and participatory agroecosystems appraisal is necessary. Further, the most effective interventions will prove to be those that enhance a household's coping strategies; even so, relief, in the form of cash- and food-for-work programs, will be a necessary part of most famine mitigation interventions in order for the poorest to benefit. The authors argue that the determining criterion for judging such relief programs (beyond nutritional improvement) is whether the programs will enhance such assets as local storage capacity, local transport, soils, water catchment, local tool manufacture, and local social organization. The authors also propose a procedure for rapid assessment of specific characteristics of famine-prone agricultural systems.

◆ ◆ ◆

Ethiopia: A Country Profile for Famine Mitigation Planning and Implementation. 1992. By R.M. Caldwell. Prepared by the Office of Arid Lands Studies for the USAID/OFDA through the USDA/OICD, Washington. US$42.80.

This report presents general information on Ethiopia's physical environment, land tenure changes, environmental degradation, population, political history, health and nutrition problems, and economy, together with a discussion of agroecological zones and associated farming systems. In Ethiopia, environmental degradation, particularly soil erosion and deforestation, have combined with drought and a prolonged civil war to create extremely high levels of food security vulnerability. This situation is detailed through a vulnerability assessment and analysis of the disaster history of the country. An analysis of the current response capabilities of early warning systems and institutions charged with delivering food aid in Ethiopia follows. The report concludes with a discussion of potential famine mitigation interventions, including improvement of early warning and monitoring systems, implementation of food-for-work/cash-for-work programs aimed at improving roads, conservation of pasture through improved offtake strategies, the refinement of the one-ox plow, and increased access to seeds and other agricultural inputs in order to create sustainable development in traditional rainfed agriculture.

◆ ◆ ◆

Famine Mitigation Bibliography, with Special Emphasis on Ethiopia, Sudan and Angola (First Edition). 1992. By B. Hutchinson, K. Johnson, M. Haseltine, and C. Casler. Prepared by the Office of Arid Lands Studies for the USAID/OFDA through the USDA/OICD, Washington. US$43.25

The strength of this indexed, 250-page bibliography is, as its authors note, in its coverage of the three countries named in its title and in documents related to nine topics selected for examination in two OFDA workshops: early warning, rapid rural assessment, cereal crops/cropping systems, gardens, seedbanks, livestock, water resources, food-for-work/cash-for-work, and conflict modification. Also included are some general references on famine, market interventions, and other countries and regions that have experienced similar famine-related problems. An anticipated second edition will include further references to market and pricing interventions and the results of another round of database searches.

◆ ◆ ◆

Famine Mitigation Bibliography, with Special Emphasis on Ethiopia, Sudan and Angola (Supplement to the First Edition). 1992. By B. Hutchinson, K. Johnson, M. Haseltine, and C. Casler. Prepared by the Office of Arid Lands Studies for the USAID/OFDA through the USDA/OICD, Washington. US$3.35.

The supplement contains 9 pages of additional entries (see above).

◆ ◆ ◆

Famine Mitigation: Proceedings of Workshops Held in Tucson, Arizona, May 20-May 23, 1991, and Berkeley Springs, West Virginia, July 31-August 2, 1991. 1991. Prepared by the Office of Arid Land Studies for the USAID/OFDA through the USDA/OICD, Washington. US$70.80.

The articles "Famine and Mitigation," by C.F. Hutchinson, and "The Importance of Household Coping Strategies to Famine Mitigation," by T.R. Frankenberger, provide a conceptual frame for the papers that follow. Contributors offer techniques for monitoring specific indicators that point to the vulnerabilities of local populations (a critical component of timely intervention), discuss a range of specific external interventions in local systems of agricultural production aimed at defending or reviving sustainable livelihoods in the wake of famine, consider an alternative (cash- and food-for-work) to the simple provision of food aid during critical famine periods, and discuss the dilemma of providing food aid and working toward the establishment of sustainable livelihoods within the context of war. In addition, country status reports are provided for Angola, Ethiopia, Mozambique, and Sudan. In each case reported, national governments or armed militias have used famine as a weapon to align political support and to undermine political opposition. The collection concludes with summaries of working group reports from both workshop venues.

◆ ◆ ◆

Food/Cash-for-Work Interventions in Famine Mitigation. 1993. By J.C. Bryson and S. Hansch. Prepared for the USAID/OFDA through the USDA/OICD, Washington. US$10.10.

This paper proposes strategies for using various combinations of food and cash—cash/food-for-work, cash/food incentives, and cash/food transfers—in the service of famine mitigation. Both food and cash have value to target groups in famine-prone areas, the authors observe, but the relative values of the two differ in different local (village and household) situations. The authors recommend that famine mitigation strategies give priority to cash interventions combined with measures to increase local food supply, so as to foster local food production and to strengthen local markets.

◆ ◆ ◆

Geographic Information Systems Applications in Crop Assessment and Famine Early Warning. 1992. By C.F. Hutchinson, P.T. Gilruth, R.A. Hay, S.E. Marsh, and C.T. Lee. Prepared by the Arizona Remote Sensing Center (OALS) and the Advanced Resource Technology Program at The University of Arizona for the Remote Sensing Center of the Food and Agriculture Organization of the United Nations, Rome. US$28.00.

This report addresses a number of ways in which GIS can be used in crop condition assessment and famine early warning. In doing so, the report considers the structure and capabilities of GIS, the types of problems encountered in different aspects of crop forecasting and early warning, application of GIS to crop condition assessment and early warning (using Kenya as a case study), and some opportunities and constraints revealed by the case study. The intended reader of the study is an analyst or decision maker concerned not with generating agricultural data but with interpreting it.

◆ ◆ ◆

Household Food Security: Concepts, Indicators, Measurements: A Technical Review. 1992. By S. Maxwell and T. Frankenberger. UNICEF and IFAD, New York and Rome. US$48.20.

The first chapter in this collection—"Household Food Security: A Conceptual Review," by Simon Maxwell and Marisol Smith—reflects the shift in thinking away from concern with national and global food supplies and toward more recent interest in "secure access to enough food all the time" at the household level. Core concepts in understanding local food security are sufficiency of food, access to food, and security of both over time. Chapter 2—"Indicators and Data Collection Methods for Assessing Household Food Security," by Timothy Frankenberger—discusses process indicators that reflect both food supply and food access, as well as direct and indirect outcome indicators. "Household Food Security: Concepts and Definitions: An Annotated Bibliography," by Marisol Smith, Judy Pointing, and Simon Maxwell, and "A Selected Annotated Bibliography on Indicators with Application to Household Food Security," by Barbara Hutchinson and Timothy Frankenberger, round out the collection.

◆ ◆ ◆

◆ ◆ ◆

Integrating Household Food Security into Farming Systems Research-Extension. 1992. By T.R. Frankenberger and P.E. Coyle. A paper presented at the Nutrition and Household Food Security in Farming Systems Research Southern and Eastern Africa Workshop, Mansa, Zambia, August 10-14, 1992.

That nearly 18 million people in Southern Africa are food insecure and at risk of severe malnutrition justifies the priority households give to securing sufficient food supplies as a major production goal, while at the same time recurrent risks associated with fluctuating rainfall and unstable markets has led many farmers to diversify their food procurement strategies to secure a wide food base. These facts have significant implications for the types of interventions promoted through farming systems research-extension (FSRE). After surveying a number of conceptual issues and discussing the client group to which most FSRE activities are directed, this paper offers suggestions for ways in which household food security considerations can be incorporated into the FSRE process.

◆ ◆ ◆

• • •

The People's Republic of Angola: A Country Profile. 1992. By E. Adelski. Prepared by the Office of Arid Lands Studies for the USAID/OFDA through the USDA/OICD, Washington. US$30.60.

This profile presents general information on the physical environment, population, and political economy of Angola and describes farming systems characteristic of four agroecological zones within the country. Unlike Saharan regions of Africa, Angola's food security crisis has not been related to drought and desertification, but rather has been caused by years of civil warfare. For this reason, famine vulnerability assessments here are presented within the context of a brief disaster history of the country. This information leads to a summary of international responses to recent Angolan food emergencies and to an analysis of the role of international donors in increasing national governmental capacity to respond to the current food emergency. Several recommendations are offered for immediate interventions by OFDA. These recommendations include the implementation of cash- and food-for-work programs to rebuild transportation networks, water systems, clinics, and veterinary support stations and to begin a reforestation project, particularly along the coast. The author also notes UN studies that document an estimated 2 million Angolans currently at risk of famine and argues that direct food aid should be supplied through the end of 1993.

• • •

Rapid Food Security Assessment. 1992.By T. Frankenberger. Prepared by the Office of Arid Lands Studies for the USAID/OFDA through the USDA/OICD, Washington. US$10.00.

Rapid food security assessment (RFSA) is a time-effective survey technique used to determine the causes, dimensions, and characteristics of a food insecurity situation in a given area. The targeting and timing of RFSAs will be triggered by early warning systems that identify specific regions that are susceptible to food shortages and by vulnerability maps that identify those areas and specific segments of the population most vulnerable to food insecurity. Once these food insecure areas have been designated, sampling procedures are used to select villages to be surveyed. The general procedure involves reviewing secondary data, carrying out open-ended interviews to attain minimal data sets, and making use of group, household, and individual interviews (using interactive data-gathering tools such as diagrams and ranking exercises) to elicit perspectives on resources, constraints, social relations, wealth distribution, seasonal trends, and selection criteria. Upon completion of a survey, contingency plans should be drawn up to link information to response. These contingency plans will consist of a decentralized household food security monitoring system based on a set of annually updated indicators and a set of predetermined responses keyed to changing food security conditions.

• • •

Republic of The Sudan: Famine Mitigation Country Profile. 1992. By P. Coyle *et al.* Prepared by the Office of Arid Land Studies for the USAID/OFDA through the USDA/OICD, Washington. US$35.40.

This profile presents general information on the physical environment, population, and political economy of Sudan, offers an overview of types of agricultural systems found there, and summarizes the farming systems characteristic of the four regions within the country that are particularly vulnerable to famine. In Sudan, the destruction of subsistence economies, civil war, periodic drought, and a long-term trend toward desertification combined to kill hundreds of thousands of people during the 1980s, and to leave nearly the entire rural population of the country vulnerable to a similar fate. An assessment of current food security vulnerability is provided, along with a brief history of the disasters that recently have engulfed the country. An analysis of current response capability is followed by suggestions for potential interventions. Specifically, it is recommended that contingency plans for response to food emergencies be merged with regional development programs.

• • •

Utilization and Preservation of Livestock Resources. 1993. By H. Blackburn, H. Glimp, D. Phillipi, D. Child, and A. Pope. Prepared for the USAID/OFDA through the USDA/OICD, Washington. US$8.00.

When livestock are impacted by drought, the resulting depression in productivity in rural areas dependent on animals for traction, nutrition, and revenue lasts well beyond the term of the drought itself. With this in mind, the authors propose a three-tiered approach to drought intervention: information assessment, simulation, and field application. Under this approach, information gathered by ministries of agriculture is assessed, the information then is used to create a group of simulation models, and the results serve as the basis for field recommendations, which are executed by government agencies or NGOs. In this way current information from the field can be used to project how future conditions might impact livestock producers.

• • •

Water Resources Management Strategies for Famine Mitigation Activities. 1992. By L. Uttal. Prepared for the USAID/OFDA through the USDA/OICD, Washington. US$5.75.

Although drought can result from a number of different causes, one of the most common drought scenarios occurs when new demands are placed on normal, but limited, water supplies, as often is the case when marginal lands in arid and semiarid zones are settled. Regardless of the cause, the first goal of water resources management in response to drought and famine is life support; the second is to rehabilitate and improve the water management infrastructure. This paper is intended to be a practical guide and reference for those involved in the planning and approval of water resources management projects related to drought- and famine-mitigation activities in Africa.

Food Security Publications from The Institute of Development Studies

The Institute of Development Studies (IDS) at The University of Sussex in the United Kingdom is a national research, teaching, and advisory center. Its interests span a broad range of development problems, particularly those related to "adjustment" strategies for countries facing declining commodity export prices and heavy indebtedness; to poverty, employment, and income distribution, and to the international flow of resources through aid, trade, and financial transactions.

The following is a list of selected IDS publications on issues pertaining to food security. For more information or to order, contact: The Institute of Development Studies, University of Sussex, Brighton, BN1 9RE, UK.

Early Warning in the Sahel and Horn of Africa: The State of the Art: A Review of the Literature (volume one of a three-part series). 1991. By S. Davies, M. Buchanan-Smith, and R. Lambert. 148 pages. IDS Research Report # 20. £8.00 + £1.35 postage & handling.

Early warning systems (EWS) were established throughout Africa in the wake of the famines that plagued the rural people of that continent in the 1970s. These systems are meant to provide timely information concerning people's access to food by monitoring meteorological conditions, natural resources, agricultural production, nutrition and health, and a variety of socioeconomic indicators. But despite the operation of EWS, famine continues to disrupt agricultural livelihoods and to spread human misery, particularly in the arid regions of the Sahel and Horn of Africa. In reviewing the literature, this report questions whether early warning systems can survive and be effective in mitigating famine.

• • •

Famine Early Warning and Food Information Systems in the Sahel and Horn of Africa: An Annotated Bibliography (volume three of a three part series). 1991. By R. Lambert, M. Gershon, M. Buchanan-Smith, and S. Davies. 108 pages. IDS Research Report #7. £7.50 + £1.00 postage & handling.

Much of the information concerning early warning systems in Africa is in the form of unpublished mimeographs and reports. This annotated bibliography includes information about authoring institutions so that those interested in the subject may have access to these data sources. Additionally, this work includes a thorough review of more commonly cited literature sources. This volume, the third of three, rounds out the most complete review of African early warning systems currently available.

• • •

Food Security and the Environment. 1991. Edited by S. Davies and M. Leach. 50 pages. IDS Bulletin 22(3). £6.50 + 75p postage & handling.

As in colonial societies of the past, environmental issues in the hinterlands are increasingly becoming the concern of metropolitan land managers. The editors of this bulletin point out the danger of repeating the mistakes of the colonial era by ignoring the intricate relationships between food security and environmental degradation among the world's poor. They argue that to encourage sustainable livelihoods, the linkages among peoples and environments must be clearly understood. The papers collected in this bulletin examine the interrelations between food security and the environment at local, national, and international levels.

• • •

Food Security and the Environment: Conflict or Complementarity? 1991. By S. Davies, M. Leach, and R. David. 47 pages. IDS Discussion Paper # 285. £2.15 + 45p postage & handling.

Potential policy trade-offs between access to food and conservation of resources can occur at the local, national, and international levels: Shall food exchanges be contingent on tree-planting to mitigate global warming? Will governments of poorer nations placate environmentalists from richer countries by aiming financing toward game parks and resource reserves rather than toward food programs for the poorest of their people? Do the rural poor invariably degrade local natural resources? Such questions lead the authors to point out the difficulty of supporting emerging complementarities between food security and the environment. They propose, however, that by looking at trends and shocks, vulnerabilities, entitlements, and responsibilities that include both environmental and food security issues, important complementary linkages can be found.

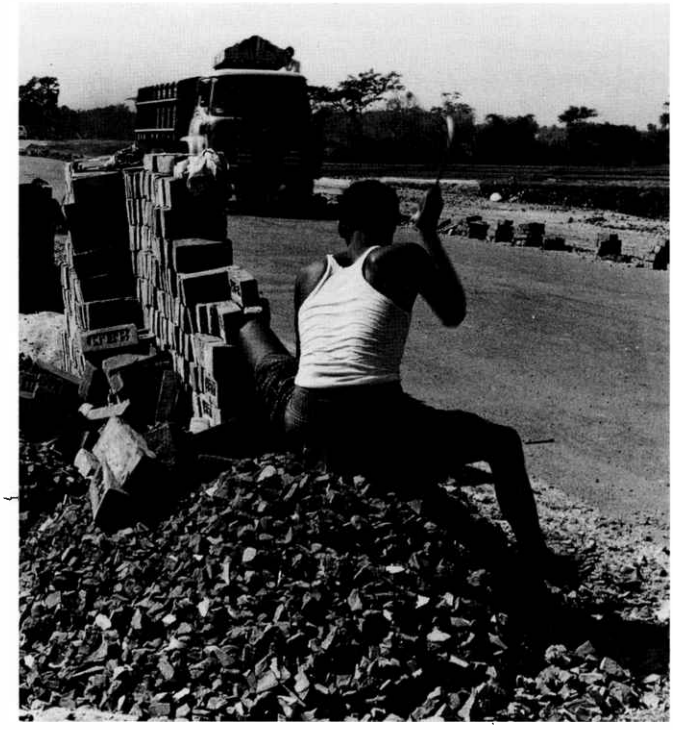
• • •

A Guide to Famine Early Warning and Food Information Systems in the Sahel and Horn of Africa (volume two of a three-part series). 1991. By M. Buchanan-Smith, S. Davies, and R. Lambert. 92 pages. IDS Research Report # 21. £7.50 + 70p postage & handling.

There are four levels of early warning systems operating in Africa: global, regional, national, and subnational. This report details EWS characteristics and offers typologies. Through a careful review of the scope of these early warning systems at each level, the authors are able to question inefficiencies and overlaps as they demonstrate the common lack of direct connection of these systems with mechanisms aimed at responding to impending famines. They also point out the limitations of many centralized systems that rely on only a few indicators, such as those provided by remote sensing data.

Household Food Security Concepts and Definitions: An Annotated Bibliography. 1993. By M. Smith, J. Pointing, S. Maxwell, et al. 65 pages. IDS Research Report #8. £6.50 + 70p postage & handling.

Studies of household food security have had great influence on food and agricultural policy, famine mitigation, and nutrition monitoring and support activities in poor countries. Concepts and definitions of household food security have proliferated in recent years, and these frameworks shape a range of institutional interventions. This annotated bibliography contains nearly 200 items concerned with household food security. Those interested in keeping track of this important and rapidly expanding field of study will find this bibliography invaluable.



In Bangladesh, building roads provides employment and improves rural communication.

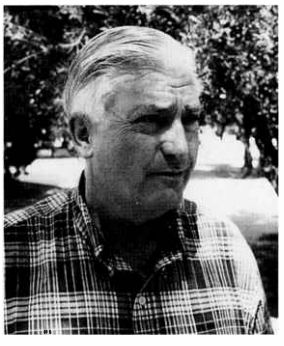
To Cure All Hunger: Food Policy and Food Security in Sudan. 1991. Edited by Simon Maxwell. 248 pages. Available from IDS. £9.95 + £1.00 postage & handling.

The rural people of Sudan have suffered several of the most devastating famines in recent memory. Ironically, these famines have occurred in a country that once was advertised as the breadbasket of the Middle East. The authors here show that drought and desertification, tied to agricultural policies oriented toward expansion of mechanized rainfed agricultural schemes at the expense of smallholders and pastoralists, have led directly to food insecurity and famine in northern Sudan. Primarily focusing their attention on the impact of macroeconomic policies on the people and agriculture of the arid northern region of the country, contributors provide balanced discussion of structural adjustments, income distribution, grain marketing interventions, and recent governmental responses to famine.

News

1993 Anderson Medal
Goes to OALS Geographer

• • •



Lay James Gibson

Dr. Lay James Gibson, Director of the Economic Development Research Program in the Office of Arid Lands Studies and Professor of Geography and Regional Development at The University of Arizona, has been honored by his colleagues in the Association of American Geographers (AAG) with the 1993 James R. Anderson Medal of Honor.

The medal recognizes exceptional achievement in the application of geography and geographical techniques to the solution of real-world problems. It is awarded annually.

In addition to his internationally respected work in regional economic development, the AAG's letter of citation notes that Professor Gibson "almost single-handedly developed the constitutions of the Pacific Regional Science Organization, the Regional Science Association International (of which he assumed the presidency on January 1, 1993), and. . . the Western Regional Science Association (which he served as executive secretary)."

Course

Food Security in Africa:
Policy, Planning, & Interventions

Brighton, England
September 9 - December 19, 1994

The course is organized by the Food Security Unit at the Institute of Development Studies (IDS), University of Sussex.

Chronic food insecurity, characterized by poverty, vulnerability, and unemployment, is widespread in most African countries and often is aggravated by unfavorable macro-economic conditions. Recurrent food crisis and famine, whether caused by drought or by conflict, are harsh reminders of the most extreme form of food insecurity, which continues to afflict millions of people.

This course, first taught in 1991, aims to help participants (1) analyze the causes of food insecurity in Africa, (2) take a critical look at plans, policies, and interventions, and (3) plan and prepare for attempts to tackle food insecurity in the future.

The course is designed for planners, policy makers, and practitioners working for government at national and sub-national levels, for donor agencies, for nongovernmental organizations, and for training and academic institutions.

FOR MORE INFORMATION, CONTACT:

Course Director (SC29)
Institute of Development Studies
University of Sussex
Falmer, Brighton BN1 9RE
England

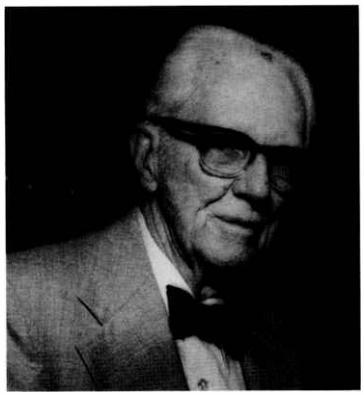
Phone: (0273) 606261
FAX: (0273) 621202

W.G. McGinnies Fellows Program

Office of Arid Lands Studies • The University of Arizona

In the fall of 1993, the Office of Arid Lands Studies (OALS) initiated a competitive fellowship program named in honor of OALS founder W.G. McGinnies.

Fellows will be affiliated with OALS and will engage in research into those physical, biological, or human aspects of arid lands that make them distinct from other environments, and those factors that constrain or contribute to the sustainable use of arid lands.



W.G. McGinnies

In addition to conducting research, fellows will be expected to make no fewer than two seminar presentations to students in the Arid Lands Resource Sciences (ALRS) doctoral program and other interested students, detailing the substance of their work. All ranks will be considered, but junior faculty especially are encouraged to apply.

• • •

Terms

The salaries of successful applicants will be met through the applicant's sponsored research or sabbatical; OALS will provide no stipend. Fellows will be housed in the appropriate division of OALS. Each will have an office and will be provided with operational support for communications, supplies, secretarial services, and use of OALS resources. Results of research may be considered for publication in the OALS/University of Arizona Press series *Monographs in Arid Lands Development.*

Qualifications

The McGinnies Fellows Program is intended to attract scholars at the Ph.D. or terminal degree level from the national and international community who have a major research interest in arid lands. However, applications from other scholars will be considered, so long as they do not require local salary support.

Timing and Duration

Applicants should note that acceptance as a W.G. McGinnies Fellow will be for a minimum of one semester (15 January to 15 May [Spring] or 15 August to 15 December [Fall]) and for a maximum of two semesters (15 August to 15 May).

Applications normally will be considered for the McGinnies Fellows Program twice each year. All materials must be submitted to The Director, OALS, by 1 August for consideration the following spring semester, or by 1 February for the following fall semester.

Procedure

Applicants will be asked to submit: (1) a description (no more than five pages) of a specific project to be undertaken during residence; (2) a statement describing how this might contribute to our better understanding of the nature of arid lands and their use; (3) a *curriculum vitae*; and (4) a letter of support from the applicant's department head or dean and/or at least one letter of reference.

A nine-member advisory board will review applications, select fellows, and encourage participation on the part of their respective faculties. The board will be drawn from The University of Arizona College of Agriculture and from those departments and academic units outside the college that have had traditional ties with OALS (e.g., Geography and Regional Development, Geosciences, Ecology and Evolutionary Biology, Atmospheric Sciences, and Anthropology). However, we also wish to have broader participation from Social and Behavioral Sciences, Humanities, Fine Arts, and Medicine.

For further information, contact:

The Director
Office of Arid Lands Studies
The University of Arizona
845 North Park Avenue
Tucson, Arizona 85719 USA

Phone: (602) 621-1955
FAX: (602) 621-3816

World Food Programme