

# **FAMINE AND FOOD POLICY DISCUSSION PAPERS**

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**DISCUSSION PAPER 5  
1991**

## **DROUGHT AND FAMINE PREVENTION IN SUDAN**

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Results of research work done under the project, "Famine Prevention," at the International Food Policy Research Institute (IFPRI) are reported in these discussion papers. The papers are circulated for discussion. They have not been exposed to IFPRI's comprehensive review process. They, nevertheless, contain valuable and original information and analyses which complement related IFPRI research reports. Support of the research project by the Ministry of Economic Cooperation of the Federal Republic of Germany is gratefully acknowledged.

Joachim von Braun

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The Government of Sudan and the International Food Policy Research Institute agreed three years ago to conduct a workshop, highlighting the results of the research on drought and famine prevention policy upon the completion of this research. Both parties are pleased to have convened the workshop as originally planned. This could not have been achieved without the close collaboration of the Ministry of Finance and Economic Planning (MFEP), which organized the workshop with efficiency and precision. Many officials from MFEP contributed to the workshop's success; prominent among them are Mrs. Leyla Omer Bashir, Hafiz M. Mahmoud, Babiker M. Babiker, Mirghani Hamza Ali, and Mohamed Ali Ahmed of the Agricultural Planning Sector; Elfatih A. Siddiq, the Deputy Undersecretary for Planning; Amar Mahmoud and Mohamed Adam of Administration; and Awad Abbas and Ali Awad Essied of Public Relations unit.

The Chairmen of the workshop sessions, Dr. Mohammed Kheir El Zubeir, First Undersecretary of Planning; Dr. Musa M. Musa, First Undersecretary of Agriculture; and Dr. Ibrahim Abu Ouf, First Undersecretary of Relief and Rehabilitation Commission have all done a superb job in conducting the sessions and guiding the floor discussions.

The discussants, Professors A. A. Abdalla and F. Atabani, devoted time and effort to review the research and present their points of view in the most effective way.

The participants of the workshop must be recognized and commended for their attendance, attention, and constructive dialogue. They constitute the top policymakers for the government and leading members of the academic community. Hence, we are sure that the views expressed, the concerns shared, and the consensus reached will be incorporated in present and future policy. We have, in fact, been assured by the Ministers of Finance and Economic Planning and of Agriculture, Natural Resources, and Animal Resources that the conclusions and recommendations of the workshop will be considered seriously by the government. We would like to extend our thanks for their presence and constructive contributions.

We gratefully acknowledge the financial support for the workshop by the Federal Republic of Germany, under the IFPRI project, "Famine Prevention in Africa."

Finally, we would like to thank Lynette Aspillera, Jay Willis, and Rajul Pandya-Lorch of IFPRI for their invaluable editorial and word processing support. However, they are not responsible for any mistakes or shortcomings of this document.

Elsayed A. A. Zaki  
Joachim von Braun  
Tesfaye Teklu

## DROUGHT AND FAMINE PREVENTION IN SUDAN

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### 1. WELCOMING ADDRESSES AND POLICY STATEMENTS BY SUDANESE GOVERNMENT OFFICIALS<sup>1</sup>

#### WELCOMING ADDRESS BY MOHAMMED KHEIR EL ZUBEIR

First Undersecretary for Planning  
Ministry of Finance and Economic Planning

Honorable Ministers; Excellencies; Ambassadors; Distinguished guests from IFPRI; International and regional development institutions; Honorable participants; Ladies and gentlemen:

I would like to welcome you on behalf of the Ministry of Finance and Economic Planning, and to express my thanks for accepting our invitation to participate in this important and timely food policy workshop.

I would also like to express, on behalf of the Government of Sudan, our appreciation and gratitude for the effort made by IFPRI since 1988 in addressing issues related to food policy in Sudan. These efforts have resulted in an important report on food policy, entitled Drought and Famine Relationships in Sudan: Policy Implications for Food Security. The findings of this research will be the subject of this one-day workshop.

Food policy is not a new concept. The history of mankind has recorded a number of policy guidelines relevant to today's food problems. History reports that Joseph, the prophet of God, was the first to draw a seven-year plan for cereal production, consumption rationing, and saving of crops in anticipation of a seven-year period of drought. Prophet Mohamed, "peace be upon him," laid down policy guidelines for food self-reliance; he said that nobody has ever eaten food better than food from the work of his own hands, and that David, the prophet of God, liked to eat from the work of his own hands.

In the course of our efforts to address food policy issues, reports have been produced by the EEC and the World Bank, as well as this report by IFPRI. In view of the recurrent drought in Sudan during the last two decades, IFPRI has conducted valuable research and has suggested a number of policies for addressing food problems in our country. Undoubtedly, the findings of this report, as well as the deliberations of this workshop, will assist the government in adopting an appropriate food policy.

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<sup>1</sup> Edited statements of transcripts from tapes.

**WELCOMING ADDRESS BY JOACHIM VON BRAUN**  
**Director of the Food Consumption and Nutrition Division**  
**International Food Policy Research Institute**

Excellencies; Distinguished participants of this workshop:

It is a pleasure for me to say a few words of welcome from the IFPRI side at the outset here.

I would like to remember that three years ago, the International Food Policy Research Institute and the Government of Sudan signed an agreement to do a study on food policy for drought-affected areas.

The questions asked three years ago, in light of the 1984/85 drought and famine situation, were three: Which population groups are most seriously affected?; How can they be most rapidly integrated into a productive growth process?; and, what policies could be most effective in coping with drought on a long-term basis?

As so frequently encountered in food policy, research on yesterday's problems provides some answers to today's problems. The rationale for this workshop, from our institute's point of view, is to learn from both good and bad experiences of the past.

I want to start with a note of thanks to the Government of Sudan for its continuous and sustained support and its excellent cooperation. Thanks also to our colleagues in the academic institutions and in the local administration, especially in Kordofan and Darfur, and in projects, such as the Jebel Marra, for their support and cooperation. This was central to the successful completion of this project. I also want to thank the donors of IFPRI. In this particular case, substantial financial support was provided by the Federal Republic of Germany, the Rockefeller Foundation, and FAO.

The specific agenda for the research project was, early on, set by a steering committee composed of distinguished members from the Ministry of Finance and Economic Planning; the Ministry of Agriculture, Natural Resources, and Animal Resources; the Relief and Rehabilitation Commission (RRC); and others. IFPRI posted three researchers in Sudan under the leadership of Dr. Tesfaye Teklu.

This research in Sudan is parallel to a similar research project in Ethiopia. They highlight IFPRI's attempt to learn from international comparisons of experiences. There is certainly scope for regional cooperation in food security.

We are increasingly coming to understand that food security problems are, in the first place, problems of households in poverty, and who lack the income to acquire food. Malnutrition is closely related to constraints in the health sector. The necessary condition for food security is enough food in the country; therefore, agricultural growth is absolutely key. The sufficient condition for food security, however, is that the poor people can get food. The discussion of the size of a "supply gap" and how it can be filled when drought hits is important. However, it addresses only half of the problem; the other half of the problem is poverty, because it is the poor who go hungry first and to the greatest extent. Filling the supply gap does not satisfactorily address the poor's food security problem.

This project, from our institution's point of view, is to enable both the government and IFPRI to learn jointly for the benefit of improved food policy. It is a search for solutions to acute and long-term problems on the basis of facts.

Mr. Chairman, Excellencies: I wish you and all of us a successful workshop.

**POLICY STATEMENT BY H. E. A. A. GENIEF**

**Minister of Agriculture, Natural Resources, and Animal Resources**

It is an honor and privilege to address this distinguished gathering on this important and urgent issue of drought and famine in Sudan. We are very glad to have these deliberations at a time when food security has top priority and is becoming a political commitment. This political commitment is manifested in our economic planning through the Three-Year National Salvation Economic Program, and is being implemented by our Ministry of Agriculture, Natural Resources, and Animal Resources in the different production systems.

This seminar is very timely because we are currently experiencing drought, which has adversely affected our production, especially in the rainfed subsector. Stemming from this political commitment for food security, we in the Ministry of Agriculture have started to realize and accommodate the socioeconomic changes, as well as the environmental changes, that have taken place in Sudan through the years and have affected the food production situation. We have to face, in a more serious and scientific manner, this vulnerable situation of food production in Sudan and to address the very strange situation in which we, a country of immense agricultural potential, experience deficit in food whenever faced by drought. We have to adjust our policies to reach a stable base for food production. Sudan is very much qualified to achieve this.

We welcome this seminar as an input in this very important discussion for streamlining our resources and policies, and for reaching a plan of action to ultimately attain food security.

We have started reacting through policies and have begun to set our priorities accordingly. To start with, we have placed great emphasis on food crops and have already made some progress in this direction; wheat is an example of this thrust. When faced with signs of drought, we expanded sorghum production in the irrigated subsector, where we could plant more than one million feddans of sorghum. If we could have fully executed our plans of implementing all of the technological package on irrigated sorghum, we could have produced enough sorghum, only from the irrigated subsector, to satisfy local consumption in Sudan.

We are also looking seriously at areas that have been continuously hit by drought and have been very vulnerable with respect to production. These areas include northern Kordofan, Darfur, and eastern Sudan. In order to create a sustained system of production in these areas, we have put greater emphasis on an irrigated system of production, especially in those areas endowed with valleys and underground water and capable of sustaining continuous and perennial irrigation for different crops.

We are very concerned with integration of livestock and diversification of food crops, especially in the irrigated subsector where we can better utilize resources. This concern is exemplified by our encouragement of animal production in the different production systems, especially in the irrigated subsector. Diversification, to us, is a better policy for securing food production, not only at the regional level but also at the provincial and district levels. We have even promoted diversification in the irrigated subsector in the Northern Region, so we can produce an array of crops rather than concentrating on one or two cash crops. This is a better policy for securing food production in remote areas.

Another area of concern is with vertical expansion of production. Looking at the low yields that we are getting both in the irrigated and rainfed subsectors, we have begun concerted efforts for raising the level of productivity per unit area for all these systems. We have to balance agricultural production in the rainfed subsector with that in the irrigated subsector. We are not aiming only at food self-sufficiency, but also at creating a stable base for exports, because the variation that hits the production of food for local consumption also affects exports negatively. This is a real challenge, but our policies so far have made progress and have given us very good indications for needed action.

We expect you, through your deliberations, to help us in our endeavor to end a very unstable and vulnerable situation of food production, especially in the irrigated subsector. We would like to mention that we look upon relief activities as an input in this direction, rather than just a relief effort at a time of emergency.

We would also like you to consider, judging from the continued drought effects that hit certain areas in different seasons and from the degeneration of the environment in these areas, if it is time that the displaced population be resettled in more productive areas, whether in irrigated subsectors or in areas in the southern part of the rainfed zone.

I would like to reiterate my thanks and appreciation to the organizers of this seminar and to you as participants. My special thanks to the representatives of IFPRI. Thank you all.

**POLICY STATEMENT BY H. E. ABDELRAHIM M. HAMDI**  
**Minister of Finance and Economic Planning**

I would like to add my voice to that of my colleagues in welcoming all of you, especially the distinguished guests from IFPRI as well as the representatives of the foreign donor community.

To start with, I would like to make some basic points. Our commitment for self-sufficiency has been elaborated by my colleague, the Minister of Agriculture. This is a real and very serious challenge and it is the cornerstone of the National Economic Salvation Program, which is a very comprehensive package of policy measures. This program has brought agriculture back to the map in Sudan.

Agriculture is now the engine of growth in Sudan. I can report with confidence from my own experiences and those experiences related by my colleagues, who have been traversing the length and breadth of Sudan, that this insistence has now been brought to bear on the imagination of the Sudanese people; the rush towards agriculture is now very real. This causes us some worry, because we have to meet an increasing demand for inputs for the coming season and the seasons thereafter; nevertheless, it is a gratifying conclusion.

With regard to the macroeconomic policies which are the context of this report, I would like to remark and elaborate on a few points. We have freed prices of all agricultural products and exports. We have also done so in the trading and importation sector. In this regard, we are now pursuing a very realistic pricing policy. You might have noticed that we have not interfered administratively in suppressing the price of sorghum, the main staple food, even when it reaches very high levels.

We have moved agricultural financing to the commercial banks to ensure that it is based, conducted, and administered on a sound commercial basis. There is already a syndication of £S2 billion for financing the agricultural parastatal, which will be raised to £S3.5 billion by the end of 1990/1991. This is something very new to Sudan. In order to further enhance investment in agriculture, the social security organizations, which have accumulated savings, have been instructed to reformulate their investment portfolios to put agriculture in the forefront. These organizations are currently considering their investments and are being reviewed by the Economic Committee. To encourage investments in agriculture, we are setting up a corporation to guarantee investments in agriculture.

Another major policy measure is to make agricultural credit available. We have announced a program of £S1 billion and are happy to say that, in fact, the budgetary allocation has spent approximately one-third of this. A few days ago, we agreed with the commercial banks and the Agricultural Bank (ABS) on arrangements to make available the remaining two-thirds for the ABS, in addition to direct investment by commercial banks on agriculture and animal production.

We have freed the banking ceiling for agriculture completely. Now, commercial banks can finance all agricultural- and livestock-related activities outside their credit ceiling. We have also increased ABS capital by £S50 million and are undertaking measures to increase ABS capital to £S500 million by the end of the program. ABS is undergoing a real revolution in following government policies, by expanding branches and trying to meet new demands for agricultural credit.

It is the policy of this government to try to address the exchange rate issue, which is a darling topic of donors. We have been doing this without very much noise. We have completely floated the Sudanese pound to meet the import bill, including some of the most important inputs for agriculture such as lubricants and most of the agricultural implements coming through the commercial investment policy. We have been moving agricultural products and other items from an exchange rate of £S4.5 per U.S. dollar to £S8 and £S12 per dollar. We have moved all imported cotton inputs to £S8.5 per dollar and we have moved some of them, like jute material and agricultural implements, yet up to £S12 per dollar. Hence, it is not a matter of simply announcing something; we are doing it almost on a daily basis.

My colleague, the Minister of Agriculture, has already told you about some of the steps related to the long-term policy. The Minister of Irrigation deserves special mention here; he is pumping blood into the arteries of the country and making available water in the long- and short-terms. We are currently addressing the question of heightening the Roseries Dam, which will be a crucial undertaking for future expansion in irrigation and will have special significance for our food policy.

The national road network is vital for agriculture. The road construction program includes finishing Damazin and further extending it to Kurmuk area. We are also starting to construct the Peace Highway to the south and the great Western Salvation Road which will link Sudan to Libya.

The agricultural mix is being considered, particularly the role of cotton. In the past, we have followed some wrong advice, going for planting only cash crops and aiming for exports and repayment of a very hopeless debt burden, which everybody knows cannot be paid. This question should no longer be addressed in the same way. In the intervening time, we still have to cope with some of the results of this past advice and we have to continue to import food. We have been importing food

grains at considerable foreign exchange costs to our economy during the last five or six years. As a government, we will continue to import; it is our responsibility, much more so this year because of our increased food shortage. We are already negotiating for supply credit on commercial and concessionary basis from many possible suppliers. We have also declared that we will accept help from foreign donors, governmental or nongovernmental, on a grant basis. However, we will still give priority to supply credit.

The government intends to play a more positive and leading role in the distribution of food to the people this year. We definitely do not want a repetition of the 1984 example of distribution. We do not need any more posturing or imagery. We need the work to be done in an orderly and dignified manner. We have the institutional capacity and the mechanism for planning and distribution on a joint basis between the foreign donors and the government agencies. We welcome a continued and active cooperation in this matter on national and provincial levels. As far as grassroots distribution is concerned, we intend to keep this and to make it basically a domain for the Sudanese, whether they are government employees or otherwise. The donors can be assured that they will have full opportunity to follow up their operations at the grassroots level in an orderly and dignified manner as suggested.

Finally, I wish to reiterate once more the basic policy of this government: self-sufficiency in food and the redirection of more resources to attain this aim. We hope to attain this aim in the very near future and have 1991 registered in the annals of history as a watershed year for this effort. We want and definitely hope to get out of this vicious circle of reaching out for handouts.

I would like to confirm that we will give special consideration to the deliberations of this workshop. We hope that this workshop will come out with very practical recommendations and sound advice. I would assure you of vigorous implementation of such recommendations, and I welcome many more. Thank you very much indeed.

## 2. RESEARCH FINDINGS AND COMMENTARIES

### **DROUGHT AND FAMINE PREVENTION POLICY FOR SUDAN: AN OVERVIEW<sup>2</sup>**

**JOACHIM VON BRAUN**

**International Food Policy Research Institute**

#### Introduction

Four points will be addressed in this overview: the drought record and effects of drought on production; the evolution of the food security and nutrition problem during the mid-1980s and its link to drought; market and price policies under the threat of drought; and a synthesis of famine prevention and relief policies. In conclusion, five policy priorities for famine prevention will be presented.

#### Drought Record and Effects

A secular trend of decline in rainfall levels appears to prevail in Sudan: Mean annual rainfall declined by 6.7 percent between 1960-69/1970-79 and by 17.7 percent between 1970-79/1980-86. Furthermore, year-to-year fluctuations in rainfall also seem to have increased over the 26 years of observations. These tendencies require a serious consideration of policies for public food stocks, grain trade, production technology, and rural services and infrastructure.

The declining trend in rainfall levels is one reason for low growth in cereal production, largely mediated through short-run impacts on yield. Drought-production relationships show that a 10 percent drop in annual rainfall from mean levels implies a 5 percent drop in cereal production and a 3.7 percent drop in yield at the country-level. Sorghum yields turn out to be more affected by rainfall declines than millet.

Drought, food prices, and food production are in a complex dynamic relationship: Drought in this period increases prices, which, in turn, leads to area and, possibly, output expansion the next year. These relationships show that, after correcting for next year's rain, sorghum output, for example, increases 5.2 percent for a 10 percent increase in price, lagged one year. Decreases in the relative price of sesame, a competing crop, also encourage farmers to shift to sorghum production.

Markets for cereals are thin and very responsive to production changes. Deflated (real) cereal prices increased more than three times in the main drought year of 1984/85 compared to 1982/83. Our related time-series analysis shows that a 10 percent drop in production leads to an approximate 20 percent increase in real prices of cereals in the same year.

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<sup>2</sup> This presentation draws on T. Teklu, J. von Braun, and E. A. A. Zaki, Drought and Famine Relationships in Sudan: Policy Implications for Food Security, IFPRI, Washington, D.C. 1990.

Food insecurity and famines, such as in 1984/85, have multiple causes. Drought is not the only cause, but is merely a triggering factor when other factors are also present. This is evident when we look at the food security and nutrition problems in more detail.

#### Food Security and Nutrition Problems

A famine prevention policy needs to take account of information on the food situation at both the country and household levels for proper planning of effective interventions.

Cereal food availability declined notably in the late 1970s and the early 1980s, dropping by an average of 1.4 percent per annum between 1970-1986. Average per capita cereal consumption dropped from a high of about 160 kgs in 1977/78 to about 120 kgs in 1984 (see figure in Policy Brief No. 3 in Annex 1). Regional shortages are not highlighted by these developments, but, when less than 140 kgs are available on a per capita basis, the situation tends to get very critical at the national level. The decline in cereal food availability was largely due to low growth in domestic production relative to population growth. The drought year of 1984 contributed to the largest annual drop in cereal consumption. Clearly, national self-sufficiency is a questionable goal when it is achieved at low levels of supply and demand equilibrium.

The incidence of aggregate decline in consumption was uneven across socioeconomic groups. In a period of food scarcity, the burden falls heavily on low income households which spend a large share of their income on food. For example, households in the bottom quartile of the income distribution in North Kordofan allocated about 70 percent of their budget to food, compared to 55 percent by the top quartile households. Income changes cause more consumption adjustments among poor households because of their large food share in income and greater need to adjust to changes in income and prices.

When drought hits, incomes decrease and prices increase. Declines in income lead to decreases in food consumption: a 10 percent drop in income translated into a 4 percent decline in calorie consumption. Food price increases—holding income constant—also lead to decreases in calorie consumption: a 10 percent increase in the price of millet results, on average, in a 3 percent drop in calories consumed.

Nutritional status records of 1985 indicate failures on the part of many households in coping with severe food shortages. Anthropometric indicators show an increased proportion of malnourished children in mid-1985. A set of child nutritional determinants is derived from an analysis of 30,000 children covered by a 1986-87 nationwide survey conducted by the Ministry of Health. Analysis shows that cutting back from 3 to 2 meals increases child malnutrition by 18 percent in these households. Even in 1986/87, 14 percent of children were in households which had only 2 meals or less per day. An improved health environment and access to health services substantially contributes to better child nutritional status. Parent's education, especially mother's education, positively impacts on child nutrition. In fact, mother's literacy increases child nutrition by more than twice as much as father's literacy. Clearly, investment in human resources in the most basic sense, that is, through improved nutrition and education, mutually reinforce each other.

### Market and Price Policy Under Drought Threat

Cereals are the staple diet of the population. Cereals are closely linked to livestock in another important manner for household food security: livestock is traded for cash to obtain food and other household necessities. Hence, movements in the price relationship between cereals and livestock (that is, their terms of trade) represent a significant indicator of purchasing power of the rural population. Domestic cereal/livestock terms of trade increased drastically from 1 in 1980 to about 8 in 1984/85, as a consequence of the drought. Thus, to acquire the same volume of cereals, up to 8 times as much livestock had to be offered in 1984/85 relative to 1980. A similar deterioration was observed in late October, 1990. Further analysis shows that a 10 percent drop in cereal production tends to result in an 18 percent increase in cereal/livestock terms of trade. These combined production and price effects resulted in food consumption failure and undernutrition for large segments of the rural population (see figure in Policy Brief No. 2 in Annex 1). Prevention of short-term price explosions such as occurred in 1985 go a long way toward prevention of increased undernutrition. At that time and now again, domestic food prices far exceeded international prices because of limited integration into the international trade regime.

Markets operate and transmit price signals across regions. Thus, even as the direct drought effects are particularly severe in drought-prone areas, the price effect hits the poor everywhere. However, poor market connections preclude markets from clearing at acceptable price levels, due to high market transaction costs. A sample of market areas shows that the share of transportation costs ranges between one-fourth and nearly one-half of total marketing costs. This largely arises from the poor road network.

The large price-controlled subsidized bread program, which should be viewed within the context of resulting interregional disparities, mostly reached urban households. Rural areas hardly received any share of the bread subsidy. Little reached the urban population in the drought- and famine-prone areas. Aggregate data from 1987 show that bread consumption constituted only 10 percent of rural household cereal consumption whereas it amounted to 44 percent for urban households. The rural population paid the full market price (or opportunity cost in case they produced their own grain) for their grain consumption.

### Famine Prevention and Relief Policies

The experience of 1984/85 demonstrated the strong link between drought and famine in Sudan. An efficient response for dispelling the danger of a drought turning into famine requires political commitment, a legal framework, and administrative capacities. A famine prevention strategy consists of several components:

1. Political stability is a prerequisite for famine prevention for three fundamental reasons. First, the already large displaced rural population is unproductive and much dependent on food aid. Second, large areas with adequate rainfall and high productivity, especially for food grains, are increasingly inaccessible due to instability and conflict, which results in lost opportunities for increasing grain production and rural employment, and, hence, for reducing vulnerability to food insecurity. Third, valuable financial, human,

and administrative national resources are diverted from economic development and investments.

2. Political stability can be enhanced by active rural participation: rural people can form their own institutions to identify and propose solutions to their problems, including food supplies, and commit resources towards meeting the costs involved. With decentralization and operative rural institutions, stability would be enhanced. India's famine prevention policy success mainly rests with local governments, not with the central government.
3. A meaningful famine prevention strategy should include macroeconomic policies in favor of efficient resource allocation and sustained economic growth. An open trade regime should lead to a significant improvement in the rural-urban terms of trade. Control of inflation is crucial for economic and political stability since inflation costs are borne by the poor, particularly rural people.
4. Policies for sustainable agricultural production need to be developed to promote agricultural production to attain regional and national food self-reliance, enhance employment and income generation, and conserve, rehabilitate, and improve natural resources.
5. Infrastructure development is a critical component in the promotion of a stable and sustainable rainfed agricultural sector. A reduction in transportation costs provides improved opportunities for mobility of goods and people, facilitates expansion of market outlets, and enhances market integration. An expansion of the transportation network also facilitates access to services (health, education, potable water, and so forth) which contribute to improving productivity and, consequently, increasing income generation capacity and improving nutritional status. Public works programs are instrumental in the expansion of rural road infrastructure. Moreover, the labor participating in these programs would come from low-income rural families and would normally spend a large share of their income on food.

In summary, the design of an effective famine prevention strategy rests on increased food production, increased employment and improved incomes of the rural population, an expanded infrastructural base, and protection of the resource base for ensuring sustained production.

Besides a famine prevention strategy, a strategy for meeting emergencies and providing relief when needed is crucial. With respect to policies for emergency preparedness and relief, it is, of course, obvious in the first instance that the less the success achieved in prevention, the more the need for relief. The focus of a relief strategy should be on short-term stabilization of incomes and prices and maintenance of basic health services. One of the lessons from the experience of 1984/85 is that the key challenge is to not only meet the food gap but to jointly fill the employment gap of the poor. Employment is the key now, as is asset rebuilding. It must be stressed that 1991 is not 1985: household capacity to cope has never recovered in many of the households since the 1985 selling of valuable assets by the poor.

Actions are needed to increase the level of preparedness to meet emergency situations of localized or nationwide food shortages and famines. These include:

- public commitment to intervene effectively and in a timely manner,
- building of institutional capacity at national, regional, and local levels,

- detection and diagnosis of distress indicators, and
- execution of development and relief undertakings in times of revealed needs.

### Conclusions

A concrete proposal on legislation for famine prevention is presented in conclusion. For relief institutions to operate efficiently, a well-structured relief legislation needs to be designed that would incorporate the basic relief policies to which the government is fully committed. India has been a pioneer in this area. Sudan had some elements of such legislation earlier this century. Such relief legislation would embody certain functions:

1. Detail the responsibility of the national and regional governments and the local authorities in identifying and declaring areas under famine risk.
2. Allocate responsibility to each vulnerable locality to maintain a certain amount of grain emergency store in accordance with a timetable drawn on the basis of requirements, with a declining balance as the agricultural production season advances and a building up in the same manner.
3. Under such law, specific actions would include rationed food distribution and actions through the health system, especially for children and mothers. As an important component, local authorities would implement public works activities to provide useful employment to potential famine victims, thereby reducing pressure to migrate to cities or camps. Such public works would focus on infrastructure and resource improvement, and thereby establish an explicit link between famine relief and famine prevention.

In crises, it is always felt that everything is necessary and nothing is possible. That's the very nature of crises. To overcome that, a narrow set of priorities is needed. A set of policy priorities for famine prevention would include:

1. Political stability, that is, end of wars;
2. Strengthening of local governments, especially decentralization in relief and rehabilitation;
3. Macroeconomic policy reforms, especially of exchange rate and pricing policies, and the control of inflation;
4. Promotion of sustainable growth in the traditional rainfed agriculture subsector through:
  - expansion of rural infrastructure with labor-intensive public works programs;
  - increased input supply, with scope for private sector involvement;
  - promotion of adaptive research, technology, and extension; and
  - protection of the environment.
5. Emergency preparedness and relief policies, including:
  - regional buffer stocks for supply stabilization;
  - improved relief management capable of early response;
  - strengthening of rural health and sanitation; and
  - comprehensive legislation for famine prevention.

**MACROECONOMIC POLICY PERSPECTIVES FOR FAMINE PREVENTION: COMMENTARY**

**FAREED ATABANI**

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The report, Drought and Famine Relationships in Sudan: Policy Implications for Food Security, prepared by IFPRI, outlines the macroeconomic framework against which the subsequent discussion and policy issues are to be viewed. The report clearly reviews the performance of the Sudanese economy during the 1970s in an attempt to identify the major causes for the problems that have plagued the economy for the past decade and a half. The report also reviews the reform programs that were adopted by the Sudanese Government to tackle these problems and to put the economy on a more growth oriented path. The report evaluates the effectiveness of these reform and recovery programs, and reaches the conclusion that these efforts failed and that the recovery programs were ultimately abandoned due to their failure to ameliorate the worsening economic situation of the country.

As a result of the abandonment of the coordinated approach to reform and the increasing reliance on ad hoc measures in response to crises, the economy was left with significant cost/price distortions that have continued to affect not only the quantity but also the quality of investments. As a consequence, economic reform and recovery are no less urgent at the present time. If the economic decline is to be reversed, resource allocations are to be improved, and a more conducive macroeconomic environment is to be established. This is imperative since the alternative is further economic deterioration, inflicting even more hardships on the vast majority of the Sudanese people, and further suffering brought about by increased vulnerability to droughts and famines.

The first and most important objective of the macroeconomic policy reform is to stabilize the economy, that is, to control and reduce the high rates of inflation, since macroeconomic stability is a prerequisite for economic development. Although the policies necessary for stabilizing the economy may not be easy to implement, there is no mystery as to what they are: noninflationary monetary policy, its fiscal counterpart, and tight control of public finances. In addition, it is essential to couple these measures with an open approach to trade.

In order to generate a noninflationary environment, and hence, improve the efficiency of resource allocation, it is essential to effectively and firmly control monetary expansion and take steps to increase the supply of goods and services in the economy. To do this effectively, economic policy must address the growing budget deficit, currently around 11 percent of GDP, which has been, by and large, financed through monetary expansion. This would require, first, the adoption of policies designed to enhance the resource mobilization capacity of the Government through:

1. Strengthening the tax administration so as to effectively collect existing taxes; and,
2. Reform of the tax structure;

and second, the restraint of government expenditures through:

1. Introduction of tight budgetary control; and,
2. Reduction and elimination of extra-budgetary expenditures; to the extent that extra-budgetary expenditures are related to the conduct of the war in the South, a quick end to that war will have substantial beneficial effects on resource allocation.

The second policy leg of economic stability is the expeditious increase in the availability of goods and services to the economy through enhanced capacity utilization and increased imports. This

would require substantial decontrol of prices and significant moves towards liberalization of the economy, resulting in increased inflow of foreign exchange resources. However, such increased levels of inflow can only come about as a result of reform of the exchange rate and trade regimes.

A meaningful and sustained reform of the exchange rate is central to the total stabilization package. It is, perhaps, important to spell out what is meant by exchange rate reform. It means, in the first instance, the consolidation of the present multiplicity of exchange rates into one realistic and market-determined exchange rate, and second, but no less important, an assurance of a continuous adjustment of the exchange rate, such that the real effective exchange rate does not appreciate over time, that is, in effect, it means to float the exchange rate. This would generate enough incentives for producers to produce and export products without the need for subsidies.

The importance of the exchange rate reform cannot be over-emphasized since, in one way or another, it plays an important role for all other aspects of macroeconomic policy. It plays a crucial role in the effectiveness of fiscal reform through its effects on customs duties, expenditure control, and monetary expansion. It has a direct effect in stimulating exports and attracting inflows of worker remittances, thereby enhancing the import capacity of the economy. This should be strengthened by reform of the trade regime, for example, by effectively and irrevocably abolishing export licensing and minimum export price setting as well as removal of all other administrative controls or directives affecting exports. This should be accompanied by substantial liberalization of import regulations and a move away from quantitative restrictions and towards more use of import tariffs. Abolition of marketing boards, export and other trading monopolies are part and parcel of trade liberalization.

Once this unified and market determined exchange rate is adopted, it should then be used to translate international parities into local prices for both producers and consumers. It has to be emphasized that international parities are the most important opportunity cost facing the economy. It is only through reliance on such parities that the present built-in consumer bias in prices and incentives can be neutralized and more remunerative producer prices and incentives be generated. It is also the only effective way to deal with the current bias in favor of capital intensive production methods and technologies which reflect neither the resource endowment of the country nor its comparative advantage. This should go a long way towards correcting the adverse rural-urban terms of trade, creating more jobs, particularly in the rural areas, and enhancing the returns to rural labor.

Looking back at Sudan's previous experience with economic reform efforts brings out some of the conditions that must prevail if such a stabilization program is to succeed. As the IFPRI report and other studies make clear, past efforts at reform failed mainly because policies were not implemented in a consistent and coherent manner. The 1978-84 reform programs were implemented in an uneven manner and characterized by ad hoc policies implemented at times of crisis with little or no consistency of approach.

Reform measures must be viewed as one package whose various elements support and reinforce each other. Once adopted, therefore, the reform package has to be implemented in its totality in a consistent and coherent manner. Partial implementation is not only unlikely to yield the expected results but can be counterproductive, and it may even happen that economic reform comes to be equated with economic hardship and dislocation.

Past experience indicates that economic dislocations can only be corrected through changes in economic policies. Previous government policies dealing with inflation have invariably taken the form of more administrative controls and price-fixing. The history of the past few years indicate that such attempts have proved futile, and have merely succeeded in reducing profit margins and creating scarcities in the official economy with a corresponding widening of the underground economy, where scarcity rents accrue to those operating in that economy. Administrative regulations and price controls do not reduce aggregate demand, they merely adversely affect resource allocation.

Effective implementation of such a stabilization program would correct the price/cost distortions, enhance both the level and quality of investment, and create more employment opportunities in sectors that were previously neglected because of inappropriate pricing policies that had an urban and/or capital intensive technology bias. In short, the reform efforts would create a macroeconomic environment that would allow the transmission of undistorted price signals to producers and allow them to react in a market-determined manner, thereby placing the economy once more on a growth path.

All this, however, presumes that the supply relationships are not fixed and that economic agents do indeed behave in a manner such as to maximize their returns. It is one of the basic assumptions of microeconomic theory that economic agents respond to a change in price by substituting one good for another and that workers respond positively to changes in incentives. These assumptions have, at varying times, been challenged in some quarters. However, both statistical and anecdotal evidence in Sudan and elsewhere conclusively show that economic subjects do indeed behave in the way economic theory predicts. If more evidence is needed, the IFPRI report provides it. The report shows that supply elasticities are not only positive but are significantly so. This applies equally to own elasticities and substitution elasticities. This is an important aspect of the report upon which much of the discussion rests. In this case, it becomes a prime objective of economic policy to support and enhance such positive responses, primarily through a reorientation of public investment. In other words, the stabilization program set out above would need to be further advanced and strengthened by appropriate changes in the direction of public investment.

A critical examination of public investment—as reflected in development expenditures—reveals that it has not only been inadequate in quantity, but has also been poor in quality. To improve its quality, public investment has to be directed towards the sectors that reflect the country's resource endowment and its comparative advantage. It is only when this is done effectively and consistently that the long neglect of traditional agriculture, whose effects the IFPRI report discusses at length, can be corrected for and the severity of drought and famines can be moderated. Growth of the traditional agricultural subsector, coupled with reduction of the wide fluctuations of such growth, will raise the incomes of lower income groups and, hence, render them less vulnerable to the most devastating effects of droughts and famine.

Once the current bias towards the irrigated subsector and capital intensive mechanized agriculture is corrected, more public development expenditures should be allocated to enhance the growth prospects of rainfed traditional agriculture. This can be achieved in two ways. First, public policy should aim at providing stronger and well-targeted services, particularly research, extension, credit, and vital information services on markets and prices, to traditional agriculture so as to improve technology and incomes. Second, the infrastructure serving the traditional

agriculture subsector should be greatly improved. Improved roads are vital, since adequate road communications not only reduce transport costs but make for more integrated and competitive markets. Indeed, due to the very poor state of rural roads, transport facilities do not exist during parts of the year, severely dislocating the production process and increasing the vulnerability of many regions to the vagaries of famine. Simple road improvements would show high rates of return both in financial and economic terms. There is no mystery in all this, and comments of this nature have been made repeatedly over the past decade and a half, in a variety of reports in Sudan. In addition, policy packages for the sustained development of traditional agriculture have been advanced in a number of reports.

In closing, one can only reiterate the conclusion of the IFPRI report, that it is only by strengthening the economic base of the rural population, preventing market failures, and protecting the environment, that the incidence of famine can be averted in a sustained way.

**HOUSEHOLD EXPERIENCES WITH THE 1984/85 FAMINE AND POTENTIAL FOR PUBLIC INTERVENTION:  
AN OVERVIEW<sup>3</sup>**

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Introduction

My presentation will focus on household coping experiences in the early 1980s, especially in Western Sudan. The principal features of such a coping process will be highlighted and public intervention programs will be studied for their potential impact on household coping capacity. This presentation largely reflects field work carried out in North Kordofan (El Obeid, Um Ruwaba, and Bara Districts).

Sudan's experience in the 1980s shows that drought can trigger a severe food crisis in marginal agricultural areas and it is worst in areas of weak community and public support. How do households cope in such a high risk environment? Available evidence shows that households follow a coping process which involves:

1. Promotion of the income and asset base to establish and/or strengthen their coping capacity;
2. Diversification of the production, income, and asset base to minimize losses in times of risky situations; and
3. Adoption of planned responses when such risky situations develop. Households choose responses (actions) which satisfy their goal of family maintenance with the minimum adverse impact on their income and asset base (Figure 1).

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<sup>3</sup> This presentation draws on T. Teklu, J. von Braun, and E. A. A. Zaki, Drought and Famine Relationships in Sudan: Policy Implications for Food Security, IFPRI, Washington, D.C. 1990.

Figure 1—Time path of coping responses

Source of Adjustment	Stage of Responses		
	Early	Intermediate	Final
Production	Change in cropping and planting practices Increased nonfarm home production	—	—
Labor	Migration in search of employment Shift to petty trade	Migration in search of employment (intensified in face of falling expected wage rate) Separation of family	Distress migration Separation of family (possibly permanent)
Assets/capital	Sale of small stock (liquid, easily reversible) Sale of large stock (nonessential)	Sale of productive assets (livestock, tools, land) in depressed market	—
Loans/transfers	Use of interhousehold transfers and loans	Credit from merchants and moneylenders	Donation (relief assistance)
Consumption	Switch in expenditure/dietary composition Reduction of current consumption level (cut in frequency and/or lower size per meal) Adjustment in intra-household allocation	Reduction of consumption level (greater dependence on market)	Reduction of consumption (survival is threatened)

### Coping Experiences in the 1980s

Our survey work in North Kordofan villages indicates a notable pattern of behavioral responses and outcomes:

1. Farmers adopt multiple paths of responses that involve production, income, consumption, and asset substitutions. For example, production responses can involve changes in cropping patterns, input uses, and planting practices. Labor can move out in search of wage employment or can migrate with herds to distant pasture. Assets, livestock in particular, can be disposed of to avoid income failure. Diversification of income sources is part of the coping strategy (Table 1).
2. Households vary in their choice of emphasis among these strategies. Even within the same strategy, for instance, livestock disposal, it is possible to find some households disposing of small and nonessential large stock, which is a reversible strategy, while others are disposing of productive animals, which is a less reversible strategy. In general, however, households prefer to avoid action that would endanger their future survival (for example, they avoid disposal of primary productive assets).
3. Success in coping, however, varies across households because of unequal income and asset bases, and unequal access to community risk-sharing networks and public support. Famine affects socioeconomic groups differently and the poor are likely to be hit hard.
4. The extensive coping strategies adopted in the early 1980s greatly diminished the income and asset position of the rural population. In our survey villages, for example, per capita herd size dropped by an average of 86 percent between 1983-1985. Recovery in the coping capacity of the rural population has been slow since 1985 because of:
  - a. continued recurrence of crop failures and a decline in crop productivity, which translate into low and variable income;
  - b. high cost of replenishment of livestock and continued reliance on livestock to protect consumption level; and
  - c. greater dependency on highly volatile markets for purchase of grain, and sale of labor and assets.

Frequent occurrences of drought have thus precluded households from restoring their lost coping capacity. The indigenous coping capacity may not be sufficient to withstand the looming food crisis without effective public support.

### Role of Public Interventions

What role can public intervention programs play in recovering and strengthening private coping capacity, that is, in improving the income and asset capacity of the rural population (first goal), and in protecting it in times of crop failure threat (second goal)? The potential contributions of five ongoing intervention programs towards these two ends will be highlighted in this section.

Case 1: The Gum Belt Project. Gum belt trees play a central role in maintaining the agro-ecological balance in an otherwise delicate and fragile ecological zone. These trees also contribute to improvement of crop productivity and thereby increased income from crop production.

Table 1—Percentage share of income sources by income and sex specific groups, 1988

Income Source	Whole Sample	Income Group			Headship	
		Low	Medium	High	Male	Female
Crop and crop products <sup>a</sup>	30.0 (100)	25.4 (100)	33.4 (100)	29.5 (100)	31.8 (100)	24.0 (100)
Gathering products	14.5 (97)	21.4 (96)	17.0 (96)	11.4 (98)	13.9 (99)	16.4 (91)
Livestock products	13.5 (95)	14.2 (90)	13.8 (98)	13.2 (96)	13.6 (96)	13.5 (91)
Handicrafts	2.6 (66)	4.6 (75)	2.7 (70)	2.1 (54)	2.4 (62)	3.5 (77)
Trading	4.9 (17)	1.1 (6)	1.5 (13)	7.6 (33)	5.8 (17)	2.3 (17)
Farm wage income	6.6 (70)	8.9 (77)	7.7 (74)	5.4 (60)	6.9 (72)	5.9 (68)
Nonfarm wage income	3.5 (18)	3.7 (17)	5.1 (19)	2.6 (17)	4.6 (25)	0.3 (2)
Transfers	15.5	11.6	9.7	19.5	12.0	26.0
Remittance <sup>b</sup>	8.5 (50)	4.3 (48)	4.3 (36)	11.8 (65)	7.0 (43)	13.1 (66)

Source: IFPRI survey, 1989.

<sup>a</sup> Figures in parentheses refer to percentage of participating families.

<sup>b</sup> Remittance is also included in transfers.

Gum production steadily declined in the 1980s, reaching its lowest point in 1984. This decline was the result of a combined decline in tree density and productivity; the latter largely due to drought.

A joint UNDP/GOS project was begun in 1981 to halt degeneration of the environment. The program delivers seedlings, technical advice, subsidized water, and food rations (an illustration of a productive use of food aid). Farmers who have a permanent residence, access to land, and working members are eligible to participate.

By mid-1989, the project covered 12,000 farmers in nearly 300 villages (Table 2). Demand for enrollment is increasing, but because of limited project resources, the project allows only one member per family, and has applied a de facto fixed quota per village (that is, entry barriers). However, project reports indicate a low level of production performance, primarily due to a low survival rate of trees (57 percent of recommended rate).

Our studies in El Obeid and Bara villages show that:

1. There are sizeable variations in production parameters across farms and villages;
2. Project fields have a relatively high tree density, compared to traditional hashab fields (Table 3); and
3. Food ration is the only significant source of variation between the income sources of participants and nonparticipants. The incorporation of food in the project has probably contributed to a large increase in the demand for project enrollment.

With the presence of food in the incentive package, prospects of improved gum price, and increased awareness of the need for preservation of the environment (difficult to perceive, however, if poverty persists), the demand for participation will continue to rise. In order to reach a greater coverage and population, the program may have to revise its present strategy, by:

1. moving towards a low tree density strategy;
2. modifying the modality of the current project operation, for example, by moving to a "model" farmers approach or shifting to a village nursery approach;
3. linking food rations to task measures of output during the pre-production phase;
4. including a credit component in its package to protect income of the project participants; and
5. devising a mechanism to bring "the asset poor" into the project.

Case 2: The Jebel Marra Program in Darfur. The extension of improved technology by the Jebel Marra Rural Development Program has enhanced the production as well as employment absorption capacity of the Jebel Marra area in recent years.

The Jebel Marra area experienced less than usual rainfall in the early 1980s, as did much of Western Sudan; the lack of rainfall was severe in 1984.

Typically, farmers from North Darfur come to the project area during the harvest period in search of employment. In 1984, a large number of refugees came to the area from places that were severely affected by the drought (North Darfur and Chad). By early 1985, the refugee population represented 23 percent of the settled project population. Eighty-three percent of these migrants picked the fertile lower valley, which experienced a significantly better grain harvest than other zones.

Table 2—Gum Arabic project participation

Year	Number of Villages	Number of Farmers	Farmers per Village	Seedlings Produced
				( '000)
1981	25	673	27	990
1982	27	756	28	1,100
1983	29	915	32	1,240
1984	39	1,479	38	1,840
1985	46	1,651	36	2,375
1986	37	2,107	57	2,849
1987	39	2,172	56	3,090
1988	30	1,765	59	3,320

Source: Department of Forestry, El Obeid office.

Table 3—Density, farm size and yield for low and high density farms

	Gum Belt Project		Traditional Hashab Garden (GENENA)
	Low Density	High Density	
Trees/hectare	173	332	110-140
Fare size (hectare)	2.9	3.2	4.4
Yield (lbs/tree)	0.75 <sup>a</sup>	2.3 <sup>a</sup>	2.3-3.5-2.5 <sup>b</sup>
Fraction of gum-producing trees/year <sup>c</sup>	0.13	0.30	n/a

Source: IFPRI Survey, 1989.

<sup>a</sup> Mean yield of a young tree.

<sup>b</sup> Yield varies by age of tree; low in young age (6-8 years), peaks in middle age (9-12 years) and then drops in later years (13-18 years). No consensus has been established whether the yield in old age is higher or lower than young, even though most tend to suggest the older trees yield better.

<sup>c</sup> 50 to 60 percent of trees are tapped on average every year.

All villages experienced a drop in grain production, but villages that had access to modern inputs through extension services experienced smaller declines. Within the participating villages, households in the project achieved a higher grain output per capita and managed to produce enough to meet minimum calorie needs (Table 4). Those without access to modern inputs produced less and had to manage by adjusting household size through adult male out-migration. Coping was much easier for those participating in the project.

Case 3: Cooperative-Based Credit Program. The Agricultural Bank of Sudan (ABS) initiated a cooperative based credit program in El Obeid district in 1981/82, which caters primarily to meeting the credit needs of small farmers in the rainfed agricultural subsector. Membership is open to resident farmers who are over 18 years of age, have access to land, and an established credit record. ABS provides targeted short-term loans to finance current production costs and storage.

ABS has so far reached nearly 2,000 farmers, covering 13 percent of the planted area in El Obeid district. However, it faces a formidable task in maintaining a profitable business in such a high-risk environment. This is notable in its behavior and performance:

1. A significant number of cooperatives were registered in 1983/84 and 1984/85, the two drought years, but only a small fraction was financed. Despite an increase in the demand for loans, ABS was unwilling to risk a high loan default rate.
2. Available evidence on loan utilization shows that a large percentage of ABS loans are used for food consumption. Hence, the ABS targeting scheme is nonoperational.
3. High rates of loan default occurred during the drought years, with the record high being in 1984/85.
4. ABS' refusal to provide relief debt or reschedule debts and its strict withholding of new loans drove out a large proportion of borrowers in the 1986/87 season. Loan participation was lowest in 1986/87 (Table 5). Farmers often expressed their reluctance to join ABS for fear of loss of income or assets in case of crop failure.

The question arises as to whether ABS should continue to finance agricultural production that is highly volatile or whether it should move to improving underlying conditions that contribute to production stability (for example, coordinate with the Gum Belt Project to support rehabilitation effort, or extend loans for application of improved technology, water harvesting practices, and so forth).

More importantly, ABS' mandate precludes households with little asset and credit records to participate in the loan program. ABS' credit program also has no provision for income support in times of imminent crop failure. There is, thus, a need for a policy formulation that either strengthens the existing informal credit market or promotes an institutional credit program that provides a source of alternative finance in times of severe income failure. ABS is definitely not positioned for such an undertaking.

Case 4: Food Aid in practice in the 1980s. There were three principal waves of food aid to Western Sudan in the 1980s in response to major crop failures, of which the first and major food aid flow was initiated in 1984-86 (Table 6). Another crop failure was experienced in 1987, prompting a second

Table 4—Grain production before, during, and after the 1984/85 drought, by participation<sup>a</sup>

Season	Grain Production Per Household (kilograms)			
	Participating Villages	Nonparticipating Villages	Within Participating Villages	
			Participating Households	Nonparticipating Households
Wet season				
1982/83	980 <sup>b</sup>	520 <sup>b</sup>	1,148 <sup>b</sup>	779 <sup>b</sup>
1983/84	973 <sup>b</sup>	449 <sup>b</sup>	1,361 <sup>b</sup>	785 <sup>b</sup>
1984/85	624 <sup>b,c,d</sup>	220 <sup>b,c,d</sup>	867 <sup>b,d</sup>	544 <sup>b,d</sup>
1985/86	1,844 <sup>b</sup>	1,568 <sup>b</sup>	2,082	1,745
1986/87	1,064	1,173	1,498	1,099

Source: Derived from Jebel Marra Rural Development Project surveys.

<sup>a</sup> Village Taij was excluded because of unusually high yields.

<sup>b</sup> Mean of participating and nonparticipating group significantly different (t-test).

<sup>c</sup> Mean statistically lower than previous years (t-test).

<sup>d</sup> Per capita grain production in 1984/85 season was 178 kilograms for participants and 75 kilograms for nonparticipants. There was no significant difference within participating villages. The same pattern appears when the comparisons are made on the basis of proportion of households with less than 1,000 calories per capita per day. The percentage was higher in nonparticipating villages (79) as compared to participating villages (41).

Table 5—Loan participation and performance, 1980/81-1988/89<sup>a</sup>

Season	Cooperatives Financed	Cooperatives Financed as Percentage of Registered Cooperatives	Percentage of Members Financed	Area Financed	Area Financed Per Borrower	Average Loan Per		Recovery Rate at First Due Date
						Area	Borrower	
				(mkh)	(mkh)	(mkh)	(£S)	(percent)
1980/81	3	100	101	1,313	5.84	17.26	100.84	50
1981/82	11	100	94	4,798	6.44	29.73	191.46	62
1982/83	12	75	69	9,048	9.01	23.94	215.70	6
1983/84	20	77	71	14,822	8.96	25.04	224.36	12
1984/85	18	53	51	13,202	8.48	20.27	171.89	2
1986/87	11	32	22	5,203	7.31	33.11	242.03	18
1987/88	19	49	42	13,430	8.79	38.99	342.24	38
1988/89	21	54	41	16,085	9.66	66.04	637.98	82

Note: 1 mkh = 0.74 hectare.

<sup>a</sup> ABS extended mainly seeds in 1985/86 season. This was not typical to any of the other years which consisted of nine-to-one ratio of cash to commodity package.

Table 6—Delivery of relief food to Kordofan region, 1984-1988

Year	Commodity	Quantity	Government Share
		(metric tons)	(percent)
1985	Sorghum	194,827	11
1986	Sorghum	131,000	0
	Wheat and wheat flour	54,700	...
	Supplementary feeding	12,156	...
	Others	8,698	...
1987	Sorghum	32,070	37
1988	Sorghum	71,790	44

Source: Regional Food Aid Administration, El Obeid.

relief flow in 1988. The good crop year of 1988/89 was followed by two consecutive years of bad harvests, which called for a third wave of food aid.

There were some common features in these waves of food aid:

1. Relief food needs were estimated at the area level (district, rural Council) using such approaches as crop harvest assessment or food gap measures (the information base to assess needs at the household level was inadequate);
2. Food allocation was targeted at the district level and eligibility was universal; families who maintained residence within specific food target areas were equally eligible;
3. Although there was an increasing shift towards subsidized sale of relief food, food aid was largely distributed free;
4. The relief program systematically excluded those who failed to maintain their residence (they lost their eligibility if they moved out of their home village) or those who, due to absence of income, could not participate in the monetization scheme.

Food aid reached a relatively high proportion of the target population. This was an outstanding achievement particularly in the 1984-85 operation given the scale of the operation and the limited degree of preparation. Food aid probably provided a critical addition to household food consumption, and possibly prevented a wider scale of starvation deaths. However, there were notable weaknesses:

1. The food aid that was actually delivered was often much less than the planned ration (Table 7). Two main explanations that have been proffered for this occurrence were the low allocation of food aid and the considerable losses due to wastage and leakage.
2. Within the specific food target area, the application of the planned equal quota per person was not observed. For example, there were significant intervillage variations within the same districts (Table 8). Such a phenomenon was related to irregularities in the timing and frequencies of food aid flows across villages and to less adherence to the application of a uniform quota—the premium of getting food aid was much higher for the remote villages.
3. Within the specific food target villages, there were large interhousehold variations, although families were supposed to share equally. Part of the problem can be ascribed to the design of the food aid policy. For example, the setting of a quota for a maximum of six-person family is inherently biased against large families. Furthermore, the application of universal eligibility (except the nonresidents) fails to recognize food aid as one of several coping instruments. Families are unequal in terms of their coping capacity. In fact, the poor and those in remote areas did not benefit as much from the relief food.

It is unlikely that the unprecedented flow of food aid experienced in the 1980s will continue in the near future, but the demand for large flows of aid will continue due to the greatly diminished income and asset position of the rural population. In order to gain as much as possible from this shrinking resource, it may be necessary to:

1. Redefine the role of food aid—The present emphasis on relief food as a response to production shortfalls needs to be examined in light of persistent production variability;

Table 7—Food aid targeted and received in districts of North Kordofan, May-October 1985

District	Target Amount	Received Amount	Percent of Delivery
	(grams/capita/day)		
Soderi	450	213	21
Bara	400	364	15
En Nahud	400	180	67
El Obeid	350	288	91
Um Ruwaba	350	132	20

Source: OXFAM-UNICEF-Kordofan Regional Government Report, September-October 1989.

Table 8—Relief food arrival time, amount distributed, and frequency in sample villages of Northern Kordofan

District	Village	Peak Hunger Period	Relief Food Arrival	Amount Received Per Person	Interval Period <sup>a</sup>
		(month/year)	(month/year)	(kgs)	(days)
Bara	El Genena	9/84	2/85	9	30-45
	Um Sereha	10/84	2/85	9	30-45
	Um Sot	10/84	2/85	12	30-45
El Obeid	Abu Khrais	11/84	12/84	4.5-6	30-40
	El Liwab	12/84	2/85	4.6-6	30-40
Um Ruwaba	El Tina	11/84	5/85	6	30-40
	El Felia	10/84	11/84	3-6	30-90
	Wed Eldeik	8/84	10/84	n/a	n/a

Source: IFPRI survey, 1989.

<sup>a</sup> Time between arrival of food aid in the village.

- otherwise, it gives relief intervention a permanence. The key role of food aid should be to provide supplementary income to protect the desired income and asset base.
2. Reassess the concept of relief 'needs'—It may be necessary to broaden the concept of needs to include needs other than food, for example, provision of health and sanitary services, livestock feeds, and market interventions to stabilize commodity prices.
  3. Improve the current food allocation criteria—The current practice of setting 'equal' quotas at the area level (district) must be continuously revised as more information is made available. Setting a quota at the district level is less efficient than setting it at the village level. Targeting at the household level is preferred, but the cost is tremendous in such an environment. There should be a concerted effort to move towards a 'self targeting' scheme, for example, provision of public works programs. The modality of food distribution must shift from free distribution (except in emergency situations to support the needy and vulnerable groups) to "food for work." Where public works programs are feasible, they should be expanded since they obviate the problems associated with administrative targeting.
  4. Improve emergency preparedness—If the essence of relief support is to protect income failure, the choice of timing is a crucial factor. Otherwise, recovery becomes slow and costly. Provision of support within a proper time framework requires public commitment, strong institutional capacity, preparation of programs and projects, mobilization of resources (finance and commodities), and timely execution.

Case 5: Restocking of Livestock. When famine prevention is limited or absent, and losses are great, rehabilitation occupies a central position in the post-famine period. UNICEF and OXFAM projects demonstrate such an effort.

UNICEF began a project to finance goat restocking in the drier areas of North Kordofan in late 1986. The target group was poor female-headed households with a large number of dependents and no livestock. It was felt that income controlled by women had the greatest and most effective impact on child nutrition and health, and that children of poor female-headed households had become the most vulnerable in the post-famine period.

IFPRI survey results show that ownership of goats has certainly improved the relative income position of the participants (Table 9). The utility of goats as a source of cash is high in bridging seasonal cash flows and providing income buffers in bad crop years, especially in drought-prone areas. There is also an observed increase in milk and meat consumption among participants. The project is under pressure for expansion to meet a growing demand for joining the project. Project expansion depends on the availability of additional capital financing and growth through progeny distribution, for which it is crucial that growth performance and monitoring and supervision improve.

OXFAM has also undertaken a restocking project for nomads in the Sodari area. The great innovative feature of this program is its use of food aid; OXFAM barter food for goats and then distributes the goats to poor nomadic families.

**Table 9—Comparison of demographic, asset, production, income, and consumption position of project participant and nonparticipant groups, Goat Restocking Project**

	Project Group	Control Group
<b>Demography</b>		
Family size	6.7	5.4
Dependency ratio	0.50	0.38
<b>Asset</b>		
Livestock per capita (LSU)		
1988	0.29	0.11
1987	0.27	0.14
1985	0.18	0.10
<b>Crop Choice</b>		
Area planted per capita (hectares)		
Cereals	0.95	0.45
Noncereals	0.53	0.43
Per capita monthly expenditure (£S)	215	182
<b>Income source (percent)</b>		
Crop/products	20.70	15.97
Livestock	12.51	7.29
Transfers	28.11	52.29
Wage income	9.82	3.70
<b>Relative income position (percent)</b>		
Low	40	60
Medium	33	30
High	27	10
Daily per capita calorie consumption	2,278	1,869

### Conclusions

Households with access to improved technology have demonstrated a capacity to produce more, maintain stable production and consumption flows, and keep their families intact. Migrant labor has also benefitted from employment generated in the project areas. Food aid has come at critical times to save human lives, but was not early enough to preempt the erosion of the asset base, especially livestock, of the rural population. The UNICEF project highlights the urgency of the need to support the asset reconstitution efforts of the rural population and demonstrates the application of the concepts of targeting and self-sustaining growth.

The experience of the 1980s points to a greater need for improvement in project choice, design, and implementation. Projects in the Kordofan area mostly work independently in selected geographic areas. Few of these projects are explicitly targeted to specific groups, especially to the food insecure. While these isolated projects can have the potential to have a sizeable impact, there is a need to develop coherent and functional integrated projects or programs within a framework of a long-term development process in which relief and rehabilitation are integral components.

### **FOOD AND AGRICULTURAL POLICY ASPECTS OF DROUGHT AND FAMINE: COMMENTARY**

**ABDALLA AHMED ABDALLA**

**Ambassador of Sudan to the U. S. A.; Former Minister of Agriculture**

### Introduction

While the adverse effects of the 1984/85 drought are still being felt, two successive years (1989 and 1990) of rainfall of less than 50 percent of the long-term average are causing considerable crop failures, loss of pasture, and soil degradation. The adverse effects on food security are immediately felt by the farmer/herder segments of the population in the areas most affected by the decreased level of rainfall.

Evidence is accumulating that during the last decade, the desert has crept between Lat. 9°-12° N, and is already threatening areas as far south as Lat. 7° N. The land expanse between Lat. 12°-15° N is now almost virtually desert. When speaking of deserts, we usually tend to imply shifting sand dunes; we forget that arid and semi-arid regions are continually facing gradual, sometimes unnoticed, deterioration of drylands used for farming and grazing, and that growers are moving to marginal lands, thereby accelerating land degradation and desertification. Recurring droughts, neglect of resource maintenance, land abuse, and misdirected investments not based on rational plans of land use, have resulted in recurring food shortages and marked demographic changes, contributing to agricultural labor shortages and higher labor costs. It was, therefore, timely that IFPRI embarked on a research project to systematically analyze the drought and famine relationships in Sudan and search for solutions to cope in conditions of recurring droughts and frequent food shortages.

While agricultural and livestock production provide livelihood for people in the study area, enhanced agricultural development per se does not guarantee enhanced food security in the economy. If food production is to be increased to achieve food security, then additional selective policies are required. It is also important to consider the linkages between food security and various

sectors and activities including industry, transport and communications, research and training, trade, finance, health and education, and encourage developments in these related sectors in a manner consciously designed to contribute to increased food security. It is, therefore, necessary to address food security as a concept and proceed to explore the possible ways and means of securing it. In addition to increasing food production, food security should embrace provision of economic and physical access for the food-insecure to adequate food for an active life. Interpretation of food security focuses heavily on requisite purchasing capacity for balanced nutrition, along with considerations related to employment, income, and the liberal functioning of market mechanisms. In a situation of recurring droughts and poor rural infrastructure, the food security system should include drinking water, public infrastructure, and nutrition interventions targeted to the more vulnerable groups of the population.

#### Food Security Constraints, Policies, and Interventions

Constraints responsible for food insecurity can be grouped into natural, demographic, technological, policy, institutional, and external factors. Drought is the most important natural constraint responsible for food insecurity in those parts of Sudan dependent on rainfed sorghum production and animal grazing, particularly the more fragile environments of Northern Kordofan, Northern Darfur, and parts of the eastern region. Drought results in crop damage and soil erosion. In addition, water scarcity is the single most important impediment to producing enough food, not to mention meeting a basic human need. Pest, plant diseases, and locusts cause large pre- and post-harvest losses.

Policies and institutions required to alleviate drought-related food insecurity should be based on an integrated approach to food production, consumption, and resource conservation, combined with the attack on poverty and support for the poorest groups. This approach is important for sustainable agricultural productivity and production and guaranteed access of the rural poor to food. Policies and interventions include: investments in agriculture to produce more food and generate higher incomes; schemes designed to generate real income for the food-insecure; subsidized employment schemes to raise income in cash or kind or provide subsidized meals to poor segments of the population; and improved infrastructure, health, and education. Interventions should be well targeted, cost-effective, and carefully designed to meet identified specific needs. Preventive measures include improved internal marketing distribution networks and general preparedness for emergencies. All these efforts are meant to influence small food producers, herders, food consumers, and marketing agents, in order to encourage greater sustainable and stable food availability to targeted segments of the population. Access to food may also be through trade or food aid.

#### Agricultural Production for Food Security

Issues of agricultural production related to the drought food-insecurity relationship include ecology, crops and cropped areas, analysis of the farming system, marketed surpluses, and supply elasticities. In spite of a limited data base, particularly with respect to farming system and yield statistics, the findings and analysis of the available data contribute effectively to understanding the various linkages of food insecurity and its relationship to drought.

The major problems constraining increase in productivity and production of crops grown and consumed by rural people may be summarized as follows:

1. Marked variability (quantity and distribution) of annual rainfall;
2. Weak technology development and delivery systems;
3. Inappropriate government policies and incentive schemes, as well as weak institutional capacities;
4. Poor storage and post-harvest handling facilities;
5. Poor physical and public infrastructure;
6. Common occurrence of pests, plant diseases, and locusts; and
7. Inadequate access to inputs and credit facilities.

Since the small farmers/herders control the bulk of the natural resources, the agricultural production policies should aim at helping them to produce more food crops, maintain a reasonable size herd, generate increased income, increase wage labor earnings, and acquire more food at reasonable prices. A strategy that focusses attention on small farmers/herders would promote the interests of the rural population and also conserve the environment. A strategy for increased and sustainable agricultural production and food security would require mutually supportive appropriate technologies, service institutions with reliable delivery systems, and solid public policies designed to provide incentives for farmers to be more productive.

Increase in farmers' productivity and production can only be obtained by providing incentives, such as: availability of improved inputs, including good seeds of high yielding varieties; rational use of pesticides; and, improved labor-saving implements particularly appropriate for small farmers, including women, and designed for local conditions. The latter means development of technologies suited for the environmental risks that confront small farmers and herders and capable of helping them to cope with environmental hazards. The existing hard conditions in the area imply that a research strategy of low-inputs use may be adopted. Low inputs, however, should not mean no inputs. Generation of improved technologies is dependent on strong agricultural research capabilities with the socioeconomic, ecological, and farming system conditions in focus. It is also important to effectively integrate research, training, extension, and development of central and regional agencies.

The International Agricultural Research Centers (IARC) of the Consultative Group on International Agricultural Research (CGIAR), such as IFPRI, ICARDA, and ILCA, should be encouraged to engage in more effective research with a wider coverage and greater focus on local crops and animal material research, particularly with respect to droughts and food security, so as to generate relevant output and impact. The ultimate aim should be to strengthen research capabilities of the national systems.

Increased agricultural and food production also require improved institutional capabilities, such as cooperatives and participatory political systems. Local leadership should be able to motivate the people and mobilize their resources for effective development.

Credit schemes for small farmers, administered by simple low cost procedures and firmly linked to the supply and delivery of required inputs, should be provided. Lines of credit should be made available to banks to provide credit assistance in money and kind to small farmers and their

cooperatives. Emphasis should also be given to financing extension services, marketing, research, and rural infrastructure.

### Infrastructure

Drought-prone areas cover large expanses of land with scattered sedentary and nomadic populations. Physical and public infrastructure is highly deficient in these widely spread drought-prone areas. East-west links are poor and transportation of food from surplus production areas is expensive. Reliable infrastructure, such as roads and communication, is naturally essential for rural people in remote areas for gaining access to inputs, services, and drinking water. Improved infrastructure is a prerequisite for ensuring increased agricultural output, reducing harvest losses, facilitating production sales and reasonable prices to consumers, and encouraging the participation of the private sector in the distribution of agricultural services and inputs. Improved access usually enables an expansion of nonfarm activities, such as repair services and shops. It also reduces the risk of crop failure and influences customs, attitudes, and values.

Construction and maintenance of rural roads and drinking water works should not continue to depend on central organizations alone. Separate regional institutional and funding arrangements are required with effective participation by local communities. Labor-intensive techniques should be encouraged to reduce costs.

### Sector-Wide Issues

Sudan is characterized by a large potentially-cultivable area and a diversity of agricultural systems—often divided into irrigated, mechanized, rainfed, and traditional rainfed (including livestock) subsectors. Past and potential sources of agricultural growth in Sudan include expansion in arable rainfed and irrigated areas, increased efficiency of water use, improved irrigation management, increased productivity through improved technologies, and decreased post-harvest losses. Furthermore, changes in the cropping patterns and cropping intensities, particularly in the irrigated sector and higher rainfall areas, provide an added potential source of agricultural growth.

Sustained and adequate agricultural and food production requires adequate rainfall, a reliable and sustained above-average annual flow of the Blue Nile, and, possibly, a change in the cropping pattern of food and other crops, particularly in the irrigated subsector.

In view of the recurring food-insecurity situation and the desire to mitigate drought which causes crop failures in the rainfed sector, it is necessary to examine the trade-offs in production choices among irrigated export crops (for example, cotton and groundnuts), food crops (for example, wheat, sorghum, and corn), and other crops (for example, sugarcane). Sudan's main agricultural policy options for economic recovery remain in the areas of achieving food self-sufficiency and increasing agricultural export earnings. Policy options related to these objectives should be viewed in terms of their relationship to each of the three subsectors in Sudan's agriculture.

### Priority Setting for Food Security Improvement

Food security issues should be accorded the priority they deserve in central and regional development planning. Well-articulated food security policies and able and flexible institutional

capacities are crucial. It is important to sensitize the central and regional governments' personnel and related institutions to the gravity of the worsening food situation, the deterioration in the environment, and the real threat of recurring famines, if the present situation continues without serious measures being promptly taken.

Agricultural growth, while it may be the most important single factor, is not sufficient for food security. Other elements are required. Effective food policy in Sudan has high institutional demands which suggests a rather narrow priority setting. It is, therefore, important for the workshop to identify this set of narrow priorities for food security improvement. The following list will probably rank high among these narrow priorities:

1. Reform of price and marketing policies of agricultural products and inputs and opening of the trade regime to provide incentives to small producers;
2. Effective stockholding at local, provincial, and regional levels. This will require efficient management of financing purchase of food, storage handling, and decision-making with respect to stock management;
3. Simple food rationing for urban households;
4. Targeted subsidies for the poorest segments of the population and specific vulnerable groups;
5. Rapid improvement of rural infrastructure, especially roads, and rural development initiatives in support of agricultural and food production, marketing, and distribution. Without improved infrastructure, all efforts to get the small producer to increase output will be reduced almost to nil;
6. Improved irrigation management;
7. Access to improved inputs, especially in high potential areas;
8. Rehabilitation and expansion of rural health services, veterinary services, and drinking water supplies; and
9. Credit schemes for the small farmer/herder.

In the context of recurring droughts and their serious impact on food security, it is necessary that Sudan consider seriously a new strategy for the irrigated subsector so that it contributes more effectively to achieving food self-sufficiency. Such a strategy requires modification of the cropping pattern within the irrigated schemes. More economic and food security rationale and criteria should be considered along with technical and agronomic reasoning in allocation of crop areas within and across large irrigated schemes in Sudan. Such policy reform will impact on foreign exchange earnings, Nile water use, and seasonal employment needs.

A new strategy for the irrigated subsector may include the following elements:

1. Full use of the Sudanese share of the Nile water, by water storage and direct pumping from the Nile, particularly for small farmers along the Blue, White, and the Main Nile and its tributaries. All commandable arable land along the banks of the Nile should be farmed to produce food and cash crops, including sorghum, corn, pulses, vegetables, and fruits. The limiting factors to be addressed include credit, delivery systems of services, and inputs, including fuel, spare parts, fertilizers, and pesticides.
2. Improving irrigation management and water use efficiency. Institutional, technical, economic, and environmental factors influence improvement of irrigation management for

increased productive capacity of the irrigated subsector. It is, therefore, necessary to examine the historical role of the government and the institutional arrangements under which the irrigated schemes operate, with a view towards government disengagement and increased farmer participation.

3. Using water made available from 1) and 2) above to increase cropping intensities in the irrigated schemes, particularly of wheat, sorghum, and sugarcane.
4. Switching areas from cotton to wheat and sorghum. This should be manipulated in conjunction with an annual assessment of grain storage and data provided by the early warning system.
5. Increasing areas under rainfed cotton, particularly in the Nuba Mountain area, where rainfed cotton area has declined markedly. This will require policies and services and a delivery system targeted to encouraging the small farmers to revert back to cotton growing.

#### Food Aid

Food aid is obviously required and is useful for alleviating emergency food shortages. It may be used as a capital resource for building emergency food reserves for drought-prone areas. Food aid can, however, create distortions in the consumption patterns of people and adversely influence production. The country should determine the degree of its dependency on food aid and the way the composition, size, and timing of food aid contribute to food security objectives.

### **3. SELECTED INTERVENTIONS DURING DISCUSSION SESSIONS**

This chapter attempts to present the workshop participants' points of view on the issues explored by the report as well as their responses to points raised in the official policy statements or by discussants of the report or by fellow participants. Excerpts of the participants' contributions are given rather than their full text for obvious reasons of space, conciseness, and for avoidance of unnecessary repetitions. The participants' contributions are presented in their original sequence of delivery.

#### **DR. SULIMAN SID AHMED**

##### **Chairman of the Higher Council for Grains**

First, I would like to comment on IFPRI's good work. In fact, I have had the honor of visiting IFPRI headquarters in 1981. Since then, I have followed their activities throughout the world, from leaflets, journals, and papers. We have received the presented research paper, which is excellent, and I have identified certain proposals which we shall study.

This workshop is timely because we have now established a higher grain council with members, including all the ministries that have relations with production, processing, trade, planning, even transport and health, as well as other ministries. All the undersecretaries concerned are members of that council which is responsible for preparing policies concerned with production, processing, marketing, and exporting grains. In this respect, such works and policies identified in this workshop shall find an institution that will take it further and present them to the policymakers and to the executive council to take care of them. The council was formed some four or five months ago, and since then, it has been active not only in trying to avert the expected consequences of shortage of food in this season, but also in trying to take certain measures to avert famine in the next coming years, for example, in a situation like this, when we have a shortage in grain production.

#### **PROFESSOR HASSAN AHMED HABISH**

##### **University of Khartoum, Faculty of Agriculture**

We have talked about the need for expansion in irrigated area and utilization of irrigated schemes to produce dura, whereas, it is much easier for us to go for production of dura in the rainfed areas. There has also been talk about the fragile areas, and all the problems there that have to be solved. Yet there has been very little talk about areas with adequate rains, even during drought years. I would have liked to see the study covering the huge areas which have not been utilized in the southern parts of Kordofan and Darfur and even in Kassala, that have adequate

rainfall and where yields are 300-350 kgs per feddan. It should be possible for us to raise these yields to approach one ton per feddan, so that, to produce 4 million tons of grain, we would need much less land than the estimated 20 million feddans (at present average yields of 200 kgs per feddan). We talk about the traditional sector, but I think we should also include the mechanized farming subsector, which has itself become a traditional sector in the sense that it has remained using the same techniques during the last 50 years.

**DR. ABDALLA SULIMAN EL AWAD**

**Islamic Relief Agency**

First of all, I see that we are talking about drought and famine prevention in Sudan which have been translated in Arabic to be drought and desertification. I wonder why. We are here to face the question, what is famine? What do we understand by famine? It seems to me that this has never been tackled by any of the speakers or even in the papers. To me, as a Sudanese who speaks Arabic, the word "maja'a," which is equivalent to famine, really is a horrifying word meaning death of people in the thousands, the dislocation of hundreds of thousands of people, a high rate of malnutrition, and so forth. I think that perhaps we should all standardize our understanding of the meaning of "drought" or the equivalent "maja'a" and then we will be able to say that the actual Arabic translation of the word will be proper. However, I would like to hear from the people who wrote the paper and the report, what they mean by drought; and whether it is the same in Arabic as I understand it.

Now, as a representative of an organization that is very related to human beings, who are the first of our concerns, I am very much interested in the aspects of food distribution to people who would be affected where there is food scarcity. I would like to relate our organization's previous experiences in this respect. In the 1984/85 famine, we had 24 settlements which housed half a million people. Before 1986, I remember I visited one of those settlements. We had a lorryful of flour to unload and we asked the people in the settlement to help us unload the wheat for them. They answered by asking how much are you going to pay us. To me, that was a very clear-cut case of dependency which I, as a Sudanese and also as a worker in this field, would work very much against. I would like the distribution policy to keep in mind that we do not want aid for our people, who are victims of dependency syndrome, but more importantly to have a policy where we have to be selective in distribution. This might be discussed in detail later on.

One last comment. I listened very carefully to Professor Atabani talking about free market. I failed to see in the whole commentary where the poor man could be able to purchase the very expensive food in a very, very free market.

**PROFESSOR MUSA. M. MUSA**

**First Undersecretary, Ministry of Agriculture, Natural Resources, and Animal Resources**

Although we have been dealing with information relating to the 1984/85 drought, all of us here have heard from the introduction by the Minister of Agriculture and the Minister of Finance and

Economic Planning and different speakers that we are now facing an even more urgent issue of drought after 1989/90 and 1990/91.

**DR. DAFA'ALLA AHMED DAFA'ALLA**

**Western Sudan Agricultural Research Project**

I want to touch briefly on the activities of the Western Sudan Agricultural Research Project. We have mainly adopted a farming research approach, which properly addresses the problem and the constraints facing the small farmers in the west. We mainly concentrate on sedentary farmers and transhumans. We hope that, if our own constraints are removed, we will extend this to cover the nomads.

I think the whole issue is an environmental one; economics comes later, because the environment affects production. If you are concerned about production, then you have to look to the questions of economic dislocation and infrastructure, exchange rate, and so forth. When we talk about famine and drought, actually, we are talking about symptoms. We are now addressing symptoms, and this is where I think this workshop has strayed a bit from the main issue.

Because drought and famine are symptoms, they are not the cause of what we are facing today. The cause is a much bigger issue than this. It is a question of the whole environment. I thought this workshop would emphasize this point, because, if we neglect the environmental issue, which has resulted in drought and then famine, desertification, and so on, we are not at all going to reach a solution to the problem which we face in Sudan, because this famine will reoccur. We had it in 1984/85 and now we are faced with famine, or at least with a food shortage, in 1990/91. This is just because we are tinkering with the problems. We are not trying to get to the root of the problems. Therefore, I think what is needed is a national organization in Sudan, which addresses the whole environmental question and transacts across ministries and borders, because there are so many ministries which are involved with this question of environment.

**PROFESSOR MUSA. M. MUSA**

The National Council for Natural Resources has already been established. Hopefully, this mechanism will help design remedies to the environmental problem.

**DR. BODOOR ABU AFFAN**

**Economic and Social Research Council**

The problem actually is that famine is deep-rooted. Dr. Dafa'alla pointed out that this is an environmental problem. No, it is not. We should not say it is a natural problem, as we say all the time. It is a man-made problem. It is the low development level which we have been experiencing in the past, since our independence. Why do we have this low level of development? Because we did not set up our development strategies right from the very beginning. We just kept shifting from strategy to strategy. So, I wish the paper itself would emphasize this point and put it bluntly.

I was very glad to hear from the Minister of Finance that "agriculture should be the engine of growth in Sudan." I am glad that we have realized this after so many years. But the questions are: which type of agriculture—traditional or irrigated?; what methodologies and techniques?; and what cost-effectiveness criteria? We have to relate all these to our agricultural endowment.

The other point that we should consider is the prerequisites for development, primarily infrastructure and human resources, in order to carry out the development process.

**DR. ISAM SIDDIG AHMED**

**Private Businessman**

Sudan has followed a development strategy of large-scale capital-intensive production projects at the expense of small-scale projects. The reason for failure is that they have ignored infrastructure, which is not only roads as the brief said. The major constraint for large-scale capital-intensive production is electric power. Sudan produces about 75 kilowatt-hour/person/year compared to many other developed countries, where the average is over 500 kilowatt-hour/person/year. These large-scale projects that the paper mentioned did not generate opportunities for employment. Actually, these large-scale projects failed because of the deficiency of power and because they did not create opportunities for work for the rural population. The rural population is far from the major cities where these projects are concentrated.

The paper mentioned that the agro-industries—oil seed and textile industries—were expanded far beyond the limits of the country's raw material production, especially in capacity. I think the country has unlimited resources and unlimited capacity for production, but the limitation arises from the infrastructure, not the condition of production.

Also, we have to divide our development strategy into short- and long-term strategies. The short-term should concentrate on small-scale business and on crops which we can really produce, like sorghum and maize, at the expense of wheat. We should move the food crops into the irrigated sector, which should boost the production of sorghum in the Gezira and, maybe, move the production of cotton to the rainfed area, because, in this respect, food is more important than cotton. We should utilize every water resource we have to produce food for the people.

**PROFESSOR ALI MOHAMMED ELHASSAN**

**Arab Authority for Agricultural Investment and Development**

I think most previous policies have done little, if anything at all, in the traditional sector. Once the traditional sector had been the mainstay of the economy. As long as I can remember, the resilience of the Sudanese economy has always been largely due to the activities in the traditional sector. Once the traditional sector was hit, due to this intended or unintended neglect, we became beggars. 1984, maybe, is a critical year. So, I think what has been said or done to alleviate the blight in the traditional sector is a step in the right direction.

There is another thing. I listened very carefully to the opening speech by the Minister of Finance and Economic Planning. I am a free-market economist. I am not ashamed to say that. I agree

with almost everything that he said. He talked about freeing exports, abolishing government monopoly, and the exchange rate. Until you do something about the exchange rate, you are not likely to do much. It is the package: you have to take it all or leave it all.

The exchange rate is very critical, even when the minister is talking about decontrol of prices. But in a number of cases, public policy is being undermined when we come to implementation. For instance, yesterday, I was reading a newspaper; what is printed in that newspaper has more impact on producers than all the deliberations of this workshop, because it is printed in Arabic, is very well circulated, and is repeated on the radio. The newspaper said, in Arabic, something to the effect that the way to price the decontrolled commodities is such and such, but this is a contradiction; how do you price a decontrolled commodity?

We try to talk about what we could do, and we run after the relief operations, and so forth. So, my question is this: Is there a way or a system by which we can detect the occurrence of the crisis before it occurs? This is a very important question, if we really want to prevent this crisis and to reduce the suffering of the people. It is much better to consider how we could detect the occurrence or expectation or the coming of the crisis. In the case of the drought and the famine, some sources say that there are some signals or indicators by which people could say that there will be a drought or there will be a famine. They usually refer to the consequence of decreasing yields or decreases in the number of livestock or grazing land are and/or the malnutrition of the population, and so forth. I think we could develop a system by which we could use these signals to detect the coming of drought or famine or the occurrence of the crisis. This will improve our capability to cope with this crisis and, consequently, to reduce the suffering of the people.

**PROFESSOR MUSA. M. MUSA**

I had been trying to go back to the studies carried out recently, such as the 1986 Rainfed Agriculture Strategy Study. It embodies a set of suggestions and recommendations especially with regard to the environment, the boosting of production, and treatment of the farming subsector, small farmers, and pastoralists. All this is done in a very nice context. This study should be put into focus and included in program projects.

**DR. ABDEL MONEIM ELSHEIKH**

**Ministry of Agriculture, Agriculture Planning, Economics, and Statistics Department**

We never try to detect the occurrence of crises. We just wait until the crises occur and, after that, we start to consider what solutions could be formulated and to address the consequences of the crises.

People usually deal with famine and drought by talking about increasing production or diversifying production or mentioning some ways by which the targeted population could be supported, but one area which has not been given appropriate attention is the area of human resource development for the targeted population. I am thinking about a system of vocational education in areas where the poorer segments of the people are.

The third point is the point of agricultural research. Improving our agricultural system, with emphasis on agricultural research, whether we go into irrigated or rainfed agricultural expansion, will help very much to increase our production. So, I am very emphatic about improving agricultural research as the most direct and cost-effective way of increasing total production, and as one way of coping with famine and drought consequences.

The fourth point is: How can we make sustainable the participation of rural people in their own affairs? How can we mobilize rural people in such a way that they can manage their affairs and improve their lot and try to address their problems? I think that under this point comes institution-building in the rural areas. If we can find ways and means, we can strengthen farmers' groups, women's groups, and cooperatives and grassroots institutions, which can undertake the formulation of plans and programs. This is the only way by which we could guarantee the sustainability of any program that could be implemented in the rural areas.

**DR. MOHAMMED KHEIR EL ZUBEIR**

**First Undersecretary of Planning, Ministry of Finance and Economic Planning**

There are a lot of economists who agree that there is an inverse relationship between food aid and food production. Food aid depresses the domestic prices of crops, thereby making it a disincentive for farmers to produce. Studies from India on a time-series basis find this reverse relationship. It is, in my view, an important relationship, which could have been studied for Sudan as well, because since 1978, we have received food aid, mainly wheat, from USAID, especially under the PL480 program. I think a study on the impact of the program on domestic production of wheat would have the same relationship. So, I want the view of the floor on this issue: Is it true that food aid is having this adverse impact on domestic production and food security?

The other point which I want to make is in regard to the policy package suggested by Dr. Atabani. Macroeconomic policy and market-oriented policies are necessary conditions, but I do not think they are sufficient conditions for food security. On the contrary, there are other important aspects, such as building infrastructure and investment in rural development. There are, of course, certain areas where the market will fail and will not work without such important conditions. If I go back to the food aid and link it with infrastructure, I think we clearly have to divert aid, not for food, but for infrastructure investment. If, for example, we total the food aid from USAID to Sudan between 1979-1988, it would be more than \$400 million. So the question now is, if we had used this \$400 million not for consumption of wheat but for heightening Roseries Dam or any other similar project, would it have been better for food security, rather than just consuming it in urban areas with subsidies.

**T. PAGE**

**WFP Director**

I want to pick up on a complex set of themes by the Minister of Agriculture, Minister of Finance, IFPRI itself, and Dr. El Zubeir, which I heard mentioned just right now.

The first is the proposal having to do with dependency on food aid in times of drought and emergencies. For productive users, free hand distribution does create dependency syndromes. Certainly that happened in the 1972/73 drought in the Sahelian countries, in which I personally was involved, where food was distributed as a free handout. As far as drought and famine are concerned, the country has to build up infrastructure to cope with these problems, the same as India and China have done, and develop public distribution systems with relief. So, we in WFP are very supportive of this approach for relief.

Reference is also made to the rationing system, which one tends to forget when one is considering drought and famine conditions. Public opinion focuses on those poorest of the poor, such as in Northern Kordofan and Northern Darfur and Red Sea Hills, and so forth, but tends to forget the rest of the country's needs. Certainly looking at relief needs in terms of food in isolation, in our view, is a totally wrong way to do things. The food need of the urban population has to be taken care of by the government.

The Finance Minister in his statement mentioned the Nile and irrigation. Water-pumping blood through the arteries of the country is a very good term. Certainly a lot of the food-for-work that should, in my view, be done by those affected currently by drought, should be directed to helping those arteries in moving out further into the country. So many things can be done on the irrigation front. Rural infrastructure has to be developed. Food-for-work lends itself well to road building and infrastructure.

To conclude, I think well of this wealth of information that IFPRI has put together so well in the documentation for the workshop here. With the commitment we have heard from the policymakers, there should be no excuse for not getting together the sizeable efforts necessary to relieve the situation for 7 million people, who are now in a very serious condition. They are most certainly at risk in various parts of the country. I would hope that we can start focusing on what the various partners want to do to collaborate with the government on alleviating the problem which faces us right now. We do have important policymakers here, important civil servants, representatives from international organizations, from various donor countries and NGOs. I do hope that we will be able to mold this wealth of information into a series of policy decisions that the government will take, based on the experience we are now discussing.

**MR. MAHGOUB ABDEL FADIL AGOT**  
**Upper Nile Regional Government**

Many people from the Upper Nile Region migrate to the northern regions and to the capital because of political instability and shortage of food and famine. For most of the displaced people, the regional government is willing to transport them back to the northern area of Upper Nile and settle them in "peace" villages and give them food, though not by way of food aid handouts. The regional government will also provide some sort of employment, a piece of land, and fishing nets. We would like the central government to help in this effort. Political stability is also one of the prerequisites to overcome the shortage of food in the south and famine.

**DR. ELSAYED A. A. ZAKI**

**Consultant**

In response to Dr. Isam's comment on capacity in oil-crushing facilities or textile mills, there is a confusion between cause and effect. The fact of the matter is that all of the installed capacity has not been utilized over the last 20 years, and at the same point in time, you can always say we have unlimited resources to produce. How much the country actually produces is what counts. Sudan has 200 million feddans of arable land; however, less than 10 percent is currently utilized. Therefore, we should not speak about unlimited resources, because there are constraints and resources are limited. Statistics would show that we have not utilized the installed agro-industrial capacity because we did not produce enough raw materials. Hence, there is a call for plans to be drawn in a consistent and coherent sense.

The other point to be clarified is the question of per capita infrastructure. Earlier reference was made to availability of electric power, which is an important constraint. It is not only its per capita size but also its location. Furthermore, it is not only electric power, but also other forms of energy, such as fuel related to transport, water pumping, grain milling, oil seed crushing, and so forth.

Finally, there is a need to distinguish between a food security concept and a self-sufficiency concept. I believe that the self-sufficiency concept, where economic and efficiency principles might be violated, is deficient. For example, we might forego completely comparative advantage. In so doing, Gezira might be changed completely into dura production. Tradeable commodities, such as cotton, which earn critically needed foreign exchange to sustain the economy, might be compromised. The consequences of such a scenario are hazardous.

**TESFAYE ZEGEYE**

**Head of Food Security Unit**

**Office of the National Central Committee for Planning, Ethiopia**

I am honored to be invited to share the experience of Ethiopia in disaster prevention and preparedness as well as in the area of food security in this high-level workshop.

Having said this, Mr. Chairman, may I be allowed to extend my sincere thanks to the Government of Sudan for facilitating my entry into the country and my participation in the workshop? I would also like to thank the International Food Policy Research Institute for providing me with support.

I will try to briefly indicate Ethiopia's experiences in coping with drought and famine and in addressing issues of food security by giving special emphasis to the institutional structures that have already been established.

Historically, Ethiopia has been affected by recurrent droughts, some of which have resulted in serious famine. The Government of Ethiopia, after the 1973 Sahelian drought, established the Relief and Rehabilitation Commission (RRC) with the task of administering and coordinating emergency relief assistance as well as the rehabilitation of the people and areas affected by drought or any other type of disaster. Since then, the RRC has been strengthened in terms of manpower, logistics, and equipment (such as by computers) in order to facilitate its day-to-day routine operations. The Early

Warning and Planning Services unit of the RRC is charged with the responsibilities of utilizing information generated by various ministries and institutions and undertaking its own crop assessment and nutritional surveillance activities. Reports are produced on a monthly and bi-annual basis, indicating crop and livestock production situations, nutritional status of the population living in drought-prone regions, the numbers of people that are going to be affected, and estimates of food requirements.

Whenever a disastrous situation is observed—when the country is not in a position to cope with the situation in its own ways—donor conferences are held and press releases are made to enable pledges to be made on time for the assistance required.

As a concluding remark on this subject, I would like to reiterate that the RRC in Ethiopia has served, and will continue to serve, as an effective mechanism for alerting both the government and the international community on the prevalence of disaster and its consequences until such time that the country can fully arrest the causes of drought and famine.

Like in many other African countries, the major objective of the development plans of Ethiopia has been the attainment of national food self-sufficiency. However, attaining food self-sufficiency alone will not improve the food security and nutritional well-being of the population. Hence, to deal with the problem of food insecurity in a broader manner, it was agreed to formulate a National Food and Nutrition Strategy (NFNS) which should serve as a policy guideline in the area of food and nutrition. To this effect, a national workshop was organized and about 30 papers were presented on various food- and nutrition-related topics by prominent local as well as international scientists.

The workshop also discussed the need for a coordinating body of the strategy and where it should be located. Regarding the location, a number of institutions, such as the Ministry of Agriculture, Ministry of Health, Ethiopian Nutrition Institute, and Office of the National Committee for Central Planning were proposed. After a heated debate and in consideration of the multi-sectoral nature of food and nutrition, it was decided to locate the unit in ONCCP.

After the conclusion of the workshop, a task force was established to draft the strategy, based on the recommendations of the workshop. The draft strategy was then presented to high-level officials and subsequently passed to the Council of Ministers for final ratification.

The NFNS, which has a long-term development perspective, has a number of components: food production; natural resources conservation and development; rural small-scale industry; rural transport; rural energy; health and nutrition; food security; markets and distribution; and macroeconomic policies.

The food security component of the strategy is, itself, divided into five major subcomponents: food security reserve; emergency preparedness and relief management; seed reserve; early warning and food information system; and storage capacity building.

The emergency preparedness and relief management subcomponent of the food security strategy is important when viewed from the prevalence of recurrent drought in the country. Hence, in order to get prepared for times of disaster and develop prevention mechanisms, a National Disaster Prevention and Preparedness Strategy was formulated by reviewing the rich experiences of India, Botswana, and China, and using the procedures followed to develop the NFNS.

Following the preparation of these strategies, attempts are being made to facilitate their implementation through identification of project profiles, initiation of different studies, development of famine codes, and so forth.

As my concluding remark, I would like to stress the fact that preparing a strategy is a relatively easy task, but the implementation of the strategy is a very difficult task, because it requires the commitment of all those people involved in the economic development of the nation.

**DR. JOACHIM VON BRAUN**

**International Food Policy Research Institute**

I want to respond to a few points very briefly at this stage of the debate.

Drought is a problem only when the development strategy is ill-designed, but drought has frequently in the past triggered major food security problems and famine. So we need to better look into these relationships carefully.

Early warning is necessary, but early response is key. Early warning of emergency of famine crises has hardly been a problem recently. No one can hide behind the shade of not having known the problem in 1984/85. I am afraid that pretending not to know is emerging currently as an issue. The design of proper early warning systems is complex; it is not just prices, harvest, and rainfall. We can learn from the Indian case. A key instrument combining all these early warning indicators is test public works: you offer a very low wage at public works and see how many turn up. That is what we refer to as self-targeting.

Human resource improvement is central to famine prevention. We place a great emphasis on this, especially on the relationships between education, health services, and nutritional outcomes.

Infrastructure is so important that I mention it again. It is not roads alone, but IFPRI research in a number of countries shows that hard infrastructure pulls soft infrastructure which is really what improves the human resource base. Hard infrastructure is the roads, rail, trucks, the power lines, the communication lines. The soft infrastructure is the services, extension, agro-technology package delivery, and health and educational services. The hard infrastructure has to come first by the public investment.

With respect to food aid and disincentive effects, the longer the research goes on on food aid and disincentive effects, the smaller the disincentive effect of food aid appears. The history of research in that field is not one of the brightest parts of the economic research. I do not want to elaborate on methodologies, but a simple fact is noteworthy: those countries which were the biggest food aid recipients in the 1960s are almost all out of it and among them are the most successful growth cases in Asia. Proper policy, integrating food aid as a resource into a proper development strategy and policy, permits making effective use without disincentive and dependency syndromes.

Others have mentioned that we should continue the cooperation between IFPRI and the Government of Sudan and the research community in the Sudan. I am pleased to declare our readiness for such continuation. I would like to stress that we do not come with a ready research agenda, but I see this workshop as an opportunity for its definition.

**PROFESSOR FAREED ATABANI**

**The Sudanese Consultations Bureau**

A lot of speakers mentioned investment in certain sectors has been lacking. That is why I choose in my intervention to emphasize the quality of investment. Is it going to the right sort of things that reflect the needs and the resources of the economy?

Our friend from the Islamic Relief Organization raised the question of poverty and how we are going to deal with it in a liberalized system. Once you have a liberalized system, where the market determines prices, the first beneficiary is the producer whose income is enhanced. He is capable then of alleviating hardship, which would come as a result of liberalized prices. Right now, the really poor are in the rural areas and they are not being reached by any of the programs now of subsidized wheat, subsidized sugar, or subsidized petroleum products.

Second, without reform programs, more hardships are inflicted on the people; the kind of hardships in which the end of the tunnel is not very clear. In contrast, hardships that accompany reform programs are of short-term nature.

The third means of alleviating the hardship is to have programs which permit adjusting social cost. These include well-targeted programs with certain elements of subsidies, but they have to be self-limiting. These programs have to be transparent. The institutions that grow have a tendency to have a life of their own. They continue forever, even after the purpose for which you created them ceases to exist. So one has to be very careful that the subsidy is going to be transparent.

**DR. TESFAYE TEKLU**

**International Food Policy Research Institute**

I would like to respond to a few points. At the beginning, there was a request about a definition of famine. We have distinguished famine and hunger in our conceptual section of the report, and we have defined hunger as not having enough to eat to lead a healthy and active life, but famine is defined as presence of widespread extreme hunger in specific areas or countries which result in drastic malnutrition and high death rate. That is the kind of definition we have followed in the report. Various studies in Sudan tend to agree that famine is the outcome of a long process and the key contributing factors are desertification, policy failure and the lack of a famine preparedness policy. We take a position that drought is a triggering factor, but that we should look into the other factors to understand the process behind the famine outcome.

The report recognizes that environmental degradation is a key factor behind the occurrence of famine. On the other hand, degradation itself is an outcome of natural as well as human action and there are economic factors behind such human action (the poor are likely to participate in wood cutting and deforestation). To present famine as a consequence of a natural outcome is only a partial explanation. A policy action to control desertification is essential, but it should be part of a comprehensive famine prevention strategy.

In regard to the issue of promoting agriculture in high rainfall areas, a key component of such a strategy among others is the promotion of technology change. Existing low input technologies can be utilized to improve soil fertility and soil moisture to increase yields. But more important,

there is great potential to move from low input technology to high input technology in high potential areas which should be pursued.

Finally, regarding the role of food aid, there is a need to shift from free distribution to productive use of this scarce resource—food. There are examples to this effect in the Gum Arabic restocking project and UNICEF and OXFAM goat-restocking project. Food aid can also be used for development of infrastructure. Of course, there should be a capacity to detect ahead of time if there is a need for the food aid and there should be programs and projects prepared, and there should be resources to mobilize to intervene in a timely fashion.

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**PROFESSOR ABDALLA A. ABDALLA**

I share the concerns of our friends from WFP that this is indeed an opportunity for us this evening to concentrate on thinking of our priority setting to benefit from the information available to us from this research and from this seminar, to address the issues generated from the study in terms of priority and focus, and also to relate these to what we are facing today, a position of food deficit. We should be able to draw lessons from this research project to address ourselves to certain policy interventions that we really need in the short term rather than in the medium and long term. Therefore I would like to appeal to the participants to try to focus their attention to real priority issues: what should the government now do, based on the information and analysis which we have? What should be the real priority policies? What should be the interventions to face the situation of today and also to prepare for what is coming.

The second point is an addition to what Dr. Teklu said about famine. I know why some participants were worried about the term famine, "maja'a" in Arabic. The way we look at famine in Sudan relates to famine in 1306 H (1889). To us it means complete denial of access to food whether or not it is there; you cannot purchase it, you cannot reach it. Then people start to die, while moving to look for food, because they are really tired and malnourished. This is what we really mean by famine. It is a horrifying thing when you mention it to a Sudanese and we would rather speak of food deficit, food gap, and food security, because a Sudanese would not believe that there is a famine if he does not see that there is mass death and mass movement, and therefore will consider whatever has been said about famine as not credible. It is a fact that many people in many regions in Sudan are consuming less food over the last number of years which is not the same degree of food consumption that they were used to. Less and less food consumption is resulting in malnutrition. This way we are always adamant to speak about a food deficit, food gap and food security in addressing the outside world.

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**PROFESSOR MUSA M. MUSA**

Most of our problems are a result of the absence of national planning. Therefore, I want to stress the point of a need for strong planning capability. On the other hand, the food issue is still divided between various agencies and, hence, there is a need for coordination.

**JON BOS**

**Head of Mission of Netherlands, Chairman of Group of Donors**

I am happy with the workshop and the work done by IFPRI. I would appreciate very much if we could come to some conclusion at both the policy level and the operational level. I am thinking in terms of a certain framework for the mechanism for a big operation. That is really what I cannot see at hand while of course, first of all and ultimately, recognizing the responsibility of the government of Sudan for this operation. I think nevertheless, we must emphasize that we really need for this operation first of all a central coordinating mechanism and secondly, a plan for logistics management. That still has not got any shape, but that should get into shape in the next few weeks. Of course, we know that there is already a central coordinating mechanism which I appreciate very much, but I think we all agree that it has to be strengthened and enforced by a strong international team of experts.

We also think that somebody or an agency should get full authority to coordinate all ministries and all agencies involved, and to issue directives in order to arrange a quick handling of goods which is to be expected in Port Sudan and also a quick handling of distribution.

I think it will be very useful if this highly qualified workshop would also be able to underline the necessity of a most favorable rate of exchange for the whole operation and would underline also the necessity of transport and fuel arrangements.

**DR. ELSAYED A. A. ZAKI**

The first point is with regards to the economic strategy. People have addressed this issue earlier in the workshop and they have discussed some trade-offs. One of the things which has been brought forward is that people should now rely more on irrigated agriculture. Whenever crops are under irrigation, then there is assumed production. I would like to remind the people that in 1981-82, we had an economic conference. The then President of the Republic thanked the traditional sector for saving the country during the blight of irrigated agriculture. So do not assume that irrigated agriculture is risk free. Unless certain conditions prevail, irrigated agriculture could also be a threat to food security and economic security of the country.

The second point with respect to the economic strategy which should be underscored is that since irrigated agriculture is specially based on economic and efficiency criteria, one would expect that the returns to the investment should at least be positive. Therefore, if we look at the cropping pattern (and I know that there are some committees which are studying that) and if we look at the crop mix, we have to make sure that we are applying economic efficiency criteria and not any other criteria. The Minister of Finance, this morning, said that there is nothing sacred in the cropping pattern, especially in cotton. The sacredness of cotton, which has been retained for over a long period of time after Independence, is not because of the desire to satisfy the traditional British markets of the Lancashire textile industry but because cotton has proved to be the most important crop economically so far. If the studies would show beyond doubt that returns to investment from the rotation, using any methodology of sound principles of efficiency, can be maximized with crops other than cotton, well and good. But I will not buy the argument of applying a linear programming

function, with the assumption that the producer is a price taker; put some few crops in, and come up with onions as the only crop which maximizes the returns in Gezira.

The third and most important point in our economic strategy is that we have to look at the relations between the farmers and the government. Ten years have passed since we applied changes to the production relations, where the agricultural parastatals shifted from the joint account system to the individual account system, giving farmers greater share in the decision-making process. It is time to evaluate that, but not to just go back to sharing or continuing the individual account system, but to have all the options available with a single important factor, which is increasing the farmers' participation in decision-making. If one looks at the Rahad or Gezira scheme, one finds that the management and the government make every single decision for the farmer and he is not really a farmer, not even a tenant; he is just a laborer. The allocative efficiency criteria, the decision-making, and participation criteria in every aspect have been violated in all these projects. We now have more educated farmers in the field and we have higher cost inputs to be utilized, and, therefore, we have to find ways and means to increase the efficiency and participation of the farmers in the decision-making.

Earlier, I made a distinction between self-sufficiency and food security. I draw on this again, but in the context of the fact that we cannot assume ourselves to be a closed economy. We are not a closed economy, because of so many factors—geography, resources, Sudanese people who are spread all over the region, and a desire to play a role in international affairs and international economics. If we think that we are not a closed economy, food security concept would then entail producing food commodities in addition to producing as much as we can of all commodities in the most efficient manner. We would then rely on international trade, where exports could be an important drive. In my own judgement, looking at the economic scene of the world right now, I would think that in the next five-to-ten years, countries which manage their economies and use the resources properly for an export drive are the countries among the LDCs which will make it in terms of economic development. Markets are opening up, not only in the Western World and in Asia, but also in other areas of the world, specifically Eastern Europe and the U.S.S.R. With markets opening up, the countries on the export drive and which have corrected their policies will be able to capture the market. Therefore, I still believe that what markets have done for Korea, Taiwan, and so forth, can do for the countries which prefer to be economically interrelated with the international market. This will give drive both to economic development and food security. Now, the concept of food security is broader; it is not self-sufficient, and is not only grains. There is no country, strictly speaking, if taken outside the context of international trade and international cooperation, that can be considered completely food secure. I do not know any. There may be some countries which can produce everything, but, in that case, the comparative advantage principles would not be met.

Earlier, there was a strong argument on pricing and exchange rate policies. Exchange rate is only a tool and, unfortunately, it is becoming an important tool. The Minister of Finance at his opening speech described how concerted efforts have been made by the government to correct the exchange rate. I commend that; I have tried, but he is having a better chance than myself, although the fact has to remain that one can never reform in a piecemeal manner. One cannot tease in so many principles and one cannot tease in economic principles too. We have to take a leap forward and make the brave decision to correct the exchange rate and let the impact trickle down to the farmer. That

is more important for us. We can make adjustments here and there, so that the social cost on the poor segment of the population can be reduced, but, at the same time, we have to be sure that the impact of a policy trickles down to those targeted groups who will benefit and will be stimulated to make the necessary contribution. I know the constraints faced by the Minister of Finance; I appreciate his constraints and I pray for him.

**MR. BASHIR MAHAJOUR ELBASHIR**

**Coordinator for Northern Region Agricultural Rehabilitation Projects (IFAD)**

The title of the workshop itself gave an impression that drought seems to be the only factor causing food shortage or food failure. I recommend that the title be changed to natural disasters, which will include drought, bad rainfall distribution, flood, and locust invasion.

**DR. HASSAN OSMAN ABDEL NOUR**

**Managing Director of National Forestry Corporation**

The agricultural activities expansion pays very little attention to the environmental question, which resulted in serious deforestation and decline in land productivity. Another conflict is between the farmers and the herders, to the extent that the government has to deploy reserve police to drive herds out of land put under crops. I would like to stress the need for land use urgently for addressing the current situation (of drought and famine).

**DR. SULIMAN SAID AHMED**

**Chairman of the Higher Council for Grains**

I support the issue of self-sufficiency. The point is that Sudan, with 4 million acres irrigated, has few alternative crops to grow in winter. Wheat and leguminous crops are the only alternative to crops in winter. So, to utilize that three or four months of winter, wheat has been planned to be grown in one million acres with another 300,000 for leguminous crops. This is feasible and it has been implemented this year. Of course, irrigation has its own problems. The point referred to earlier about 1981/82 is valid, but it is due to a ten-year neglect of irrigated production during the 1970s. No hard currency was allotted to irrigated crops to import tractors, implements, spare parts, and so forth. The irrigated production did collapse and the productivity level was reduced. This year, we did reduce the cotton crop from about 400,000 to 250,000 feddans, but the main issue here was the absence of inputs, which are all imported fertilizers, chemicals, and so forth.

Another point which I want to stress is that we are coming to the free market. But is there a free market in the world? No one now exports food crops to the enlarged European market. The countries of eastern Europe have their own problems, but in future they might attach themselves to greater Europe. America is self-sufficient. You cannot export food crops to that country. The Arab countries themselves are trying to unify and if they become united, they will import grain,

livestock, sugar, and oil crops to the tune of about \$9 billion dollars annually. Sudan could prepare itself to that extent by developing the attitudes towards unity, which begins now with Libya and, hopefully, to be extended to other countries.

Until now, no international agency or country has declared if they can participate to help fill the gap which we shall be facing this year. If there is no rain next year, we need to concentrate on growing more than a million acres of sorghum with improved seeds, so that we can get 2 million tons of grain from this.

Another point is that the government, while trying to do this, is buying sorghum. This sorghum shall be distributed to people, perhaps to the targeted areas in the west and elsewhere, at the prices they can afford. We are also encouraging private merchants to import sorghum, but, in fact, they cannot find it in the international markets, since, as you know, the sorghum that we eat is produced by very few countries. The world at large produces sorghum for fodder, which is not suitable for human consumption. You know that in 1984, not everybody was happy utilizing the sorghum we imported, except in very severe cases when they needed to eat anything that they could get.

We also appreciate the fact that the ministers have said that they would accept any assistance that would come from the international community. We have a very efficient system for distribution, because we have people's committees which are responsible for the distribution. These committees, starting this year, shall be elected by the people. They are very efficient in the distribution of sugar and bread in the capital, which has at least 4 million inhabitants. I think things will go smoothly by ensuring that sorghum can go to the targeted group.

**DR. JOACHIM VON BRAUN**

**International Food Policy Research Institute**

I would like to say that I am, from IFPRI's perspective, very pleased with this workshop. I think that the presence of the high-level policy-making community from Sudan shows that the issue of food security is taken extremely seriously. I think we also are very fortunate to have very competent leaders from the key institutions in our discussion sessions. Research on conflicting issues, such as famine, requires great seriousness and openness. Researchers other than politicians, if I might say so, are paid for saying what they find in the research. And they can do so. I keep arguing that we, as researchers, would not be worth our money if we did not do so. I would like to deal briefly with two issues.

The first issue is what to do in the future. I laid out a set of priorities earlier, which I think is consistent with Professor Abdalla's set of priorities. The points on strategic issues emphasized by Dr. Zaki are right to the point and provide a basis for long-term food policy strategy.

But, what to do now? I would like to comprehensively utilize the information from the research findings regarding 1984/85 and relate it to 1990/91. The facts suggest that:

1. Production shortfalls to meet consumption needs are large. Now everybody recognizes that.
2. Household purchasing power in some drought affected areas is eroded more than in 1984/85.

Food prices are higher than at that time in real terms in some areas and livestock prices are lower.

3. Filling the country's food supply gap does not solve the problem of the hunger of the poor, who lack purchasing power. Food crop production, say, in Gezira, will not solve the problem of the poor who lack purchasing power.
4. Malnutrition rates are already increasing, which we know from comprehensive surveys, such as in the Red Sea area.

I conclude from this that attention is needed to address the supply and hunger problems. If 1984/85 could be called famine ("maja'a"), then 1990/91 will be "maja'a" unless appropriate relief operations are launched in those affected areas. This includes moving food there, which is simply said, yet is difficult enough; distributing aid with local government authority; and, frequently overlooked, providing improved health services in such environments which are tremendously under stress under famine conditions.

**MR. HASSAN GEBRIEL ELZUBEIR**  
**Commissioner of North Kordofan**

I will talk about my own experience between the years 1984-86 and 1990/91. In 1984/85, I was chief executive officer in Um Rwaba District, which was hard-stricken by drought. Now I am responsible for Um Rwaba District as well as other districts in North Kordofan Province. I have a question: What are the lessons which we have learned from the 1984/86 drought? Have we learned anything? To me and from my own experience, past and present, I will say that we have learned nothing. We have learned very little and we have to learn more and more to deal with food security. Still, now in 1991, we are facing the same problems of logistical problems, fuel problems, different policies, and administrative problems. We have too many national and regional levels of authority which are nonharmonious. We have problems of difficult communication and feedback problems of different policies between different regions in one country, which sometimes creates so many difficulties in making food accessible to hungry people.

People are now talking about whether it is famine or food gap or whatever. We have spent more than two months, nearly three months, in order to move 10,000 tons of food from Port Sudan to North Kordofan. We are talking of deficiency of food. If we have food at Port Sudan, and people are starving in North Kordofan, and if our monthly requirement in North Kordofan is 10,000 tons, and it takes three months to move it from Port Sudan, people will die before the food reaches them.

So, I think, in the first place, we will have to think about creating one harmonious body at the central level to deal with food security or the food question. Secondly, we have to clarify our policy about food to everybody, and also, with frankness, as the last speaker said, because we are dealing with peoples' lives.

Also, we have to strengthen the role of regional governments in dealing with food problems and let them be more effective without this strong central grip. We in North Kordofan Province and in Kordofan Region are living these problems everyday. I think the right place for the workshop is El Obeid and the next workshop should be held at El Obeid. I hope that this workshop will give us solutions for the problem we are facing now.

**T. PAGE**

**WFP Director**

I am trying to split up the various important matters that have been discussed in the workshop under two headings: policy and operational. I find that half of the items that I listed in policies fit into the operational category and vice versa. I think that it is symptomatic of the inter-relationship that has to be there between policies and operations, which is the theme of this workshop. We had excellent presentations from the macroeconomic level. We had the results of research done in North Kordofan and obviously the prevention of famine is related to all these factors.

Before I go down my list, perhaps I could provide a little bit of information on drought that affects other countries in the region. Ethiopia, which is struck by the same drought, requires 941,000 tons of emergency food aid. Mozambique requires 800,000 tons; Liberia, 200,000 tons; Angola, 100,000. The Western Sahelian countries, Chad, Nigeria, Mali, Mauritania have all applied to WFP for emergency food assistance. Collectively there are four countries just asking for over 500,000 tons. The Sudan assessment, which WFP has just completed, is basically that 7.5 million people are affected principally by drought. But the continuing civil war in the South and those refugees in the camps will be in need for emergency food aid because they do not have the purchasing power to buy their food either from the market or the public distribution system. The total requirement is 1.178 million tons, which is an extremely high figure. But, unless it is provided, I am afraid we are going to face a very serious situation in the Sudan. As one would say in the other countries, which I just mentioned, unless emergency food aid is provided there as well, the world availability of food at this time is much reduced because of the needs of the U.S.S.R. I am sure many people know that EEC countries decided recently to provide \$1 billion as food aid to the U.S.S.R. The USA has done likewise, and India, a country where many died as a result of famine 15 years ago, is providing 100,000 tons of food aid to the U.S.S.R. So the world availability is very much less this year, at a time when a number of countries are facing food shortages. The overall requirement for emergency food this year is between 5 and 6 million tons, of which about 3.7 million is required for Sub-Saharan Africa.

If we move now to try to split the deliberations of this workshop, the points and comments made by participants into follow-up actions needed on the policy side and operational side. Obviously because of Sudan's geographical location, it has a drought-prone country as its neighbor. A food policy should be developed, which takes into account the problems that drought brings, so the population of the country is secured against it. It is going to happen again. It is not a one-year phenomenon.

The point mentioned by numerous speakers, which I want to underline, is the lack of purchasing power of those in drought-affected areas. It does not matter, in fact, whether the national situation has a small food gap or large food gap. In fact, the matter is that quite a number of people cannot buy their daily necessities of food.

The Netherlands representative, who is the head of the group of donors, mentioned something about exchange rates. I put that in the policy issues and in the operational issues which we will

come on to, that is vital to the donors who wish to help Sudan in its time of need. It is vital for the U.N. system. For the NGOs who do not make profit, it is a key issue.

Switching over to the operational side of things, the Minister of Finance articulated a policy for priority this time, a credit for the imports of foods. There needs to be response because food imports are bulky and because the infrastructure is limited, in terms of railways, the trucking capacity, the administrative capacity, and so forth. Decision has to be made on both sides, on your side and the donor side, to see how it is possible to prevent a very serious situation.

Regarding those who said the grants of food aid from both bilateral and multilateral sources are welcome, all these need to be put into a coordinated schedule and what is to be done with the grants. The government has articulated that its policy is to distribute relief to the extent possible on food-for-work basis, so, there are durable assets created, so that one can improve the capacity of land and stop, to the extent possible, the encroachment by the desert. That is extremely wise in my view, but on the operational side, we need to work together; we need to have the food, if people are going to be mobilized on food-for-work basis. There are a lot of hungry people in Sudan at this time.

On the logistic side, it certainly is on the operational side of things. Port Sudan is one of the better ports on the east coast of Africa. Nothing wrong with it, but it is possible to increase the capacity of the port. I am not worried at all about Port Sudan, but I am worried about the forwarding capacity from Port Sudan, both by railways or trucks, to places in North Darfur and North Kordofan, which, of course, is such a long distance. In addition to trucking capacity which needs to be mobilized and requires management and fuel, food should be imported in a coordinated and phased way. To distribute food for 7.5 million people is a big task. And there are specialized agencies, usually voluntary agencies. They want to assist the government in that task. Certainly the relief commission has said, on numerous occasions, that they would be most welcomed, but this all must be put into action.

I think we heard results of an excellent study by IFPRI, done together with government authorities at both provincial and national levels. I would hope to conclude that it is possible for this workshop to come up with a list of operational and policy recommendations. I have been struck by the level of participation by the government here in this workshop. There should be serious recommendations, in my view, to government, donors, and international organizations, so that the knowledge we now have is put to use very promptly.

It shall now be possible to put together an operation which will prevent the catastrophe occurring. Is everyone waiting for something? I think they are. And somebody has to break the bottleneck. We all are waiting for each other in this matter. I enjoy very much listening to the many interventions. If we do not take the necessary actions, there is, otherwise, I am afraid, going to be, probably, "maja'a" deaths.

All the evidence suggests that, in the absence of large-scale and clear actions, there is a very serious situation just around the corner. In fact, it is there in North Kordofan, North Darfur, and the Red Sea Hills. Let me give a little bit of information. One of our friends over there mentioned that there is not enough food contributed at all, but in response to an earlier government request for 75,000 tons of emergency food, 71,000 tons, in fact, has been announced in terms of contributions from Netherlands, Italy, Japan, U.K., and WFP.

I have just come from China, where I spent the last four years. The Chinese eat sorghum as well. They have 300,000 tons of it available for purchase. India, too, in central provinces, has a large population which eats sorghum and millet; their crop is about to come up. The problem is, we need the money to buy it. We have some donors who will take advantage of the availability of sorghum grown elsewhere.

I would hope to conclude that it is possible for this workshop to come up with a list of operational and policy recommendations. I have been struck by the level of participation by the government here in this workshop and there should be serious recommendations, in my view, to the government, donors, and international organizations, so that the knowledge we now have is put to use very promptly.

**DR. ISAM SIDDIG AHMED**

I have some proposals for policy for the next season. On the operation side:

1. The government should allow importation of food. This has already been declared for wheat and wheat flour. We should open importation of foodstuffs for all kinds of food, including rice and pulses, such as undecorticated lentils. The government should buy from the private sector and subsidize the food price for those who cannot buy their food requirements.
2. The government should open oil importation by the private sector to meet transport and agricultural needs. This could be done through companies existing in the field. The transportation is a bottleneck; transport needs fuel. And even for next season irrigated agriculture which we are trying to go for.
3. The government should allow importation of small-scale machinery, especially for vegetable oil crushing and decortication of pulses.

On the policy side:

1. The government should immediately break down the monopoly in cotton, gum Arabic, and oil seeds marketing, so that we help the traditional producer in the next season. This break can only be done by dissolving these organizations immediately.
2. The government should adopt the policy of constructing silos in strategic areas, especially Gezira. I would like to emphasize the production of sorghum in Gezira. We could gain a lot by expanding sorghum in the irrigated sector, rather than expanding wheat production, although vertical expansion of wheat is desirable.

**MR. ELDAW ELNAIEM**

**Ministry of Finance and Economic Planning (Finance)**

The last speaker and some others have talked about the problem of transport and its connection with food security.

Our friend from Kordofan said they suffer very much from the lack of channeling the food to the Kordofan area. I want to state that all the evidence there suggests that in the absence of large-

scale and clear action, there is a very serious situation just around the corner. In fact, it is there in North Kordofan, North Darfur, and the Red Sea Hills. Weak infrastructure, exemplified in transport bottlenecks, leads to a shortage of food supply and an increase in prices. Roads improve accessibility for remote areas and enhance relief efforts. In this context, the newly completed road to El Obeid is a great help.

Earlier in the discussion, Mr. Zaki proposed to adjust the exchange rate. I don't think so. If we adjust the exchange rate, this will boost prices and shoot them so high, to the point that the whole population suffers and the farmer will get nothing. There are so many middlemen in the system between the farmers and the point at which the products are exported, and the farmers will not benefit.

I want to emphasize the fact that Sudan proved to be a good recipient for food aid during 1984-86. In a recent conference held by donors in Paris to revise logistical problems in the recipient countries, Sudan proved to be the best country for distributing, organizing, and channelling the food aid coming from abroad.

**DR. ELSAYED A. A. ZAKI**

I would like to present a set of four priorities and suggest some means by which these priorities can be achieved:

1. Expansion of agriculture and sustained agriculture production in traditional agriculture.  
Means by which this priority can be achieved include:
  - a. Accessibility to improved inputs;
  - b. Enhanced irrigation facilities to supplement rains in the rainfed areas for high value crops and livestock (underground water);
  - c. Improved irrigation management in irrigated schemes;
  - d. Rapid improvement of rural infrastructure (rural roads, rural power supply);
  - e. Credit facilities (ABS, IFAD/ABS);
  - f. Extension services; and
  - g. Pricing and marketing and storage infrastructureThese require sound economic and agricultural policies to increase agriculture crops and food production.
2. Averting food shortage and famines, by:
  - a. Effective stockholding at local, provincial, and regional levels;
  - b. Provision of water for humans and animals;
  - c. Targeted subsidies, which may be associated with some rationing to the poor, both urban and rural; and
  - d. Expansion of rural health, associated with nutrition and hardening of the population and, especially, children.
3. Provision of relief:
  - a. Legislation which will make the announcement of a crisis automatic;
  - b. An effective early warning system;

- c. Effective communication system and management for food transportation and distribution;
  - d. Strengthened role for provincial and regional authorities; and
  - e. Provision of employment opportunities in terms of food-for-work programs.
4. Building of institutional capacity.

**PROFESSOR ABDALLA A. ABDALLA**

I would like first to associate myself with Dr. von Braun regarding the points he made in summarizing what is to be done tomorrow and what is to be done today. I would also like to endorse very strongly the very in-depth contribution and input made by the WFP representative. I was very comforted when listening to both inputs, because I have been here for about a week, consulting with senior government officials. I would say, very comfortably, that the differences in terms of policies and operational issues is small, making use, as we said earlier, of the excellent report that has been based on research studies of the past, so that we can formulate new policies from that experience.

I think we are in almost complete agreement to the extent that the planning, recognition of the problem, measures that have already been taken by the government in the area of self-reliance and several other measures taken, although very plausible, are not yet adequate to meet the impending serious situation. Therefore, international assistance is a must. There is a situation to be faced seriously now.

To address the existing situation at the operational level, I think we are in agreement that there are reasons to strengthen the central coordinating body which exists now. There is a need for improvement of coordination between the government and the donors. There is a need for a high-level coordinating committee or body that will plan, discuss, deliver, and decentralize to the level that the distribution of the food is right. There are certain authorities there, but the donors and the NGOs, credible NGOs, who had done a wonderful job in this country, will be given the full opportunity to see to it and to monitor to the extent that they are satisfied that this food is equitably and justly distributed to the targeted segment of the population. I think there is no reason that the government will shy away from this, because it does not intend to be corruptive about it, to divert it to any other receiving ends.

I would suggest that we make use of this workshop to put together all the ideas that have surfaced this morning and tonight in a kind of recommendation or statement that formulates the steps that the government and donors need to take. I think the time has come, and it is already overdue, for the donors and the government to understand through dialogue and face frankly a situation which is recognized by both the government and the international community. Therefore, I will suggest that a small group sit down and put together this input that will help the government in formulating the food policy to address the existing situation. This should be done in the coming few days, rather than wait for the outcome of the proceedings of the workshop.

I would strongly endorse the categorization made by Dr. Zaki to list what I attempted to produce in the priority list, but I need to also add to what he mentioned, the need to strengthen the institutional capacities.

**DR. MOHAMMED KHEIR EL ZUBEIR**

In response to Professor Abdalla's suggestion and Dr. Abu Ouf's intervention, I think we are here to hear these valuable deliberations on the existing situation. I think the first man who will be responsible for these operations is the chairman of this session. He is the Undersecretary of the Ministry of Relief and Rehabilitation, which is the responsible ministry for relief operations. I think the message has been well sent to us. We have had the honorable Minister of Agriculture, who attended all the sessions and heard the deliberations. We are going, of course, to write some reports regarding the outcome of this valuable workshop. We will deliver it officially to our ministers, so that they can take into particular consideration these issues regarding the current situation of the food deficit and shortage and possible famine.

**DR. ELSAYED A. A. ZAKI**

I think this discussion is not only on relief, and the recommendations are more comprehensive. The Ministry of Agriculture, RRC, and the Ministry of Planning are all very well integrated in this process. So I would rather make a proposal that the three first undersecretaries write the recommendation jointly to their Ministers.

**DR. MOHAMED KHEIR EL ZUBEIR**

I have just responded to this emergency situation, but, of course, this report was prepared well before this emergency situation occurred. We are going to tackle and deal with these medium- and long-term policies arising out of this report, as well as other reports. Actually, we are working together with the Ministry of Agriculture to discuss ways and means to establish a food security institution in the whole government organization. So, my remark was only in response to what we are going to do with the recommendation which has emerged from the discussions of the emergency situation. This is what we are going to tackle. Of course, the main issue will also be well taken by all of us.

**ELFATIH A. SIDDIQ**

**Ministry of Finance and Economic Planning (Planning)**

A Summary of Deliberations:

1. Food security should be the basic objective of the government. This is to be achieved by

- the appropriate food policies. In this respect, a distinction is to be made between food security and self-sufficiency, where food security agri-policies play a key role.
2. Accumulated experience has shown that the absence of sound macroeconomic policies and increasing reliance on ad hoc measures in response to economic crises, the lack of political will, and weak institutional capacity are not all conducive for preventing erosion of the country's capacity to deal with the drought crisis. Therefore, drought alone cannot be blamed for food insecurity, which would, finally, result in famine.
  3. To avoid the bitter experience of the past, there are certain prerequisites for addressing the problem of food insecurity prevention, namely:
    - a. Adoption of a coherent and consistent package of macroeconomic policies, based on efficient allocation of resources;
    - b. Adoption of sound food policies to achieve sustained agricultural development with appropriate balance between various subsectors (irrigated, mechanized, traditional) and between food crops and cash crops;
    - c. Emphasis on sustainable food production in the traditional subsector to enhance the income-generating capacities of the rural poor;
    - d. Due attention to resource conservation and management as deserved;
    - e. Emphasis on investment in hard-core infrastructure (roads, power, water supply, communications, and so forth) and soft-core infrastructure (appropriate technology, extension, research, credit, and so forth);
    - f. Enhance the policy analysis capacity in the country, including creation of an overall coordination body, as well as strengthening and coordinating the activities of implementing units involved in food.
  4. In order to cope with the food gap or famine, certain needed prerequisites are an efficient early warning system and more importantly early and prompt response to the problem. This includes ensuring regional support. Related to this issue is relief, where
    - a. The concept of relief should be broadened to include sanitation, health services, protection of livestock, and so forth.
    - b. We have to avoid the aid dependency syndrome. Relief, therefore, should be targeted to affected groups and in a way to increase their capacity to generate income by providing food for work.
    - c. A legal structure is required with clear distinction of responsibilities at all levels, and with more decentralization of responsibilities. This should be translated into an anti-famine code.

#### 4. CONCLUDING REMARKS: CONSENSUS AND DEBATE

Elsayed A. A. Zaki

The workshop discussions indicated general agreement among the participants on some basic issues, such as the need for a development strategy, an efficient relief operation, and a food security policy which relates to drought, desertification, and famine prevention. However, views diverged on the strategies, policies, and operational aspects for confronting these issues. This concluding chapter highlights ten of those issues where the debate is still continuing, with the hope that such an approach will alert policymakers to the significance of these issues and will stimulate researchers to further seek clarification.

#### FAMINE AND HUNGER

For months, the government insisted that the food situation in Sudan should be addressed in terms of food shortages or food deficits which could be filled by increasing food availability through planting more grains in irrigated schemes and/or limited food imports. The government considers the use of the term "famine" under the circumstances to be inappropriate. In contrast, international donors contend that the food situation will inevitably develop into a famine of significant proportions. During the workshop, some participants suggested that the issue is definitional.

In the report,<sup>4</sup> hunger is defined as not having enough to eat to lead a healthy and active life and famine is defined as the presence of widespread extreme hunger in specific areas or countries which results in drastic malnutrition and high death rates. Some participants contested that famine is equivalent to "maja'a," an Arabic word connotating a horrifying phenomenon, to Sudanese people, of complete denial of access to food and deaths in the thousands during mass movements of dislocated and malnourished people. This definition, in the opinion of those participants, is the rationale for the government to speak about food deficit and food gap.

The issue has to be viewed in a continuum. Extreme hunger leads to malnutrition and death, particularly in a low sanitary and high disease environment. If food shortages are widespread then the situation can very quickly develop into one of excessive movement of people looking for food, mass hunger, widespread malnutrition, and increased deaths, especially of the most vulnerable—the poor, old, and children. There is no doubt that the situation in 1984/85 developed in the manner just described to become a major "maja'a," comparable to that of 1306 H (1889). Participants repeatedly expressed the opinion that the 1990/91 situation could also develop into a famine

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<sup>4</sup> T. Teklu, J. von Braun, and Elsayed A. A. Zaki, Drought and Famine Relationships in Sudan: Policy Implications for Food Security, IFPRI, Washington, D.C., 1990.

("maja'a") of significant proportions unless serious measures are undertaken to head it off. The indicators to attest for such a proposition include:

1. Production falls have lead to a national food gap which is, by all accounts, significantly large—estimated at one-third of national consumption.
2. Household purchasing power is eroded more than in 1984/85. For example, in Northern Kordofan, livestock assets are down by about 70 percent. At the same time, food prices are higher than then in real terms. The erosion of purchasing power reduces accessibility to food. Filling the supply gap will not eliminate the danger of famine.
3. Malnutrition rates are increasing much, as indicated by recent surveys for Red Sea and Kordofan.
4. Attempts to fill the gap are hampered by a stalemate in the government's relationship with donors, scarcity of foreign exchange, unavailability of fuels, and lack of transportation and storage capacity.

In conclusion, it would be more appropriate to work with an operational definition that is realistic and has a vision for averting the occurrence and damaging effects of famine than with a fatalist definition that would describe the aftermath of a famine.

#### **CAUSES OF FAMINE**

The immediate visible cause of famine is drought, which triggers shortage or scarcity of food, and poverty, which leads to denial of access to food. There are fundamental structural reasons for famine. Famine is an outcome of a long process; the key contributing factors are environmental (drought, desertification, soil erosion), development, investment, and economic policy failures and lack of famine preparedness policy. In fact, absence of sound policies on all fronts and reliance on ad hoc measures, lack of political will and commitment, and weak institutional capacity increase the country's vulnerability to food insecurity. Therefore, human action is behind both the degradation of environment and failure of policies and the interaction among these complex variables and, thus, should bear most of the blame. Hence, while there was consensus on the policies contributing to and needed to avert famine, the question of which factors are more important in contributing to famine is still under debate.

#### **FOOD SECURITY**

Official policy statements and some participants brought to the forefront the old 19th century debate of food production to achieve self-sufficiency versus efficient production on the basis of comparative advantage principles with some degree of dependence on international trade. The debate is between a narrow concept of food security, which is in terms of self-sufficiency through national production of staples, and a broader concept of food security, in which the country would produce efficiently the food items it is capable of producing, in addition to other tradeable commodities which would be used to earn the critically-needed foreign exchange for sustaining the economy and ensuring the supply of imported inputs to enhance food and nonfood production capability.

In pursuit of food self-sufficiency, government officials indicated that scarce resources, such as irrigation water, would be allocated to produce grains, at the expense of cash crops and tradeables. There is a presumption that production under irrigation is guaranteed, but the history of irrigated agriculture in Sudan has demonstrated time and again that it is not totally reliable and not necessarily risk free. It is an irony that the most well-known famine in human history took place in the country which depends for its food production on irrigation from the River Nile.

Furthermore, production of staple grain in adequate quantities is necessary but not sufficient to avert famine. Some elements of the sufficiency condition, such as transportation, preservation, stockpiling and distribution (let alone imported inputs for food production), can only be met by procurement from international markets. Hence, it is more prudent to profess the more comprehensive concept of food security.

#### **DEVELOPMENT STRATEGY**

There was an overall agreement among the participants that a sound development strategy is a prerequisite for food security in terms of protection of the environment, increased food production and enhanced employment and income generation. For Sudan, it was further agreed that this strategy should rest on agriculture. However, participants differed on the degree of emphasis to be given to the precedence and priority to irrigated agriculture (based on capital-intensive investment and high import content) or to rainfed agriculture (low capital intensity, low import content, and high labor intensity). Given the vulnerability of rainfed agriculture to levels and distribution of rainfall, participants recommended the development of the southern part of the rainfall zone, where, with the use of high input technology, productivity could be increased substantially.

Irrigated agriculture should be operated as a profitable enterprise. Presently, the government is reviewing the rotation of the agricultural parastatals to determine the crop mix and cropping pattern. There is a bias towards incorporating food crops in the rotation in support of self-sufficiency, but this might compromise the earning of foreign exchange, which is critically needed to sustain production and keep the economy running. The efficiency criteria in farming should be sustained lest it render the country more vulnerable to food insecurity.

Participants agreed on the importance of diversification of production in both the traditional rainfed and irrigated subsectors, which is believed to reduce risk and improve harvests and which, in turn, enhances food security. Livestock integration in the traditional rainfed and irrigated subsectors was also supported, in the hope that it would increase profitability of farming, diversify production, and make available important food commodities, such as meat and dairy products, to consumers. Diversification and integration would, in this way, lead towards more balanced growth of the agricultural sector.

#### **MACROECONOMIC POLICY**

Macroeconomic policy, which is comprised of pricing, monetary, fiscal, exchange rate adjustment, trade and employment policies, affects production and consumption directly. As such, macroeconomic

policy is important for food security. Participants had differing views on what the package should include, although they agreed that the package should be pursued in its entirety and that piecemeal solutions would not work.

Exchange rate adjustment raised considerable mixed feelings. Some participants valued its impact on producers' returns and, therefore, its positive impact on food security. Opponents argued that the productive sectors face supply rigidities and could not respond adequately; as such, devaluation would only increase costs and fuel inflation. Proponents argued that an exchange rate adjustment is not by itself inflationary and that inflation is brought about by increased money supply and scarcity in consumer goods. It was generally recognized that producers are responsive to higher prices for their products. Therefore, there was a call for allowing the impact of the adjustment to trickle down to the producers. Price controls were seen as obstacles to producing such desirable effects. Some participants saw the most important obstacle to increased producer prices to be the parastatal monopoly powers, especially on export crops, which include, besides cotton, primary products such as gum Arabic, vegetable oils, and livestock produced by the traditional rainfed subsector.

#### **INVESTMENT POLICY**

There was a consensus among participants that investments in the areas of transport, storage, energy, rural water supply, and health facilities are critical for food security; in particular, the quality of investment was emphasized.

#### **INSTITUTION BUILDING**

Participants were of the view that emphasis should be given to human resource development. Special attention should be paid to institutions which can provide early warnings, enhance famine preparedness, assist in food distribution, and respond to emergencies.

#### **RELIEF AND FAMINE PREVENTION**

A prerequisite for relief and famine prevention is the availability of food. Participants emphasized policies that would increase production of food, build stocks at times of surplus production, improve and increase storage capacity at both production and major consumption centers, improve efficiency of the transport network for distribution, and implement an effective rationing system at times of acute shortages to ensure minimum food consumption. However, the problem is not just that of food availability in the market, it is also that of poverty. Hence, activities to enhance the income generation capacity of the rural population and protect the value of their assets at times of emergency are also seen as vital to food security.

Participants strongly advocated food-for-work schemes, but emphasized that these could be used to expand infrastructure necessary for food production and distribution. Projects, such as clearance and extension of canals for irrigation, rural water supply, rural roads, afforestation, and so forth,

lend themselves easily to this cause. Use of food as a scarce resource in the expansion of food production capacity should decrease and, perhaps, eliminate the disincentive effects associated with food aid. Some participants argued that there was an inverse relationship between food aid and the national capacity for food production, although it was pointed out by other participants that the factual basis for such an assertion was limited. There was a consensus that the dependency syndrome at the community and household levels should be avoided, and free distribution of food should be limited to those who cannot afford to pay at all, that is, to the absolute poor. This goal could further be achieved through food subsidies to carefully identified target groups.

The success of relief operations depends on early warning and early response to the famine crisis. Experience shows that early response in terms of admission of a critical food shortage has been lacking, since most governments consider this to be embarrassing. To avoid any embarrassment, the famine and relief legislation should entrust an independent agency with powers of automatic declaration of an emergency and ability to request assistance from either national or international sources.

Another important factor for the success of the relief operation is the strengthening of the role of the local communities, provincial and regional government authorities in the distribution of food aid to the affected population. The operation should be transparent and based on clear eligibility criteria to ensure that food is delivered to the needy people. There has been an intensive debate on the role of the NGOs within this operation. It has been generally agreed that, whereas distribution would remain with the national authorities, credible NGOs could participate in logistics and management of food delivery to affected areas as well as supervision of the distribution of aid to the recipients. Such an elaborate system, with a large number of agencies involved, would require an effective coordination mechanism with clear standard operating procedures among the government, donor agencies, NGOs, and government authorities at various levels.

#### **PRIORITY SETTING**

Participants emphasized the need for a clear scheme of prioritization by the government with respect to short-term objectives for relief and medium- and long-term objectives for rehabilitation and development aimed at achieving food security. The government needs to weigh the trade-offs carefully and design its short- and long-term plan in accordance.

#### **RESEARCH AGENDA**

Overall, there was a very daring conclusion of the workshop, that past research is relevant to present and future problems. The continuing cooperation between international research organizations and government agencies and national research institutions is regarded as a crucial input to policies designed to enhance food security.

**ANNEX 1**

**POLICY BRIEFS DISSEMINATED BEFORE THE WORKSHOP**

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*Food Policy Workshop on: Drought and Famine Prevention in Sudan  
of  
Ministry of Finance and Economic Planning, Khartoum, and  
International Food Policy Research Institute, Washington, D.C.*

*Khartoum, January 7, 1991*

**Brief No. 1: MACRO-ECONOMIC ENVIRONMENT AND FAMINE**

A sustainable famine prevention policy requires growth with employment expansion for the poor, especially in the farm sector. However, this, in turn, requires a conducive macro-economic environment, which is the focus of this brief.

Sudan, in pursuit of the "breadbasket" strategy in the 1970s, committed resources to capital investment projects, particularly the expansion and maintenance or rehabilitation of large-scale irrigated agriculture and mechanized farming. Development of traditional smallholder agriculture had low priority, and, in fact, it is only in the 1980s, following the adoption of the "Rainfed Agriculture Strategy," that programs of rural credit, extension, improved technological packages of adaptive research, agricultural inputs, supplementary irrigation and animal services have been developed for the traditional rainfed agriculture. The capital-intensive projects did not generate much employment opportunities for the rural people. Moreover, agro-industries, oil seed mills, and textile industries were expanded far beyond the limits of the country's raw materials production capacity. At the same time, investments in infrastructure such as trunk and rural roads as well as storage and market facilities lagged behind.

The exchange rate policy was particularly designed to derive public revenues from the export of cotton, the main tradeable. Agricultural tradeables were heavily taxed in an implicit way at the declared legal exchange rates and losses due to exchange rate overvaluation were quite severe. Whereas producers of cotton under irrigated agriculture and large mechanized farms could partially avert the adverse effects of currency overvaluation, given their political clout, producers in traditional agriculture faced the vagaries of such a policy in full. Traditional cotton producers received extremely low prices and were forced to abandon cotton production. Producers of gum-Arabic and livestock in the traditional sector had their prices suppressed.

The implications of these policies were such that the structure of incentives was not adequate for inducing agricultural production and enhancing rural employment. Thus farmers continued to face the problems of low producer prices, inaccessible markets due to inadequate information and poor infrastructure, high consumer prices for the rural (relative to the urban) population, besides scarcities of basic necessities. Off-farm and seasonal employment opportunities declined. This pushed more and more of the rural population to liquidating their farm assets, including livestock, to meet cash needs, especially for supplementary food. The end result was that, under such situations, traditional producers were likely to commit less resources to agricultural investments, further reducing both production and incomes.

In the meantime, with high population growth rates there were more mouths to feed with less food and cash and hence undernutrition spread widely. Local food shortages and starvation, exacerbated by distribution problems, became more noticeable every year. Considerable environmental deterioration also occurred, resulting from decreasing rainfall trend, frequent droughts, pressure on land from humans and animals, and deforestation for fuel wood purposes. Rainfall data indicate Sudan's increasing vulnerability to drought which, in turn, contributed to ecological degradation and environmental hazards. The resource base of the economy continued to diminish steadily.

During the 1980s, a series of macroeconomic adjustment programs were undertaken. They were designed to:

- reduce budget deficits through increased public revenues and decreased public expenditures;
- streamline fiscal and monetary policies with the objectives of reducing the money supply, curbing deficit financing, and ultimately controlling inflation;
- stimulate the economy especially through export promotion and exchange rate adjustment to the extent needed to render the country's exports competitive in international markets;
- reduce market distortions and abandon price controls except on a few sensitive items, such as bread, pharmaceuticals, and petroleum products which were supplied by the government.

The set of policies adopted during the adjustment period did not achieve its goals. Instead, real per capita GNP registered negative growth. Exports also showed an acute decline during the 1980s of -1.4 percent. The savings ratio, in real terms, was only 0.1 percent during the 1980s. The investment rate fell from 22 percent in 1982 to around 10 percent in 1988. Inflation continued to destabilize the economy, soaring from 13 percent in 1982 to 70 percent in 1988. Losses to producers of non-cereal tradeables (traditional, mechanized, and irrigated), due to exchange rate overvaluation, were high throughout the 1970s and 1980s (11.6 percent of direct taxes and 64 percent of indirect taxes for the period 1970-1988).

In summary, reform programs have not produced the intended results because the adjustment programs have been inadequate and have not been pursued in needed magnitude and commitment to produce desired results. Successive governments have relied heavily on partial solutions and economy-wide controls in order to suppress excess aggregate demand. The poorer segments of the society have borne more than a proportionate share of the burden, both in terms of a producers' tax and a bias against the rural populace in the form of consumer subsidies. The rural poor, who are already in a destitute condition, trigger drought into famine. Unrest and security problems in rural areas further aggravated the problem.

Macroeconomic policies should be geared towards reducing the drought-famine relationship. More specifically, they should be designed to allocate resources efficiently, sustain economic growth, improve the rural-urban terms of trade, and control inflation. Only if such improvements and stabilization are achieved can the pace of rural-urban migration be slowed down and ultimately arrested. The present low returns to rural labor and reduced revenues for farming, partly due to macroeconomic policy, are prime causes of food insecurity.

More emphasis needs to be placed on investments in rural infrastructure, including rural road network, storage facilities, market facilities, supply of agricultural inputs, development of technological packages, and so forth. Programs to increase income generation capacity, rural employment opportunities, and credit facilities for producers to acquire inputs should be promoted. Again, this requires a proper macroeconomic policy framework.

It is only by strengthening the economic base of the rural population, preventing market failures, and protecting the environment that the incidence of famine can be averted in a sustained way.



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**Brief No. 2: MARKET AND PRICE POLICY FOR FAMINE PREVENTION**

It is of central importance for government policymakers to have a comprehensive understanding of how markets and prices function, especially during times of food shortages. Knowledge of the production-price relationships provides a crucial input into policies regarding interregional trade, stockholding, and food imports (including food aid). A key question of this brief is: To what extent can market interventions and/or free market policies facilitate famine prevention?

Cereals are the staple diet of the population and they represent the major item in the rural population's household expenditures. Cereals are also the major feed crop for animals during the dry season when rainy season pastures are used up. Consequently, well-functioning cereal markets and marketing structures such as roads, storage facilities, and market information are vital to the well being of the population at large, and to the rural population in particular.

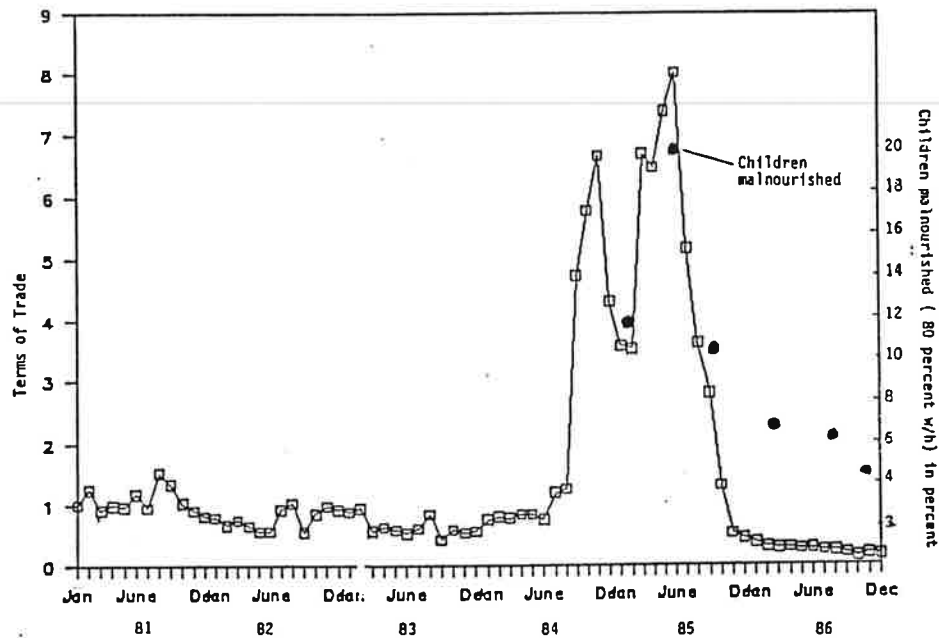
Price-Income-Food Security Links

Cereals are closely linked to livestock in another important manner: livestock is traded for cash to obtain food and other household necessities. Hence movements in the price relationship between cereals and livestock (i.e. their terms of trade) represents a significant indicator of purchasing power of the rural population. Another important indicator of the accessibility of rural producers to food is the terms of trade between cereals and cash crops of the traditional sector, such as sesame and groundnuts.

Domestic cereal/livestock terms of trade increased drastically from 1 in 1980 to about 8 in 1984/85, as the consequence of the drought. Thus, to acquire the same volume of cereals, up to 8 times as much livestock had to be offered in 1984/85 relative to 1980. Further analysis shows that a 10 percent drop in cereal production tends to result in an 18 percent increase in cereal/livestock terms of trade.

Domestic terms of trade between cereals and cash crops, such as sesame and groundnuts, increased two- to threefold as a consequence of the drought-related cereal production declines. These combined production and price effects resulted in food entitlement failure and undernutrition for large segments of the rural population (see figure).

Seasonal cereal-livestock terms of trade and child malnutrition  
January 1981-December 1986 in Kordofan  
(sorghum to cattle terms of trade)



Prevention of short-term price explosions, such as in 1985, would go a long way toward prevention of increased undernutrition. Domestic food prices exceeded international ones by far because of limited integration into the international trade regime.

### High Transaction Costs

Markets operate and transmit price signals across regions. Thus, while the direct drought effects are particularly severe in drought-prone areas, the price effect hits everywhere. However, poor market connections preclude markets from clearing at acceptable price levels, due to high market transaction costs. Apart from administrative barriers, when a region prohibits the transfer of food out of its boundaries, transportation costs alone account for, on average, between 10 to 15 percent of consumer prices. A sample of market areas shows that the share of transportation costs ranges between one-fourth and nearly one-half of total marketing costs. This largely arises from the poor road network as evident from the comparison of transport shares of eastern and western Sudan market areas: the cost share is higher in western markets where the rural road network is less developed. Market

connections are particularly poor for livestock markets, and not unexpectedly for the most distant markets of western Sudan. At times of food shortages, pastures are also lacking, and since animals are trekked a distance of up to fourteen hundred kilometers from producer markets to consumer markets, transfer costs are extremely high.

Although the study could not assemble information on actual marketing costs during the 1984/85 food crisis, market costs were apparently prohibitive in many instances. In such cases, rural people would then move to the food rather than wait for the food to be moved to them, even if some of them still had the required purchasing power. A large share of the interregional migration is due to drought and food shortage where there is the combined effect of lack of food and employment locally.

### Urban-Biased Food Subsidies

Sudan operated a large price-controlled subsidized bread program which should be viewed within the context of policies for producer prices, commodity specific taxation and resulting inter-regional disparities and rural versus urban effects. Rural areas hardly received any share from the bread subsidy, which mostly reached urban households. Little reached the drought- and famine-prone rural areas. Aggregated data show that bread consumption constituted only 10 percent of rural household cereal consumption whereas it amounted to 44 percent for urban households. The rural population paid the full market price (or opportunity cost in case they produce their own grain) for their grain consumption. They also paid much higher prices for consumer goods, including essentials such as bread, soap, and vegetable oils. Black market margins were anything between 5 and 10 times the official declared prices and many consumer goods were either scarce or unavailable.

### Market Policies

The overall macroeconomic policy, including exchange rate, trade and price policies, directly affect prices and food accessibility to rural households. Some evidence from the past suggests that these policies were in disfavor of traditional agricultural products (Brief No. 1). In fact, the dramatic changes in the terms of trade for nonfood commodities relative to food noted earlier could happen only because of the limited integration of the country in the international exchange economy. Administrative and trade financing constraints as well as bottlenecks in infrastructure prevented the clearance of markets at lower price levels. A less constrained foreign exchange situation (or more timely food aid) might have prevented some of the resource wastage and human misery that occurred during the crisis.

The foregoing analysis implies that although prolonged droughts are the triggering factor for famines and human suffering, by themselves, they are not necessarily causing famines. Poor market connections in the case of food, spatial and temporal spread of food and cash crops

prices, and market information are of particular importance. There is evidence that integration with international markets, fair prices for agricultural products, an exchange rate in favor of or at least nondiscriminatory against export crops, an efficient and timely supply of consumer commodities, and the continuation of essential rural services would reduce the danger of food shortages, malnutrition, famines, and en masse rural dislocations and rural-urban migration.

Lesson from past experiences suggest that future policies should emphasize the following:

- Improvement of the market structure and a more open domestic and international trade regime to eliminate the danger of market failure and to ensure early access to markets for food, other consumer goods, agricultural products, and farm inputs;
- Regional stock-holding of food, under the control of regional governments, to ensure fast and effective mobilization in times of (local) shortage, given the deficient infrastructure linkages;
- Adequate prices to rural producers for their agricultural produce in line with international prices;
- Distribution of food at times of scarcity on the basis of a systematically stratified rural population so that primarily the needy and vulnerable segments of the population are given free food, lest a harmful dependency attitude is encouraged—distribution should be timely in order to avoid rural population mass migration.

In addition, policies which enhance rural income and increase food accessibility by households are required:

- Improvement of employment opportunities through public work programs for assurance of a steady flow of income to enable rural households to purchase basic necessities;
- Restoration of the rural household asset base, particularly needed after a lean year, so that vulnerability is reduced and rural households do not become prone to food insecurity in case the next season crop fails—credit for livestock re-acquisition by the poor is an important component;

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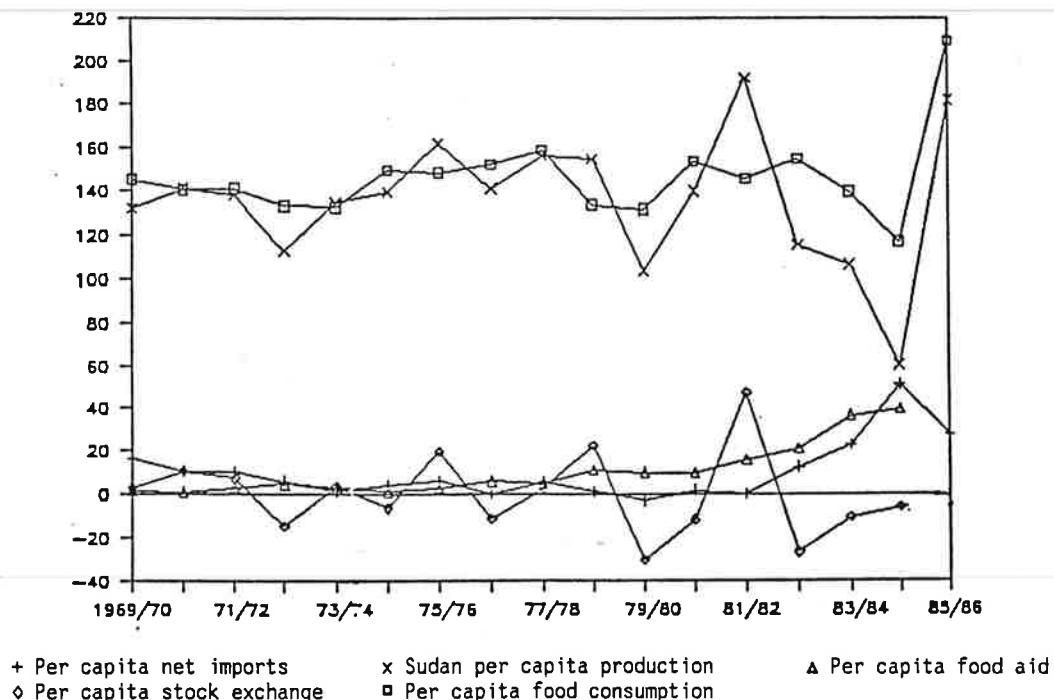
## **Brief No. 3: FOOD AND NUTRITION PROBLEMS: NEED FOR PUBLIC INTERVENTION**

Famine prevention policy needs to take account of information on the food situation at both country and household level for proper planning of effective interventions. Such information is the focus of this brief.

### National Food Availability

Cereal food availability declined notably in the late 1970s and the early 1980s, dropping by an average of 1.4 percent per annum between

Per capita food consumption, Sudan, 1969/70-1985/86



1970-1986. Average per capita cereal consumption dropped from a high of about 160 kgs in 1977/78 to about 120 kgs in 1984 (see figure). The decline in cereal food availability was largely due to low growth in domestic production relative to population growth. Cereal food availability is quite determined by domestic staple food production, which contributes about 90 percent of cereal consumption on average, declining to a low of 75 percent in the 1984 drought year. The drought year of 1984 contributed to the largest drop in cereal consumption. Recovery was significant in the next two years.

### Household Consumption

The incidence of aggregate decline in consumption was uneven across the socioeconomic groups. In a period of food scarcity, the burden falls heavily on low income households. Low income households spend a large share of their income on food. For example, households in the bottom quartile of the income distribution in North Kordofan allocated about 70 percent of their budget to food, compared to 55 percent by the top quartile households, according to a national consumption and expenditure survey undertaken before the 1980 famine. The poor spent more of their food budget on staple crops than did the nonpoor. Households respond in varying degrees to income and price changes. Real income changes cause more consumption adjustments among poor households because of their large food share and greater need to adjust to changes in income and prices.

Declines in income lead to decreases in food consumption: a 10 percent drop in income translates into a 3.6 to 5.8 percent decline in calorie consumption. Households with comparable incomes but larger families consume less calories on average. Price increases also lead to decreases in calorie consumption: a 10 percent increase in the price of millet results, on average, between a 2.9 to 3.6 percent drop in calories.

A decrease in income induces an increase in the share of the budget allocated to staple food. Similarly, an increase in food price is accompanied by an increase in the staple food budget share. These increases are much stronger among the poor. The poor have very few degrees of freedom with budget reallocation, since food budget shares are already high and scope for maintaining food consumption levels by shifting from expenditures from the nonfood budget is quite limited. Other short run options include cutting meal sizes and/or frequency of meals, changing the diet composition, such as by increasing the share of collected foods, and acquiring additional means of financing food consumption, such as through dissavings. In the Sudan survey area, it was observed that not less than 80 percent of the sample households, particularly adult members, cut their level of food intake during 1985. A sizeable proportion of the households augmented their diets by consuming gathered foods. While these adjustments are adopted in the normal "hungry season" among the poor, their importance significantly increased in the 1985 famine year.

## Nutrition

Nutritional status records of 1985 indicate failures on the part of many households in coping with severe food shortages. Anthropometric indicators show an increased proportion of malnourished children in mid-1985 as well as high infant and child mortality rates. In Kordofan, the dramatic deterioration in purchasing power and a high incidence of diseases translated into an increased incidence of severe child malnutrition, particularly in the north arid region (see also Brief No. 2).

A more complete set of child nutritional determinants is derived from an analysis of 30,000 children covered by a 1986-87 nationwide survey collected by the Ministry of Health. High levels of food consumption per capita and higher meal frequencies improved child nutrition. Analysis shows that cutting back from 3 to 2 meals increases child malnutrition by 18 percent in children of these households. In 1986/87, 14 percent of children were in households which had only 2 meals or less per day. Children who had recently had diarrhea were worse off, especially in the short run. An improved health environment and access to health services substantially contributed to better child nutritional status. Parent's education, especially mother's education, positively impacted on child nutrition. In fact, mother's literacy increased child nutrition by more than twice as much as father's literacy.

## Policy Issues

Improvements in food intake above the current low level in Sudan are crucial for human survival and well being. The problem of acute food shortages remains a major concern for a significant proportion of households. Even in a good year such as 1986-87, the malnutrition problem was widespread. An improvement in the access to food, however, is not sufficient to attain the desired nutritional outcome: health, sanitation, and education play key roles, too.

- Public policy must address the key components of the poverty-hunger relationship to deal with the problem of access to food. Central to such a drive is the need to improve agricultural labor productivity in rainfed agriculture, given that the problem of food access by the bulk of the rural population is linked to low and variable returns to labor.
- Public policies designed to improve nutritional outcomes should go beyond the goal of enhancement of food consumption. Public action must be directed to expand health services (at least primary health care), improve the community sanitation environment, and provide access to safe water. In addition, investments in human capital, especially formal education, promise high returns to nutritional improvements.



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**Brief No. 4: FAMINE PREVENTION AND RELIEF POLICIES FOR SUDAN**

The experience of 1984/85 has demonstrated the strong link between drought and famine. An efficient response for dispelling the danger of a drought turning into famine, requires political commitment, a legal framework, and administrative capacities.

Famine Prevention Policies

Political stability is a prerequisite for famine prevention for three fundamental reasons. First, the already large displaced rural population is unproductive and, at present, much dependent on food aid. Second, large areas with adequate rainfall and high productivity, especially for food grains, are increasingly inaccessible due to instability and conflict, which results in lost opportunities for increasing grain production and rural employment, and, hence, for reducing vulnerability to food insecurity. Third, valuable financial, human, and administrative national resources are diverted from economic development and investments.

Political stability can be enhanced by active rural participation: rural people would form their own institutions to identify and propose solutions to their problems, including food supplies, and commit resources towards meeting the costs involved. With decentralization and operative rural institutions, stability would be enhanced.

A meaningful famine prevention strategy should include macro-economic policies in favor of efficient resource allocation and sustained economic growth. Trade and pricing policies should lead to a significant improvement in the rural-urban terms of trade. Control of inflation is crucial for economic and political stability since inflation costs are borne by the poor, particularly rural people (Brief No. 1).

Policies for sustainable agricultural production should be developed to

- promote agricultural production to attain regional and national food self-reliance;
- enhance employment and income generation; and
- conserve, rehabilitate, and improve natural resources.

To maintain production of food and cash crops, the government needs to ensure adequate and timely availability of agricultural inputs at prices which farmers can afford. These need not be subsidized but policy can impact on prices by reducing transaction costs and by supplying credit for input purchase. Other components of the technological package would deal with low and variable rainfall, low soil fertility, water conservation and dry farming techniques, seasonal shortages of labor, and farmers' management practices. Technological packages have already been developed within the country by the Western Sudan Agricultural Research Project and the Jebel Marrah and Savannah schemes, which could serve as a base for interventions of this nature (Brief No. 5).

Infrastructure development is a critical component in the promotion of a stable and sustainable rainfed agricultural sector. A reduction in transportation costs provides improved opportunities for mobility of goods and people, facilitates expansion of market outlets, enhances market integration, and reduces probability of market failure. An expansion of the transportation network also facilitates access to social overhead services (health, education, potable water, etc.) which contribute to improving productivity and, consequently, increasing income generation capacity and improving nutritional status. Public works programs are instrumental in the expansion of rural road infrastructure. Moreover, the labor participating in these programs would come from low-income rural families and would normally spend a large share of their income on food. Hence, in areas of food deficiency, payments can be made partly in terms of food and, at the same time, development objectives are enhanced through the created assets.

Preserving, promoting, and protecting the environment is fundamental for enhancing future productive capacity of the drought-prone areas. Desertification, climatic changes, increasing human and livestock population, impoverishment of rural population, and past policy failures have contributed to environmental degradation. A strategy for environmental protection should call for modification of the existing common property rights system, provision of incentives for voluntary resettlement of rural populations and provision of income support activities to rural people during times of stress.

In summary, the design of an effective famine prevention strategy rests on increased food production, increased employment and improved incomes of the rural population, an expanded infrastructural base in

terms of a national and rural network of roads and storage facilities, and protection of the resource base for ensuring sustained production.

### Emergency Preparedness and Relief

Besides a famine prevention strategy, a strategy for meeting emergencies and providing relief when needed is also crucial. Its focus is on short-term stabilization of incomes and prices and maintenance of basic health services (Brief No. 3).

Actions needed to increase the preparedness to meet emergency situations of localized or nationwide food shortages and famines include:

- public commitment to intervene effectively and timely,
- building of institutional capacity at national, regional, and local levels,
- detection and diagnosis of distress indicators,
- preparation of programs and projects on a continuous basis,
- execution of development and relief undertakings in times of revealed needs.

To actually have the capability to undertake relief work once food shortages reach critical level, elements such as buffer stocks, relief management and early warning systems, strong rural health and sanitation systems, and legislation for famine prevention are important.

Buffer Stocks. The development and efficient operation of a buffer stock, located at storage facilities close to high risk areas, is an important element. The stocking and dissemination of grains require clear guidelines as to the targeted areas, eligible groups, the period when distribution commences, and the price of grains.

Relief Management and Early Warning Systems. A high-powered relief management system, which has a network extending to local, provincial, regional and national levels, would have as its objective not only the supply and distribution of food during shortages and famines, but, also, the prevention of famine in the first place. The relief institutions need to establish a well-equipped—both in terms of equipment and highly motivated professional personnel—early warning system with strong links to local governments and communities.

Strengthening Rural Health and Sanitation. A strong rural health system is a necessity under any circumstance and not just from a famine relief perspective. The strong linkages between infrastructure and health and sanitation in rural areas have been highlighted by this research. Not only does improved hygiene impact directly on child nutrition, but it facilitates coping with drought-related consumption fluctuations. Altogether, a strengthened and effective health service system can promote a powerful tool to manage relief more effectively and would deal

with both chronic food insecurity's symptoms, and thereby strengthen the capacity to survive transitory food insecurity and related health risks. Therefore, the quality of health services and the density of the network in rural areas need to improve, which is a key function of public investment for human resource development.

Legislation for Famine Prevention. For relief institutions to operate efficiently, a well-structured relief legislation program needs to be designed that would incorporate the basic relief policies to which the government is fully committed. The relief legislation should detail the responsibility of the national and regional governments and the local authorities in identifying and declaring areas under famine risk and in diminishing the impacts of shortages.

Each vulnerable locality should be put into a position of maintaining a certain amount of grain emergency store in accordance with a timetable drawn on the basis of monthly requirements with a declining balance as the agricultural production season advances and a building up in the same manner. Local authorities would be required to prepare periodically (weekly and monthly) a report which would include detailed statistics and information on production, stocks, withdrawals, and the number of people likely to be subjected to risk of malnutrition or starvation. The early warning system would, in addition to other information on rains and the like, compile these data at provincial and regional levels, analyze and make recommendation, and present a full report to the regional and central authorities with specific actions to undertake, authorized under such law. Specific actions would include rationed food distribution and actions through the health system, especially for children and mothers. As an important component, local authorities would implement public works activities to provide useful employment to potential famine victims, thereby reducing pressure to migrate to cities or camps. Such public works would focus on infrastructure and resource improvement, and thereby establish an explicit link between famine relief and famine prevention.

The central authorities would make public announcements about the situation and seek assistance, if necessary, from the international community. Authorities, especially at the local level, will then be entrusted with the field inspection of the relief work and assessment of the effectiveness of the relief program. (Further insights related to food aid experiences are in Brief No. 5.)

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**Brief No. 5: COPING WITH FAMINE: PROJECT LEVEL EXPERIENCES**

A typical farm household in the semi-arid belt of Sudan adopts a strategy of income diversification to cope with low and variable crop income. Households cope by substituting responses within and between the principal components of the production-income-consumption-saving chain. Production responses can involve changes in cropping patterns, input uses, and planting practices. Labor can respond by moving out in search of wage employment, migrating with herds to distant pastures, or engaging in self-employment in petty trading. Food consumption responses can involve shifts in dietary components and reallocation of household budgets from nonfood to food. Dissaving can occur via livestock disposal.

Public response must be based on a proper understanding of the dynamics of the household coping process and the context within which the process evolves. Timeliness of intervention is critical: action must be taken before the coping capacity is so eroded that recovery becomes impaired.

This brief is on lessons learned from the 1980s experiences with respect to public preparedness to protect household and community coping strategies and the potentials and constraints of interventions in place since the 1985 famine. A brief review of selected project experiences in Darfur and Kordofan with improved technology, food aid, tree planting, and goat restocking provides pointers for the future.

Improved Agricultural Technology

The extension of improved technology by the Jebel Marra Rural Development Project (JMRDP) in the 1980s enhanced the production and employment absorption capacity of the Jebel Marra area, which is an agriculturally high potential area producing surplus grains in years with sufficient rainfall. The area experienced lower than usual rainfall in the early 1980s which became more severe in 1984, as in much of

Western Sudan. Not only did the area have to cope with food shortages of its own population but it also had to absorb a large number of refugees who came from more affected areas (other parts of Darfur and Chad).

Improved agricultural technology was a powerful tool for mitigating the drought crisis. While all villages experienced reductions in grain production, that was much less severe in villages with access to modern inputs through extension services. Villages participating in the project had more grain per capita compared to nonparticipating villages. Households in the project, i.e., those with access to technology, managed to produce enough to meet minimum caloric needs and to maintain their families intact. On the other hand, 79 percent of households in villages without access to extension produced less than 1000 calories per day per capita in the drought year. Nonparticipant households had to cope with the 1984/85 crisis by adjusting household size through adult male out-migration. Finally, the concentration of technological change in a comparatively high potential area provided a respite for drought refugees from a large surrounding area.

### Food Aid

There were three principal waves of food aid to Western Sudan in response to major crop failures in the last decade, of which the first and major effort was undertaken in 1984-86, followed by another relief flow in 1988 and a third wave after the bad harvest of 1989.

Food aid probably provided a critical addition to household food consumption in 1984/85 and possibly prevented a wider scale of starvation deaths, but there are indications that it could have been more effectively utilized. First, it came too late for some villages which had to move en masse in search of work and relief food. Second, universal eligibility practices spread relief food thinly across the population, and the rural population ended up receiving less than the minimum calorie specification. Third, the quota mechanism, by allocating equal amounts of food aid per person, did not take into account variations in individuals' food requirements and, furthermore, by setting a maximum quota per family of six-persons equivalent, it did not take into account variations in the size and composition of families or variations in household-coping capacity. Fourth, the poor and people in remote areas probably did not benefit as much from the relief food: the residence requirement excluded those who migrated earlier from their villages, most of whom were more likely to be poor; and, since every participant was required to pay in cash a share of his ration at subsidized price, the poor who had no income support had either to forgo their ration or to sell part of their free ration to pay for the sale portion. For those in remote areas, the effective price of the food ration was probably higher than the official subsidized rate due to increased transportation costs, underweight bags, and extra premiums to get favored access.

It is essential to reconsider the concept and approach of food aid, since it is unlikely that the unprecedented flow of food aid of the

1980s will continue in the near future, although the demand for income support intervention remains high due to the greatly diminished income and asset position of the rural population. The concept of relief may need to be broadened from solely free food distribution to include, for example, the provision of health and sanitary services, which could have saved more lives in 1985. Furthermore, the current emphasis on relief food as a response to production shortfalls needs to be examined in light of the persistent production variability in the semi-arid environment. Food aid, where deemed necessary, should be more focused on providing income support and/or income enhancement. Provision of public works programs, using food as payment, meets this goal and also obviates the burden of administrative targeting since public works programs have an inherent capacity for self-targeting.

### Restocking the Gum Belt

Production of gum experienced steady decline in the 1980s, reaching its lowest point in 1984. These are indications that the gum belt was shrinking in its northern frontier. A joint UNDP/UNSO/GOS project, begun in 1981 to reverse the process in the eastern part of the Kordofan Gum Belt. By mid-1989, the project covered about 12,000 farmers in nearly 300 villages, delivering seedlings, technical advice, subsidized water, and WFP-donated food ration. The survival rate of trees on participants' farms was low, about 57 percent of the recommended rate, which has been ascribed to factors related to poor production practices at the nursery and farm levels, inadequate maintenance and monitoring support, pest attacks, moisture stress, and possibly labor scarcity (since transplantation and beat up operations coincide often with the peak agriculture season). There are also great variations in the production parameters of gum output.

There were no significant variations between project participants and equally eligible but nonparticipant households in their socioeconomic position, except in their income sources and relative income position. Both groups derive a substantial share of their income from transfers, but the sources differ: food rations for participants, and remittances for nonparticipants. Project participants are relatively less concentrated in the lowest income bracket and it is quite possible that the relative position of the groups may widen as the project runs its full course and the trees move into their productive phase.

Demand is increasing for expansion of project enrollment, especially in the aftermath of the 1984 drought. Thus far, participation has been restricted to remain within the project's resource capacity by applying a rule of one member per family and a de facto fixed quota per village (on average 57 farmers since 1986).

One option for broadening the scope of participation in the short run, given the scale of the project, is to modify the modality of the project operation, for example, by focusing on a "model farmer" approach, where groups are formed around model farmers, seedlings are provided to groups on a rotating 'credit' basis and the actual

allocation is conditional on the group's performance. In addition, it is necessary to modify the current incentive structure to allow linkage of payments to task measures of output. Food must be linked to task rate and limited to the preproduction phase. It would also include a credit component available to participants in time of severe income failure. At the project level, the management should adhere to the primary goal of pursuing a wide coverage of areas through promoting a minimum recommended planting rate. In the long run, as the scale of the project expands, a training component for model farmers should be incorporated, and attempts made to switch to a low cost approach such as, for example, the village nursery approach with which some NGOs have recently experimented.

### Restocking of Goats

UNICEF started a project to finance goat restocking in the drier areas of North Kordofan in late 1986. The target group was poor female-headed households with a large number of dependents and no livestock. It was felt that income controlled by women had the greatest and effective impact on child nutrition and health, and children of the poor female households had become the most vulnerable in the post-famine period. By the end of 1989, a total of 1521 parent goats were distributed to 760 female-headed households, and another 248 goats were distributed to 124 participants from the collection of offspring from the original parent stock. Ownership of goats has certainly improved the relative income position of the participants, albeit with sizeable income substitutions. Twenty-seven percent of the project group belonged to the relative high income position compared to 10 percent of the control group. Increased milk and meat consumption and cash generation through sale of male goats were sources of benefits. The utility of goats as a source of cash is high in bridging seasonal cash flows and providing income buffers in bad crop years, especially in drought-prone areas. The project is under pressure for expansion to meet a growing demand for joining the project. Project expansion depends on the availability of additional capital financing and growth through progeny distribution, for which it is crucial that growth performance and monitoring and supervision improve.

### Conclusions

Households with access to improved technology have demonstrated a capacity to produce more, maintain stable production and consumption flows, and keep their families intact. Migrant labor also benefitted from employment generated in the project areas. Food aid came at critical times to save human lives, but was not early enough to preempt the erosion of the asset base, especially livestock, of the rural population. The UNICEF project highlights the urgency of the need to support the asset reconstitution efforts of the rural population and demonstrates the application of the concepts of targeting and self-sustaining growth.

The experience of the 1980s points to a greater need for improvements in project design and implementation. Design problems are largely related to a lack of compatibility in project goals (e.g., low tree density for environment protection vs. high tree density for income maximization), completeness of intervention instrument (e.g., absence of a sanitary/health component as part of relief work), completeness of incentive structure (e.g., sale of subsidized food without an income support scheme), and definition of project eligibility (e.g., choice of universal or targeted food distribution scheme). Weaknesses in project implementation are due to lack of flexibility in organizational structure, inadequate monitoring and supervisory capacity, and poor physical infrastructure. The thinness of manpower and physical infrastructure has, in particular, a considerable impact on project outcome. It should be stressed, however, that project success much depends on appropriate macroeconomic policy environment (Brief No. 1) and market stabilization policies (Brief No. 2).

Table 1—A sample of ongoing rehabilitation activities in North Kordofan in 1988/89

Intervention Program	Source/Sponsor	Target Area	Target Group
- Smallholder credit for cash crop production	ABS/USAID ABS/Sudan ABS/SCF ABS/IFAD CARE/Netherlands	El Obeid Um Ruwaba Um Ruwaba En Nahud En Nahud	Villages selected on the basis of high production potential; membership is open to farmers with access to land and proven repayment capacity.
- Restocking of gum arabic trees and other forestry <sup>a</sup>	UNSO/WFP/UNDP	Um Ruwaba El Obeid Bara	Villages with low acacia Sengal tree coverage are selected. Open to farm families who own land, work on farm, and reside in the villages.
- Restocking of small animals (mainly goats)	UNICEF <sup>b</sup> OXFAM	Bara and El Obeid Sodari	Low-income women with no livestock. Nomadic families with no more than five goats or sheep.
- Home gardens development	UNICEF	El Obeid Dilling	Low-income women.
- Irrigated agriculture	UNICEF	Bara	Low-income women.
- Grain storage (village level)	UNICEF	El Obeid Bara	Low-income women.
- Cheesemaking	UNICEF	El Obeid Dilling	Low-income nomadic women.

Notes: ABS = Agricultural Bank of Sudan; SCF = Save the Children Federation; UNSO = United Nations Sudano-Sahelian Office; WFP = World Food Program.

<sup>a</sup> CARE/Canada in En Nahud district, SCF/US in Um Ruwaba, UNICEF in Bara and El Obeid, and ILO in BARA, operate small-scale forestry projects.

<sup>b</sup> UNICEF also undertake other projects like poultry, mechanized farming, composting, seeds, beekeeping, handicrafts, adult education, and village water supplies in the whole region.

**ANNEX 2**

**WORKSHOP PARTICIPANTS**



**MINISTRY OF FINANCE AND ECONOMIC PLANNING-IFPRI WORKSHOP ON  
"DROUGHT AND FAMINE PREVENTION"**

**LIST OF PARTICIPANTS**

NAME	AFFILIATIONS
Awad Abbass	Ministry of Finance and Economic Planning (Planning)
Fawzia Ali Abbass	Agricultural Bank of Sudan
Abdalla A. Abdalla	Ambassador of Sudan to the U.S.A.
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Mohamed Abdelrhman	Livestock and Meat Marketing Corp.
Nurelhuda M. Abubakr	Ministry of Agriculture
Mohamed Adam	Ministry of Finance and Economic Planning (Planning)
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Mahgoub Abdel Fadil Agot	Upper Nile Regional Government
Ali G. Kuffy Ahamed	Friendship Hall
Isam Siddig Ahmed	Private Businessman
Ismail Yousif Ahmed	Ministry of Finance and Economic Planning (Power and Mining Sector)
Mohamed Ali Ahmed	Ministry of Finance and Economic Planning (Planning)
Suliman Said Ahmed	Chairman of the Higher Council for Grains
Ali El Atta Ali	Islamic Call Organization
Mirghani Hamza Ali	Ministry of Finance and Economic Planning (Planning)
Mustafa Hassan Ali	Relief and Rehabilitation Commission/Early Warning System
Abdalla Alobodi	First Undersecretary of Economy, Ministry of Finance and Economic Planning
El Tag Fadlalla Alrahim	Sudan Oil Seeds Co. (Managing Director)
Mofida Elamin Amer	Central Information Office
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Abdalla Suliman El Awad	Islamic Relief Agency
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Yolanda Banks	Canadian Embassy, Addis Ababa, Ethiopia
Abdel Razig El Bashir	Ministry of Finance (Director, Investment Bureau)
El Sayed El Bashir	ICIPE, Nairobi, Kenya
Leyla Omer Bashir	Ministry of Finance and Economic Planning (Planning)
Moawia Bashir	Ministry of Finance and Economic Planning (Debt Management Unit)
Osman M. Beleil	Ministry of Agriculture
Ch. Boegemann-Hagedorn	Embassy of the Federal Republic of Germany
Jon Bos	Head of Mission of Netherlands, Chairman of Group of Donors
Joachim von Braun	International Food Policy Research Institute, Washington, D.C.
Dafa'alla Ahmed Dafa'alla	Western Sudan Agricultural Research Project
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Fathi Abu Elgasim	The Agricultural Bank of Sudan
Ali Mohammed Elhassan	Arab Authority for Agricultural Investment and Development
Mohamed Abdallah Elhede	Nubu Mountains R.D.P.
Eldaw Elnaiem	Ministry of Finance and Economic Planning (Finance)
Galal Hassan El-Nour	Ministry of Agriculture-Northern Region
Abdel Moneim Elsheikh	Ministry of Agriculture (Agricultural Planning, Economics, and Statistics Department)
Modawi Eltiraifi	Ministry of Transport
Hassan Gebriel Elzubeir	Commissioner of North Kordofan
Ali Awad Essied	Ministry of Finance and Economic Planning (Planning)
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Abdelrahim M. Hamdi	Minister of Finance and Economic Planning
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M. S. Harbi	Undersecretary, Animal Resources, Ministry of Agriculture, Natural Resources, and Animal Resources
Hashim Mohammed Hashim	Sudan Rural Development Company
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Ibrahim Ali Ibrahim	Ministry of Finance and Economic Planning (Economy)
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Ali Kambal	FAO
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Awad Khalifa	Deputy Commissioner, Relief and Rehabilitation Commission
A/El Moneim Khogali	Minister of Energy
J. Krebs	European Economic Community
Frederick Machmer	USAID
Abbas Abdel Magid	Private Sector
Asma Mahjoub	Central Information Office
Einas Mahjoub	Sudan News Agency
Amar Mahmoud	Ministry of Finance and Economic Planning (Planning)
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Kamil Mansour	Ministry of Agriculture
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These papers are available from Food Consumption and Nutrition Division, International Food Policy Research Institute, 1776 Massachusetts Avenue, N.W., Washington, D.C. 20036.