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**INTERNATIONAL
FOOD
POLICY
RESEARCH
INSTITUTE**

**CONTINGENCY
PLANNING
FOR FAMINES
AND OTHER
ACUTE
FOOD
SHORTAGES:
A BRIEF
REVIEW**

J. S. SARMA

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**CONTINGENCY PLANNING FOR FAMINES AND
OTHER ACUTE FOOD SHORTAGES: A BRIEF REVIEW**

BY J. S. SARMA

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FOREWORD

Many countries are periodically faced with disasters caused by droughts, cyclones, floods, or other natural calamities in localized or extensive areas. The adverse effects of these calamities are particularly severe in developing countries already affected by chronic food shortages; in these countries disasters may lead to sudden and acute famine. Poorer sections of the population within these areas are often affected the most. Though donor agencies and international organizations have been responding to these situations with offers of food aid and other assistance, the problems associated with national preparedness to meet such emergencies are much more complex. Not enough attention has been devoted to a systematic study of these issues at the national policy and implementation levels.

The issue of contingency planning for famine and acute food shortages was discussed at the annual meetings of the Board of Trustees of the International Food Policy Research Institute (IFPRI) held in 1981 and 1982. At the suggestion of the Board, a paper reviewing the roles and functions of international agencies in this field and identifying the areas requiring further work was prepared by J. S. Sarma, largely on the basis of the material received from the Food and Agriculture Organization of the United Nations (FAO) and other agencies. This paper was considered at the Board meeting held in February 1983 in Damascus, Syria. The Board felt that more action-oriented research was needed in this important area.

Because it was thought that it might provide useful information and guidance to various national and international agencies that might be interested in undertaking such studies, this paper is being issued for circulation to a wider audience.

John W. Mellor

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1. INTRODUCTION

Although international and national initiatives related to food security are receiving attention, other issues, such as contingency planning for famines and other acute food shortages are also important. The adverse effects of these shortages are particularly severe in low-income developing countries and among poorer groups in those countries. Many people have died of famine not because of food production shortages, but because there were serious problems with the food distribution systems, or because vulnerable groups had inadequate purchasing power. Not enough is known about the measures needed to deal with such emergencies in different countries with differing food systems. Actions to mitigate the hardships arising from the scarcities of work, water, and food associated with severe droughts will vary.^{1/} These include improving the exchange entitlements of the people;^{2/} adopting crop life-saving techniques, introducing alternative crop strategies, and undertaking compensatory cropping programs in irrigated areas; providing drinking water; and preventing and recouping animal losses.

Food aid from national or international donor agencies can help to augment food supplies in times of acute food shortages, but its proper distribution within a country is the responsibility of national governments. This requires well-developed institutions and infrastructures and appropriate policies. Well-intended food aid sometimes gets diverted from the needy, because the administrative arrangements for the distribution of the aid are lacking. With imaginative policies and management, distress to people can be averted even in years of severe food shortages, as experiences in some countries have shown.

^{1/}India, Ministry of Agriculture and Irrigation, Drought Management in India (New Delhi: Ministry of Agriculture and Irrigation, 1979).

^{2/}These are made up of "employment entitlements, money prices of labor or of products of labor, or of services, and the money price of food" (A. K. Ghose, "Food Supply and Starvation: A Study of Famines with Reference to the Indian Sub-Continent," Oxford Economic Papers 34 (July 1982): 371.

2. COMPLEXITY OF THE PROBLEM

Famines and other acute food shortages include situations in which many people find themselves so deprived of their accustomed food supplies that they would suffer considerably unless special efforts were made to provide and distribute food. These famines and shortages can be classified according to the nature and duration of the emergency: short-term emergencies caused by earthquakes, floods, cyclones, and so forth; medium-term emergencies caused by one or more crop failures due to drought, flood, disease, and pests or by mass migration and political refugees; and long-term emergencies caused by disruption of food supplies by war, desiccation, erosion, and so on.^{3/}

Although the obvious form of deprivation for the family or the individual is lack of food, the causes leading to that deprivation may be different. They might be the result of crop failure; loss of harvested crops in the fields, stores, or homes because of floods, cyclones, and so forth; a deficiency of supplies in the market; or lack of money to purchase food, perhaps because no income-earning employment opportunities are available. When these deprivations are acute and occur on a large scale in a localized or widely dispersed area, they warrant government intervention and assistance. In countries or areas where people are normally malnourished, even a marginal crop failure or disaster may cause large-scale distress and deprivation.

The sequence of good, bad, and normal years and their frequency are important. Some adverse effects of drought or food-related emergencies, such as a lack of employment in agriculture or related operations, are felt in the same crop years, whereas others, such as deprivation caused by a reduction in stocks held by farmers, are felt toward the end of the marketing or consumption year following the crop year, particularly when the crop in that year is also bad.

The types of measures to alleviate these adverse effects include taking precautions against a food shortage when there is advance warning and measures for administering relief after a shortage occurs. Acute shortages may be handled by distributing cooked food through community kitchens and supplying free or subsidized foods, including grains and milk powder -- at prices within the reach of the vulnerable sections of the population. The procedures to be adopted differ according to the type of emergency. Programs that generate employment

^{3/}G. B. Masefield, Food and Nutrition Procedures in Times of Disaster (Rome: FAO, 1967; reprint ed., Rome: FAO, 1974).

and income, such as scarcity relief works and food-for-work projects, are necessary where unemployment is at the root of the problem. Following a prolonged drought or a break in the monsoon, a midcourse correction of cropping programs to save crops may have to be adopted.^{4/} In some areas, drinking water may be a problem. In others, medical and health problems may need attention.

Steps to improve food supply and distribution include monitoring weather and its effects on crops, developing early warning systems, maintaining reserve stocks and making arrangements to transport imported and locally procured stocks, storing these in pest- and disease-proof stores, augmenting public supplies through imports, and developing adequate distribution arrangements. Needless to say, some of these latter arrangements depend on the system of food distribution adopted in the country.^{5/} Also, preparations to meet the famine or other food emergencies need to be made at three levels: by local or provincial governments, national governments, and international institutions.

Action through the International Monetary Fund's (IMF) financial facility, international buffer stocks, emergency food aid, and other international arrangements alone may not always enable the afflicted country to meet emergencies, particularly those that are sudden and intense. Factors such as import prices, the availability and cost of shipping, congestion at ports, and internal transportation affect the availability of relief supplies in areas of dire need. Any delay in getting the supplies to the people in need may result in immense distress and loss of lives. Problems involved in shipping and transportation cannot be dismissed as logistical problems. In fact, these problems raise policy issues that may need detailed study and analysis to find alternative ways to overcome them.

^{4/} For a description of these measures, see India, Ministry of Agriculture and Irrigation, Drought Management in India.

^{5/} Where regular public distribution systems do not exist, ad hoc agencies may have to be set up to distribute the relief supplies where normal trade channels cannot be entrusted with this work.

3. CONCERNED AGENCIES AND ORGANIZATIONS

The principal international organizations and agencies concerned with planning for meeting food shortages are the Food and Agriculture Organization of the United Nations (FAO), the United Nations World Food Programme (WFP), and other United Nations organizations. The International Food Policy Research Institute (IFPRI) has an important, though indirect, role. Other voluntary and private organizations are also engaged in such relief work.

The work of the FAO and the WFP is discussed at length below; the work of other agencies is referred to more briefly. IFPRI's role is discussed at the end of this chapter.

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

Within FAO, several units are concerned with contingency planning. For instance, as early as 1967, the Nutrition Division published a study entitled Food and Nutrition Procedures in Times of Disaster. The study was undertaken after a joint FAO/WHO Expert Committee on Nutrition pointed out the necessity for a handbook that discussed food management in times of disaster. The manual is divided into five sections: precautions against food shortage, general administration of relief, food procedures in different types of emergencies, special aspects of emergency feeding, and medical problems in a famine. (See Appendix 1 for the manual's table of contents.)

The manual is addressed primarily to government officials who are expected to arrange for the provision of food supplies in an actual disaster. It does not deal with other problems such as providing shelter, clothing, and medical supplies and controlling infectious diseases. Nor does it discuss programs for creating employment or for dealing with the agricultural aspects of drought management, perhaps because less emphasis was put on these measures and even less known about them. Furthermore, the guidelines are given in general terms, although specific instances are mentioned to illustrate various points. The guidelines could have been more useful if they were related to the different typologies of countries. Despite these drawbacks, it is a valuable study and many of the guidelines are applicable even today.

Following a decision taken at the Fifth Session of the Committee on World Food Security (CFS), an ad hoc working party was set up to examine the adequacy of existing preparedness to meet acute and large-scale food shortages and to consider ways to improve these arrangements. The report of the working party was considered at the

Committee's Sixth Session in April 1981. The Committee recognized that no pattern of national preparedness or contingency planning could work in all countries and regions, since their natural resources, administrative structures, and infrastructure facilities varied widely. It therefore recommended a general approach (as proposed by the working party) to national preparedness covering the following main elements: maintaining national reserve stocks, establishing or strengthening national monitoring and early warning systems, creating special units to deal with food emergencies both in countries at risk and in donor countries, and preparing a manual to deal with the food relief activities to be undertaken in the event of a severe food shortage or famine. The list of objective national and global indicators to signal acute and large-scale food shortages considered by the working party is given in Appendix 2.

One of the agenda papers prepared for the working party by the Commodities and Trade Division of FAO contains a detailed discussion of the measures to be undertaken before, during, and after an emergency. The topics include assessment of the food situation and needs; declaration of a state of food emergency; procurement of supplies internally as well as through imports; improving the distribution network through ration shops, fair price shops, food for work, gratuitous relief, and communal feeding; transportation and logistics; regulation of private trade operations; and legislation. A tentative list of advance arrangements for improving national preparedness considered by the working party is given in Appendix 3.

In order to improve national preparedness, the CFS suggested that all countries vulnerable to food shortages prepare plans for national preparedness in the light of their experiences with food emergencies; that regional workshops should be organized to share national experiences; and that evaluations of the efficiency of emergency relief mechanisms should be conducted with a view to refining such systems.

At the Fifteenth Session of the FAO Regional Conference for Asia and the Pacific Region, held in New Delhi in March 1980, the question of increasing the preparedness of agriculture in areas susceptible to drought and floods was discussed. The conference touched on the extent and severity of droughts and floods in the region, their basic causes and their effects on agricultural productivity. The action plan offered identified the essential components of a contingency plan that would be implemented before, during, and after a disaster. Several measures to prevent droughts and floods also were discussed. The detailed recommendations covered increasing preparedness in drought- and flood-prone areas; initiating disaster research; formulating contingency plans at all administrative levels of government; improving organization and management; storing materials; establishing operational agencies, training programs, warning services, special funds, crop insurance, and soil conservation operations; encouraging people's participation; reconstructing watersheds and improving drains; drawing up a good weather code; and improving regional and international cooperation.

The FAO has proposed convening a regional workshop in Bangkok in the middle of 1983 to review the experiences of the countries of Asia and the Pacific region. FAO intends to use the findings of the workshop to prepare a manual, to be published in 1983, for dealing with distress within countries.

The Global Information and Early Warning System on Food and Agriculture, a part of the Commodities and Trade Division, is designed to detect early signs of deterioration in food-crop conditions and to give advance warning of food shortages. Similarly, another group, the Locusts, Other Migratory Pests and Emergency Operations Group, tries to compile information on impending attacks by locusts and other pests.

The Office for Special Relief Operations (OSRO), which was formerly the FAO Office for Sahelian Relief Operations, responds to requests for emergency assistance. Its activities also include programs to facilitate rehabilitation of food production and supply following emergencies with long-term consequences. It also assesses the emergency food requirements of countries and helps disaster-prone countries prepare for and prevent emergencies.

FAO also established a Food Security Assistance Scheme (FSAS) in 1976 to help developing countries establish national reserves, early warning systems, and food security infrastructures. It assists interested countries in devising national food security programs, preparing projects, and mobilizing external resources and it coordinates multilateral and bilateral aid for food security.

FAO's Technical Cooperation Program could provide emergency assistance to developing countries to meet urgent rehabilitation needs arising from disasters, but the amount of funding available under the program is limited.

UNITED NATIONS ORGANIZATIONS OTHER THAN THE FOOD AND AGRICULTURE ORGANIZATION

The WFP is the principal multilateral agency distributing food aid in emergencies. It relies on the FAO Early Warning System for analysis of the size of the food aid requirement. Its governing body, the Committee on Food Aid Policies and Programmes, provides a forum for consultation on national and international food aid programs, and determines the amount of aid to be given by WFP. WFP also has responsibility for coordinating emergency food assistance. Some of the projects of the WFP directly assist national preparedness, for example, in the establishment of stabilization stocks or the improvement of land subject to floods. This unit monitored the Emergency Operations in Kampuchea.

The WFP administers the International Emergency Food Reserve (IEFR), which is designed to ensure that developing countries receive

food aid in emergencies. Under the IEFER, donors agree each year on a contribution that they will make available in response to emergency requests channeled through WFP.

Another organization within the UN System is the Office of the United Nations Disaster Relief Coordinator (UNDRO) set up in 1972. It helps developing countries that are prone to disasters identify vulnerable areas, formulate or improve existing plans, improve coordination mechanisms within the country, train personnel, and stockpile emergency relief supplies. Its involvement in the food problem in the past has been largely confined to coordinating relief efforts by specialized agencies and the donor community, as in the droughts and famines in Haiti and Ethiopia.

In 1977 the Protein-Calorie Advisory Group of the United Nations published A Guide to Food and Health Relief Operations for Disasters. The guide has two themes: preparedness planning for relief operations following a disaster; and implementation of relief strategies concerning food supplies, nutrition, medicine, and health. Water supply and environmental sanitation and post-disaster rehabilitation and development are also dealt with in the guide.

The United Nations Development Programme (UNDP) helps with relief, reconstruction, and disaster preparedness. The UNDP country resident representatives have been designated as UNDRO and WFP representatives in the field. They not only coordinate disaster relief, but also assist in preparedness and prevention.

Two other UN organizations involved in disaster relief for special groups are the United Nations Children's Fund (UNICEF) and the Office of the United Nations High Commissioner for Refugees (UNHCR).

VOLUNTARY AND OTHER ORGANIZATIONS

Other voluntary and private organizations are engaged in disaster and famine relief as well. Some of the major ones are the League of Red Cross Societies (LRCS), which is a federation of National Red Cross societies around the world,^{6/} Catholic Relief Services, the Lutheran World Federation, CARE, OXFAM, and the World Council of Churches. A detailed review of the work of these and similar organizations is outside the scope of the paper. However, it may be added that the LRCS runs disaster preparedness workshops and has published a disaster relief handbook.

Apart from the various official and nongovernment agencies in the recipient national governments, some of the donor countries also have special units, such as the Office of Foreign Disaster Assistance in

^{6/}The International Committee of the Red Cross deals mainly with the victims of war and so has not been included here.

the U.S. Agency for International Development (AID).^{7/} In addition there are regional arrangements such as the Association of South East Asian Nations (ASEAN) Emergency Rice Reserve and the Permanent Interstate Committee on Drought Control in the Sahel (CILSS). Some of their aims fall within the purview of national preparedness.

IFPRI

The mandate of IFPRI requires it to identify and analyze national and international strategies and policies for meeting food needs in the world, with particular emphasis on low-income countries and on poorer groups, and with the objective of contributing to the reduction of hunger and malnutrition. Although IFPRI has not been involved in policy research on contingency planning per se, its current research programs in the related fields of food security, food consumption, nutrition, production policy, and development strategy have an important though indirect bearing on measures needed to improve national and international preparedness to deal with drought and famine.

Research on food security by IFPRI's International Food Trade and Food Security Program assesses the nature and amount of food insecurity in developing countries and how international approaches can alleviate it. Research on improving food security tries to design measures to reduce annual fluctuations in supplies in developing countries and to ensure that food is supplied to the poor at stable prices. Furthermore, the major food problem in developing countries is their increasing inability to meet consumption needs from domestic food supplies. National food policies designed to improve production and consumption are sometimes hampered by trade policies and balance-of-payment constraints. These are inextricably related to food import policies. Thus research undertaken by IFPRI in the field covers issues of food security and self-sufficiency and trade in developing countries.^{8/}

Because food deficits must be filled by imports, solutions to food supply problems in developing countries have international implications. Schemes to stabilize world prices can lessen the effect of fluctuating import prices, and a system that provides financial resources to purchase the needed imports can greatly benefit developing countries. Thus IFPRI's research includes work on a food financing facility and food aid. To better understand how food aid can help finance the food imports required by developing countries with foreign exchange constraints, IFPRI has undertaken a study of cereal food-aid flows. Food aid channeled to poor families can also supplement income and be a temporary source of additional calories, thus providing

^{7/}Provision also exists for grants for disaster relief under Title II of U.S. Public Law 480.

^{8/}Self-sufficiency may imply no food imports as well as meeting the foreign exchange needed for food imports from export earnings.

immediate material benefits to the poor. And food aid adds to the longer-run development potential of the recipient countries. But the main constraint in many countries has been a lack of appropriate institutions to use the food aid efficiently. IFPRI research focuses attention on these issues as well.

Also, in 1981, Food Security for Developing Countries, edited by Alberto Valdes, was published based on the outcome of an international conference on the subject, sponsored by IFPRI and the International Maize and Wheat Improvement Center (CIMMYT), Mexico. This book attempts to clarify the food security issue, to identify sources of insecurity, to assess the size of the problem in 24 developing countries located in Asia, Africa, the Middle East, and Latin America, and to explore possible national and international solutions.

Research in IFPRI's Food Consumption and Nutrition Policy Program contributes to the knowledge and understanding of how selected public policy measures affect the real incomes, food consumption, and nutrition of low-income households and their members. At first IFPRI focused its attention on food distribution policies, consumption patterns, and the impact of price and subsidy policies on income distribution. The information available on the nutritional implications of government policies and programs was examined, and the principal gaps in policy-related knowledge were identified. IFPRI research efforts are now concentrated on selected market intervention policies and the impact of technological change in agriculture on the food consumption and nutrition of low-income households. Future research programs will cover agricultural and rural development programs and policies, food price policies, income and food transfer programs, and integrated health and nutrition programs. Projects on technological change will estimate and assess the effect it has on calorie and protein consumption in calorie-deficient countries.

In the Production Policy and Development Strategy Program, two areas of research are particularly relevant to national preparedness programs. The first is crop insurance and the second is the analysis of instability in agriculture and the relationship between rapid growth in agriculture and year-to-year fluctuations of production.

In general, past and current research at IFPRI has tended to emphasize long- and medium-run issues more than short-run and operational problems.

OTHER LITERATURE AVAILABLE

The experience of famines and droughts in individual countries has been documented in several national and international journals and books. Two of the publications that discuss the Indian experience are Parched Earth -- the Maharashtra Drought 1970-73, by V. Subramanian (Bombay: Orient Longman, 1975), and The Indian Famine, 1967, by K. Suresh Singh (New Delhi: People's Publishing Company, 1975). The

latter deals with measures taken to deal with the famine in Purulia, the most affected district of Bihar. The international relief operations undertaken during the Sahelian drought of 1973-75 were also reported by FAO in an illustrated brochure entitled Drought in the Sahel (Rome: FAO, 1975).

Amartya Sen presents a penetrating analysis of the great Bengal famine (1943), the Ethiopian famine, the drought and famine in the Sahel, and the famine in Bangladesh in his book, Poverty and Famines -- An Essay on Entitlement and Deprivation (Oxford: Clarendon Press, 1981) wherein he explains a new approach to reducing starvation and famine based on exchange entitlements. Alamgir deals with famine in Bangladesh in his book, Famine in South Asia -- Political Economy of Mass Starvation in Bangladesh (Dacca: Institute of Development Studies, 1980).

4. CONCLUSIONS

A number of conclusions may be drawn from this review. First, although much attention has been paid to providing emergency food and other relief to developing countries in need and to coordinating the international efforts of donors, little attention has been paid to the problems within a country struck by severe food shortages. The two exceptions are the handbook prepared by the Nutrition Division of the FAO and the papers prepared for consideration by the Ad Hoc Working Party on National Preparedness by the FAO Commodities and Trade Division. In the agenda paper entitled "Ways of Improving National Preparedness to Meet Acute and Large-Scale Food Shortages," it was noted that it was not possible to prescribe a uniform pattern of national preparedness or contingency planning for all countries "since their natural resources, administrative structure and infrastructural facilities (e.g., marketing, communications, transportation, storage) varied widely." It was considered unwise to recommend rigid guidelines for all food emergencies even for the same country since each emergency had its own peculiarities. So the paper identified certain types of relief activities, related tasks, and administrative procedures based on common features of food shortages. Its recommendations were general, not specific. This is not to suggest that they are not useful but they do not cover all situations.

Second, the guidelines are weak and incomplete. This is particularly true for food-for-work programs, crop life-saving techniques, and midcourse crop corrections programs (including the introduction of alternative crop strategies and compensatory cropping programs).

Third, the guidelines seem to be based on traditional approaches to famine and disaster relief and rely on current experience. They are not the results of a careful assessment of alternative approaches based on detailed analyses of the experiences of different countries.

And fourth, although the national and global indicators are described in detail, the effectiveness of the global Early Warning System depends upon the efficiency of the national systems. For example, meteorological information, price data, and the size of carryover stocks often give the earliest warnings of impending disasters. The efficiency with which local systems monitor rainfall, prices, and stocks in the developing countries needs to be evaluated, particularly in those countries with poor agricultural statistics reporting systems.

One way to deal with these deficiencies is to discuss the guidelines and indicators at regional workshops, where the experiences of countries can be pooled. This is what the FAO plans to do with the

countries of Asia and the Pacific region. While the workshops do disseminate the work already accomplished, there are other, better methods of drawing up detailed and specific guidelines.

IFPRI's approach -- making detailed case studies of food policy issues in carefully chosen countries and pooling the results of these analyses -- is an approach that is worth considering. It is possible to categorize the developing countries into typologies by their vulnerability to frequent droughts, floods, or cyclones; by their food self-sufficiency ratio, which determines whether the country can deal with an emergency with its own food resources or has to depend upon outside resources; by the type of food system adopted, that is, whether it has a public distribution system or whether distribution is entirely in the hands of private trade, and whether the government procures foodgrains; by the availability of infrastructure, that is, of storage facilities, transportation equipment, and so forth; by the numbers of administrative personnel trained or experienced in disaster relief; and by foreign exchange availability.

Selected indicators of the food economies of 99 developing countries based on the analyses conducted at IFPRI are given in Appendix 4.9/ With this categorization, the country groups most needing study can be identified. Case studies can then be made of typical countries in different regions and their experiences in dealing with past emergency situations can be compared before deciding upon the approach to national preparedness and drawing up a set of guidelines applicable under different situations. Such a comparative study would have the advantage of making the benefit of the experience of different countries available to a wider audience that would include both the developing countries and the donor community.

^{9/}These indicators are: coefficient of variability of cereal production, calorie sufficiency ratio, overall food self-sufficiency ratio, value of cereal imports and food aid, ratio of cereal imports to total export earnings, ratio of cereal imports to total domestic utilization of staple food crops, and GNP per capita income levels. The countries are classified according to their levels of income and import dependence.

APPENDIX 1: TABLE OF CONTENTS OF FOOD AND NUTRITION
PROCEDURES IN TIMES OF DISASTER, BY G. B. MASEFIELD^{10/}

- I. PRECAUTIONS AGAINST FOOD SHORTAGE
 - General Considerations
 - Fixing of Responsibility for Relief Measures
 - Warnings from the Agricultural Service
 - Food Storage
 - The Use of Grain Marketing Boards to Prevent Shortage
 - Crop Insurance
 - Preparation of Ration Schemes
 - Protection of Livestock Against Disasters

- II. GENERAL ADMINISTRATION OF RELIEF
 - Staff for Relief Duties
 - Survey of Need and Appeals for Aid
 - Co-ordination of Government and Voluntary Work
 - Clearance of Relief Supplies at Ports

- III. FOOD PROCEDURES IN DIFFERENT TYPES OF EMERGENCY
 - TYPES OF EMERGENCY
 - SHORT-TERM EMERGENCIES
 - General
 - First Administrative Action
 - Provision of Food Supplies
 - Communal Feeding Arrangements
 - Special Characteristics of Feeding in Short-Term Emergencies
 - The Rehabilitation Phase
 - MEDIUM-TERM EMERGENCIES
 - General
 - Prefamine Measures
 - Administrative Measures for Food Control
 - Price Control
 - Action Against Hoarding
 - Estimation of Food Requirements
 - The Use of Introduced Food Supplies
 - Rationing Systems
 - Protection of Food Supplies
 - Use of Wild and Unusual Sources of Food
 - The Survival of Livestock in Famine
 - The Ending of Relief

^{10/}G. B. Masefield, Food and Nutrition Procedures in Times of Disaster (Rome: FAO, 1967; reprint ed., Rome: FAO, 1974).

LONG-TERM EMERGENCIES

General
 Rationing Systems
 Price and Food Controls
 Domestic Food Production and Conservation
 More Intensive Use of Land
 Special Problems of Feeding Refugees

- IV. SPECIAL ASPECTS OF EMERGENCY FEEDING
 CALCULATION OF NUTRITIONAL NEEDS
 Calorie Requirements
 Protein Requirements
 Translation of Requirements into Practical Rations
 The Requirements of Special Groups
 WATER SUPPLIES
 FUEL SUPPLIES
 RADIOACTIVE FALLOUT
 FOOD ACCOUNTANCY
 EVALUATION OF PROCEDURES
- V. MEDICAL PROBLEMS IN A FAMINE
 THE ASSESSMENT OF NEED
 Reserves in the Human Body
 Loss of Weight
 Vital Statistics
 EPIDEMIC DISEASES
 Two Administrative Points to be Stressed
 SPECIAL FEEDING PROBLEMS
 VITAMIN DEFICIENCIES
 Deficiency of the B Vitamins
 Deficiency of the Fat-soluble Vitamins
 MINERALS
 FAMINE HOSPITALS AND THE ROLE OF MEDICAL SERVICES

APPENDIXES

1. Information to be included in a request for emergency assistance with food supplies.
2. Estimated calorie requirements in countries of three types.
3. Protein requirements of children and adults and the effect of protein quality.
4. Calculation of the upper level of protein requirements.
5. Food composition table for some common foods.

BIBLIOGRAPHY

APPENDIX 2: LIST OF OBJECTIVE NATIONAL AND GLOBAL INDICATORS^{11/}

I. National Indicators of Food Shortage

A. Severe production problems

(i) Exceptionally unfavorable food crop conditions at any stage in the production cycle due to unfavorable weather, serious outbreaks of pest attacks, man-made disasters or other causes, as well as animal diseases, which could lead to a substantial shortfall in the production of basic foods.

(ii) A deterioration in producer incentives.

B. Severe marketing problems

(i) A sharp and substantial rise in domestic food prices at different stages of the marketing process.

(ii) A substantial drop in market deliveries of basic foods.

(iii) Transportation bottlenecks preventing movement of certain basic foods from surplus to deficit areas.

(iv) Hoarding on a substantial scale and smuggling across national boundaries.

C. Severe import constraints

A substantial rise in the prospective import bill of basic foods in a low-income country with a difficult balance of payment position.

D. Refugees or displaced persons

A large influx of refugees.

E. Serious nutritional problems

Serious deterioration in the nutritional situation, including deterioration in the purchasing power of certain vulnerable groups.

^{11/}Excerpted from Food and Agriculture Organization of the United Nations, "Report of the Ad Hoc Working Party on Preparedness for Acute and Large-Scale Food Shortages," pp. 9-12 (CFS:81/4), December 1980. (Mimeographed.)

II. Global Indicators

A. Global food shortage

- (i) Prospective import requirements of cereals in aggregate at current prices exceed export availabilities by a substantial amount.
- (ii) Substantial and sudden increase in export prices of wheat, rice and coarse grains.
- (iii) Exporters' supplies of cereals are unduly low in relation to their domestic consumption and export needs.
- (iv) World cereal carryover stocks falling below a minimum safe level which was estimated by the Secretariat at 17-18 percent of world cereals consumption.
- (v) Substantial cereal production shortfalls in importing countries.

B. National food shortages requiring international action

- (vi) Substantial foodgrain production shortfall in low-income developing countries as a whole.
- (vii) Prospective food aid requirements in aggregate substantially exceed food aid availabilities.
- (viii) Exceptionally large rise in prospective commercial import bill of cereals of low-income developing countries as a group.
- (ix) Substantial decline in export prices of commodities on which developing countries depend significantly for their export earnings.
- (x) Substantial and sudden changes in world prices of fertilizers and other agricultural inputs.
- (xi) Locust plagues.

APPENDIX 3: ADVANCE ARRANGEMENTS FOR IMPROVING PREPAREDNESS^{12/}

In order to be better prepared for large-scale food shortages, countries at risk should:

- (i) Maintain minimum reserve stocks of basic food grains.
- (ii) Establish national monitoring and early warning systems for basic food supplies.
- (iii) Establish, on a standby basis, food disaster units, or charge an existing administrative unit with the responsibility for planning and organizing food relief programmes.
- (iv) Prepare food relief contingency plans and codify tasks to be undertaken and procedures to enter into force in the event of acute and large-scale food shortages. This would include:
 - lists of advance arrangements needed for introducing or intensifying internal procurement operations;
 - advance plans for the distribution of food;
 - regular collection of information on population by different categories in areas prone to food shortages with a view to estimating their food requirements during shortages and if necessary selecting zones where rationing may be introduced;
 - lists of people who may need gratuitous relief during food shortages, people to be served by mobile canteens, and lists of available vans which could be converted into such canteens;
 - advance arrangements for establishing communal feeding centers during food shortages;
 - provision for close coordination of procurement, handling, storage and distribution functions, listing in advance all the activities as well as the linkages between them;
 - an inventory of transport facilities available in the private sector which could be mobilized during a food emergency;
 - identifying field agencies through which rationing could be arranged as well as pre-establishing rules and regulations under which they may be called upon to function, if it is decided to arrange distribution through government-controlled outlets.

^{12/}Excerpted from Food and Agriculture Organization of the United Nations, "Ways of Improving National Preparedness to Meet Acute and Large-Scale Food Shortages, Including Improvement in Internal Distribution Networks to Facilitate Access to Available Supplies of All Grains," pp. 11-13. An agenda paper for the meeting of the Ad Hoc Working Party on Preparedness for Acute and Large-Scale Food Shortages (CFS: WP/80/5), August 1980. (Mimeographed.)

- (v) Establish methods for the timely assessment of the food situation and food needs of the people and regions threatened by food shortages, and of the country as a whole.
- (vi) Establish principles governing the declaration of a state of "food emergency."
- (vii) Establish procedures for timely requests for bilateral and multilateral assistance in assessing and meeting large-scale emergency food requirements.
- (viii) Prepare a shelf of food-for-work projects with as much operational detail as is feasible.
- (ix) Organize movement of supplies before the onset of the rainy season to remote areas where communications may be disrupted by rain.
- (x) Make advance arrangements for renting the required storage accommodation in both procurement and distribution centers.
- (xi) Ensure that existing legislation is sufficient, or keep a draft legislation ready for enacting, to allow the government to assume powers for undertaking various relief activities or control measures.
- (xii) Evaluate any past experience with price and food supply controls, as well as past performance of food relief operations.
- (xiii) Proposals for publicity and mass media communication.

Potential donor countries should:

- (xiv) Establish food disaster units which could quickly react to requests for emergency assistance.
- (xv) Earmark food reserves or funds for emergency assistance.
- (xvi) Establish quick-action procedures for handling emergency food aid requests.
- (xvii) Preposition stocks in strategic locations to ensure that food-stuffs are readily available for delivery.
- (xviii) Place at the disposal of the food disaster unit transport equipment and related supplies for allocation during food emergencies.

APPENDIX 4: TABLE OF SELECTED INDICATORS OF THE FOOD ECONOMY OF DEVELOPING COUNTRIES

Region/Country/ Selected Indicator	Coefficient of Variability of Cereal Production	Calorie Sufficiency Ratio (percent)	Staple Food Self-Sufficiency Ratio (percent)	Value of Total Cereal Imports (U.S.\$ million)	Value of Food Aid	Ratio of the Value of Total Cereal Imports to Export Earnings (percent)	Ratio of Total Cereal Imports to Total Staple Food Crop Use (percent)	GNP Per Capita (U.S. \$)
Asia								
High-income countries								
High import dependence								
Hong Kong	44	117	neg.	173	0	n.a.	86	2,713
Korea, Republic of	6	114	71	465	101	4	32	981
Malaysia	7	116	58	206	0	3	42	985
Singapore	---	132	neg.	146	0	1	143	2,811
Fiji	14	113	50	13	0	4	49	1,289
Middle-income countries								
High import dependence								
Mongolia	31	104	93	12	n.a.	n.a.	16	869
Papua New Guinea	26	98	82	28	0	4	17	507
Low import dependence								
China	n.a.	100	97	1,381	0	n.a.	4	426
Korea, Democratic People's Republic of	4	117	99	74	0	n.a.	7	612
Philippines	6	94	94	114	4	3	9	434
Thailand	8	99	170	20	0	neg.	1	419
Low-income countries								
High import dependence								
Sri Lanka	13	92	56	190	43	21	44	160
Low import dependence								
Bangladesh	7	81	87	201	162	31	9	86
Bhutan	1	89	104	1	0	n.a.	1	92
Burma	6	102	108	6	7	neg.	---	132
India	7	85	105	601	102	7	2	155
Indonesia	7	98	93	633	125	6	9	297
Nepal	4	94	104	neg.	neg.	neg.	---	110
Pakistan	8	98	98	126	65	5	6	205

TABLE OF SELECTED INDICATORS OF THE FOOD ECONOMY OF DEVELOPING COUNTRIES, continued

Region/Country/ Selected Indicator	Coefficient of Variability of Cereal Production	Calorie Sufficiency Ratio (percent)	Staple Food Self-Sufficiency Ratio (percent)	Value of Total Cereal Imports (U.S.\$ million)	Value of Food Aid (U.S.\$ million)	Ratio of the Value of Total Cereal Imports to Export Earnings (percent)	Ratio of Total Cereal Imports to Total Staple Food Crop Use (percent)	GNP Per Capita (U.S. \$)
North Africa/Middle East								
High-income countries								
High import dependence								
Algeria	30	98	48	384	1	6	54	1,117
Cyprus	49	120	41	35	neg.	6	58	1,685
Iraq	33	96	63	300	0	4	42	1,596
Jordan	66	84	31	71	17	6	89	985
Libya	38	125	33	115	0	1	68	6,417
Saudi Arabia	25	87	24	296	0	1	90	8,380
Low import dependence								
Turkey	11	116	99	8	0	neg.	---	1,109
Middle-income countries								
High import dependence								
Egypt	5	111	75	711	282	16	44	326
Iran	10	122	81	443	0	2	21	n.a.
Lebanon	21	101	18	90	8	n.a.	81	n.a.
Morocco	30	106	74	186	21	8	20	601
Syria	39	106	95	71	21	5	16	877
Tunisia	26	111	72	77	14	5	37	832
Yemen Arab Republic	12	93	91	53	2	5	25	n.a.
Yemen, Democratic Republic of	7	80	44	36	neg.	13	63	340
Low-income countries								
Low import dependence								
Afghanistan	7	81	100	12	3	n.a.	1	156
Sudan	18	95	114	35	8	4	6	278

Sub-Saharan Africa								
High-income countries								
High import dependence								
Gabon	17	103	70	10	0	1	27	3,173
Ivory Coast	11	107	94	50	neg.	2	13	1,122
Reunion	19	117	13	24	0	n.a.	79	2,777
Middle-income countries								
High import dependence								
Botswana	n.a.	89	69	5	n.a.	2	19	544
Congo	25	100	83	9	n.a.	3	15	516
Ghana	24	88	97	47	7	5	11	378
Liberia	8	103	88	20	neg.	n.a.	20	409
Mauritania	28	82	29	24	2	13	68	307
Mauritius	43	113	5	32	1	8	88	719
Senegal	22	94	138	0	5	14	31	365
Swaziland	23	98	79	3	n.a.	1	11	548
Low import dependence								
Cameroon	16	104	84	21	0	2	5	491
Kenya	6	92	136	8	11	neg.	2	301
Nigeria	10	94	96	403	0	3	7	508
Zambia	10	89	103	13	2	1	7	447
Zimbabwe	23	107	108	6	0	n.a.	1	469
Low-income countries								
High import dependence								
Gambia	14	96	178	8	neg.	13	39	216
Guinea-Bissau	27	102	91	8	0	n.a.	28	262
Lesotho	20	92	73	8	n.a.	n.a.	21	262
Somalia	13	93	80	31	7	22	34	131
Low import dependence								
Angola	8	88	95	23	0	n.a.	9	278
Benin	9	94	100	7	neg.	6	5	206
Burundi	11	97	108	3	neg.	n.a.	1	140
Central African Republic	7	96	97	2	neg.	2	1	234
Chad	10	75	99	5	1	5	2	134
Ethiopia	3	78	102	18	5	4	2	112
Guinea	12	83	95	15	7	n.a.	6	212
Madagascar	5	109	95	32	0	8	5	226
Malawi	13	96	99	5	neg.	2	2	167
Mali	11	90	97	9	2	6	3	117
Mozambique	11	82	96	34	6	n.a.	10	135
Niger	16	87	100	13	4	17	4	199
Rwanda	15	98	101	4	1	3	1	169
Sierra Leone	7	90	90	11	neg.	7	7	205
Tanzania	11	90	95	25	17	5	4	209
Togo	19	88	97	5	1	2	5	283
Uganda	11	89	100	1	0	neg.	---	n.a.
Upper Volta	12	84	98	11	1	7	3	125
Zaire	13	104	93	81	7	n.a.	7	205

TABLE OF SELECTED INDICATORS OF THE FOOD ECONOMY OF DEVELOPING COUNTRIES, continued

Region/Country/ Selected Indicator	Coefficient of Variability of Cereal Production	Calorie Sufficiency Ratio	Staple Food Self-Sufficiency Ratio	Value of Total Cereal Imports	Value of Food Aid	Ratio of the Value of Total Cereal Imports to Export Earnings	Ratio of Total Cereal Imports to Total Staple Food Crop Use	GNP Per Capita
		(percent)	(percent)	(U.S. \$ million)	(U.S. \$ million)	(percent)	(percent)	(U.S. \$)
Latin America								
High-income countries								
High import dependence								
Chile	13	108	66	167	24	6	35	1,236
Costa Rica	16	111	132	16	neg.	2	25	1,347
Jamaica	38	119	24	66	5	6	75	1,079
Mexico	8	115	93	256	0	3	11	1,186
Panama	13	102	109	9	n.a.	1	15	1,226
Surinam	7	101	113	7	0	2	42	1,609
Trinidad and Tobago	18	111	11	4	0	3	79	2,824
Venezuela	18	99	49	276	0	3	50	2,738
Low import dependence								
Argentina	11	143	203	1	0	neg.	---	1,805
Brazil	5	105	101	538	neg.	4	9	1,419
Uruguay	22	110	109	6	0	1	4	1,316
Middle-income countries								
High import dependence								
Bolivia	7	86	82	33	4	5	20	432
Colombia	7	97	90	70	1	2	11	686
Cuba	28	114	27	285	n.a.	n.a.	71	657
Dominican Republic	5	93	75	58	1	6	32	765
Ecuador	10	92	99	41	neg.	3	18	792
El Salvador	12	90	86	21	neg.	2	17	572
Guatemala	5	92	94	18	1	1	11	317
Guyana	25	107	114	10	neg.	3	31	524
Honduras	5	92	112	13	2	2	12	438
Nicaragua	14	109	92	13	neg.	2	16	813
Peru	6	97	66	155	3	8	30	726
Low import dependence								
Paraguay	13	122	99	6	neg.	2	4	745
Low-income countries								
High import dependence								
Haiti	10	90	81	30	5	15	18	236

Sources: Food and Agriculture Organization of the United Nations, "Production Yearbook Tapes," Rome, various years; Food and Agriculture Organization of the United Nations, "Trade Yearbook Tapes," Rome, various years; Food and Agriculture Organization of the United Nations, Food Balance Sheets (Rome: FAO, various years); Food and Agriculture Organization of the United Nations, Fourth World Food Survey (Rome: FAO, 1977); International Food Policy Research Institute, "Food Aid Tape," Washington, D.C., no date; World Bank, "GNP Tapes," Washington, D.C., various years.

Notes: N.a. means not available. Neg. means less than 0.5 percent or U.S. \$0.5 million. High income indicates that per capita GNP in 1977 U.S. dollars is equal to or more than \$900. Middle income indicates that per capita GNP in 1977 U.S. dollars is more than \$300 but less than \$900. Low income indicates that per capita GNP in 1977 U.S. dollars is less than or equal to \$300. High import dependence indicates that total cereal imports are more than 10 percent of the total domestic utilization of staple food crops. Low import dependence indicates that total cereal imports are less than 10 percent of the total domestic utilization of staple food crops. Staple food crops are defined as cereals, root crops, pulses, groundnuts, and bananas and plantains, which are expressed in cereal equivalents.

The coefficient of the variability of cereal production is obtained as the standard deviation of the variable

$$\frac{c_t - \hat{c}_t}{\hat{c}_t} \times 100,$$

where c_t is the production of cereals in the year t and \hat{c}_t is the trend value of the production based on the semilog trend during the period 1961-77.

The calorie sufficiency ratio is the calories per capita per day averaged for 1975-77 divided by calorie requirements recommended by the Food and Agriculture Organization of the United Nations and the World Health Organization.

The staple food self-sufficiency ratio is the 1973-77 average of the staple food crop production divided by the average of total domestic utilization of staple food crops for the same years.

The value of total cereal imports is the value of commercial cereal imports plus food aid averaged for 1976-78 in 1977 U.S. dollars, at c.i.f. prices.

The value of food aid is the sum of all cereal food aid averaged for 1976-78, in 1977 U.S. dollars, at c.i.f. prices.

The ratio of the value of total cereal imports to export earnings is in terms of 1976-78 averages for those values in 1977 U.S. dollars. Export earnings are defined as the export value of goods, services, and private unrequited transfers.

The ratio of total cereal imports to total staple food crop use is in terms of 1976-78 averages.

The GNP per capita figures are averages for 1976-78 in 1977 U.S. dollars.

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