

**IMPROVING FOOD SECURITY  
OF THE POOR: CONCEPT,  
POLICY, AND PROGRAMS**

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Published in 1992 by the

International Food Policy Research Institute  
1776 Massachusetts Avenue, N.W.  
Washington, D.C. 20036  
U.S.A.

Library of Congress Cataloging-in-Publication Data

Improving food security of the poor : concept, policy, and programs /  
Joachim von Braun ... [et al.].

p. cm.

Includes bibliographical references (p. ).

ISBN 0-89629-322-X

1. Food supply--Government policy. 2. Nutrition policy. 3. Poor--  
Nutrition--Government policy. I. Von Braun, Joachim, 1950- .  
II. International Food Policy Research Institute.

HD9000.6.I48 1992

363.8'83--dc20

92-6770

CIP

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# Contents

1. Summary . . . . .	1
2. Introduction . . . . .	5
3. Conceptual Framework for Food Security . . . . .	6
Definition and Measurement of Food Security . . . . .	6
Determinants of Food Insecurity and Links to Nutrition . . . . .	7
Principal Consequences of Food Insecurity . . . . .	10
4. Dimensions of the Food Security Problem . . . . .	12
How Many People Are Food Insecure? . . . . .	12
Where Are the Food-Insecure People? . . . . .	13
Who Are the Food-Insecure People? . . . . .	14
5. Review of Policies and Programs for Improving Household Food Security . . . . .	18
Types of Policies and Programs and Experience with Their Food Security Effects . . . . .	18
Operational Aspects of Household Food Security Measures . . . . .	28
6. Principles and Priorities for Policy Actions . . . . .	31
Addressing the Risks . . . . .	31
Principles and Institutional Arrangements for Priorities . . . . .	32
Bibliography . . . . .	35

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## Tables

1. Major famines since the early 1970s .....	14
2. Examples of countries with different food security problems, according to three indicators .....	15
3. Sources of risks of food insecurity and affected populations .....	17
4. Food security risks and policy choices .....	32

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## Acknowledgments

We appreciate the reviews and comments on an earlier draft by the following colleagues at the International Food Policy Research Institute: Raisuddin Ahmed, Romeo Bautista, Marito Garcia, Lawrence Haddad, and Eileen Kennedy. We also benefited from stimulating comments by Bill Clay, Urban Jonsson, Panos Konandreas, Richard Longhurst, John Lupien, John Mason, Philip Payne, Beatrice Rogers, and Ramesh Sharma. This report is an extended version of a theme paper prepared for the Food and Agriculture Organization/World Health Organization International Conference on Nutrition.

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## Summary

Improving household food security is an issue of supreme importance to many millions of people worldwide who are suffering from persistent hunger and undernutrition, and to others who are at risk of doing so in the future, including coming generations. Food security is a widely debated and much-confused issue. The objective of this report is to clarify the issue and thereby contribute to rationalizing the debate over appropriate food security policies.

Achieving a sufficient food supply—a necessary condition for food security—and making it sustainable, that is, keeping pace with growing food needs, remains a global challenge. Promotion of agricultural growth and of food crop yield, in particular, needs to remain high on the policy agenda.

Many developing countries are making efforts to improve their food security, but they face difficult choices due to budgetary and institutional resource constraints. Typically, these countries rely heavily on a narrow set of policy instruments such as food rationing, general price subsidies, employment programs, or feeding schemes. Few countries employ an optimal combination of instruments to address the various dimensions of food insecurity. This report illustrates the potential for a comprehensive portfolio of food security policy instruments that would be attuned to the specific nature of a country's food security problem. The many low-income countries now in transition from planned to market-oriented food policies particularly need to consider the entire range of instruments in the context of new economic policies.

Food security is basically defined as access by all people at all times to the food needed for a healthy life. The food security concept addresses people's risks of not having access to the required food. These risks can be

with respect to crop production, employment, and income, for instance. Thus, household food security is the ability of a household to secure enough food to ensure adequate dietary intake for all of its members.

In theory, two types of household food insecurity—chronic and transitory—can be distinguished. In reality, however, they are closely intertwined. Typically, the poorest people, who are chronically food insecure, are hit hardest by transitory food insecurity problems.

The multiple dimensions of food insecurity suggest that there can be no single indicator for measuring it. Global, regional, and national food security can be monitored in terms of food demand, supply, and stock and trade indicators. Household food security monitoring requires disaggregated consumption information at the household level, based on surveys. Socioeconomic, demographic, and nutritional variables such as real wage rates, employment, prices, and anthropometric status, when properly analyzed, can complement programs and activities that monitor changes in household food security. The absence of such monitoring and related analytical capacity in most low-income countries is a major deficiency.

Access to food, availability of food, and risks related to either access or availability are the essential determinants of food security. Food production, stockholding, and trade are the primary determinants of national, regional, and local availability of food. Variations in availability or prices can contribute to food insecurity by causing fluctuations in food consumption. Poverty is a major determinant of chronic food insecurity; the poor do not have adequate means to gain access to food in the quantities needed for a healthy life.

Food insecurity leads to much human suffering. It also leads to substantial productivity

losses and a misallocation of scarce resources due to diminished work performance, lowered cognitive ability and school performance, and inefficient or ineffective income-earning decisions. Efforts to become food secure may also exact a heavy toll from households if, for example, most of their income and time is spent on obtaining food. Households may achieve temporary food security—for example, by disposing of assets—at the cost of becoming highly vulnerable to future insecurity. The search for food security may also have important implications for a region's environment and natural resource utilization as well as its demographic situation.

Exactly how many households and individuals are food insecure is not known because of definitional and measurement difficulties and inadequate data; estimates vary from 300 million to 1 billion. Although knowledge of the dimensions of the food security problem needs to be improved, the lack of precise numbers should not stand in the way of devising and implementing policies and programs to improve food security.

A range of alternative policies is available to improve household food security; there is not just one general, optimal set of policies for this purpose. The characteristics of a country's food security problem, the nature of the food-insecure population, resource availability, and institutional capabilities all need to be considered when making policy choices.

An effective food security policy aims to ensure an adequate dietary intake for all households without exposing them to excessive risks in attaining that intake. A policy is efficient when it reaches this goal at the least cost and is sustainable in the long run. Public and private actions deal with the risk of food insecurity, and an optimal combination of these actions—considering costs and impacts—characterizes successful food security policies. Food security policies and programs need to build on comprehensive assessments of interrelated national, community, and household food security problems and on evaluations of the public and private capabilities to deal with these problems at all three levels.

The dimensions, causes, and consequences of food insecurity differ widely from country to country, and even within the same country. Hence, a general blueprint for setting priorities cannot be suggested or even considered. The

search for the optimal combination of policies has to be country-specific. The policies discussed briefly below have distinct impacts in the short and long runs, and their powers of risk-reduction differ.

*Macroeconomic policy and development strategy.* These play important roles in influencing food security. The long-run effects of alternative development strategies for growth and poverty alleviation emphasize the relevance of choice of strategy for food security, whereas the short-run effects on the poor of structural maladjustments in low-income countries in the 1980s demonstrate the relevance of macroeconomic policies for food security. Policies for improving food security must go beyond direct food- and agriculture-related policies and encompass nonagricultural and economywide policies that have implications for prices, income, and employment of the poor and thus for food security.

*Storage and trade-oriented policies for stabilization.* While generally attractive to policymakers, these policies need to be attuned to a country's specific production and trade risks. Price stabilization around narrow margins is frequently beyond the financial and administrative reach of many low-income countries. Price stabilization can reduce short-term adjustment stress on households. Yet there is increasing evidence that points to a "minimalist" approach to price stabilization. For countries that operate under severe foreign exchange constraints, an international finance facility for emergency food imports would be desirable. Alternatively, the existing Food Financing Facility of the International Monetary Fund could be made into an effective tool. The roles of food aid are discussed in this context as well as in the context of projects.

*Production-oriented policies and programs.* Policies and programs for increasing food production and production of crops for sale can improve food security if they increase or stabilize the real incomes of the food-insecure people. Technological innovation and commercialization in agriculture help to alleviate poverty and improve food security by stimulating agricultural growth, improving employment opportunities, and expanding food supplies. Gains in real income lead to improve-

ment in food consumption and nutritional welfare. Agricultural growth further enhances food security by stimulating, through multiplier effects, nonagricultural employment and income. Agricultural growth also affects food insecurity by permitting household assets to grow, thus reducing the vulnerability of households to short-term disruptions in their income streams. Rural financial markets need to develop rapidly along with agricultural growth to enable households to build up productive asset bases. A policy of self-sufficiency in food production or adoption of a "food first" policy that advocates food crops to the exclusion of cash crops is not necessary for food security when trade is not impaired. In environments with risky markets, however, the joint promotion of food crops and cash crops is required in support of food security enhancement.

*Labor-intensive public works.* Income generation through such programs can reduce risks for food-insecure households, both directly through wage earnings in the short run and indirectly through income flows from improved infrastructure in the long run. Program design influences the food security effects of public works. Income effects of public works also have favorable private savings and investment effects that improve household food security. Public works programs reach the food-insecure through mechanisms and design features such as wage-rate policy, regional targeting, and specific selection of households and household members. Self-targeting is a unique feature of properly designed public works.

*Credit.* Credit to the poor to stabilize consumption and promote self-employment through private investment can also improve household food security. Credit programs that combine small-scale credit with group motivation, technical advice, and assistance in institution-building have been found most successful for these purposes.

*Targeted feeding, food stamps, and food subsidies.* These food-related income transfers are widely used to alleviate food insecurity. In recent years they have been attacked for their potential negative effects on markets and for their high fiscal costs. Targeted feeding programs can increase food intake by a greater amount than comparable cash transfers, al-

though they are not easy to administer. Besides increasing food consumption, such programs can encourage school and health clinic attendance. Food stamp programs are expected to have the higher food-consumption effects of food income transfers but the lower administrative and fiscal costs of food handling and transport. However, experience with such programs is mixed. Consumer food price subsidies are extensive in developing countries. Combined with rationing or attached to the typical foods of poor people, these subsidies help to improve the food security of the poorest populations in areas frequently subject to serious food shortages. However, it is difficult to achieve both universal food security through rationed distribution of food and targeted income transfer goals in one program in a cost-effective manner.

*Emergency relief programs.* Relief programs must be invoked to respond to food emergencies that may result in famines, the harshest form of transitory food insecurity. Effective emergency relief response demands food, capital, and institutional capacity; however, national and local constraints on capital and institutions hinder response. Nongovernmental organizations are important for overcoming institutional deficiencies, but capital constraints are more difficult to overcome. An effective early warning system is an essential element of relief management. However, it is also important to ensure early responses to early warnings; a free press and a transparent political environment are vital for this.

Various private and public actors, ranging from the food-insecure households themselves to communities, nongovernmental organizations, local governments, national governments, international agencies, and bilateral donors, act to improve household food security. Governments play a key role in achieving food security through strategy formulation, policy design and implementation, monitoring, and evaluation of progress. Households adopt a variety of coping mechanisms and strategies, not always efficient or effective, ranging from loss prevention to loss management. Households usually act in a community context, and community-level action for food security can be supported by government policy and nongovernmental organizations.

When making plans to improve food security, the reinforcing detrimental linkages between food insecurity, disease, poor sanitation, and inadequate education must be considered at the outset. Otherwise, food security measures on their own will have a limited effect on nutritional improvement.

The report concludes with a set of principles and priorities for policy actions. The coun-

try-specific challenge to relate appropriate policy mixes to the food security risks is highlighted. An argument is made for a long-run perspective, under which an appropriate division of labor among national and international actors in the fields of agriculture and health is essential. Food security requires economic development and large-scale public commitment and is not achievable with a few cheap interventions.

## Introduction

Improving food security is a widely debated and much-confused issue, but one of supreme importance to many millions of people worldwide. This report presents the issues and reviews policies and programs that can improve household food security. In the process, the borderlines and overlaps with nutritional improvement are identified.

The report highlights the scope for the combined use of various policy instruments to achieve food security. Many countries focus primarily on a single instrument for food security. Some countries mainly use general food price subsidies, whereas others focus on subsidized rationing or feeding schemes or employment guarantees, and so on. This specialization in instruments and overreliance on their use may result in inefficient and ineffective policy.

The large number of low-income countries in transition from planned to market-oriented food policies may be especially at risk of continuing to use a narrow set of administration-intensive instruments for food security rather than employing a comprehensive portfolio of policies.

Hunger and undernutrition continue to be serious problems for many people in many countries. Persistent hunger is a condition brought about by not having enough to eat. Undernutrition results from insufficient intake of specific nutrients in a diet and may or may not coexist with hunger. Both are closely related to poverty. Sufficient food is a basic human right.

Food security policy has multiple dimensions that range from ensuring the food supply at global, country, and local levels to ensuring sufficient effective demand for adequate food consumption. The ultimate goal of an effective

food security policy is to provide for individuals' adequate dietary intake through availability and accessibility of food, which are necessary conditions for nutritional well-being. To improve the food security situation, the specific nature of a population's food security problem must be well understood. Building the monitoring and analytical capacity to obtain such an understanding is part of an effective and efficient food security policy.

Household food security can be improved in the short and long runs through various means. The economic and fiscal costs of alternative strategies, policies, and programs must be important criteria for decisionmaking. Apart from strategies that are specifically designed to ameliorate food insecurity, macroeconomic and sectoral policies have intended as well as unintended food security effects that need to be understood and considered. The appropriate role of the state and other public actors, such as local governments and communities, in achieving household food security needs to be identified. Making this identification requires an understanding of markets, production relationships, and capabilities of private actors. Such an understanding is also required for identification of effective international assistance strategies for food security.

The report begins by defining food security with the objective of clarifying and conceptualizing the key issues. The dimensions of the food security problem at different levels are then described, and food-insecure people in different economic contexts are identified. Policies and programs for improvement of food security are reviewed, and their operational aspects are discussed. The report concludes with a synthesis of recommendations for priority policy actions.

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## Conceptual Framework for Food Security

### DEFINITION AND MEASUREMENT OF FOOD SECURITY

Food security is defined, in its most basic form, as access by all people at all times to the food required for a healthy life. Access to the needed food is a necessary, but not a sufficient, condition for a healthy life. A number of other factors, such as the health and sanitation environment and household or public capacity to care for vulnerable members of society, also come into play.

The food security concept addresses people's risks of not having access to needed food. These risks can arise from income or food production, for instance. Even in a "normal" situation, with no crises such as war or shocks such as sudden price changes, these risks typically are higher the closer a household is to inadequate dietary intake. Thus, at the household level, food security is the ability of the household to secure enough food to ensure adequate dietary intake for all of its members.<sup>1</sup>

The aim of an effective food security policy is to ensure that all households have an adequate dietary intake and can acquire it without being subjected to excessive risks. A country and its people are food secure when production, markets, and social systems work in such a way that food-consumption needs are

always met (Maxwell 1990). The risk of household food insecurity is dealt with through public and private actions, and the optimal combination of these actions is at the core of successful food security policies.

Availability of food *and* access to food are two essential determinants of food security. The first does not ensure the second; food may be available, but a household, for various reasons discussed later, may not have access to it. However, adequate national or local food availability remains a necessary condition for household food security.<sup>2</sup>

In theory, two types of household food insecurity—chronic and transitory—can be distinguished, but in reality they are closely intertwined. Chronic food insecurity is a persistently inadequate diet caused by the continual inability of households to acquire needed food, either through market purchases or through production. Chronic food insecurity is rooted in poverty. Transitory food insecurity, on the other hand, is a temporary decline in a household's access to needed food, due to factors such as instability in food prices, production, or incomes (World Bank 1986). In its worst form, transitory food insecurity can result in famine. It is typically the chronically food insecure who are hit hardest by transitory food insecurity problems. The differing causes and

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<sup>1</sup> A comprehensive technical definition, essentially followed here, is given in a draft document prepared by the United Nations Administrative Committee on Coordination—Subcommittee on Nutrition: "A household is food secure when it has access to the food needed for a healthy life for all its members (adequate in terms of quality, quantity, safety, and culturally acceptable), and when it is not at undue risk of losing such access" (UN ACC/SCN 1991, 6).

<sup>2</sup> In many famine-prone African countries a close relationship is observed between domestic food production, regional and local food availability, and household food security. However, it is also observed that malnutrition may be widespread and a number of households may be food insecure in countries where total food supplies are adequate to meet nutritional needs if better distributed—the case of India is notable (FAO 1987). High levels of food self-sufficiency tend to coincide with low levels of household food security in many African countries (von Braun and Paulino 1990).

characteristics of food insecurity among households may require corresponding differences in responses.

There are important differences in household food security issues in rural and urban contexts. In urban areas, household food security is primarily a function of the real wage rate (that is, relative to food prices) and of the level of employment. Further, the miserable health environment in poor urban areas sometimes makes the urban food security situation qualitatively different from the rural situation. Differences in calorie consumption and requirements exist between rural and urban areas. Typically, calorie consumption is lower in urban areas, partly because of differences in activity levels. Although the prevalence of food insecurity is lower in urban areas than in rural areas, urban poverty with chronic food insecurity will become an increasingly important problem in the future with higher rates of urbanization.

Given the multiple dimensions (chronic, transitory, short-term, and long-term) of food insecurity, there can be no single indicator for measuring it. Different indicators are needed to capture the various dimensions of food insecurity at the country, household, and individual levels:

- Food security at the country level can, to some extent, be monitored in terms of demand and supply indicators; that is, the quantities of available food versus needs, and net import needs versus import capacity. (Import capacity is defined as foreign exchange earnings net of debt-service obligations and other necessary foreign exchange expenditures.)
- Food security at the household level is best measured by direct surveys of dietary intake (in comparison with appropriate adequacy norms). However, they measure existing situations and not the downside risks that may occur. The level of, and changes in, socioeconomic and demograph-

ic variables such as real wage rates, employment, price ratios, and migration, properly analyzed, can serve as proxies to indicate the status of, and changes in, food security. Indicators and their risk patterns need to be continually measured and interpreted to monitor food security at the household level.

- Anthropometric information can be a useful complement because measurements are taken at the individual level. Yet such information is the outcome of changes in the above indicators and of the health and sanitation environment and other factors. Most important, this information indicates food insecurity after the fact.

## **DETERMINANTS OF FOOD INSECURITY AND LINKS TO NUTRITION**

Food security is composed of availability of food, access to food, and risks related to either availability or access. The role of food availability and fluctuations in that availability is considered in this section. Determinants of access to food and nutritional well-being, such as poverty, are also considered here. Although the conceptual focus is on households, macroeconomic and external policy problems have, especially in recent years, played an increasingly important role in influencing, adversely, household food security.

### **Food Availability and Fluctuations**

In a world increasingly integrated through trade and political-economic ties among nations, sufficient global availability of food is of increasing importance for household food security.<sup>3</sup> So far, the world has kept up with the challenge of population growth.<sup>4</sup> However, global food availability cannot be taken for granted in the long run in view of continued population growth, increased land scarcity, and

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<sup>3</sup> World food trade increased from 8 percent of production in the early 1960s to 12 percent in the mid-1980s; developing countries, as a group, doubled their food imports per capita, but increases for low-income developing countries were negligible (FAO 1987). It is likely that these low-income countries, especially those whose food equation remains balanced at unacceptably low levels, will participate to a much greater extent in the world food market as they attempt to improve their food security.

<sup>4</sup> Despite the addition of 1.8 billion people to the world's population in the last 25 years, average food availability rose from 2,320 calories per capita per day during 1961-63 to 2,660 calories in 1983-85 (FAO 1987).

difficulties with achieving sustainable increases in yields of food crops.<sup>5</sup> Availability of food at the household level requires that food be available in the local or community markets, not just nationally, which in turn requires relatively smooth market operations, functioning infrastructure, and a free flow of information. As relevant as the household perspective is for guidance of the complex distributional issues, one must not lose sight of global production needs and responsibilities as a foundation for sustained, long-term, improved household food security.

National, regional, or local availability of food is determined primarily by food production, stockholding, and trade at any of these levels. Variations in any of these can contribute to food insecurity. For instance, increased cereal production variability has been shown to significantly increase food consumption variability (Sahn and von Braun 1989). Recent evidence indicates that year-to-year variability in world food production may be increasing (Hazell 1989). Fluctuations in a country's capacity to import food (which is a function of export earnings, world prices, and debt-service obligations, among other variables) also contribute to food insecurity by affecting the local availability of food, although it may be available globally.

Seasonal variations in production and seasonally high food prices are often important contributors to transitory food insecurity of poor households, which can escalate over time into chronic food insecurity and nutritional deterioration (Sahn 1989; Chambers, Longhurst, and Pacey 1981). Sudden changes in incomes and prices affect the ability of households, not always in the same way, to obtain food that is available.<sup>6</sup> An important source of fluctuations in seasonal food prices lies in the costs of storage and failure to manage public food stocks adequately. Further, the ability of households to effectively demand adequate food is governed by exogenous events

(for example, price shocks, war, deteriorating terms of trade), domestic policy changes, and stochastic weather-induced events such as droughts, interacting with existing technology and a given resource endowment.

### **Determinants of Access to Food and Nutritional Well-Being**

The last decade has been a particularly harsh period for many low-income developing countries. World recession, the debt crisis, exchange rate misalignments, oil price shocks, depressed commodity prices, high real interest rates, and stagnation in foreign aid flows have all exacted, in their own ways, a heavy toll on developing countries and their peoples. Economic growth has been negligible if not negative in many countries, especially those of Sub-Saharan Africa, during this decade. The effects of these developments on household food security and welfare have been severe, as demonstrated by changes in child welfare indicators such as malnutrition, infant and child mortality rates, and incidence of disease (Cornia, Jolly, and Stewart 1987). The poor have been particularly hard hit by these macroeconomic and external problems (Pinstrup-Andersen 1990) and by the deterioration in real wages, increased unemployment rates, and cutbacks in social sector spending that have resulted from the macroeconomic stabilization and adjustment programs many of the affected countries have had to adopt.

At the country level, access to food from the international market is a function of world food prices and foreign exchange availability. However, for many food-deficit and foreign-exchange-deficit countries, recourse to the international market is limited, and food aid offers an important form of access to food. The global supply and demand for food aid and its allocation among countries are driven by complex factors, not just market forces and charity. Supply by donors is influenced by fiscal con-

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<sup>5</sup> World food demand in the year 2000 is projected to be about 2.8 billion metric tons, about 1 billion tons higher than the 1.8 billion tons consumed during 1981-85 (Paulino 1990). These projections are essentially trend based.

<sup>6</sup> For example, a decrease in food prices may reduce the incomes of food producers while benefiting non-food-producing consumers. Surplus farmers who often meet most of their foodgrain needs from home production can choose to maintain adequate levels of food consumption even if real earnings fluctuate, whereas landless agricultural wage laborers whose real earnings are determined by market wages, hours worked, and retail prices are highly susceptible to increased variations in production and prices and therefore are adversely affected as consumers.

straints, world market prices, and "surplus" production levels. In some instances, allocation of food aid among countries is a consequence of political tradition. Food aid, while it has played a critical role in times of emergency for some countries, is not a reliable source of food supply for food-deficit, low-income countries; it has been observed that when world market prices rise, food aid supply by donors typically is reduced.

Poverty is a major determinant of chronic household food insecurity. The poor do not have adequate means or "entitlements" (Sen 1981) to secure their access to food, even when food is available in local or regional markets. Furthermore, the poor are vulnerable to shocks that are liable to slip them into temporary, that is, transitory food insecurity.

Increasing the incomes of households that have malnourished members can improve their food security in terms of improving their access to food. Additional income can also improve their nutritional well-being—influenced by multiple factors, including food consumption—as measured by anthropometric indicators.<sup>7</sup> In general, increases in income are associated with increases in caloric intake of staple foods, especially for the poorer households, but to a lesser extent for those in higher income groups (Alderman 1986). Increases in income are also strongly associated with non-staple food consumption, especially meats (Alderman 1986). Consequently, the income effect on consumption of micronutrients that are found primarily in meats, such as iron, is high, whereas the income effect for micronutrients that come primarily from vegetables, such as vitamin A, is lower (Bouis 1991).<sup>8</sup> Nonfood expenditures rise more rapidly with income than do food expenditures; income elas-

ticities for such necessities as health, housing, and clothing are often quite high, that is, over one.

In addition to their current income flow, poor households build their asset bases out of incremental income. Expanded asset bases reduce the vulnerability of households to short-term downturns in income flows; part of the asset base can be liquidated in times of adversity, an action that helps to maintain or, at least, not further degrade household-level food security.<sup>9</sup>

Increases in household income, while improving access to food, do not always directly contribute to improved nutritional well-being of the household. The additional income may be spent on foods of low nutritional value or it may be spent on nonfood items. The effect of income on nutritional status may not always be through increased food consumption, but indirectly, through better sanitation, for instance. It is important to keep two points in mind. First, patterns of household spending and consumption, while rational to the household head, may not necessarily be optimal from a nutritional perspective. Nutrition is only one of a series of considerations that enter into decisions on household spending and consumption. Households with extremely limited resources may face the hard choice of either maintaining a flow of income—however low—through allocation of sufficient food to the income-earning members of the household or placing a high priority on the nutritional status of economically inactive members such as children or the elderly. Second, lack of knowledge regarding the food and nutritional needs of household members may hold back full access to needed food, even when available. Incorrect information imposed from outside the household and

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<sup>7</sup> In three case studies from The Gambia, Guatemala, and Rwanda a 10 percent increase in income, from a level of US\$100 per capita, resulted in a 3.5-4.9 percent increase in household food-energy consumption and a 1.1-2.5 percent increase in weight-for-age of children (von Braun 1990). Macrolevel data from a number of developing countries suggest that a doubling of per capita income from \$300 to \$600 results in a reduction of about 40 percent in the prevalence of below standard weight-for-age of children (von Braun and Pandya-Lorch 1991b).

<sup>8</sup> An analysis of Philippine farm households shows that the income elasticity of iron was 0.44, whereas the income elasticities of vitamins A and C were not significantly different from zero (Bouis 1991). Recent evidence from Kenya indicates that as the caloric intake of preschoolers rose with increasing income, there was a decline in their vitamin A consumption (Kennedy and Payongayong 1991).

<sup>9</sup> For example, during a famine period in Ethiopia, households in the upper-income tercile in a survey population were able to obtain US\$15 from asset sales, while households in the lower-income tercile were only able to obtain US\$5, because the former owned larger herds and other assets (Webb and Reardon 1991).

promotion of nonfoods or non-nutritious foods can add to this problem.

Food security and the nutritional well-being that arises from food consumed by households are determined by at least five interrelated factors:

- Availability of food through market and other channels, which is a function of factors discussed above;
- Ability of households to acquire whatever food the market and other sources have to offer, which is a function of household income levels and flows and the resource base for subsistence farming;
- Desire to buy specific foods available in the market or to grow them for home consumption, which is related to food habits, intrahousehold income control, and nutritional knowledge;
- Mode of food preparation and distribution among household members, which are influenced by income control, time constraints, and nutritional knowledge; and
- Health status of individuals, which is governed by such factors as the nutritional status of the individual, nutritional knowledge, health and sanitary conditions at the household and community levels, and caretaking.

Again, each of these determinants has specific risk attributes that—especially if they are covariate—determine food security and nutritional risk.

Food security and nutritional well-being are connected through the actual use of food by individuals, as determined by some of the five above-mentioned factors; for example, health, the composition and energy density of diet, mode of processing and preparing food, and, for infants, the extent of breast-feeding and general child care. Projects and policies that alter the allocation of women's time may have significant nutritional effects through changes in breast-feeding, child care, food preparation, female energy requirements, and eating habits.

Health and sanitation factors that significantly hamper the attainment of satisfactory nutritional status need to be identified so that improving them becomes an objective of any type of intervention. Improving food security, which is an essential step toward securing good nutritional status, is the focal issue of this report. Not covered here are the other important factors identified above, which together with food security determine the ability to achieve good nutritional status.

## PRINCIPAL CONSEQUENCES OF FOOD INSECURITY

Food insecurity and the frequently extreme efforts made by affected households to avert it lead to much human suffering. In addition, food insecurity results in substantial productivity losses in both the short and long runs because of reduced work performance, lowered cognitive ability and school performance, and inefficient or ineffective income-earning decisions designed to hedge against food availability and access constraints. Food insecurity can thus lead to a misallocation of scarce resources and loss through sale of productive assets. Food is essential to survival, and people are more emotionally secure and better off psychologically when they have food security. Food security and adequate nutrition are beneficial outcomes in themselves as well as important inputs to economic development.

Improved adult nutrition leads to higher farm productivity and higher productivity in the labor market.<sup>10</sup> High levels of morbidity, due in part to insufficient nutrient intake, can reduce work time directly as well as indirectly through the need to take care of sick family members.<sup>11</sup> High levels of morbidity can also divert household resources away from farm or nonfarm investments toward medical care.

Cognitive development and school performance are impaired by poor nutrition and health,

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<sup>10</sup> Empirical studies find nutritional status and labor productivity, as measured by wages or own-farm output or both, to be positively related (Strauss 1986; Sahn and Alderman 1988). Haddad and Bouis (1991), using data from the Philippines, find that better nutritional status is associated with higher wages. Thus, substantial lifetime losses may be expected in adults who are stunted as a result of poor health and nutrition during childhood.

<sup>11</sup> Surveys from The Gambia and Rwanda find that preschoolers are ill 10-17 percent of the time, and women are ill 16-29 percent of the time (von Braun, Puetz, and Webb 1989; von Braun, de Haen, and Blanken 1991).

with consequent losses in productivity during adulthood.<sup>12</sup> Poor nutrition and health in early childhood can have long-term consequences that affect a child's later progress in school. Among school-age children, nutritional deficiencies are responsible in part for poor school enrollment, absenteeism, early dropping out, and poor classroom performance. Educators have often overlooked the significant improvements in school performance that can result from nutrition and health interventions (Pollitt 1990).

Not only does food insecurity have deleterious effects on households and individuals, but the effort to achieve food security may also exact a heavy toll from households if, for example, it involves their spending most of their income on obtaining food,<sup>13</sup> leaving little for the basic necessities of life such as housing and health.<sup>14</sup> Households may achieve temporary food security at the cost of substantial asset disposal and future indebtedness, thus digging themselves deeper into the mire of poverty. In the extreme case, a household that uses almost all of its resources to achieve food security in the present renders itself highly vulnerable to food insecurity in the future.

The efforts of food-insecure households to acquire food may also have important implications for the environment and the use of natural resources. Many poor and food-insecure house-

holds live in ecologically vulnerable areas (Leonard and contributors 1989), and inappropriate or desperate land use practices can cause environmental degradation that can further undermine their livelihood.<sup>15</sup> Food-insecure households do not deliberately degrade their resource base without any thought of the consequences; on the contrary, they are fully aware that their food security is threatened if their environment is threatened. "Vulnerability to food insecurity means in most cases vulnerability to environmental degradation and vice versa" (Davies, Leach, and David 1991). The food-insecure and the poor often have to choose between short-term satisfaction of food needs with long-term environmental degradation and short-term hunger with long-term environmental conservation.

The search for food security may also have important implications for a region's demographic situation, especially if it leads to short- or long-term migration to other areas in search of employment and income or, in the extreme case, in search of relief food. Such out-migration may result in an increased number of female-headed households, a higher dependency ratio in the sending area, and changes in the dynamics of the labor market. The receiving areas, mostly urban slums, experience considerable food-security strain from the influx of migrants.

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<sup>12</sup> An innovative study in Guatemala tracked down after 14 years most of the schoolchildren who had received supplemental feeding in a study project and found that, in spite of no further feeding interventions, those children who had received the supplements maintained their height advantage and performed better on achievement tests (Martorell et al. 1991).

<sup>13</sup> For instance, poor rural households in Rwanda spend 74 percent of their income on food (von Braun, de Haen, and Blanken 1991), and those in northern Nigeria spend 79 percent on food (Hazell and Roell 1983), leaving very little for much else, and also leaving these households teetering at the edge of disaster should sudden adverse changes occur in their incomes or food prices.

<sup>14</sup> Poor households do not spend much on health, but they increase this expenditure drastically when their incomes grow. Studies from Guatemala and Rwanda show that poor households typically quadruple their health expenditures from the bottom to the top income tercile (von Braun, Hotchkiss, and Immink 1989; von Braun, de Haen, and Blanken 1991).

<sup>15</sup> Kumar and Hotchkiss (1988) find that in the poor hill areas of Nepal, increased deforestation forces women to allocate more of their labor time to collection of fuelwood, to the extent that they spend almost as much time on collecting fuelwood as on farm labor, with probable adverse effects on agricultural production, child care, and nutrition.

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## Dimensions of the Food Security Problem

### HOW MANY PEOPLE ARE FOOD INSECURE?

It is difficult to know exactly how many households are food insecure given definitional and measurement problems and inadequate data. It is even more difficult to identify the number of food-insecure individuals given intrahousehold inequalities of differing kinds in different regions as well as changes over time. Improved knowledge of these issues is needed for effective policymaking. Yet lack of precision should not stand in the way of devising and implementing policies and programs for improvement of food security.

Efforts have been made to arrive at rough estimates of the number of food-insecure people. The Food and Agriculture Organization of the United Nations (FAO) and the World Bank have spearheaded these efforts, joined in recent years by the International Food Policy Research Institute (IFPRI), the World Hunger Program of Brown University, and other researchers (FAO 1963, 1977, 1985, 1988; Reutlinger and Selowsky 1976; Reutlinger and Alderman 1980; World Bank 1986; Millman 1990; Broca and Oram 1991; Millman et al. 1991). Because of differences in definitions, assumptions, country coverage, and data quality, among other factors, the estimates vary from about 300 million to 1 billion. For instance, FAO's most recent estimate, for 1983-85, cal-

culated that 348 million were undernourished at the 1.2 basal metabolic rate (BMR) level, and 512 million were undernourished at the 1.4 BMR level (FAO 1988). According to a recent study (World Bank 1986), 340 million people in developing countries in 1980 did not have enough income to obtain a minimum calorie diet that would prevent serious health risks and stunted growth in children, and 730 million people did not have enough income to acquire a diet for an active working life.<sup>16</sup> According to a recent IFPRI study (Broca and Oram 1991), about 595 million were calorie deficient in developing countries, excluding China.<sup>17</sup>

These estimates, however, only give a rough indication of the incidence of food deficiency among the poor, not of food insecurity. The estimates disregard fluctuations and risks in the availability of and access to food, which are the key features of food security, and they relate to food-energy deficiencies only. Frequently they are derived indirectly from income, as in the case of the World Bank studies just cited, and not directly from actual calorie-consumption information, as in the IFPRI study. While food-deficient households are obviously food insecure, they are not necessarily the only food-insecure households. Many households may be barely coping and at risk of becoming food deficient, say, the next year; such households are also food insecure. There can be considerable fluctuation into and

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<sup>16</sup> A recent study by Millman (1990) extrapolated earlier World Bank and FAO estimates to 1988. She calculated that 455 million people in developing countries lived in households too poor to obtain sufficient energy for minimal activity among adults and healthy growth among children, and 1,015 million people lived in households too poor to obtain sufficient energy to work.

<sup>17</sup> Estimates of the food-deficient poor in China range from 70 to 100 million in the early 1980s (Zhong et al. 1991).

out of food deficiency, and hence into and out of food insecurity.<sup>18</sup> Estimates of food deficiency, based on cross-sectional survey information, understate the prevalence of food insecurity,<sup>19</sup> but the degree of understatement is unknown. Thus, crucial information about the scale of transitory food insecurity is lacking.

Recent estimates also suggest that nutritional deficiency is widespread: some 150 million children are underweight, about half a billion women are anemic due to iron deficiency, about 20 million infants are born with low birth weight each year, some 40 million children are afflicted with vitamin A deficiency, and over a billion people are deficient in iodine (UN ACC/SCN 1991).

There are indications of considerable progress in poverty alleviation in the 1960s and 1970s, with a somewhat mixed performance in the 1980s (World Bank 1990; FAO 1987). Without much doubt, the incidence of poverty, that is, the proportion of the population that is poor and thus food insecure, is declining. For instance, FAO indicators suggest the proportion of the population that was undernourished under a cutoff definition of 1.2 BMR declined from 19 to 15 percent in all developing market economies between 1969-71 and 1979-81 (FAO 1987). Under a broader definition of 1.4 BMR, the respective decline was from 28 to 23 percent. A World Bank (1990) report, using survey data from 11 countries covering at least 10 years, also shows considerable progress in reduction of the incidence of poverty. In the 1980s the incidence of poverty continued to decline in several east and south Asian countries, but elsewhere it has increased. However, given population dynamics, especially the rapid population growth rate in Sub-Saharan Africa, the number of poor and food-insecure people has been increasing, despite the reduction in the incidence of poverty, and appears set to continue increasing.

Severe food insecurity that degenerates into famine is disappearing. Today, unlike the

late 1960s and early 1970s or even the early 1980s, symptoms of famine are seen in only a few African countries such as Sudan, Ethiopia, and Mozambique (Table 1). The risk of famine, however, continues to exist in other countries because of political, economic, and environmental shocks and insufficient preparedness and famine-prevention policies (Drèze and Sen 1989; Teklu, von Braun, and Zaki 1991; Webb, von Braun, and Yohannes 1991).

## WHERE ARE THE FOOD-INSECURE PEOPLE?

An approximate idea of the numbers of food-insecure people can be provided; similarly, an approximate idea of the location of these people is available. Essentially, all estimates concur that South Asia, particularly India and Bangladesh, holds a large proportion of the developing world's food-insecure population, particularly the extreme poor, followed by East Asia and Sub-Saharan Africa. The incidence of food insecurity is high in Africa and South Asia, somewhat high in the Middle East and North Africa, but considerably lower in East Asia and Latin America and the Caribbean.

The IFPRI study (Broca and Oram 1991) on location of the food-energy-deficient population by agro-ecological zone found that the incidence of food-energy deficiency ranged from 23 percent in Central America to 26 percent in South America, 35 percent in Asia, and 38 percent in Sub-Saharan Africa. In the aggregate, food-energy deficiency tended to be lowest in the wet zones and highest in the arid zones. By region, the largest number of the poor in Sub-Saharan Africa were located in the arid zone, where the incidence of poverty was also highest. In South Asia, 90 percent of the poor were located in the warm tropics and subtropics. In Southeast Asia, the warm, the seasonally dry, and the humid zones contained the largest number of the poor, with the smallest share located in the cool tropics. In most

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<sup>18</sup> For instance, the 1956/57-1977/78 time-series data from India on the incidence of rural poverty show considerable fluctuation in rural poverty from year to year to the extent that rural poverty increases or decreases by as much as 50 percent within periods of three to six years (Ahluwalia 1986; Mellor and Desai 1986).

<sup>19</sup> For example, in a Philippine data set, out of 323 households with average calorie adequacy above 80 percent of requirements (that is, not food deficient in a chronic sense), 197 dipped below 80 percent at least once during a 16-month period (Haddad, Sullivan, and Kennedy 1991).

**Table 1—Major famines since the early 1970s**

Famine Years	Countries Affected
1968-74	Nigeria (Biafra), Somalia, Chad, Burkina Faso, Mali, Mauritania, Senegal, Djibouti
1972-73	Bangladesh
1972-74	Ethiopia, Nigeria (Hausaland)
1973-75	Niger
1974-76	Angola
1975	Cambodia, Laos
1977-78	Zaire (Bas-Fleuve)
1980-82	Uganda (Karamoja), Kenya (Turkana)
1982-85	Ethiopia, Angola, Uganda, Mozambique, Burkina Faso, Mali, Mauritania, Niger, Malawi, Tanzania
1984-85	Sudan, Mozambique, Chad
1987	Ethiopia, Mozambique
1988	Sudan, Somalia
1991	Ethiopia, Sudan, Liberia, Mozambique

South American countries, the highest number of the poor was in the humid and wet zones, but the largest share of the poor was in the dry zone. In Central America and the Caribbean, the largest number and share of the poor were in the warm tropics, followed by the cool tropics. In most instances, the distribution of the poor mirrors the population distribution in the agro-ecological zones.

Some of the countries with widespread food-security problems, measured according to three indicators—low average levels of calorie consumption, large fluctuations in and low levels of food consumption, and large numbers of absolute poor—are listed in Table 2. This is not an exhaustive list, but it serves to show that there is some overlap of countries among indi-

cators, that is, some countries suffer from food insecurity as defined by more than one indicator. The table also shows the importance of identifying the nature of the food insecurity problem—for instance, the source, the duration, and the characteristics of affected populations—to accurately identify which countries have which problems.

#### **WHO ARE THE FOOD-INSECURE PEOPLE?**

Depending on factors such as agro-ecological characteristics, access to land, diversity of income sources, and state of development of the economy, food-insecure households can be

**Table 2—Examples of countries with different food security problems, according to three indicators**

<u>Indicator 1</u> Very Low Level of Average Food Consumption <sup>a</sup>	<u>Indicator 2</u> Large Fluctuations and Low Levels of Food Consumption <sup>b</sup>	<u>Indicator 3</u> Existence of Large Numbers of Extreme Poor <sup>c</sup>
Angola	Malawi	Brazil
Bangladesh	Mozambique	China
Bolivia	Namibia	India
Burkina Faso	Nepal	Mexico
Central African Republic	Nigeria	Pakistan
Chad	Rwanda	
Ethiopia	Senegal	
Guinea	Sierra Leone	
Haiti	Somalia	
Kenya	Sudan	
Madagascar	Uganda	
	Zaire	

Note: The list of countries included in this tabulation is selective because of lack of suitable data. Exclusion from the list does not indicate an absence of food security problems.

<sup>a</sup> Average food-energy consumption in 1989 was below 2,100 kilocalories per capita (World Bank 1991).

<sup>b</sup> Average energy consumption in 1989 was below 2,300 kilocalories per capita and above average coefficients of variation in food-energy consumption during 1972-1983 (World Bank 1991; Sahn and von Braun 1989).

<sup>c</sup> This group includes middle-income countries with pockets of absolute poverty, such as Brazil and Mexico, as well as large, low-income countries whose regional differences in fluctuations tend to cancel each other out (for example, India, Pakistan, and China).

members of different socioeconomic and demographic groups in different areas. Nevertheless, some common characteristics of food-insecure people emerge, of which poverty is a central one. The poor face the most severe constraints in their own food production and in their

access to food from markets, which renders them vulnerable to food security crises.<sup>20</sup> A number of common sociodemographic characteristics emerged from a recent comparative study that looked at income source patterns of malnourished rural poor in 13 survey areas in

<sup>20</sup> For example, in Ethiopia, during the recent famine, 63 percent of the poorest third of households on the income scale reduced their consumption to one meal or less per day, whereas the proportion of households that dropped to such levels was 47 percent among the upper third of households (Webb, von Braun, and Yohannes 1991). Similar patterns have been observed in Sudan (Teklu, von Braun, and Zaki 1991).

Africa, Asia, and Latin America (von Braun and Pandya-Lorch 1991b):<sup>21</sup>

- Food-insecure households tend to be larger and to have a higher number of dependents and a younger age composition;<sup>22</sup>
- Ownership of land or access to even small pieces of land for farming has a substantial effect on the food security status of rural households, even when income level is controlled for; the prevalence of food insecurity tends to be higher among landless or quasi-landless households, who are much more dependent on riskier sources of income than farm income and on the diversification of the rural economy;<sup>23</sup>
- Women's income has an important influence on the food security status of the household, and female-controlled income is more likely to be spent on food and nutrition than male-controlled income;<sup>24</sup>
- The relationship between income diversification and malnutrition is difficult to generalize; the relationship is context- and location-specific and is a result of household coping strategies.<sup>25</sup> A typology of food-insecure households needs always to be aware of this context and

location specificity (Haddad, Sullivan, and Kennedy 1991).

Typically, food-insecure people spend a large share of their income on staple food consumption or allocate a large share of their production resources to subsistence food production in normal years, or both; yet they may barely meet their needed levels of dietary intake.

Different types of risks affect different groups of food-insecure households and their members in different ways (Table 3). The most severe food security problems arise from simultaneous combinations of common risks that hit household members in demographic risk groups. For example, children in poor smallholder households that have limited income diversification may be affected if their households experience a bad crop or loss of employment and are located in an area of civil unrest. The possible combinations are numerous. In order to improve household food security, the specific risks need to be identified so that effective and efficient risk-reducing actions can be developed.

The location specificity of food security risks also relates to the existence or the lack of community or state social security systems to mitigate risks.

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<sup>21</sup> In this study, the poor are defined as those whose food-energy consumption fell below levels at which healthy life is ensured.

<sup>22</sup> For example, food-insecure households in the Sahelian zone of Burkina Faso had an average household size of 11 and a dependency ratio of 0.51, compared with a size of 8 and a ratio of 0.40 for food-secure households (Reardon 1991).

<sup>23</sup> For example, in North Arcot, India, during the drought year of 1982/83, 73 percent of landless households were food deficient vis-à-vis 61 percent of farm households (Yohannes 1991).

<sup>24</sup> Household consumption analysis from Kenya and Côte d'Ivoire shows that female-controlled income had a positive and significant effect on household food consumption (Kennedy 1991; Hoddinott and Haddad 1991).

<sup>25</sup> Surveys from Kenya and India show that larger off-farm income shares are accompanied by a higher prevalence of malnutrition, but the opposite pattern is observed in The Gambia, and a U-shaped relationship is seen in several other survey sites (von Braun and Pandya-Lorch 1991b).

**Table 3—Sources of risks of food insecurity and affected populations**

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Risks	Households and People at Risk of Food Insecurity
Crop production risks (pests, drought, and others)	Smallholders with little income diversification and limited access to improved technology such as improved seeds, fertilizer, irrigation, pest control Landless farm laborers
Agricultural trade risks (disruption of exports or imports)	Smallholders who are highly specialized in an export crop Small-scale pastoralists Poor households that are highly dependent on imported food Urban poor
Food price risks (large, sudden price rises)	Poor, net food-purchasing households
Employment risks	Wage-earning households and informal-sector employees (that is, in peri-urban areas and, when there is a sudden crop-production failure, in rural areas)
Health risks (infectious diseases, for example, resulting in labor-productivity decline)	Entire communities, but especially households that cannot afford preventive or curative care and vulnerable members of these households
Political and policy failure risks	Households in war zones and areas of civil unrest Households in low-potential areas that are not connected to growth centers via infrastructure
Demographic risks (individual risks affecting large groups)	Women, especially when they have no access to education Female-headed households Children at weaning age The aged

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## Review of Policies and Programs for Improving Household Food Security

### TYPES OF POLICIES AND PROGRAMS AND EXPERIENCE WITH THEIR FOOD SECURITY EFFECTS

A wide range of alternative policies can be pursued; there is not just one general, optimal set of policies for improving household food security. Characteristics of the food security problem and institutional capabilities need to be considered when making policy choices, as must economic and fiscal costs of desired actions.

The reviews of policies and programs that follow are structured along the lines of the major categories of risks for food security that were identified in Chapter 4. However, specific programs frequently impinge on more than one of those risks.

#### The Role of Strategy and Macroeconomic Policy

A broad distinction can be made between a strategy of "growth-mediated security" and one of "support-led security" (Drèze and Sen 1989). The first approach is "to promote economic growth and take the best possible advantage of the potentialities released by greater general affluence, including not only an expansion of private incomes but also an improved basis for public support" (Drèze and Sen 1989, 183). The second approach, one of targeted programs, is "to resort *directly* to wide-ranging public support in domains such as employment provision, income redistribution, health care, education, and social assistance in order to remove destitution without waiting for a transformation in the level of general affluence"

(Drèze and Sen 1989, 183). Obviously, the two approaches are connected, especially in the long run.

Much can be done to reduce food insecurity through national public action, even when national per capita income is low, as the well-known experiences of countries such as China, Sri Lanka, and Costa Rica demonstrate. (For examples, see Ahmad and Wang 1990 on China; Edirisinghe 1987 on Sri Lanka; Valverde et al. 1983 on Costa Rica.)

Long-run effects of alternative development strategies for growth and poverty alleviation have shown the striking relevance of choice of strategy (Mellor 1986; Alderman 1986; Mundlak, Cavallo, and Domenech 1989). Similarly, the short-run effects for the poor of structural maladjustments in low-income countries in the 1980s, discussed in Chapter 3, have stressed the relevance of macroeconomic policies for food security (Cornia, Jolly, and Stewart 1987; Pinstrup-Andersen 1990). Discussion of policy for improving food security must not be limited to direct food- and agriculture-related policies. Nonagricultural and economywide policies, such as industrial protection and fiscal policies, are highly relevant for prices, income, and employment of the poor and thus for food security in the short and long runs (Krueger, Schiff, and Valdés 1988).

#### Storage, Trade, and Food Aid Policies for Stabilization

There is a continued strong feeling among policymakers—not only in low-income countries—that storage under public control is essential for food security. At the time of the

1974 World Food Conference and even into the 1980s, "food security" was largely understood as a matter of national and international trade and of storage policies to deal with production fluctuations (Valdés 1981). It is now increasingly well understood that production fluctuations, infrastructure, government policy, location, and sectoral diversification are important determinants of a country's demand for storage and stabilization of food availability and prices. The stabilization drive needs to be attuned to a country's specific production risks (for example, whether it is prone to droughts or floods) and trade risks (for example, whether it is landlocked) (FAO 1983; Sarris 1985). The response of local- and farm-level storage to public policies is an important consideration, especially in circumstances where postharvest losses are significant and where local market disruptions occur frequently. Technical improvement of storage to cut losses remains highly relevant in many countries.

There are benefits—including some for food security—and costs of price stabilization. Price stabilization is an expensive proposition and increasingly so the more stability is attempted. Frequently, low-income countries cannot afford it financially or administratively and therefore need to search for optimal levels of stabilization. Timmer (1986) suggests that government trading agencies could simply extend their day-to-day trading skills in implementing their price policy to intermediate-term planning for price stabilization using imports and short-run working stocks. This would involve "reading market price trends, setting domestic prices on this trend, and then having the financial flexibility to subsidize imports or exports if that is necessary to enforce the domestic price guidelines" (Timmer 1986, 89). Administrative and opportunity costs of the resources engaged in stabilization need to be accounted for.<sup>26</sup> Benefits are in terms of a more stable investment climate and—more relevant to

this report—of reduced short-term stress on households to adjust.<sup>27</sup>

Yet there is increased evidence that argues for a "minimalist" approach to price stabilization. Knudsen and Nash (1990, 556), on the basis of a recent review of domestic price stabilization schemes in developing countries, suggest the following principles to governments to minimize the cost of mitigating adverse effects of price instability: "rely on market mechanisms when possible; avoid schemes that require physical handling of the commodity; do not try to stabilize prices too much; and try to mimic prices that would be established in a freely functioning market."

Countries that operate under severe foreign exchange constraints find it difficult to increase commercial food imports in order to cope with food shortages. Having to allocate scarce foreign exchange to food imports (above their normal allocation) destabilizes their imports of investment goods, with consequent adverse effects on the economy. Such countries are quite dependent on food aid—unfortunately not always a reliable or timely source of food—although food aid programs have developed innovative means of reducing time lags and costs, such as triangular transactions, commodity exchanges, and local purchases of food, which increase the usefulness of food aid (Relief and Development Institute 1987, 1990).<sup>28</sup> For such countries, it would be highly desirable to establish at the international level an emergency facility for financing food imports or to make the existing International Monetary Fund's Food Financing Facility an effective tool (Huddleston et al. 1984).

An international mechanism needs to be developed that stabilizes overall food aid supply in times of global food scarcity, introduces criteria for food aid allocation to countries in times of need, and represents a sufficient transfer to beneficiaries in need. Food aid needs will probably increase in the 1990s in

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<sup>26</sup> For country experiences and policy proposals, see the innovative work of Pinckney (1988, 1989) on Kenya and Pakistan, and of Ahmed and Bernard (1989) and Ravallion (1987) on Bangladesh.

<sup>27</sup> Of most importance is the prevention of drastic price shocks. When real prices of cereals more than tripled and cereal-livestock terms of trade increased eightfold in Sudan in 1985, child malnutrition prevalence rates (those children with weight-for-height below 80 percent of standard) rose from 5 percent to 20 percent in Kordofan (Teklu, von Braun, and Zaki 1991).

<sup>28</sup> Food aid is further discussed in a later section on food subsidies. It is dealt with here as an issue that cuts across the other programs discussed in this chapter.

Africa, where food import needs will widen during times of foreign exchange shortage before technological improvements and export earnings can close the gap.

Food market and trade interventions are widespread not only in low-income countries, but to an even greater extent in high-income countries. High-income countries' stabilization policies can destabilize world markets. The extent and level of intervention in low-income countries vary, and the late 1980s saw considerable steps toward liberalization of the agriculture and food sectors in these countries. This does not indicate a reduced concern for food security on their part.

### Production-Oriented Policies and Programs

Production-oriented programs that aim to increase food production or production of crops for sale or both can have favorable effects on food security if they increase or stabilize the real incomes of the people facing food insecurity. The impact of these policies is mediated through changes in food prices and incomes and is influenced by trade policies discussed below. Growth in food supplies can have a dual effect on food security by reducing food prices, which benefits food-purchasing households in rural and urban areas, and, depending on the nature of growth, by promoting employment. As incomes of poor households increase, their absolute expenditure on food consumption also increases, although the relative share tends to decrease.

Technological innovation and commercialization in agriculture induce economic gains by stimulating agricultural growth, improving employment opportunities, and expanding food supplies, all of which involve and benefit the poor and help to alleviate poverty (Lipton and Longhurst 1989; Binswanger and von Braun 1991). A policy of self-sufficiency in food production or adoption of a "food first" policy that emphasizes food crops to the exclusion of cash crops is not necessarily desirable or crucial for alleviating hunger and undernutri-

tion when market infrastructure and policies do not impair trade. The "green revolution"—the irrigation, seed, fertilizer, and pest-control package for rice and wheat, in particular—has expanded farm and nonfarm output, employment, and wages and has stimulated migration, thus contributing to both household and regional food security, especially in high-potential production areas such as Punjab in India (Bhalla 1983), the Muda Irrigation Scheme in Malaysia (Bell, Hazell, and Slade 1982), and Laguna Province in the Philippines (Herdt and Ranade 1976). Of course, technological innovation and commercialization are not restricted to crops, but may also encompass livestock.

Commercialization of agriculture frequently contributes to improving household food security when the poor benefit from the increased income and employment generated by such activities (von Braun, Kennedy, and Bouis 1989). Gains in real income from technological change or commercialization translate into gains in food consumption and nutritional welfare. In some instances, however, the poor have failed to reap the benefits, or have even lost, from the technological change or commercialization. These adverse effects, where they have occurred, are mostly attributable to inelastic demand for the promoted commodities or to adverse institutional developments such as eviction of tenants,<sup>29</sup> coerced production, or forced procurement (Bouis and Haddad 1990; Binswanger and von Braun 1991).

Food-insecure people who are subsistence farmers will benefit from their own increased food production for home consumption, which insures them against market risks. When subsistence-oriented farm households are given the option of adopting cash crops that offer higher returns, they tend to adopt these crops quickly, yet they also tend to maintain substantial resources in food production for home consumption as an insurance mechanism<sup>30</sup> (von Braun, Kennedy, and Bouis 1989). Thus, in environments with risky markets, the joint promotion of food crops and cash crops is required in support of food security enhancement.

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<sup>29</sup> For example, in an area of the Philippines where contracts for growing sugarcane were given only to landowners and not to tenants, it was observed that landlessness increased and the status of tenants around the sugar mill deteriorated (Bouis and Haddad 1990).

<sup>30</sup> For instance, although new export vegetable crops yield higher returns per unit of land and labor than subsistence crops, members of an export crop scheme in the western highlands of Guatemala still plant, on average, half of their land with maize and beans, the major staple food crops (von Braun, Hotchkiss, and Immink 1989).

The employment effects for the poor that result from technological change and agricultural commercialization are a function of the local labor market and of newly introduced crop-specific technologies.<sup>31</sup> The cultivation and capital-intensive processing of crops such as sugarcane may not result in much incremental employment and may even have an adverse effect on employment for smallholder households if field labor is reduced. However, in general, the commercialization of agriculture often entails a substantial expansion in demand for hired labor, and to the extent that wage-labor households rank among the food-insecure population, this employment-generation effect is of particular benefit to them.

There are other, somewhat more indirect, effects of agricultural production growth on food security that are noteworthy. First, off-farm nonagricultural activities often contribute a significant proportion of total household income.<sup>32</sup> Much of this nonagricultural employment and income is derived from increased demand for local goods and services, which in turn is partly the consequence of multiplier effects of agricultural growth due to commercialization and technological change (Mellor 1986; Hazell and Roell 1983). Second, poor households build up their asset base out of incremental income. Agricultural growth permits an expanded asset base, which makes households less vulnerable to short-term disruptions in their income streams, as discussed earlier.

Sociocultural situations determine quite different effects of technological change and commercialization on women's work in agriculture, which can consequently have different implications for their household food-security status. The scope for targeting technology toward specific groups is limited. The topic of technological change in agriculture and women's workload is much debated. A recent synthesis of case studies finds that women's work in agriculture is generally reduced not only relatively but also absolutely with rising

incomes, which correlate with increased farm size (Leslie and Paolisso 1989). When increased workload results in increased returns to women's labor, this may translate into improved household and child welfare, despite the increased work of women, when incremental income is spent, for instance, on child health and nutrition.

To fully tap the potential of production-oriented programs for food security, rapid development of rural financial markets needs to parallel agricultural-growth promotion. This will enable households to increase their ability to save and build up productive asset bases, and it will help them to avoid investments and savings in the form of nonproductive assets. Rural financial markets are particularly needed to facilitate smoothing of consumption in environments where commercialization of agriculture leads to payments in the form of large lump sums of cash a few times a year. Moreover, banking facilities should expressly be open to individuals, and not just to (usually male) heads of household who are enrolled in a particular production scheme, so that the benefits of commercialization can be spread more widely across the community and not restricted solely to direct participants in a production scheme.

While landowning households benefit most from the direct income effects of agricultural growth, landless and small food-deficit farmers benefit most from the indirect effects on off-farm employment generation (Hossain 1988b). These indirect employment effects that help the poorest households are further facilitated by infrastructural development (Ahmed and Hossain 1990).

### **Other Income- and Employment-Generation Policies and Programs**

Besides policies and programs oriented toward agricultural production, other programs for generation and diversification of employment and income can reduce risks for

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<sup>31</sup> This not only applies to own-farm employment, but to employment in processing and trading as well.

<sup>32</sup> Among 13 household-level surveys conducted in developing regions in Africa, Asia, and Latin America, the share of nonagricultural income in total income ranged from 13 to 67 percent; in half of the survey locations, the nonagricultural income share of households was almost or exceeded 50 percent (von Braun and Pandya-Lorch 1991a).

food-insecure households. These other income-generation programs differ from programs oriented toward food production in that they stimulate or stabilize the demand for food but may not directly expand the food supply simultaneously. This section reviews two such income-generation actions: labor-intensive public works for food security, and credit to the poor for consumption stabilization and self-employment. Both can be part of effective community development. Other income-generation programs such as home gardening and backyard livestock production promotion can be important, too, but are not discussed here.

#### *Labor-Intensive Public Works Programs.*

Labor-intensive public works programs can address, simultaneously, three central problems facing many low-income countries today—food insecurity, growing unemployment, and poor infrastructure (see Drèze and Sen 1989; von Braun, Teklu, and Webb 1991; IFPRI/BIDS 1989). Public works activities are, in general, public programs that provide employment and generate public goods such as physical and social infrastructure. Labor-intensive public works go a long way toward direct and sustainable poverty alleviation and strengthening of self-help capacities. Food aid can be, directly or indirectly (monetized), a component of the wage payments.

The household food security effects of labor-intensive public works programs are a function of program design. For instance, a short-term project may result in expenditure patterns by the poor that treat project income as "windfall profits." An example from

Guatemala hints at that behavior.<sup>33</sup> A similar explanation may be attributed to the small food-consumption benefits observed during the short work season of the Bangladesh food-for-work program (Kumar and Chowdhury 1985; Osmani and Chowdhury 1983). In contrast, long-term benefits from improved rural infrastructure produce more secure income flows and substantial consumption improvements for the lowest-income households.<sup>34</sup>

Good public investment through public works programs and, thus, the creation of productive and sustainable assets need to be emphasized in policy. It is important to note, however, that income effects derived from public works programs for the poor also have favorable private savings and investments effects that improve household food security, as observed from experiences in Bangladesh and Guatemala (Kumar 1988; Bell, Hay, and Martinez 1989). Strengthening financial institutions for the poor in tandem with public works programs is suggested in order to foster these positive effects.

Public works programs can be a viable instrument for famine prevention, as demonstrated by the Employment Guarantee Scheme (EGS) from Maharashtra, India.<sup>35</sup> The employment guarantee feature of the EGS also triggers "relief works" automatically at local levels.<sup>36</sup> Such a feature makes it possible to address crises that otherwise might be too small to trigger public action—an important lesson for dealing with the problem of localized famines in Africa. A program such as the EGS that includes an employment guarantee as well as favorable employment stabilization and insurance effects stands out as a model.

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<sup>33</sup> Almost complete independence was observed between expenditure from food aid income and expenditure from income from other sources in the context of food-for-work schemes in Guatemala City (Bell, Hay, and Martinez 1989). Consumption effects seemed significant as 65 percent of households in this small sample increased their food consumption as a result of food aid.

<sup>34</sup> For example, in rural Bangladesh villages with better infrastructure development (gauged by a number of criteria), 12 percent of households were food insecure (that is, consuming less than 80 percent of caloric requirements), compared with 20 percent in villages with poor infrastructure (Kumar 1988). This difference is explained by higher incomes (18 percent more employment was available for the landless) and lower prices of marketed items in villages with better-developed infrastructure.

<sup>35</sup> The scheme provides an unlimited guarantee of employment to all adults in rural Maharashtra who are willing and able to work at the given wage.

<sup>36</sup> Between 1972 and 1987, Maharashtra State, as a whole, suffered from a serious crisis in only one year, 1979/80, although different districts suffered from local crises at different times. The Employment Guarantee Scheme responded automatically to crisis situations in affected districts, even when the overall situation in the state was better than average (Ezekiel and Stuyt 1989).

The target group of labor-intensive public works programs, the food-insecure poor, are successfully reached through a variety of mechanisms and design features that include wage rate policy, regional targeting, and specific selection of households (for example, displaced households) and of household members (for example, women). Properly designed public works programs have a unique feature in favor of poverty alleviation with low administrative costs and effects: self-targeting. At properly defined wage rates, the working poor identify themselves by appearing at public works schemes. However, the self-targeting feature of public works programs operates effectively only with an appropriately low wage-rate policy and a flexible absorption of applicants without rationing workplaces (Ravallion, Datt, and Chaudhuri 1990). Note that public works programs are not able to directly address the needs of food-insecure individuals who, for whatever reason, are unable to participate in the schemes. In areas with limited labor markets and uncertain and complex seasonal work patterns, such as some parts of Africa, community-wide works activities, based on traditional systems of work obligation, can be a viable alternative to the operation of public works in the labor market. Women frequently participate to a high extent in public works programs.

The issue of payment entirely in cash or partly in kind is related to the wider problem of wage-rate determination and to the question of risk of food-market failure.<sup>37</sup> Regularity of payment may be another critical requirement for workers.<sup>38</sup> When increased demand for food is induced through a large public works scheme,

food must be forthcoming locally or inflation may result, which will also affect nonparticipating households. Food aid can play a role in mitigating such effects if it enables expansion of the food supply according to the demand induced by public works programs.

The institutional link between institutions related to food security and those related to public works has to be strengthened. Food security issues (for example, regional and seasonal dimensions) do not fully enter policy formulation in many countries.

*Credit for Consumption Stabilization and Self-Employment.* Credit to the poor for consumption stabilization and for promotion of self-employment through private investment is an important mechanism for improving food security in the growing and diversifying rural economies of many low-income countries. Many interesting innovations occurred in programs of this type in the 1980s. These programs are most likely to succeed in areas where agricultural growth is proceeding well and where there is good infrastructure coverage and market activity; nonfarm activities can easily be further stimulated. Programs that have been found to be most successful in generating self-employment for the poor and stabilizing their consumption are those that combine small-scale credit with group motivation, technical advice, and assistance in institution-building, such as Bangladesh's Grameen Bank.<sup>39</sup> Group loans for poor households without collateral have been found to be an effective mechanism that ensures repayment as long as the group size remains small and peer pressure can operate.<sup>40</sup>

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<sup>37</sup> In the Bangladesh Food-for-Work Programme, 37 percent of workers surveyed wanted only food payments and 8 percent wanted only cash payments, with the remainder wanting a combination of food and cash (Osmani and Chowdhury 1983). In a cash-for-work scheme in Ethiopia, a majority of the participants preferred to be paid in food, as they observed an escalation of food prices just prior to the food payments.

<sup>38</sup> In an Ethiopian site where cash payments were made regularly, workers generally preferred cash payments, even though they had to walk for two days in search of food that they could buy at reasonable prices, because of their expectation that food payments were likely to be delayed or irregular. Where market disruptions occurred, workers had a strong preference for in-kind payment (Webb, von Braun, and Yohannes 1991).

<sup>39</sup> The Grameen Bank was established in 1983 to provide interest-bearing credit to the rural poor who lacked collateral. Accumulation of capital by the poor has increased significantly; for instance, the number of cattle owned by borrowers increased by 26 percent per year. New employment, particularly for poor women, has been generated (about one-third of members were unemployed before they joined the bank). Incomes have increased; average household income was one-sixth higher in project villages than in control villages, despite similar endowments of land and male workers (Hossain 1988a).

<sup>40</sup> The Grameen Bank's experience with loan repayment has been excellent; only 0.5 percent of loans to 975 borrowers surveyed were overdue beyond one year (Hossain 1988a).

## Targeted Distribution and Food Subsidies

Food income transfers are a widely used means of alleviating food insecurity. They have, especially throughout the 1980s, come under attack for their potential adverse effects on markets and for their high fiscal costs. In the current climate of structural adjustment, there is additional pressure to eliminate these programs except for those that can be justified on strong humanitarian or developmental grounds. Three types of programs will be considered here: targeted feeding programs; food stamps; and food price subsidies, rationing, and food aid.

*Targeted Feeding Programs.* Except in the context of emergency relief, feeding programs are generally aimed at those persons especially vulnerable to malnutrition—usually children and women of child-bearing age at low income levels. Targeting of feeding and food distribution programs is achieved through various means, depending on the level of nutritional need and the objectives of the programs (Kennedy and Alderman 1987). Geographical targeting works well when a high prevalence of food insecurity is identified in selected areas. School feeding programs can be used to target school-age children. Means tests and vulnerability tests are also used.<sup>41</sup> Food distribution to the general population is rarely cost-effective, partly because of leakages, in improving household food security. Care should be exercised that the administrative costs of targeting do not overwhelm the feeding programs.

Feeding programs rarely increase the food intake of targeted persons by 100 percent of the food given, because of sharing this food with household members or substituting it for home-produced and purchased food. Feeding programs are not easy to administer. However, politically and socially they are a relatively more acceptable means of operating a targeted income transfer program and have been shown to have more potential than comparable cash-income transfers to increase food intake. The income elasticity of food expenditures tends to

be less than unity, and not all of the increased expenditure goes to increasing calorie intake but also to improving the quality of the diet in terms of taste and convenience of the food (Kennedy and Alderman 1987).

In many of these programs, the feeding component serves additional objectives besides improving food consumption, such as encouragement of school attendance and learning and of attendance by low-income women at pre- and postnatal clinics, provision of preschool child care to poor working mothers, and provision of training and skills to low-income women so that they reduce their dependency on low-paid, erratic, and heavy work in the casual labor market. Recent experiences with surveillance programs in the Philippines and Thailand show that the social stigma generated by identification of child or maternal malnutrition has led to improvements in home diets.<sup>42</sup>

School feeding programs have important long-term benefits attached to them. The World Food Programme, in evaluating its own experience with food aid to education, found that school meals do act as an incentive for parents to send their children to school and, moreover, to keep them there and that the food provides a significant and sometimes decisive income transfer to the parents (WFP 1990). India has a wide experience with school feeding programs; enrollment and attendance rates appear to have improved (Gupta and Hom 1984; CARE-India 1977; Shah 1988). In the United States, the Special Supplemental Food Program for Women, Infants, and Children (WIC) has, by forestalling some of the need for health care, resulted in savings in Medicaid health care costs that are greater than WIC program costs (Mathematica Policy Research, Inc. 1990).

*Food Stamps.* Interest in food stamp programs as a means of providing a food-mediated income transfer to low-income households and as an alternative to food subsidies has picked up in recent years. Food stamp programs are expected to retain the higher food-consumption effects of food-based income and to reduce the

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<sup>41</sup> A means test is usually difficult to administer and often relies on community-level identification of recipients. Vulnerability tests are based on health or nutrition indicators and have been used to educate parents on the benefits of improving the dietary intakes of women and children.

<sup>42</sup> Personal communication from Rodolfo Florentino, the Philippines.

administrative burden and costs imposed by food handling and transport.<sup>43</sup>

Experience with food stamp programs is mixed; they have not been easy to administer. In Zambia, large-scale counterfeiting of food coupons has led to the virtual elimination of such programs. In Sri Lanka, the income-verification procedure for food stamps has excluded wage-earning workers on tea plantations, although they appear to be a nutritionally needy group (Kennedy and Alderman 1987). These problems are not unique to food stamps, but are also encountered with in-kind transfers. It is common knowledge that even the largest and most successful experience with food stamps, that of the United States, still misses a large proportion of eligible households (Davis and Senauer 1986; Coe 1983).<sup>44</sup> However, little empirical information is available on food stamp programs in the developing world, even from Sri Lanka, which in 1979 replaced its decades-old food subsidy scheme with food stamps. When the food stamp subsidy scheme began in 1979 in Sri Lanka, its benefits amounted to 83 percent of the benefits from the earlier general price subsidies, but by 1981/82 its value had been reduced to 43 percent by the diminishing real value of the stamps due to inflation (Edirisinghe 1987). The food stamp scheme was not successful in helping the bottom 20 percent of households, whose per capita calorie consumption declined by about 8 percent between 1978/79 and 1981/82. Yet food stamp income has increased the calorie consumption of all participating households. The drawback to fixed, nominal-value food stamps is that they do not protect the consumer from short-term price fluctuations, even when periodically adjusted for inflation (Pinstrup-Andersen 1988).

To be cost-effective, targeting of food stamp programs has to be based on a means test. This is not perfect even in the United States and is especially problematic in low-income countries where income records are virtually unavailable or misleading. It is likely that if food stamp programs use some of the

methods used for targeting feeding and food distribution programs, they may be more effective.

*Food Price Subsidies, Rationing, and Food Aid.* Consumer food price subsidies are very widespread and have been introduced in nearly every low- and middle-income country in the past few decades. Household food security is a common goal among other goals of subsidy programs. A comprehensive review of the origins and effects of programs currently found in many developing countries, such as ration shop schemes in India, Pakistan, and Bangladesh and food subsidies in Egypt, shows that they were established to assure consumers of access to a specified quantity of food staples at fixed (subsidized) prices (Pinstrup-Andersen 1988). Many of these programs were introduced or expanded during wartime or specific food-crisis situations. According to Pinstrup-Andersen (1988, 8), "the principal purpose of the schemes when initiated was clearly one of reducing uncertainty at the household level concerning the ability to acquire a certain minimum amount of food staples."

Over time, the initial objectives have been frequently diluted, as powerful interest groups, primarily the urban middle classes, have bought into the subsidy programs for their own benefit. An indicator of this dilution is provided by changes in commodity coverage; programs initially included essential staples only, but coverage has been expanded to include sugar in India and chicken in Egypt, for instance.

Two of the most common types of food price subsidies are the generalized price subsidy, which sets a lower market price for a commodity that benefits all consumers, and the limited-access subsidy, which rations a commodity to some or all members of a community at a price lower than that prevailing in the open market. Generalized price subsidies are much more costly in terms of fiscal and economic costs than limited-access subsidies and are also more regressive in the distribution of economic

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<sup>43</sup> It has been estimated that with a general subsidy, getting US\$1 worth of food to the malnourished would cost US\$12 (Reutlinger and Selowsky 1976).

<sup>44</sup> Smallwood and Blaylock (1985) found, using a two-equation model, regional differences in the probability of participation in the food stamp program in the United States. They also found a reduced probability for working men and women to participate in the food stamp program.

benefits.<sup>45</sup> Programs that provide fixed-quantity rations have, in general, been successful in reaching the population groups to which they were directed. However, the experiences of Egypt, Sri Lanka, and the Philippines illustrate the difficulty of achieving both universal household food security, through rationed distribution of food, and targeted income transfer goals in one program in a cost-effective manner (Alderman and von Braun 1984; Edirisinghe 1988; Garcia 1988).

A combination of targeting methods similar to those mentioned earlier can be used. Means tests can be used in the limited-access programs. Self-targeting can be achieved by using commodities that are considered "inferior" in consumer preference and thus are more abundant in the expenditure patterns of the poorer populations. Geographical targeting can be employed in food-deficit areas. While costs are lower relative to generalized price subsidy schemes, there are inevitably problems with leakage and corruption in limited-access programs that require close supervision and management (Alderman, Chaudhry, and Garcia 1988).

Food price subsidy programs have several favorable characteristics. In countries and regions that are frequently subject to serious food shortages, subsidized public distribution helps to move emergency supplies into them to improve the food security of the poorest groups. Availability of such food-distribution programs is credited with maintaining food security and nutrition levels for the poorest population segments during droughts in India (Drèze 1988). Food subsidies increase the real incomes of households with access to the subsidies. In a number of programs surveyed, food subsidies accounted for 15-25 percent of the total real incomes of low-income households that received subsidies (Pinstrup-Andersen and Alderman 1988). Food price subsidies generally increase household food

consumption.<sup>46</sup> Furthermore, food price subsidy programs have a positive and significant effect on the food consumption of preschoolers, although these programs may also result in decreased consumption of other foods by the preschoolers and leakage to other household members (Lustig 1988; Garcia and Pinstrup-Andersen 1987). Garcia and Pinstrup-Andersen (1987) provide related cost calculations based on a rare, controlled experimental scheme.

Traditionally, food aid has been used to support different types of food price subsidies, an action that has been viewed as a mixed blessing. By promoting food subsidies, food aid has been perceived as inhibiting domestic food-production growth in the short run, and in the long run as misallocating resources, both public and private, so as to create a dependency on externally subsidized food. Empirical evidence does not support such a general conclusion. Many countries, such as India, South Korea, and Taiwan, that used to be major food aid recipients, no longer depend on it. The so-called disincentive effects of food aid on domestic agriculture have been exaggerated, and many recipient countries with high levels of food aid have subsequently achieved above-average agricultural growth. The actual effects of food aid are very much a function of recipient countries' food and agricultural policies (Singer and Maxwell 1979; von Braun and Huddleston 1988). To utilize food aid effectively for improving household food security and contributing to development, governments need to protect their producers from the potential disincentive effects of food aid. This is best achieved by a joint expansion of supply and demand for food—demand being achieved through labor-intensive development, including public works, already discussed above.

The actual role of food aid has undergone some changes. Although it is still largely used to provide emergency relief and balance-of-payments support to food-deficit low-income

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<sup>45</sup> Untargeted food subsidies, such as those in Egypt, are expensive in fiscal terms, costing about US\$2 billion annually in the early 1980s (Pinstrup-Andersen, Jaramillo, and Stewart 1987). The Egyptian programs are on the high end of the cost range, however. It should be noted that real fiscal costs of food subsidy programs have decreased since 1980 in most countries, absolutely or as a proportion of government expenditure or gross domestic product (Pinstrup-Andersen, Jaramillo, and Stewart 1987).

<sup>46</sup> Daily energy consumption increased by 115 calories among the poorest population decile in Sri Lanka as a result of the subsidized ration-shop scheme (Gavan and Chandrasekera 1979). In a pilot food subsidy scheme in the Philippines, average daily calorie consumption increased by 130 calories (Garcia and Pinstrup-Andersen 1987).

countries, food aid is increasingly being designed and used for developmental purposes. Thus, food aid is basically a resource in direct or indirect support of the food security policies and programs discussed above and of relief, discussed in the next section, not a "program" or "project" in itself.

Where food aid is provided to food-deficit countries for open market sales and for budgetary support for development activities, it is increasingly recognized that these funds can provide incremental support for activities that can contribute to sustainable food security.

### **Emergency Relief Programs**

Today, food emergencies that deteriorate into famines are national and international policy failures. These famines are, in most cases, an indication of lack of preparedness and political commitment. The basic concept of preparedness entails public commitment to intervene effectively and on time; to build institutional capacity at international, national, regional, and local levels; to detect and diagnose indicators of distress; to prepare programs and projects on a continuous basis; and to execute development and relief undertakings at times of need. The stock holding, trade policy actions, and food aid utilization (including relief employment programs) just discussed are an integral part of preparedness and response to emergencies. Production and income-generation policies also discussed earlier are the basis for effective emergency prevention.

Emergency relief involves food, capital, and institutional capacity for effective response. At present, it appears that the major constraints in dealing with emergencies lie more with capital and institutional capacity at the national and local levels. The international food-emergency-response capacity of the World Food Programme (WFP), for example, has been developed into an effective instrument, yet it is constrained by capital and by national institutional capacities. Nongovernmental organizations (NGOs) play a

key role in overcoming institutional deficiencies, but the need still remains for overcoming the capital constraints of effective emergency operations.

Relief management entails the establishment by the government of a system equipped with executive powers to take appropriate action in food handling and distribution (including emergency food aid from donors) with a network extending to the local, provincial, and regional levels. Effective early warning systems are an essential component of such preparedness. A free press and a transparent political environment at the local and central levels are important for ensuring early responses to early warnings. Well-structured relief legislation that incorporates the basic policies to which the government, central and local, is committed is also important.<sup>47</sup>

The specific components of relief action and their scheduling are a function of the nature of the emergency and the country's circumstances. All activities with short-term household food security effects, such as targeted feeding programs, national food distribution, expanded food imports through trade and food aid, expanded employment programs, and household access to savings or credit<sup>48</sup> can be elements of the relief action. Narrow targeting of relief has proven difficult in emergency situations (Buchanan-Smith 1990). Emergency responses tend to be impaired by poor infrastructure in countries such as Sudan and Ethiopia. Investment in infrastructure is thus essential not only for development but also for increasing the effectiveness of relief.

### **Monitoring and Evaluating Food Security Programs and Activities**

During the past decade, there has been a great deal of emphasis on establishing systematic surveillance and monitoring of food insecurity to improve the ability of governments and donors to respond in a timely and effective manner to food security problems (Kennedy and Payongayong).<sup>49</sup> Surveillance and monitor-

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<sup>47</sup> See Drèze (1988) on India's famine code.

<sup>48</sup> For example, Grameen Bank members had access to their savings after the flood of 1990 in Bangladesh.

<sup>49</sup> Examples include FAO's Global Information and Early Warning System on Food and Agriculture and USAID's Famine Early Warning System (FEWS) in selected African countries. The United Nations Administrative Committee on Coordination—Subcommittee on Nutrition has a program for reporting the world nutrition situation (UN ACC/SCN 1987, 1989).

ing activities can be broadly classified into two groups: crisis-response type and development-response type. Early warning and surveillance activities that are intended to provide a response to an impending or occurring crisis may be thought of as the crisis-response type. Activities that monitor changes in food security over time and evaluate different development activities and policies for their food-security effects, with the objective of suggesting ways of improving the benefits, are the development-response type.

Monitoring indicators include, but are not limited to, climate changes, satellite imagery that monitors farm-level crop plantings, and crop prices. Food consumption and nutrition information (rather belated indicators) are part of such direct monitoring of food insecurity (Beaton et al. 1991; Haddad, Sullivan, and Kennedy 1991). Most often, early warning indicators are derived from features that can be observed without detailed community-level surveys. Surveillance activities provide more microlevel indicators of actual food insecurity and its consequences, such as malnutrition, disease, and death. These involve a combination of demand- and supply-side failures (although some early warning indicators such as price changes and climatic variables are also included) and have so far been used mostly to document crises that have escaped the early warning net. In some cases, demand-side failures may precede supply-side failures; for example, in high population-density areas, agricultural-labor income could decrease prior to a poor harvest. To the extent that these demand-side failures are not independent of a crop failure, they should be picked up in an effective early warning activity that can predict crop failure in such regions. An important prerequisite for the success of the crisis-response type of activity is that it be closely linked with the decisionmaking groups that can respond quickly to the information being generated.

The second group of activities, the development-response type, monitors changes in food security among population groups, evaluates different sets of activities, and requires more detailed data collection and analysis at the household level. Since this is a costly exercise and needs to be undertaken over a period of time, it is mainly taken up by central government authorities, occasionally with some donor support. A close link with program and policy

decisionmakers and participants is important for development-response monitoring systems.

Despite the popularity of food security and nutrition monitoring systems in developing countries, a recent inventory noted that such systems suffer from poor-quality data, low coverage of surveillance systems, excessive costs, and failures in linking nutritional data with causality (Kennedy and Payongayong 1991). Furthermore, it is difficult to fully identify the food-insecure and the vulnerable households; using an absolute cutoff for food insecurity makes no allowance for households that are just above this cutoff but may be very vulnerable to food insecurity in the event of a sudden shock.

Monitoring food security and nutrition indicators is generally an expensive proposition and beyond the reach of many low-income countries. Alternative low-cost indicators are needed. Alternative indicators can include such items as the number of unusual foods consumed (for example, those collected from the bush), the household's dependency ratio, and some aggregate health and sanitation factors that can identify, either singly or in combination, households and individuals at risk of food insecurity (Haddad, Sullivan, and Kennedy 1991).

## **OPERATIONAL ASPECTS OF HOUSEHOLD FOOD SECURITY MEASURES**

Various private and public actors who participate in improving household food security can be distinguished. These actors range from the food-insecure households themselves to communities, NGOs, local governments, national governments, international agencies, and bilateral donors. A perspective needs to be developed and articulated on which actors can contribute what actions that are best for improving household food security, and what division of responsibilities and comparative advantages among these actors would be most suitable.

### **Household Coping**

Households adopt a variety of coping mechanisms and strategies to offset the effects of production shortfalls and market

uncertainties. These private coping responses are not always efficient or effective because of lack of resources, inadequate institutional support, and other factors. Three basic stages can be identified in the pattern of household coping or failure to cope. These stages take a household from loss prevention through crisis damage containment (loss management) to, at the extreme, household collapse.<sup>50</sup> The first stage involves elements of risk minimization such as savings, investments, accumulation of assets, and diversification of income sources. The second stage involves disaccumulation of previous investments, calling in of loans, and a search for new credit. Although the opportunity costs of protecting future income streams from past investments rise, households are forced to dispose of productive assets when financial markets are not in place, thus making it more difficult for households to recover quickly after a food emergency. If adverse conditions persist and adequate external help is not forthcoming, households may have no choice but to sell all their remaining assets, subsist on collected foods that are not a usual part of their diet, and migrate to other areas for relief. As households move along this "coping path," coping becomes increasingly indistinguishable from suffering. Coping with food insecurity can have difficult, life-threatening effects on food-insecure households and selected vulnerable members.

### **Community-Based Systems and Grass-Roots Action**

Households do not usually act in isolation but in the context of a community. Community-level action for food security in low-income countries occurs to a greater extent in rural areas than in urban areas. Considerable diversity exists in terms of institutions and actions, and community-based actions can include joint savings, labor pooling, common fields, local tax collection for welfare in cash and in kind, and so forth. Village studies have contributed considerable insight into community-level actions for food security and nutritional improvement and into points of entry for strengthening such actions

through policies and programs (Lanjouw and Stern 1989; Mata 1978; Hill 1972; Dey 1982).

### **Nongovernmental Organizations and Private Voluntary Organizations**

To a large extent, the prevalence of food insecurity is itself a reflection of the inadequacy of existing state-level policies. Unless these state-level policies are analyzed with a commitment to modifying them to improve their food security effects, it is unlikely that much can be changed there. NGOs and private voluntary organizations (PVOs) can, to a considerable extent, remedy emergency problems that state programs fail to rectify. NGOs and PVOs have the ability to bring resources—financial, technical, and managerial—that are lacking at the local level and combine them with local participation in identifying needs and bottlenecks. This combination has been found to be successful in providing effective solutions in situations, particularly food emergencies, where state commitment was lacking.

As NGOs and PVOs are likely to involve community participation, they can be effective in finding sustainable solutions as well in mobilizing community resources to tackle food insecurity issues. Their capacity for effective programming is diminished when there is state involvement dictating rigid terms of operation. Clearly some oversight and coordination are required by the state, but this needs to be kept to a minimum. NGOs can be effective in areas where the state is not, such as provision of rural health services, even to the extent that the public sector in some countries is, in some instances, channeling its resources through these organizations (for example, in Gujarat State, India).

### **The State and Its Branches**

Governments play the key role in food security policy. Strategy formulation, policy design and implementation, monitoring, and evaluation of progress are all central functions of government. These functions can be fulfilled successfully only if a sound capacity to analyze

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<sup>50</sup> Further details on coping mechanisms can be found in von Braun, Webb, Reardon, and Teklu 1991 and Chambers 1989.

food security problems is established and used by policymakers. At what level of the government these functions can best be located is a function of the size of the country and its institutional capacities. The division of responsibility between local and central government for ensuring food security, with much weight accorded to the former, merits attention.

*Local Government.* Local governments are usually in a better position than the central government to assess the food security needs of the population and to suggest policies and programs for actions, if needed. However, they frequently lack the technical, administrative, and financial resources to effectively design and implement activities. Efforts to promote local participation are based on an assumption that this would increase the relevance and success of development efforts. But to the extent that local elites control the political process, development programs may be seen as a threat to the status quo.

*Central Government.* Central governments, and in some large countries, provincial governments as well, have greater financial, technical, and administrative resources than local governments for designing overall food-security strategy as well as detailed plans and activities. In too many instances, however, projects are implemented with little or no input from local communities, or are not modified to fit differing local needs. Including such input and adjusting programs to community needs would require much more decentralized decisionmaking and involvement of local government than occurs at present. There are relatively few instances of efforts that have successfully combined the complementarities of central and local government to design and implement food security efforts. Price stabiliza-

tion and trade policies for food security remain the domain of central governments—or in the case of large countries such as India, also of state governments. There is an urgent need in most countries with food security problems to establish explicit cooperation at central government levels in policy and program formulation, and—to begin with—in joint information generation and analyses by agricultural, food-distribution, and health-related bodies at all levels.

### **Donors and International Agencies**

Donors and international agencies supporting food security can play their supportive role best in an enabling policy environment, that is, in the context of food security strategies of individual countries and regional bodies such as the Southern African Development Coordination Conference. Their assistance in developing such strategies, including institutional support, can be an important part of food security policy and program assistance. Clarity in division of labor among agencies is needed to avoid diluted programs, conflicting policy promotions, and wasteful use of scarce resources—financial, organizational, and institutional. Food security assistance policies of donors and international agencies suffer from a lack of such clarity.

International donor agencies possess several advantages over local agencies. They usually have, at least in small countries, considerably more resources at their disposal; they are not perceived as potential rivals for political power and so may have more freedom to implement particular policies and operate in particular regions; and they often have more technical expertise. They may also have certain disadvantages, such as lack of knowledge of local conditions and customs, and less ability to respond quickly and flexibly to changing circumstances because of a large bureaucratic structure.

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## Principles and Priorities for Policy Actions

Food security policies and programs need to build on comprehensive assessments of interrelated national, community, and household food security problems and on evaluations of the public and private capabilities to deal with these problems at all three levels. These assessments should be undertaken in the context of building a long-term institutional capacity for them where it does not exist on a significant scale, or in the context of improving and maintaining such a capacity in many countries. For small countries, regional cooperation to form this capacity can be advantageous (the Southern African Development Coordination Conference in southern Africa sets an example).

Practically all low-income countries and many middle-income countries have substantial numbers of food-insecure households and individuals. However, the dimensions, causes, and consequences of food insecurity differ widely from country to country, and even within the same country, so no general blueprint for prioritization can be suggested or should even be considered. Nevertheless, the acute problem of famine mitigation and prevention in the few remaining famine-prone countries and the much larger problem of poor households' chronic and transitory dietary deficiencies—of both macro- and micronutrients—in rural and urban areas require the highest attention from national policymakers and the global community.

### ADDRESSING THE RISKS

This report has reviewed food security policies and programs that specifically or generally address the risks for households to become food insecure. These risks can origi-

nate from different sources, and the effectiveness of actions in dealing with these risks in the short and long runs can vary. For example, a program that raises yields of food crops may not have much of an effect on household food security in the short run, whereas a short-term feeding scheme on its own may not have much of an effect in the long run. Table 4 links the food security risks with policies and programs discussed in Chapters 4 and 5.

The following guidance can be derived from Table 4:

- Crop production risks are best addressed directly through technological change and commercialization of agriculture in the long run. In countries with high risks for food availability and prices, joint promotion of technological change in staple foods and commercialization of agriculture is called for.
- Short-term food availability and related food price risks can be addressed through a large array of options including macro-level policies, stockholding, trade and aid policies, and programs such as public works, provision of consumption credit, food subsidies, feeding programs, and income transfers that strengthen the entitlements of food-insecure households. Agricultural production policies address these risks in the long run.
- Employment and income risks can be tackled in the long run through agricultural production policies, and in the short run through entitlement strengthening as indicated. Labor-intensive public works would have both short- and long-run risk reduction effects, the latter through creation of assets that generate future income streams.

**Table 4—Food security risks and policy choices**

Policy Choices	Crop Production Risks	Availability and Price Risks	Employment and Income Risks	Health Risks
Agricultural production policies				
Technological change	III	III	III	I
Commercialization, diversification	II	II	III	
Promotion of behavioral change; education	I	II	I	II
Other income- and employment-generation policies				
Public works	I	ss,I	sss,II	
Credit		ss	sss	s
Macrolevel policies		ss,II	ss,II	s,I
Food stocks, trade, food aid policies		sss,I		s
Subsidies and transfer policies				
Feeding programs		sss	sss	ss,II
Food stamps, including transfers		ss	sss	s,I
Food price subsidies; rationing		sss	ss	s,I

Note: The extent of positive effects is represented as follows:

I, II, III = some, moderate, high long-term impact; and  
s, ss, sss = some, moderate, high short-term impact.

- Food security policies alone—with the exception of those feeding programs that have strong ties to health care—have only a limited effect on mitigation or prevention of health risks, which, together with food security risks, establish nutritional risks. Other policies and programs are needed in conjunction with food security policies. Promotion of behavioral change through nutrition education can have favorable effects for dealing with most of the risks. Long-run benefits result from the effects of short-term subsidies and transfer policies on human-capital enhancement.

The typical problem of combined chronic and transitory food security problems in poor households requires a well-designed portfolio of food security policy actions. Such a portfolio builds on problem assessments, that is, the nature of risks, and on instruments that are

available, which are influenced by institutional capacities. Throughout this review, a number of complementary actions that need to be undertaken in conjunction with food security policies and programs have been identified. These complementary actions include the development of an adequate market infrastructure and policies that do not impair trade. The rapid development of rural financial markets open to all individuals, which permits consumption-smoothing, is another complementary action.

#### **PRINCIPLES AND INSTITUTIONAL ARRANGEMENTS FOR PRIORITIES**

The instruments for dealing with food-availability and price risks and with employment and income risks of the food-insecure population are increasingly well enough under-

stood so that setting ambitious targets for improving household food security on a country-by-country basis in the 1990s is possible. However, political commitments and resources at national and international levels are needed to underwrite ambitious targets. Sustained improvement of food security is not achievable with just a few cheap interventions. Food security requires large-scale public-resource commitments.

Countries need to identify their worst food-security problems—in terms of risks and population groups exposed to them—and give the highest priority to tackling them. These may be risks of macro- and micronutrient deficiencies or diet quality problems or, for instance, chronic seasonality problems. Such a "worst first" rule typically has the advantage of offering high returns in food security improvement relative to the resources invested. Solutions to the worst food security problems tend to be achievable at relatively low cost.

Because of its country specificity, the cost aspects of improving food security are not comprehensively addressed in this report. However, a guiding principle is to achieve food security fast, yet in a sustained way, with a portfolio of policy instruments whose marginal benefits in food security improvement are about equal to their respective marginal costs. Following such a principle leads toward using optimal combinations of measures rather than perfecting a single policy instrument and over-extending reliance on single, short-term interventions. Investment in food policy research capacity is a precondition for the success of such an approach.

Efforts to improve food security need to take note of and address, from the outset, the reinforcing detrimental linkages between food insecurity, disease, poor sanitation, and inadequate education. Otherwise, forging ahead with food security measures alone will have a limited effect on nutritional improvement.

Institutional capacity is a precondition not only for monitoring a changing food security situation but also for evaluating the effects of food security policies and programs. Only when the state of food security and its change for the better or worse is transparent will appropriate action be forthcoming and international support for action be sustained. Combining monitoring capacities in governments and international agencies dealing with agriculture,

health, and planning is a needed action. Impact evaluation and program adjustments require grass-roots participation. A small and clear-cut set of indicators—derived from representative surveys that are comparable over time—is needed for this purpose. Such indicators can include the prevalence of households below the cutoff point for minimum per capita food-energy consumption, the prevalence of micronutrient deficiencies (that is, vitamin A, iron, iodine), and child and adult anthropometric indicators, among others, in relation to the fundamental sources of risks for household food security stated above.

Institutional capacity is also important to facilitate implementation of food security policies and programs. It is imperative that the various institutions involved in this activity be linked. A legal basis for such institutional capacity is needed so that sustained consistent action, rather than erratic intervention, is ensured. A comprehensive "anti-famine" code at the country level is an example of such a legal basis.

A long-run view of food security improvement needs to be established and institutionalized. Renewed acceleration of agricultural growth with sustainable technology remains a precondition for household food security given high population growth rates, increasingly limited land bases, and dependence on agricultural employment and income by a large proportion of the rural food-insecure population. Otherwise, availability, price, employment, and income risks will accelerate. Reducing fertility to achieve rapid transition to a stabilized population through appropriate social, health, and education policies must figure prominently among long-term priorities. However, improved food security through public action today will yield long-term benefits as the pressure on the poor for private food security provision by means of large families is reduced.

Food security policy must evolve as a basic element of a social security policy, to be achieved by proper division of labor between the various private and public, including international, actors. Such a division of labor depends on country and community circumstances and capabilities. Proper incentives for cooperation on the task of nutritional improvement must be set and institutionalized. Given the nature of political and administrative processes,

the recognized need for cooperation and coordination among agencies and ministries, for example, agriculture and health, must be continuously reinforced. The related United Nations' agencies, such as FAO, WHO, United Nations Children's Fund (UNICEF), and WFP,

the International Fund for Agricultural Development (IFAD), and other development agencies, as well as the World Bank and the International Monetary Fund, have a key role to play in setting good examples and in fostering such cooperation at country levels.

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