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Undernutrition and Poverty: Magnitude, Pattern, and Measures for Alleviation

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Magnitude and Pattern of Undernutrition

What is the magnitude and pattern of undernourishment in the developing world? The nutritionists are not all unanimous on the methodology of estimating undernutrition. Controversies cover a number of aspects. First, there is the controversy relating to the relative importance of calorie deficiency, on the one hand, and deficiency of protein, as well as of vitamins, on the other. It is now agreed among the majority of nutritionists, however, that in most countries the composition of diets is such that whenever they provide enough calories, they also meet the minimum protein requirements. This is true so long as the diet does not consist exclusively of one or two very bulky carbohydrates, so that the amount of carbohydrates which provides adequate amounts of both calories and protein is too large to be consumed and absorbed per day by an average individual. The lack of adequate vitamins and minerals, even if adequate calories are available, causes specific diseases but does not cause an endemic lack of energy and general ill health, which is at the core of undernutrition. The dominant problem in most developing countries is a lack of adequate calories.

Second, even if deficiency in calorie intake is recognized as the most important aspect of undernutrition, dietary energy requirements vary depending upon age, sex, and level of physical activity of individuals. (Osmani 1985; FAO 1985). There is no consensus among experts as to whether the actual or some optimum level of physical activity should be used in determining dietary energy requirements. The estimates of undernutrition by the Food and Agriculture Organization of the United States (FAO), for

example, have been based on the assumption of a minimum level of physical activity, that is, energy expenditure involved in eating, washing, dressing, and sleeping. The basic metabolic rate (BMR) of an individual is a rate of energy expenditure in a fasting rate to complete rest in a warm environment, which varies between individuals depending upon age and sex (Osmani 1985; FAO 1985). Satisfactory data on energy expenditure rates for different types of activities in different circumstances and countries or on time-allocation of individuals/groups of individuals among different types of activities are hard to come by.

There are two additional problems in the estimation of dietary energy requirements. First, individuals can adapt to certain minimum levels of calorie intake without danger to their health or without "physiological dysfunction" by means either of metabolic regulation, that is, varying the efficiency of dietary energy utilization by changing body composition, or by reducing weight. Among these alternative possibilities of adaptation, the latter is more likely than others (Osmani 1985). This phenomenon results in intraindividual variations in energy requirements and may thus cast doubt on the concept of average calorie requirements of individuals. Since BMR is calculated from body weight and since body weight adjusts within limits to changes in calorie intake without danger to health, energy requirements are estimated by FAO on the basis of the lower limit of the range of desirable weight for a given height. Second, the use of an average requirement does not allow for variations in requirements arising from genetic differences between individuals. This creates the possibility of misclassification but the direction of bias is indeterminate. To use an average requirement to estimate the undernourished population implies that there will be some, among those classified as undernourished, who will not be undernourished and some who are undernourished will be excluded.

The possibility of metabolic adaptation to food intake tends to suggest that the calorie requirements should be set not at the average level but at the lower end of the calorie distribution, i.e., standard deviations away from the average calorie (1.2 BMR). On the other hand, the presence of interindividual differences in energy requirements supports the use of average energy requirements as the cut-off point (1.5 BMR) on the assumption that statistical errors of overestimation or of underestimation cancel each other out (FAO 1985; Osmani 1985).

Direct observations on the distribution of food intake by individuals are difficult to come by in all countries. In many cases, therefore, indirect estimates of calorie intakes are made on the basis of a country's distribution of income or of aggregate food expenditures, this is, on the assumption that the distribution of income or aggregate food expenditure are both monotonically related to the distribution of calorie intake. This correlation does not always hold in practice. Higher income does not always lead to a

higher calorie intake. With increasing incomes, higher-valued food commodities are consumed which do not necessarily have higher nutrient content, that is, the same nutrient value is obtained with a higher expenditure. Additionally, when a certain amount of minimum requirements as perceived by individuals are met, even at a relatively low level of income, an increase in income may lead to a temporary decline in the percentage of income spent on food with a view to attaining a minimum level of non-food basic items, after which high-income elasticity of demand for food is restored.

Estimating the Number of Undernourished

On the basis of above assumptions, FAO estimates the number of the undernourished population in the developing countries during 1979–1981 was between 348 and 512 million for 89 developing countries, excluding China. For 1983–1985 between 15 percent and 22 percent of the population of these countries was undernourished. The percentage of their undernourished population declined over the years, that is, from 19 percent and 27 percent during 1969–1971. While differences exist among different regions in terms of percentages of the population that are undernourished, ranging from 35 to 26 percent in Africa and 14–22 percent in Asia to 10–14 percent in Latin America and 9–6 percent in Near East/North Africa, the large majority of the world's undernourished population lives in Asia (58 percent) and in Africa (28 percent) (FAO 1987a).

There are wide divergences among countries and regions in the developing world in terms of per capita calorie availability. Asia (excluding China) and Africa, with per capita daily calorie supplies at 2250 and 2050 respectively during 1983–1985, are below the average for the whole developing world; the difference in per capita calorie supplies between Africa and Asia is not as striking as the difference in the percentage of the population that is undernourished (FAO 1987a).

The various estimates of the magnitude of the undernourished population are based on the assumption of ideal environmental conditions, that is, ideal sanitary and health conditions including pure drinking water. Ill health and infectious disease both reduce energy intake and increase energy requirements, and thus may contribute to undernutrition. Malabsorption of food, especially in diarrheal diseases, reduces the effective utilization of food. Parasitic elements residing in gastrointestinal tracts claim a share of the food and thus reduce the amount available to the body. Energy is also diverted to the production of protective factors or elements in the body for resistance against infection. All of these factors increase an individual's energy requirement. Loss of appetite through illness and infections reduces

the intake of food and, in some cultures or societies, food allocation is reduced during illness.

In summary, the quantitative measurement of undernutrition thus depends upon assumptions regarding the degree of adaptability of individuals to variations in food intake, interindividual differences in calorie requirements, levels of physical activity of individuals, and the individual's health and sanitary environment. None of the prevailing estimates of the undernourished population include environmental factors. The FAO estimates of undernutrition in 1983–1985 include a high and a low estimate; the low-minimum estimate ($350 million) allows for intraindividual variability and for adaptation to low food intake through the adjustment of body weight; the high estimate ($512 million) is based on the concept of average requirements, which allow interindividual differences, and hence may include some who are not undernourished and exclude some whose requirements are higher than the average. Neither the low nor high estimates of FAO allow for any economically or socially necessary level of physical activity. Once allowances for an average level of physical activity are made, as in the World Bank estimates, the estimated number of the undernourished population may go up to 700 million or more. (What is an average level of physical activity, and what are the calorie requirements for different degrees or types of physical activity are all matters of controversy, as has been mentioned earlier.)

Whatever the exact number, the number of the undernourished population in the developing world is significantly high. But it is not so staggeringly high as to discourage efforts to alleviate it. In this context, one can in some sense consider the low estimate as representing those who are the most severely undernourished.

The Seasonality of Undernutrition

A number of other issues relating to undernutrition have important policy relevance. There is a seasonality in the pattern and magnitude of undernutrition. This is derived from the seasonality in (a) the pattern of physical activity or energy expenditure, which determines energy requirements, and (b) in food intake, arising from seasonal variations in the price and availability of food supplies as well as in employment and income. During the lean season when food stocks are depleted and new supplies have yet to come to the market, employment opportunities may be limited, and for certain farming operations, there may be an increased energy expenditure.

In terms of nutritional status, the vulnerable groups frequently include women, especially lactating and pregnant women, and children. In these

cases the gap between requirements and supplies of calories is often larger than the average gap for all households. This is partly related to the intra-household distribution of food and other basic non-food requirements. There is some evidence in a few Asian countries, such as the Philippines and Bangladesh, that selective deprivation of women takes place, whereas in Africa, such as Kenya and Gambia, and in parts of Latin American, where women do the most work, they are often fed better. In some African countries women get paid a "bride price" because they are considered to be of great economic value. Also girls, more than boys, accompany their mothers during the day and benefit more from traditional nurturing and feeding.

Access to food and access to hygiene, including personal and environmental hygiene, complement each other. In particular, an increase in per capita income or household income does not lead to a fall in the incidence of illness, especially in children. Diarrhea has a significant negative effect on a child's growth. Although increases in income have a positive impact on children's calorie intake, the impact is small. Diarrhea, energy intake, and mother's height and/or her nutritional status all affect children's nutrition.

During the 1980s, as a result of the impact of structural adjustment policies undertaken in many developing countries, including heavily indebted countries, poverty and undernutrition have tended to worsen. Reductions in public expenditures, including those on health and nutrition measures as well as on development policies, frequently combined with a cut in food subsidies and a corresponding rise in food prices, have contributed to the fall in employment as well as the rise in poverty in several countries (Helleiner 1987; Demery and Addison 1987).

The major thrust of the remainder of this paper is on the general macroeconomic and the agricultural sector issues bearing on poverty, hunger and undernutrition; other issues such as health and environmental aspects, though important, are not dealt with except in passing.

Measures for Alleviating Hunger and Undernutrition

In spite of the high hopes and solemn resolutions of the U.N. World Food conference in 1974 held in the aftermath of the World Food Crisis of 1974 to ensure that no child should go to bed hungry and that no family should fear for tomorrow's bread, widespread hunger and poverty persist. Adequate and stable food supplies and assured access on the part of the poor and hungry to the basic foods that they need are the three basic foundations/cornerstones on which poverty-alleviating measures need to be based.

At all levels, whether global or regional, and in most developing coun-

tries, per capita calorie supplies have increased over the past two decades. The rate of growth of food production in developing countries as a whole since the 1970s has exceeded the rate of growth in population, except in Africa in the past decade or so. However, at the same time, per capita demand exceeded per capita food production, resulting in increasing food imports by developing countries; the largest share in the food imports of developing countries (60 percent or more) belongs to middle-income countries. The food imports of the poorer developing countries are constrained by their low income and limited export earnings to pay for imports. Thus worldwide adequacy does not ensure sufficient supplies for poor countries with a foreign exchange constraint; food aid finances more than 20 percent of cereal imports of low-income food deficit countries (FAO 1987b).

National self-sufficiency in food production does not by itself promote greater access to food on the part of the poor. In the Near East and in Latin America, the percentage of the undernourished population fell significantly between 1969/1971 and 1983/1985 (from 15.7 percent to 5.6 percent in the Near East, and from 12.7 percent to 9.5 percent in Latin America) while at the same time their food (cereal) self-sufficiency declined, more drastically in the Near East than in Latin America, which turned from a net exporting region (105 percent self-sufficiency) to a net importing region (96 percent self-sufficiency). Africa, for example, is a region where both food self-sufficiency declined and undernutrition expanded during this period. India has achieved self-sufficiency in recent years but contains vast numbers that are undernourished (FAO 1987a).

The Failure of Entitlement

Adequacy of food supplies at the aggregate level derived from domestic production and/or imports does not by itself contribute to the alleviation of poverty nor does it prevent the occurrence of the extreme form of food deprivation typified by famines. This is because the poor do not have adequate purchasing power to secure access to food. The failure of "entitlement" or effective demand can occur in a variety of ways which are linked to the system of production and distribution of income in an economy (Sen 1981). Those who are food producers need adequate land and other inputs to produce food; those who purchase food require access to other assets through the use and exploitation of which they can acquire command over enough income to purchase food. Alternatively, they require employment at an adequate wage. Among the purchasers of food, those who produce nonfood or nonagricultural commodities must sell enough of other commodities at prices which secure an income high enough to ensure access to adequate food. A shortfall in food production can cause deprivation or hunger either because food production is the main source of income and

purchasing power, or because a fall in output causes a rise in food prices which, without a corresponding increase in the income of food purchasers, results in a decline in food consumption. A fall in entitlement may be caused by a fall in the price of other assets, such as cattle, or commodities to be exchanged against food (a fall in the terms of trade), a decline in employment or the wage rate, or a rise in the price of food caused by a general expansion of monetary demand.

The multiple source of either inadequacy or a decline in entitlement and of access to food outlined above, both in the short run and long run, emphasize that first, alleviation of undernutrition requires action not only on the supply side but also on the correction of various causes of demand failure. Second, the failure of entitlement and effective demand arises not only within the agricultural sector but also outside it, as evidenced by an increasingly large number of poor people residing in the urban areas.

Urbanization has important implications for (a) the pattern or composition of food demand and (b) the marketing and distribution of food which is produced in rural areas but consumed in urban areas. Urbanization, independently of changes in the level of income, causes a shift of the consumption pattern away from traditional crops such as sorghum, millet, roots, and tubers, toward cereals such as maize, wheat, and rice. Not only the rich but also the poor urban consumers are increasingly dependent on cereals, which are mostly imported and which, in many cases, cannot be substituted by domestic production due to agro-ecological constraints, especially in Africa. National food pricing policy, combined with an overvalued exchange rate, often cheapens imported cereals vis-a-vis traditional crops, which in the past have not benefitted from cost-reducing technological innovations either in production or in storage and processing. The latter suffers, in addition, from the high costs of marketing and distribution. Traditional crops, unlike cereals, cannot be processed for the preparation of convenience foods, a necessity in the context of an increasing participation of women in the labor force which leaves little time for elaborate methods of preparation required by traditional foods (Reardon and Delgado 1986).

Changes in food consumption patterns are inevitable in response to increasing incomes and changes in consumers' preferences. What is needed is to ensure that the speed of such changes does not outstrip the capacity for growth and adjustment of the domestic economy, including agricultural production potential, in line with comparative cost considerations and evolving patterns of food demand. The agricultural sector needs to adjust to changing demand structures through technological change, in both production and processing. This has to be encouraged by appropriate incentives, including incentive prices, to exploit its comparative cost advantage.

Neither self-sufficiency in food production nor the pursuit of a policy

of "Food First" emphasizing food crops to the exclusion of cash crops, is crucial for the alleviation of hunger and undernutrition. The degree of self-sufficiency sought by a country should be governed by its comparative costs of production, the equilibrium rate of exchange, and degree of security of access to world supplies. The greater the uncertainty surrounding access to world supplies, as perceived by importing countries, (due maybe to export embargoes or restrictions, threat of war, or interruptions in transportation, etc.), the greater is the incentive for reliance on domestic production. The controversy regarding food crops versus cash crops is greatly exaggerated; they are often jointly produced in a system of mixed farming, dictated by considerations of efficient crop husbandry. Furthermore, farmers who are predominantly producers of cash or export crops diversify their cropping patterns to include food crops as well in order to reduce risks associated with crop failures, or with interruptions and fluctuations in the supplies and market prices of food. Frequently, specialization in export/nonfood crops is warranted by comparative cost considerations, and/or by agro-ecological characteristics.

Past empirical evidence indicates a positive association between the growth in overall or per capita staple food production and growth in the area devoted to cash crop production (Braun and Kennedy 1986). Food crops are often sold as cash crops, and there are developing countries with food exports as major sources of foreign exchange. The adverse impact of nonfood cash or export crop production on poverty/hunger is often traced to a number of associated circumstances, which are not by themselves the inherent or immutable characteristics of export crop production. It is argued, for example, that export/cash crops are often produced in large-scale plantations or with capital-intensive techniques which have limited or no favorable impact on incomes and employment of the rural poor. Also, earnings from export crops are spent not on food purchases for the producers of export crops, but on imports of consumers' goods (including luxury goods) for the urban rich. In addition, an expansion in any one region in the production of the export cash crop, which diverts land and other inputs away from food production, is not always offset by an increase in the supply of food from other regions. This is often due to the underdeveloped state of the transportation, marketing and distribution systems.

The above are examples of either policy failures or institutional bottlenecks which can be resolved or removed given an appropriate policy framework. This should promote the participation of the growers of export crops in the overall national gains which accrue from an efficient expansion of export/cash crops. A deterioration in income distribution or an increase in poverty arising from policies which discriminate against the poor, who happen to be producers of export crops, requires additional or offsetting measures for the alleviation of hunger. A similar case is one in which food

prices for those who are engaged in expanding the production of export crops rise due to shortcomings in the organization of food production and marketing. Evidence, based on a number of case studies in developing countries on the introduction of new export crops or of a shift from food to cash/export crops, indicates that the income of the farmers as well as their calorie intake increased as a result of increased commercialization. The impact on calorie intake and on nutritional status was positive but small; incremental income was spent on nonfood items as well. There was in no case a decline in the nutritional status of the average farmer. However, changes in cropping pattern or technology adversely affected the income of particular groups in some instances. For example, in the Philippines large landowners acquired land for sugar cane cultivation away from corn-growing tenants, who had no secure rights, turning the tenants into landless wage labor in sugar plantations (Braun and Kennedy 1986).

Instability in food supplies and prices, as well as in the entitlements/incomes of the poor, aggravates hunger and malnutrition. This instability hits the poorest countries and the poorest people the hardest since they have very little reserve either of food or financial resources to fall back upon. The loss or sale of assets to meet short-term food crises leads to long-run deprivation and poverty. Infectious diseases or ill health suffered during periods of food shortages often impair long-term health and ability to work. A major source of instability is in food and agricultural production, which is a source both of food and income for the poor. To this is added, at the national level, (a) instability in export earnings which causes instability in income and employment in the export sector as well as in import capacity, and (b) instability in macroeconomic factors affecting both rural and urban income. Frequently, technological progress increases not only the average level of crop yields but also the variability of yields due to a variety of reasons, that is, narrowing of the genetic base of crops, dependence on a few high-yielding varieties, variability in the availability and price of purchased inputs which assume growing importance, greater vulnerability to the impact of the weather fluctuations or pests and diseases, etc. Measures are needed both to reduce the variability of output as well as to offset its adverse impact on the poor.

Patterns of Growth, Technological Progress, and Poverty

The challenge facing developing countries is how to design an agricultural development strategy which would augment food supply and, at the same time, increase the income and employment of the poor so that they can secure access to food at a price which they can afford. The poor are not only the small farmers, often with land of a size which does not

provide adequate income, but also the rural landless laborers and the urban jobless. Frequently, the poor farmers are located in arid or infertile regions with uncertain or inadequate rainfall. In particular, the questions besieging policymakers are the following: How should one increase the productivity of the small farmers, often subsistence farmers, with an inadequate endowment of resources or agro-ecologically inferior lands? What are the policies to provide incentives to surplus producers to expand output and the marketable surplus as well as to provide an increased employment for the landless? How can employment be expanded for the landless and jobless in both agricultural and nonagricultural activities in the rural areas?

Distribution of land to those without land, or with very little land, provides them with a source of employment and income as well as of food supply. Whenever landholdings remain unutilized or are inadequately utilized and small farmers carry on an excessively intensive cultivation, leading to soil degradation, a redistribution of land contributes to growth, sustainability, and equity. While the political difficulties in the way of land redistribution are often enormous, it is also evident that without a redistribution of land under circumstances where (a) land distribution is highly unequal, and (b) where the feasible rate of expansion of nonfarm employment to absorb the landless falls short of what is needed to make a dent on the income of the poor, a major assault on rural poverty is unlikely and the chances of the rural poor shifting to the cities to add to the urban unemployment and poverty are very high. (The Gini coefficients of land distribution in Latin America and Near East are much higher (0.7–0.8) than in Asia and Africa (0.4–0.6) [FAO 1986, 1987]).

Where the majority of the rural poor are small farmers, a strategy designed to expand their access to high-yielding inputs, credit and water, would help reduce poverty. Experience to date confirms that the small farmers not only adopt but also make an efficient use of modern technology, provided supplies of inputs are available and extension and educational efforts reach them. Inequality will probably increase but poverty may be reduced (a) if sufficient supplies of services and inputs are available, and (b) if institutions are developed to organize small farmers to enable them to take advantage of the opportunities available to them. That a part of the services and inputs intended for the small farmers will be diverted to the rich landowners is a necessary consequence of an unequal, rural socio-political structure. Furthermore, new technology needs to spread to widely diversified agro-ecological regions, especially in rainfed, low-productivity regions as well as to a wide variety of crops, including traditional crops which are often the poor's main source of employment and food, (Lipton and Longhurst 1988d). When the rural poor are predominantly the landless, expansion of employment in both agricultural and nonagricultural activities remains the major policy instrument.

The Critical Role of Women

Both analysis and experience tend to confirm that in any poverty-oriented development strategy, women occupy a critical role. In many countries women play an important role in agricultural production in both food and cash/export crop production; in some cases, they play a greater role in food production than in the production of cash crops. Insofar as the nutritional impact of an increase in household income and expenditure is concerned, what is important, however, is not which particular crops or activities generate family income but who controls income and household expenditures, especially food expenditures.

Modernization of agriculture affects women's role as a producer and provider of food; it affects the allocation of their time between various activities within and outside the household. The greater their participation in agricultural operations outside the household, the less time is available for other household chores including the provision and preparation of food and the care of children, both of which affect the nutritional status of the family. Traditionally, women's access to inputs and services for agricultural production has been constrained by the sex-bias in the delivery system and institutions; women's lack of command over land restricts their access to credit obtained on the security of land. Measures to expand their access to requisites for increased agricultural production are critical in promoting both equity and growth, especially when women-headed households are often the poorest families.

Evidence in a number of developing countries indicates that increasing women's control over household income and expenditure is likely to have a favorable impact on nutrition. It is the absolute increase in income rather than their relative share, which is important. For example, with the introduction of irrigation in rice production in Gambia, there was a shift in relative control over production and income from women to men, as the communal land was assigned to men away from women in order to promote an efficient management of the new irrigation technology. But, at the same time, new technology greatly increased women's labor inputs and their wage earnings; it also improved total calorie consumption and the nutritional status of the family. Furthermore, a greater availability of food, especially during the "wet or hungry season", prevented a drop in food consumption and a loss in weight during that season. This resulted in an overall improvement in the nutritional status of the family.

The Role of Modern Technology

Modern technology, especially biological and chemical innovations in agriculture, increases employment; intensive application of modern inputs

requires increased amount of labor per hectare and secondly, it makes possible greater cropping intensity. Macroeconomic policies regarding the price of capital and labor, that is, the rate of interest and the wage rate, have an impact on the choice of techniques, that is, a lower relative price of labor will favor a more labor-intensive technique, and activities which can contribute towards employment expansion. Price incentives play an important role in the spread of modern technology; the responsiveness of supply to price incentives is greater, the higher the level of technology and infrastructure. Cost-reducing technological innovations reduce the price of food and thus increase the real income and food consumption of the poor. This process is facilitated if landowning middle farmers enjoy a rapid technological progress, expand their marketable surplus, and are willing to share part of their gains in productivity with the consumers through a reduction in price rather than if they themselves acquire the entire benefits through higher profits (Mellor and Ahmed 1987; Mellor and Desat 1985). A low price of food facilitates labor-intensive development, including labor-intensive industrialization and export expansion.

Furthermore, a higher percentage of the increased income of the middle landowners, unlike in the case of the richest landowners, is spent on labor-intensive services and consumer goods often produced in the rural areas. The net result is an increase in nonfarm employment and hence in the income and food demand of the poor which in turn stimulates food and agricultural production. This is in addition to the forward and backward linkages of agricultural growth stimulating the production of inputs for agriculture, on the one hand, and the processing of agricultural output, on the other. In some instances, an increase of $10 in the income of the agricultural sector has resulted in an increase of $8 in nonagricultural income as a result of linkages between agricultural and nonagricultural sectors (Hazell et al. 1983; Wanmali 1985).

An employment-oriented agricultural development strategy needs to identify and encourage an expansion of production among those landowning-farming classes who, given the distribution of land and rural income in a country, share the twin characteristics of (a) highly labor-intensive food and agricultural production techniques and activities, and (b) a pattern of consumer demand which emphasizes labor-intensive consumer goods and services. Infrastructure, credit, and technical education are essential components of a policy designed to stimulate nonfarm agricultural employment in response to agricultural growth. Also important is a pricing policy for inputs and capital which stimulates labor-intensive techniques/activities.

The uneven spread of technological progress, especially among the small farmers, while the large landowners reap the initial benefits of new technology, may cause a loss in real income for the farmers as they confront a decline in output price without a corresponding reduction in cost.

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Furthermore, the high profitability of new technology may lead the large landowners to acquire land from tenants for self-cultivation by converting the latter into landless wage laborers.

The adverse side effects of technological progress on the poor such as these need to be counteracted among others by (a) a fast diffusion of technology to the small farmers, (b) an output price support policy which prevents precipitous price declines following the introduction of new technology, (c) provision of security of tenure for tenant farmers, and (d) organizations of landless laborers to counter the imperfections of the labor market adversely affecting the conditions of their employment.

The foregoing illustrates that in the absence of institutional change and asset redistribution, under conditions of high concentration of land and economic power in rural areas, the promotion of growth concurrently with equity or, in some cases, with a reduction in the incidence of poverty, is a very challenging and complex task.

Direct Measures for the Alleviation of Poverty

The impact of overall growth on poverty is seldom fast and large enough to make a dent on poverty and undernutrition in the near or medium-term future. Furthermore, growth itself may be slowed down by an undernourished population which lacks energy and is ill-equipped to take advantage of opportunities for work or employment. Among the measures which have a direct impact on poverty and undernutrition are food subsidies and/or direct transfers of income to the poor. Food subsidies can be used to provide food to the poor at less than the market price. Also, direct income transfers can be made to the poor, but such transfers need to be combined with an increased supply of food or else rising food prices tend to offset the transfer of income.

Since low-income groups spend 40–50 percent of their income on food, a reduction in the prices of food staples through subsidies by 20 percent raises the average income of the poor by 8–10 percent. Since expenditure on cereals frequently amounts to about 15 percent of the Gross Domestic Product (GDP) in low-income and 8 percent in middle-income countries, a 20 percent subsidy on the price of cereal constitutes 3–1.6 percent of their GDP (Alderman and von Braun 1984). The financial transfers involved in any sizable food subsidy scheme are considerable and can scarcely be afforded by many developing countries.

How to design and implement a food subsidy program targeted to the poor, without a very high administrative cost, is a daunting challenge. The narrower and the more sharply focused is the subsidy, the higher is the

administrative cost. For example, in one case, the administrative cost of securing a given increase in calorie consumption of preschool, malnourished children through the targeting of food subsidies to the household with malnourished preschool children, was estimated to be half of what it would have been, if the subsidy were to be targeted exclusively to the malnourished children themselves (Garcia and Pinstrup-Andersen 1987). The cost of a subsidy can be kept down if the beneficiaries happen to be concentrated in a well-defined geographical area, if commodities subsidized are cheap and are mainly consumed by the poor, and if the implementation of the scheme can be integrated within an existing administrative machinery, that is, agricultural extension workers or child or maternity welfare centers, or if delivery of food is undertaken through existing marketing systems such as local stores. It is unlikely that food subsidy increases the food consumption to an equivalent extent of the subsidy. Necessarily a part would substitute for existing food consumption. However, the net increase in food consumption obtained through subsidized food is usually higher than the increase obtained through an equivalent increase in monetary income (Reutlinger 1986).

Among the measures directly augmenting the income of the poor are public-work projects. They provide self-targeting for the poor and are effective if wages are below market wages. The subsidy involved in public-work projects is reduced if the gap between the value of assets created by such projects and the cost of execution of projects can be kept down (Reutlinger 1986). In view of the need in many developing countries for large variety of rural and urban infrastructure projects, that is, roads, drainage, irrigation, markets, storage, schools, hospitals, etc. which are highly labor-intensive, they potentially constitute a significant source of employment, especially if repairs and maintenance are also included. The basic challenge confronting many developing countries in expanding the effective use of such projects is how to develop institutional and technical capacity to design and implement such projects, and to provide enough resources not only for their execution but also for their repair maintenance.

International Assistance for Poverty Alleviation

Undernutrition in developing countries coexists with large food surplus and, in some cases, overnutrition in developed countries. Is there a straightforward and simple way of transferring surplus food from developed countries to feed the poor and hungry in the developing countries?

There are two ways in which excess food in developed countries can be used in developing countries for relief of poverty. Food aid in the form of grant or concessional sales can substitute for commercial imports and re-

lease foreign exchange resources which can be directed towards poverty-oriented projects and programs. Many poverty-oriented programs suffer from a lack of external capital inputs.

Furthermore, an employment-oriented development strategy which expands the income of the poor leads to increase in the demand for food. This will be true even if the main thrust of development strategy is towards increasing domestic food production. In many developing countries a large majority of farmers are involved in food production so that their income and employment can be expanded by focusing mainly on increasing food production. An increase in food production when it is associated with an increase in output and income in the nonfood and nonagricultural sectors frequently leads to a rate of increase in aggregate income and food demand which, given the high income elasticity of food in low-income countries, is in excess of a feasible rate of increase in domestic food production in the near- or medium-term future. This increases requirements of food imports. For example, 10 percent growth in per capita agricultural productivity is associated with 9–11 percent growth in per capita GDP; 10 percent in per capita GDP is associated with 10–11 percent increase in food imports. A recent study found a 10 percent growth in total GDP to be associated with 19–25 percent growth in cereal (not food) imports (Bautista 1987). Food aid by expanding aggregate food supply helps meet the increase in food demand, which results from an accelerated growth in income and employment of the poor; this moderates or prevents a rise in food prices and obviates the adverse effects on the poor. For low-income food deficit countries, the share of food aid in food imports was 20 percent during 1983–1986; for some countries the ratio was as high as 50 percent or more (FAO 1987c).

Food aid can finance employment-oriented development projects designed to promote growth in income and employment. It can finance the wage component or food expenditures of those engaged in development projects. The disincentive effect of food aid on domestic prices is offset if an additional demand is created either through food aid–financed projects or by an employment-oriented strategy. The additional income flow from food aid projects must exceed the amount of food aid by a multiple, so that extra demand for food matches increases in food supply. To the extent that only 40–60 percent of additional income is spent on food in low-income countries, the creation of additional income of $1.60 to $2.50 is needed to absorb, without a price decline, $1 worth of food aid. Food aid projects require supplementary inputs other than labor, that is, both imported inputs as well as local nonlabor inputs; the former in turn necessitates additional nonfood financial aid, and local inputs would require financing through domestic savings or program food aid which replaces commercial imports and generates resources for use in food aid projects. If food-for-

work projects are to generate additional income and demand, they must be in addition to those that would otherwise have been undertaken. An effective use of food aid, as it is obvious from the foregoing, would require close coordination with external financial assistance, in the context of an overall development strategy oriented towards expansion of income and employment of the poor.

Public expenditures in many developing countries on agriculture, on current developmental inputs like fertilizer, seeds, pesticides, as well as on capital expenditures such as irrigation, mechanization, land development, and research, etc., are not commensurate with either agriculture's importance in overall economy or with requirements for an accelerated growth in agriculture. Private investment tends to be discouraged by inadequate price incentives or by the discriminatory impact of macroeconomic policies like exchange rate overvaluation or industrial protectionism which reduce relative rates of return on investment in agriculture. Above all, investment, public and private, is constrained by the inadequacy of overall domestic resources in many developing countries.

External assistance to agriculture in 1983–1985, estimated to be about $8.3 billion in nominal prices and $5.9 billion in 1975 prices, fell considerably short of what the World Food Conference in 1974 set as a target, i.e., $8.3 billion per year in 1975 prices, which was later on revised upwards to $11–12.5 billion (FAO 1987c). Furthermore, on a per capita basis, low-income countries received a lower amount, i.e., $3.16 in 1983/1985 compared to $4.74 for all developing countries. The predominant source of external assistance has been the international agencies like the World Bank, Regional Development Bank, and International Fund for Agricultural Development (IFAD), etc. devoting 25–30 percent of their assistance to agriculture.

In the last two decades, external development assistance tended to emphasize poverty-oriented development projects in the agricultural sector. While this was in general desirable, there were two problems. One related to the design of such projects which focused on what was called "integrated rural development projects"; they were more complex, comprising multiple components and requiring sophisticated administrative and management capacity. Second, in many cases poverty-oriented projects concentrated on the needs of the small farmers only and did not pay adequate attention to (a) rural infrastructure like roads, communications, transport and markets, electricity, etc., especially in the 1970s and 1980s; (b) landless rural poor; and (c) rural nonfarm employment. That public work projects relating to irrigation, drainage and rural roads often tended to favor the nonpoor rather than the poor was unavoidable in the context of a highly unequal distribution of land and economic and social power. Projects or programs which provide greater access for the poor to nonland assets, and which

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either expand their self-employment in agriculture or increase nonfarm employment, deserve a greater emphasis however.

External assistance to strengthen local institutions, including local administrative machinery and rural people's associations or organizations which are able to design and implement agricultural and nonagricultural projects, has a high priority. Availability of credit holds a key to this approach. How to provide credit not only for productive purposes but also for temporary consumption needs for small farmers or landless laborers who can offer security, not of land but of their own labor, or of crop only; how to minimize the administrative costs of small loans provided at nonsubsidized rates of interest; and how to ensure high rates of repayment through various innovative approaches involving farmers' groups or associations all constitute a challenge confronting both the donors and recipients in developing countries. There are successful examples like Grameen Bank in Bangladesh, the lessons of which need to be learned and spread far and wide (Hossain 1988).

Can external assistance be helpful in implementing land redistribution where landholdings are highly skewed and constitute a serious bottleneck in the way of a successful assault on poverty? In many countries an important constraint is the lack of domestic financial resources to compensate the landowners; external assistance can be integrated with a program of land redistribution to compensate the large landowners, as well as to finance programs designed to increase agricultural productivity. Also, food aid may be useful in the transitional period to meet any shortfall in food production caused by temporary dislocation.

External financial and food assistance can also be used to reduce the instability of food supplies that arise from rises in food import price, declines in domestic food production, and falls in export earnings, which reduce the availability of foreign exchange for the import of food. Food aid has often responded in the past to varying import requirements of food aid-dependent countries, but there is no systematic mechanism by which food aid, especially bilateral food, responds to changes in recipients' food supply. Globally, however, the flows of food aid were positively associated in the past with the variations in supplies and stocks in donor countries, which did not necessarily coincide with the opposite variations in the recipient countries. Efforts to enhance the role of food aid in stabilizing food supplies of recipient countries on a more systematic basis, possibly by expanding the multilateral food aid for this purpose, need to be intensified.

IMF Cereal Import Facility

The International Monetary Fund (IMF) Cereal Import Facility (CIF), launched in 1981 as a component of the IMF Compensatory Financing Facility for Export Shortfalls (CFF), was intended to compensate for the

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exceptional, but temporary and reversible, rise in cereal import bill, arising either from a shortfall in domestic production or a rise in import price. It was expected that availability of CIF would encourage developing countries to pursue food security, not through food self-sufficiency, but through reliance on world markets as dictated by comparative cost considerations. The reliance on and confidence in world markets can be encouraged only if they are assured of food supplies at times of high prices or domestic shortfalls, irrespective of the state of their external balance of payments. By linking it with the CFF, and furthermore, by relating drawings on CFF increasingly in recent years to stricter IMF conditionality about domestic policy reforms, significant departures have been made from the original purpose.

First, to argue that a rise in export earnings at a time of rise in import price of food, or a shortfall in domestic food production reduces or eliminates the need for cereal import financing, is to argue that first claim under all circumstances on a rise in export earnings is import of cereals, even though such an action may reduce imports of fertilizers and consequently food production the next year. Furthermore, rise in import price of cereals may be associated with a rise in other import prices, both agricultural and nonagricultural, and may more than offset the rise in export earnings. Linking cereal imports with CFF is tantamount to making access to cereal facility a part of the IMF overall financial assistance for meeting short-term balance of payments difficulties, irrespective of their sources.

Second, the temporary shortfalls in export earnings are not primarily due to policy failures of developing countries. The policy failures in developed importing countries, including a recession or raw material inventory policies, or monetary or exchange rate policies, also cause short-run declines in export earnings. Furthermore, assistance for meeting short-term export shortfalls need not be linked to policy reforms to deal with long-run adverse trends caused by structural changes in demand and supply conditions, or by inappropriate policies, even though they may not strictly be distinguished. In any case, it is not necessary to use, for at least two reasons, CFF to seek to correct long-term factors, if any, which may cause short-term export shortfalls. In any case short-term shortfalls are never fully compensated by CFF, and there are other IMF facilities which are intended to deal with long- and medium-term structural issues. At least in view of the special nature of food, the political sensitivity to and implications of an absence of its assured supply, as well as its humanitarian aspects, the Cereal Import Facility should be available almost semi-automatically.

The access to the IMF Compensatory Financing Facility for export shortfalls, once considered as an important source of multilateral short-term finance, has been restricted in recent years. Following a recession in developed countries in 1981/1982, the drawing on this facility during 1982/

1983 went up to as high as $6 billion. But a subsequent change in rules in 1983 limiting the access to this facility and imposing the conditions for domestic policy reforms, resulted in a fall in drawings to less than $1 billion a year between 1984 and 1986 (Kaibini 1988).

The principal focus of international development assistance in very recent years is on debt and structural adjustment problems in the developing countries. This focus, combined with a general climate of "aid fatigue" in donor countries, has caused a major shift on emphasis in domestic policy failures, rather than the lack of resources, including external resources, as reasons for inadequate growth or poverty.

While the important role of international development assistance in support of domestic policy reforms is recognized, its amount and pattern have not lived up to expectations. Several countries, including some in Africa, have undertaken domestic policy reforms in the process of structural adjustment, but have been unable to receive external assistance adequate enough to generate a sufficient growth momentum needed to sustain the national acceptability of sometimes painful policy reforms. On the other hand, appreciable amounts of bilateral assistance continue to flow to countries without significant policy reforms, casting doubt on the credibility of aid for policy reforms.

Among the external constraints on development are restrictions on access to world markets faced by developing markets for their exports. The progress in the reduction of trade barriers to agricultural exports of developing countries is slow and expectations are hinged on the outcome of the outgoing General Agreement on Tariffs and Trade (GATT) negotiations. A significant reduction in restrictions on their exports, both raw and processed agricultural commodities, would substantially add to the exchange earnings of developing countries in amounts which can compare very favorably with the flow in recent years of external assistance to the agricultural sector. Unlike in the past, trade liberalization needs to be applied across the board and to commodities of special interest to developing countries, including not only cereals, oilseeds and oils, and meat, but also sugar and tropical products, etc., to be of significant benefit to developing countries. Trade liberalization by itself does not contribute to the alleviation of hunger. It is true, however, that some alleviation is effected when small farmers or farm laborers become employed in the export sector as a result of trade liberalization.

If trade liberalization in cereal products causes a rise in world price through a reduction of excess supplies in world markets, food deficit low-income countries may suffer a rise in import bill. However, such a rise in world prices is more likely in respect to dairy products and meat, the most highly protected sectors in developed countries' agricultural sector, than in cereals. The low-income countries scarcely import such commodities in any significant amounts. Moreover, if trade liberalization takes place on a wide

range of agricultural commodities, gains from increased income from other commodities will, in many cases, more than offset the losses from a possible rise in cereal prices.

Conclusions

The number of undernourished populations in developing countries, excluding China, is estimated to range between 450 and 700 million. The numbers vary depending upon assumptions regarding (a) the extent to which individuals adapt to a decline in calorie intake without adverse effects on health, and (b) the levels of physical activity. The higher the level of physical activity undertaken, the higher is the magnitude of calorie requirements. The percentage of the total population undernourished is the highest in Africa (about 30 percent), with Asia a close second (22 percent). However, about 60 percent of the world's total undernourished population resides in Asia.

The low estimate of the undernourished population in developing countries given above may be said to represent those who are most severely undernourished. Furthermore, above estimates do not take into account the impact of inadequate health and sanitary environment on the state of undernutrition; hence in some regions and countries, the above numbers may underestimate the magnitude of undernutrition. Access to food and access to hygiene are the twin pillars on which progress in the elimination or reduction of undernutrition depends.

Assurance of access to food on the part of the hungry and undernourished requires measures, on the one hand, to expand their food entitlement through the expansion of employment and income and, on the other hand, to ensure adequate and stable food supplies. Self-sufficiency in food production either at the national or the household level is not necessary; what is needed is self-reliance in food, that is, ability either to produce or procure food through an optimum cost-effective combination of domestic production and imports.

How to design an agricultural development strategy which simultaneously expands food production, on the one hand, and raises the income of the poor, on the other, is not an easy undertaking. Inequality may increase in the medium term, yet poverty may decline provided enough care is taken to ensure that inputs, services and credit (that is, preconditions of modern technological progress) are available to small farmers; that land-owning-middle farmers are encouraged to expand output and provide increasing employment through labor-intensive activities and techniques, supported by appropriate macroeconomic policies; and that nonfarm employment in the production of labor-intensive manufactured goods, trade, and services is stimulated in response to increasing demand resulting from agricultural growth.

Hunger and undernutrition at the household level are also dependent on such factors as who in the family earns income, who controls the household food expenditure, and how the additional income is spent. This is why women's role in food production and household food consumption is so crucial because in many societies they play an important role. Measures to increase their employment and income-earning opportunities as well as to increase their access to education play an important role in alleviating undernutrition.

The hard core of the poor and the undernourished in many countries consists of the rural landless labor, the small farmers, farmers in arid or infertile regions, and the urban unemployed. Direct assault on poverty and undernutrition is needed, especially in the short run, to strengthen the poverty reducing impact of employment oriented growth strategy. They include such measures as food subsidies, narrowly targeted towards the poorest and the vulnerable groups, as well as labor-intensive public work projects.

What is needed is a coalition of political forces or interest groups in developing countries which look beyond the short-term interests of those who own most of the economic assets and wield economic and political power, and are able and willing to adopt reformist policies in favor of the poor. At the same time the organizations of the poor need be promoted or strengthened in order to enable them to utilize effectively the opportunities opened up by the public policies and institutions as well as to serve as a countervailing force where markets are non-competitive.

International assistance can strengthen poverty and hunger-reducing domestic efforts through either food or financial aid. External assistance for promoting technological progress and infrastructural development should help, first, to reduce the price of food, which is a major determinant of the real income of the poor, and second, to expand employment by strengthening intrasectoral, i.e., farm and nonfarm, linkages. Not all such assistance will go directly and fully to the poor; leakages are unavoidable. They occur in domestic programs as well as in those internationally financed. International assistance should encourage and support policy reforms, which eliminate discrimination against the poor, including discrimination against the rural and the agricultural sectors where the majority of the poor live in most developing countries.

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