

Poverty, Hunger, and Malnutrition

For hunger is a curious thing: at first it is with you all the time, waking and sleeping and in your dreams, and your belly cries out insistently, and there is a gnawing and a pain as if your very vitals were being devoured, and you must stop it at any cost, and you buy a moment's respite even while you know and fear the sequel. Then the pain is no longer sharp but dull, and this too is with you always, so that you think of food many times a day and each time a terrible sickness assails you, and because you know this you try to avoid the thought, but you cannot, it is with you. Then that too is gone, all pain, all desire, only a great emptiness is left, like the sky, like a well in drought, and it is now that the strength drains from your limbs, and you try to rise and find that you cannot, or to swallow water and your throat is powerless, and both the swallow and the effort of retaining the liquid taxes you to the uttermost.

— Kamala Markandaya¹

This Chapter

- 1 Describes the world food situation
- 2 Examines different forms of poverty, hunger and malnutrition: their magnitudes and consequences, and how they are measured
- 3 Identifies principal causes of and potential solutions to problems with poverty, hunger, and malnutrition in developing countries

THE WORLD FOOD SITUATION

World Food Demand and Supply

World food consumption and production have each grown about 2.2 percent per annum since 1970, while in developing countries consumption has grown about 3.7 percent and production 3.5 percent. Cereals

¹Kamala Markandaya, *Nectar in a Sieve* (New York: New American Library, 1954), p. 91.

are the most important sources of food and, since the mid-1960s, world cereal production has risen by roughly one billion tons per year. It is likely that an additional billion tons in production per year will be needed by 2030 to meet food needs of a world population expanding in numbers and in income. It is also likely that cereal imports by developing countries will increase from about 10 percent of consumption to about 15 percent.

While the overall numbers and projections suggest gradual improvement in reducing malnutrition in the world, there are still several countries in which per-capita food consumption has declined and is not likely to increase enough to significantly reduce the number of undernourished. Even in countries with growing average food consumption, some groups may not see their consumption levels increase: household food consumption is closely related to household incomes, and the most disadvantaged are afflicted by low and uncertain levels of income. In addition, the rate of growth in agricultural output for the world as a whole has slowed since the 1980s, and the use of cereals and sugar to produce bio-fuel products has created competition for these products for food. When food supplies are short, prices rise, creating severe problems for those who spend a high proportion of their limited income on food. The effects of the food price increase in 2007–2008 are a good example, as they are estimated to have caused an increase in the number of people malnourished in the world from 800 million to 860 million. A best-case scenario for the world over the next 30 years would seem to point to a reduction in severely malnourished to about 400–500 million people, but for populations in many countries the struggle for food will continue. Therefore we turn now to how poverty and access to food manifest themselves in terms of hunger, malnutrition, and, in some cases, famine.

POVERTY

Poverty has many faces and is one of the major challenges facing the development community. Poverty is widely understood to be an inability to meet basic needs, and the poor tend to be hungry, are without adequate shelter, and have limited access to health care. The poor lack opportunity, and their powerlessness often lead to hopelessness and despair. To most people reading this book, poverty is an invisible and abstract problem, somewhere out there. We seldom think about it, and when we do we often don't know what to think or how to take action against it. Trends since the early 1980s point to a decrease in global poverty, but stark challenges remain; in 2005, an estimated 1.4 billion

people — about one fourth of the world's population — lived in extreme poverty and efforts to reduce poverty must be constantly refined.

Measuring Poverty

Since poverty is multidimensional, efforts to measure it can be complicated by attention to its different dimensions. Two broad types of measurement schemes exist: monetary and non-monetary. Monetary measures consolidate the different dimensions into a single unit of measure — money. Their strengths include the ability to make comparisons in a common unit, a non-arbitrary measurement scheme, and ability to quantify the extent, depth and severity of poverty (see box 2-1). However, monetary approaches often fail to capture dimensions of poverty that may be especially important and intractable, such as social exclusion and political powerlessness.

Non-monetary measures include qualitative assessments and indices that combine different dimensions such as the Human Development Index (HDI) and Human Poverty Index (HPI) described in Chapter 1. These indices often face the criticism that the weights used are arbitrary and measures vary significantly when the weights are changed.

The different approaches complement each other, and their combination has allowed a deeper understanding of poverty. For example, participatory poverty assessments that engage in discussions with groups of poor people about their conditions and the unique challenges they face often accompany monetary assessments, and the combination can help in understanding how policies can be formulated to reduce poverty.

Vulnerability: Transitory and Chronic Poverty

Poverty is not a constant state for many developing-country households. Weather, pests, diseases, and policies cause fluctuations in income that translate into movement in and out of poverty — households are vulnerable to becoming poor. This in-and-out-of poverty situation is important because separate policies may be needed to address transitory compared to chronic poverty. Evidence shows that transitory poverty — households who move in and out of poverty over time — accounts for a substantial portion of overall poverty. As a result, means of protecting people from transitory income shortfalls may substantially improve the global poverty picture. Formal and informal insurance schemes, social safety nets, and other means of reducing or managing risks can help achieve this aim. Rural public work programs — such as

BOX 2-1.
MONETARY MEASUREMENT of POVERTY¹

Three primary challenges in measuring poverty are: (i) deciding what to measure, (ii) identifying a value, below which a household is deemed to be poor, and (iii) adding it up for the population. Poverty involves an inability to control sufficient resources to meet a minimum level of well being, and analysts use household income or consumption expenditure to measure it. Consumption is generally preferred because income, particularly in rural areas, is seasonal and variable, while consumption is smoother and often easier to measure. The poverty line is the value of income or expenditures on a daily, monthly or annual basis below which a person is deemed to be poor. This poverty line can be determined many ways. In the United States, the poverty line was created in 1963 using the minimum cost of achieving an adequate diet based on U.S. Department of Agriculture food plans. Non-food expenditures were accounted for by observing that poor households generally spend about a third of their total budget on food: the food poverty line was multiplied by 3 to obtain the total poverty line. This line has been updated over time by adjusting for changes in the cost of living. A commonly used international poverty line is the World Bank's use of \$1 per person per day (in 1993 prices) to reflect extreme poverty (this number was recently revised to be \$1.25 in 2005 prices) and \$2 per day (2005 prices) to reflect moderate poverty.

With a household survey, incomes or expenditures can be compared to the poverty line: households with values below the line are poor. Policy makers are interested not only in which households are poor, but also in where the poor are located, what they do, and how poverty has changed over time. Monetary indices of poverty are used to address these concerns, and the most commonly used poverty index, called the Foster, Greer, Thorbecke (FGT) Index,² is one that reflects the prevalence (proportion of the total population that is poor), depth (the degree of shortfall below the poverty line) and severity of poverty (the degree of inequality among the poor). This index gives policy makers a nuanced view of the total poverty picture: for example, a policy may increase the depth of poverty among some while reducing the total proportion of the population that is poor. According to the most recent estimates, 40 percent of the population in South Asia was poor in 2005 compared to 51 percent in Sub-Saharan Africa. In contrast, the poverty severity measures were 3 percent for South Asia compared to over 10 percent for Sub-Saharan Africa, indicating a far more serious problem in poverty severity in Sub-Saharan Africa than in South Asia.

¹ For more information, see Martin Ravallion, "Poverty comparisons: A guide to concepts and methods," Living Standards Measurement Study Working Paper, no. 88 (Washington, D.C.: World Bank, 1992).

² J. Foster, J. Greer, and E. Thorbecke, "A Class of Decomposable Poverty Measures", *Econometrica*, Volume 52 (1984), pp. 761–66.

dam-building, irrigation and water supply schemes, road construction and maintenance programs — are examples of social safety nets that may reduce vulnerability to poverty and build infrastructure for agricultural development.

Chronic poverty is often caused by very different factors: households do not have access to enough human, physical, natural, and other assets to earn sufficient incomes for minimum levels of well-being. Poverty traps caused by insufficient assets, severely degraded natural resources, and other factors, are difficult to escape and often require long-term investments in asset building, access to new factors of production, and improved institutions.

Agricultural Development and the Poor

One of the most common misconceptions about poverty is that it is largely an urban problem. Pictures of teeming slums with inadequate sanitation and rotting infrastructure help bolster this perception. In contrast, rural residents are thought to live in relatively spacious conditions and to be able to rely on own-production of foods in times of dire need. In fact, on a global level, the rural poor make up more than three-fourths of the total poor, and rural poverty is twice as prevalent as urban poverty.² Rural poverty is a major problem and, as we will see throughout this book, agricultural development can play a major role in its reduction, but agricultural development can also alleviate urban poverty.

Agricultural technology has direct impacts on the rural poor by increasing incomes of farmers, many of whom may be poor. Care must be taken during development and subsequent release of new technologies to ensure that they are accessible to poor producers, but evidence shows that in many cases poor producers benefit directly. Indirect benefits to the poor from growth in agriculture come from two primary sources: increased demand for labor and increased supply of food, causing food prices to drop. The latter benefit can be substantial and is an important reason why global poverty fell from the early 1980s until recently. Food price declines have led to higher levels of living even for

² The prevalence of global rural poverty was estimated in 2005 to be 29.7 percent compared to a 13.2 percent poverty rate in urban areas of developing countries. While rural poverty has declined relative to urban poverty due to urbanization, 75.4 percent of the developing world's poor are found in rural areas. Source: Martin Ravallion, Shaohua Chen, and Prem Sangraula, 2007, "New Evidence on the Urbanization of Global Poverty," Policy Research Working Paper forthcoming, World Bank.

people who do not depend directly on agriculture. When global food markets tighten as they did recently, poverty rises due to the indirect effect of higher food prices.

HUNGER, MALNUTRITION, and FAMINE

Hunger is a silent crisis in the world. In times of famine, it can tear at the heartstrings as media attention focuses on its dramatic effects. In fact, the most extreme type of hunger is severe calorie and protein under-nutrition during a famine. However, more pervasive is chronic under-nutrition and malnutrition associated with poverty, illness, ignorance, maldistribution of food within the family, and seasonal fluctuations in access to food. We begin our discussion of hunger with the contrast between famines and chronic malnutrition.

Famines

Famine is marked by an acute decline in access to food that occurs in a definable area and has a finite duration. This lack of access to food usually results from crop failures, often in successive years, due to drought, flood, insect infestation, or war. During a famine, food may actually be present in the affected area, but its price is so high that only the wealthy can afford it. Food distribution systems may break down so that food cannot reach those who need it.

Famines have occurred throughout history. In recent years, their prevalence has been greatest in Sub-Saharan Africa, but famines also have occurred in North Korea periodically since 1995, in Kampuchea (formerly Cambodia) in 1979, Bangladesh in 1974, India in 1966 to 1967, and China in 1959 to 1961. The latter was the worst famine of the 20th century and resulted in an estimated mortality of at least 16 million people.

Famine is the extreme on the hunger scale because it causes extreme loss of life and concurrent social and economic chaos over a relatively short period of time. As access to food falls, people begin by borrowing money and then selling their assets to acquire money to purchase foods. Subsistence farmers sell their seed stocks, livestock, plows, and even land. Landless laborers and other poor groups lose their jobs, or face steeply higher prices for food at constant wages. As the famine intensifies, whole families and villages migrate in search of relief. The telltale signs of acute malnutrition and, eventually, sickness and death appear (see Box 2-2).

Fortunately, progress is being made against famine. Although large variations occur in annual food production in individual countries and world population continues to grow, the frequency and intensity

BOX 2-2.**NATURAL DISASTER and FAMINE in BANGLADESH¹**

From June to September 1974, severe flooding in the Brahmaputra River in Bangladesh led to large-scale losses of the dry-season rice crop and created pessimism about the prospects for the transplanted spring crop. The price of rice doubled in fewer than three months during and after the floods. Two months after this sudden upturn in rice prices, unclaimed dead bodies began to be collected in increasing numbers from the streets of Dacca, the capital city. Similar collections were reported throughout the countryside. The government of Bangladesh officially declared a famine in September 1974. Estimates of the final death toll vary widely, but most agree that more than 1 million people died of starvation or related causes during and after the famine.

Insufficient food stocks clearly hindered the government's efforts to provide relief. Inadequate relief stocks should not, however, be confused as a cause of the famine; the evidence clearly shows that in 1974 adequate food grains were available in Bangladesh to avoid famine. This same evidence shows that the districts most affected by the famine even had increased availability of food per person compared to prior years.

What, then, caused the famine? Landless laborers and farmers with less than half an acre of land were most severely affected by the famine. These groups, whose only true asset was their labor power, found that the value of their labor declined greatly relative to the price of rice. Despite available food in local markets, they were unable to purchase it. The flood did not immediately affect food supply since the lost crop would not have been harvested until the next year anyway. It did, however, greatly lower employment opportunities. Lower wages combined with higher rice prices were the root causes of the 1974 Bangladesh famine.

¹ Most of this material is drawn from Amartya K. Sen, *Poverty and Famines: An Essay on Entitlement and Deprivation* (New York: Oxford University Press, 1981).

of famines has decreased due to improved information and transportation networks, increased food production and reserves, and dedicated relief organizations. Much of the starvation we see during famines now occurs in areas where transportation systems are deficient and where political conflict thwarts relief efforts. The recent North Korean famine was due to a combination of natural disasters, economic collapse, and lack of political will to alleviate the problem.

Chronic Hunger and Malnutrition

As devastating as famines are, they account for only a small fraction of hunger-related deaths. Famines can be attacked in a relatively short period of time if political conflict in the affected country does not

hamper relief efforts. Chronic hunger and malnutrition affect a much greater number of people and are more difficult to combat.

Although no accurate figures on the prevalence of malnutrition exist, the World Health Organization (WHO) estimates that a half-billion people suffer from protein and calorie deficiencies and perhaps an equal number suffer from malnutrition caused by inadequate intakes of micronutrients, principally iron, vitamin A, and iodine. Thus, roughly 15–20 percent of the world's population suffers from some form of malnutrition. Malnutrition does not affect all segments of the population equally. Preschool children and pregnant and nursing women are particularly vulnerable to its dangers.

Serious malnutrition in developing countries reflects primarily under-nourishment — a shortage of food — not an imbalance between calories and protein. The availability of calories per capita by country is illustrated in Figure 2-1. Many of the countries with very low per-capita calorie availability are found in sub-Saharan Africa. A close, but not perfect, correspondence exists between low calorie availability and the low-income countries identified in the previous chapter. The major nutritional problem was once believed to be the shortage of protein. Although dietary protein is important, many nutritionists now believe that when commonly consumed cereal-based diets meet energy (calorie) requirements, it is likely that most protein needs will also be satisfied, for most people older than about two years of age. Thus, for everyone except infants, the greatest concern is the total quantity of food available to eat, and this quantity can most readily be measured by total dietary energy in terms of calories per day. In settings where overall energy intake meets minimum needs, any remaining protein or micronutrient deficiencies can often be improved with rather small investments to improve the quality of the diet.

Table 2-1: Estimated Number of People Affected by Preventable Malnutrition Worldwide

Deficiency	Morbidity due to Malnutrition	Estimated Prevalence of Morbidity	Group most affected
Protein and energy	Underweight	150,000,000	Children
Protein and energy	Stunted growth	182,000,000	Children
Iron	Anemia	2,000,000,000	Every age and sex
Vitamin A	Blindness	250,000 - 500,000	Every age and sex
Iodine	Brain damage	50,000,000	Every age and sex

Source: World Health Organization, 2003.

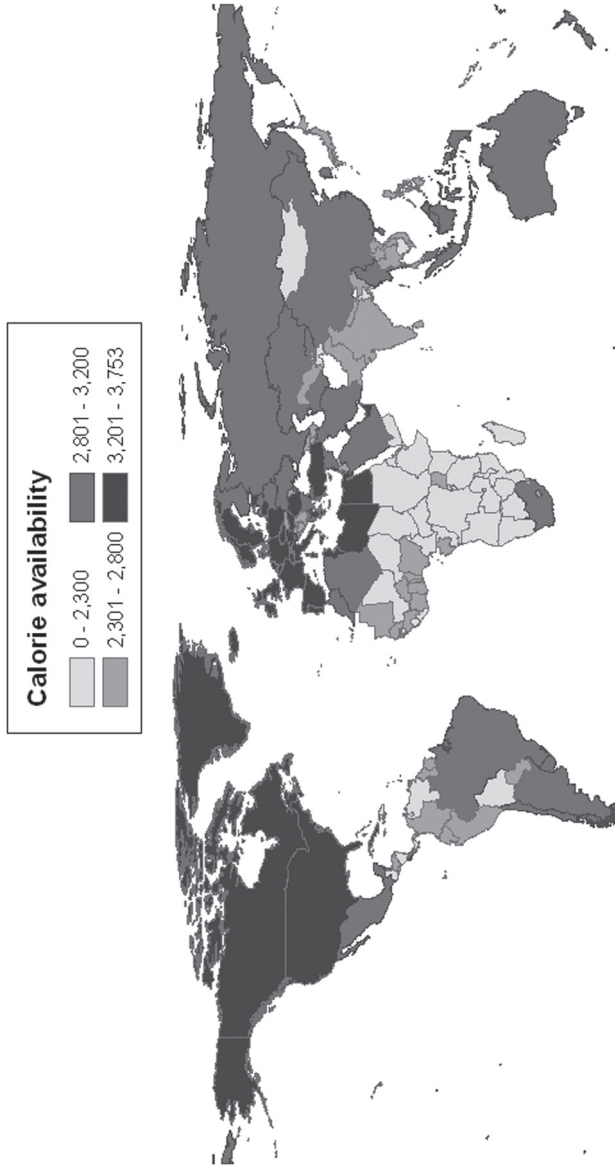


Figure 2-1. Daily calorie availability per capita, 2003. (Source: FAOSTAT data.)

Nevertheless, areas can be found with adequate calorie intake but deficient protein or micronutrient intake. Regions where diets are based on staples such as cassava or sugar rather than cereals are more likely to be deficient in protein even if calories are adequate. Iodine deficiency is common in regions far from the sea, for example parts of the Andes in South America. Iron deficiency is a particularly serious problem among women of childbearing age all over the world, and vitamin A deficiency is common in several countries.

Consequences of Hunger and Malnutrition

Stunted growth, reduced physical and mental activity, muscle wasting, increased vulnerability to infections and other diseases, and, in severe cases, death are the most common consequences of calorie deficiencies. Death most frequently results from dehydration caused by diarrhea, whose severity is closely linked to malnutrition. Chronic protein malnutrition results in stunted growth, skin rash, edema, and change of hair color. A diet relatively high in calories but low in protein can result in an illness known as kwashiorkor, while a diet low in both calories and protein can result in an illness known as marasmus. People can live about a month with kwashiorkor, 3 months with marasmus; 7–10 million people die each year from the two diseases.

Iron deficiency anemia affects muscle function and worker productivity. Vitamin A deficiency is a leading cause of childhood blindness and often results in death due to reduced disease resistance. Iodine deficiencies cause goiter and cretinism.

There is little doubt that hunger and malnutrition result in severe physical and mental distress even for those who survive the infections and diseases. Malnutrition can affect the ability of a person to work and earn a decent livelihood, as mental development, educational achievement, and physical productivity are reduced. People with smaller bodies because of inadequate childhood nutrition are paid less in agricultural jobs in many countries. Lower earnings perpetuate the problem across generations, leading to a vicious cycle of malnutrition and poverty.

Measuring Hunger and Malnutrition

Measuring the extent of hunger and malnutrition in the world is difficult. Disagreement surrounds definitions of adequate caloric and protein requirements while data on morbidity and mortality reflect the combined effects of sickness and malnutrition.



Woman and child in Ethiopia
(photo by Mesfin Bezuneh).

Nutritional assessments are usually attempted through food balance sheets, dietary surveys, anthropometric surveys, clinical examinations, and administrative records. Food balance sheets place agricultural output, stocks, and imports on the supply side and seed for next year's crops, exports, animal feed, and wastage on the demand side. Demand is subtracted from supply to derive an estimate of the balance of food left for human consumption. That amount left can be balanced against the Food and Agricultural Organization of the United Nations' (FAO) tables of nutritional requirements to estimate the adequacy of the diet. This method provides rough estimates at best, due to difficulties in estimating agricultural production and wastage in developing countries.

Food balance sheets provide only a picture of average food availability. Malnutrition, like poverty, is better measured if the distribution of food intake or of other indicators is also taken into account. Average national food availability can be adequate, while malnutrition is common in certain areas, or among particular population groups. Even within families, some members may be malnourished while

others are not. To measure malnutrition accurately, information on households or individuals is required.

Household and individual information can be obtained from dietary or expenditure surveys and from clinical or field measurements of height, weight, body fat, and blood tests. These methods are expensive and seldom administered on a consistent and widespread basis for an entire country. They can be effective, however, in estimating malnutrition among population subgroups. Since preschool children are most vulnerable to nutritional deficiencies, random surveys to measure either their food intakes or anthropometry (body measurements) can provide a good picture of the extent of malnutrition. Another procedure for estimating the extent of malnutrition is to utilize existing data in hospital, health service, and school records. Unfortunately, these statistics can be biased because the records for rural areas are scarce, the poor are the least likely to have sought medical attention, and the quality of the information in the records is uneven. For example, many countries in Latin America record the heights, weights, and ages of first-year elementary school children. Unfortunately, many members of the poorest populations groups do not attend school. Because of these biases, estimates of malnutrition among school-aged children generally understate the true problem. One reason why malnutrition is misunderstood is that its measurement is so difficult.

CAUSES of POVERTY, HUNGER and MALNUTRITION

A variety of factors contribute to poverty, hunger and malnutrition, but inadequate income is certainly the most important underlying cause. The World Bank estimates that redistributing just 2 percent of the world's output would eliminate most poverty and malnutrition. But such redistribution would be feasible only if those who now go hungry had some way to obtain that food, or something to offer in exchange. If people, for whatever reason, produce too few goods and services, they lack income to buy food and they go hungry. Even in times of famine, decreased purchasing power rather than absolute food shortages is often the major problem, as food may be available in nearby regions. Incomes in the affected area have declined so that people cannot afford to buy food from unaffected areas.

Figure 2-2 contains a schematic diagram of the determinants of household well-being and individual nutritional status. Access to productive assets such as land, labor, natural resources, and the policy regime (prices and other factors) determine household income and well-being. Income, including the value of own production and in-kind transfers determine how much food can be purchased or consumed by

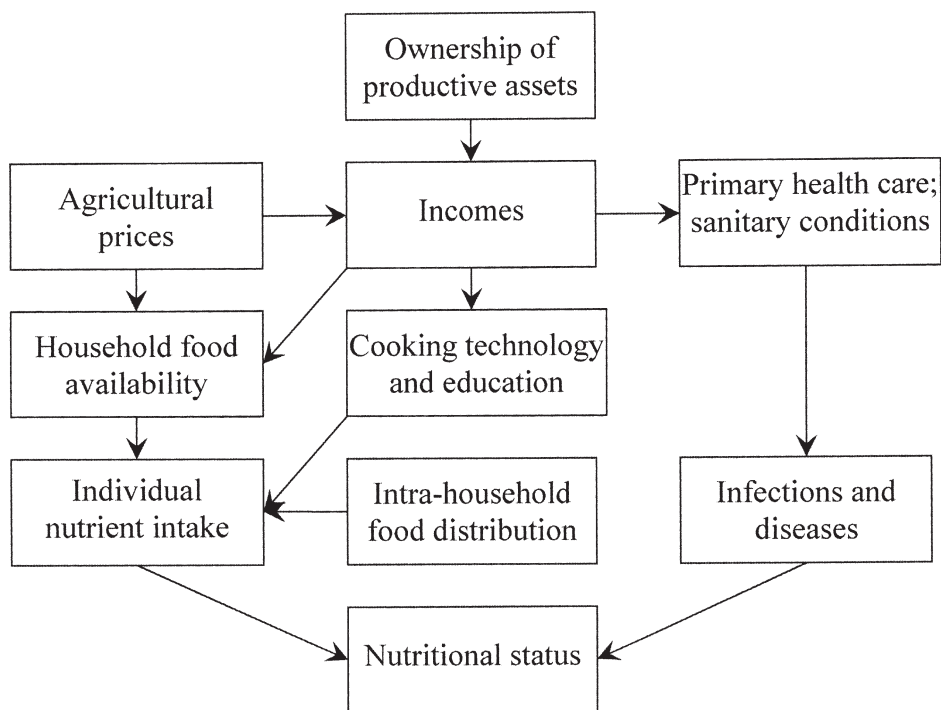


Figure 2-2. Determinants of household well-being and individual nutritional status.

the family. Total food purchases and consumption do not, however, tell the entire story. Health status and family food preparation, along with how food is distributed among members of the family, help determine how food available to a family is related to individual nutritional status.

Health and Malnutrition

Poverty's interaction with malnutrition is often compounded by infectious diseases and parasites that reduce appetites, cause malabsorption of food, or result in nutrient wastage due to fever and other metabolic processes. Health problems and malnutrition exhibit a synergistic relationship: infections and parasites lead to malnutrition while malnutrition can impair the immune system, thus increasing the risk of infection and the severity of the illness.³ Measles, parasites, intestinal

³ See Joanne Leslie, "Interactions of Malnutrition and Diarrhea: A Review of Research," in J. Price Gittinger, Joanne Leslie, and Caroline Hoisington, eds., *Food Policy: Interacting Supply, Distribution, and Consumption* (Baltimore: Johns Hopkins University Press, 1987), pp. 355–70 for additional discussion.

infections, and numerous other health problems are prevalent in developing countries. Many of these health and sanitation problems lead to diarrhea, which in turn can lead to dehydration and death. Health is determined by, among other things, household sanitary conditions. These in turn are influenced by family assets and income, and by government programs. There is room for optimism related to many childhood diseases. The World Health Organization reports that, because of sustained efforts to vaccinate children, the majority of the world's children under one year old are now vaccinated against six common childhood diseases. However, the last twenty-five years have seen HIV-AIDS become an escalating problem, first in Africa and increasingly in Asia. Malaria also remains a serious problem in many countries, especially in Africa where 14 countries report over 10 percent of their populations infected.⁴

Poor Nutritional Practices

Ignorance of good nutritional practices, maldistribution of food within the family, and excessive demands on women's time can all contribute to malnutrition and perpetuate poverty. The results of studies that have examined each of these factors provide conflicting evidence as to their importance. Each factor is undoubtedly significant in some areas of the world but not in others. For example, in parts of Northern India and Bangladesh, evidence indicates that adult males receive a disproportionate share of food in the family compared to young females, but this is not universally the case.⁵ Problems that appear to be related to ignorance, and are in fact discriminatory, are sometimes related to culture and often to poverty.

Some evidence shows that whether the male or female controls income within a family helps determine how food is distributed. There also is strong evidence that increased educational opportunities for women are linked to improved nutritional practices and more equitable distribution within the family.

Seasonal and Cyclical Hunger

As with poverty, many people in developing countries move in and out a state of malnutrition. There are hungry seasons, hungry years, and hungry parts of the life cycle. A given individual may or may not survive these periods and frequently experiences lasting physical, mental, and emotional impacts even if he or she does survive.

⁴ UNDP, *Human Development Report 2005* (New York: Hoechstetter, 2005).

⁵ See Michael Lipton, "Variable Access to Food," in Gittinger, Leslie, and Hoisington, eds., *Food Policy*, pp. 385–92.

Hungry seasons occur because of agricultural cycles. In the weeks or months preceding a harvest, food can be in short supply. This normal seasonality can be exacerbated if crops in a particular year are short or households are unable to effectively store food or income. In certain seasons of the year, particularly the rainy seasons, disease and infection are more common. Likewise, droughts, floods, and insect infestations happen in some years but not in others. Young children are vulnerable, in part due to dangers associated with diarrhea. Pregnant and lactating women experience extra nutritional demands on their bodies while the elderly suffer disproportionately as well, particularly if they lack the support of their children.

SOLUTIONS to POVERTY, HUNGER and MALNUTRITION PROBLEMS

Solutions to hunger and malnutrition problems depend on the types and causes, but alleviation of poverty is needed for a long-term solution. Famine relief strategies differ from solutions to chronic hunger and malnutrition, but even in famines, the poor are most likely to be afflicted. Unfortunately there is no magic bullet to the solution of poverty. A concerted effort across many fronts is required.

Raising Incomes

Lifting vulnerable people out of poverty is central to any long-term strategy to alleviate malnutrition in the world. For subsistence farmers, this strategy implies raising productivity, increasing access to land, or creating opportunities to migrate to off-farm employment. For the population in general, it implies a need for increased employment opportunities combined with higher productivity per person. The latter requires growth in jobs and in capital per job in the non-farm sector. Enhanced education, an investment in human capital, will also increase productivity and incomes. Equal access to jobs and expanded economic opportunities in impoverished regions can also help reduce poverty. Economic growth without increased employment for the poorest segments of the population will do little to reduce hunger. Programs to increase employment and earnings opportunities for women are particularly important, partly because these opportunities help accelerate the transition to lower birth rates (for reasons discussed in Chapter 4).

Agricultural Production

Agricultural productivity is particularly important for the incomes and nutritional status of the poor, because in most developing countries the

poorest people have no choice but to be farmers, and they feed themselves and their families using their own labor and available land. Increased productivity for those farmers not only raises their incomes and purchasing power, but can also lower the price of food for those who must buy it to feed their families, making it possible for the poor to purchase larger quantities. Hence, methods for increasing food production are a major focus of this book. Increased use of purchased inputs, improved marketing and credit institutions, improved agricultural policies, better education, effective agricultural research, and investment in infrastructure such as roads, storage, and irrigation systems are particularly important.

Safety Nets

As noted above, much poverty is transitory and caused by fluctuations in income. These fluctuations, in turn, can have dramatic impacts on nutrition, and they can lead to longer-term poverty because households often invoke harmful coping mechanisms to deal with them. Safety net programs, such as cash and in-kind transfers, public works programs, conditional cash transfers, and fee waivers for health and education, can distribute wealth to the most needy and provide insurance against risks. By protecting vulnerable farmers against the adverse consequences of risk, safety nets allow them to make better investment decisions and adopt new technologies and production practices (such as new seeds and fertilizers) that increase mean incomes. Safety nets need to be properly targeted and efficiently administered to avoid waste, but much has been learned in recent years about their design and implementation. Many countries have now successfully implemented them.⁶

Food Intervention Programs

Food price subsidies, supplementary feeding programs, and food fortification can each help reduce nutritional deficiencies. Few developing countries have come close to eliminating malnutrition without some combination of these practices. However, these programs alone cannot solve problems of chronic malnutrition.

General food price subsidies were used in Sri Lanka for several years and helped relieve malnutrition and extend life expectancy to a remarkable degree. However, food price subsidies are expensive, and

⁶ See Margaret Grosh, Carlo del Ninno, Emil Tesliuc, and Azedine Ouerghi, *For Protection and Promotion: The design and implementation of effective safety nets* (Washington, D.C.: The World Bank, 2008).

even Sri Lanka decided to cut back its general subsidy, and instead to target specific groups. A study by the International Food Policy Research Institute (IFPRI) of the Sri Lankan food stamp scheme indicated that the targeted subsidies did reduce program costs substantially, but had mixed results in reaching the poor.⁷ Food price subsidy schemes sometimes lower prices, thereby reducing incentives for domestic food production.

Several countries have instituted supplementary feeding programs for vulnerable groups such as children and pregnant and nursing mothers. In some cases these programs provide food to be consumed in a specific location such as in schools or health centers, while in others food may be consumed at home. In either case, while total family food consumption rises, that of the food recipient usually grows by less than the total donation. Some food is shared with family members. The evidence on supplementary feeding programs indicates that they often are associated with measurable improvements in nutritional status, but they tend to be expensive for the benefits received. Administration of these projects can be very difficult. In some cases, these programs have been assisted with food aid from other countries as discussed below.

Another food intervention program involves fortification by adding specific nutrients during processing. The most successful example is iodine fortification of salt to prevent goiter. Vitamin A also has proven relatively inexpensive to add to foods such as tea, sugar, margarine, monosodium glutamate, and cereal products. Attempts have been made to fortify food with iron to prevent anemia, but reducing iron deficiency anemia has proven to be a complex problem. In general, the effectiveness of adding nutrients to food is reduced by the fact that the poor buy few processed foods, there is often cultural resistance to the fortified product, and the cost of fortification is prohibitive. In many cases, the “fortified” food has been shown to have no more nutrients than unfortified foods; quality control can be prohibitively expensive in developing countries. Recent success in incorporating vitamin A and iron into rice through genetic modification provides another avenue for reducing these micro-nutrient problems.

Health Improvements

Efforts to improve sanitation, reduce parasite infections, and prevent dehydration caused by diarrhea can reduce malnutrition and

⁷ Neville Edirisinghe, “The Food Stamp Scheme in Sri Lanka: Costs, Benefits, and Options for Modification,” International Food Policy Research Institute, Research Report No. 58, Washington, D.C., March 1987, pp. 1–85.

mortality substantially. For example, oral rehydration therapy, involving the use of water, salt, and sugar in specified proportions to replace fluid lost during diarrhea, can significantly reduce diarrhea-related deaths. Investments in sanitation services, such as potable water and latrines, when combined with effective education programs, can improve nutritional status by reducing diarrhea. Better health services such as immunization programs can reduce the incidence and intensity of diseases that contribute to malnutrition.

Political, Social, and Educational Changes

Political stability can help alleviate both famine conditions and chronic hunger. The famine in Ethiopia in 1983 and 1984 was exacerbated by political upheaval that hampered relief efforts. The recent famine in North Korea also has political roots. Because programs to curb chronic hunger and malnutrition require long-term commitments, they are necessarily rendered less effective by political instability. Responsible political action can improve income distribution in a country, thereby reducing poverty and malnutrition.

Social, cultural, and educational factors also come into play. For example, declining rates of breastfeeding in some countries have contributed to malnutrition as substitutes can be less nutritionally complete, are often watered down, and in some cases are even unsanitary. In other cases, breastfeeding may continue too long without the addition of needed solid foods. While social and cultural factors change slowly, and economic factors influence decisions, education can help. In fact, few consumption practices are totally unaffected by education. Nutrition education programs, especially when combined with income-generating projects or efforts to increase a family's access to nutrients, such as home gardening, have been shown to lead to improved nutritional status.

International Actions

International actions can help alleviate poverty, famine, and chronic malnutrition. **Because increased incomes are so important to improved nutrition, opening of markets in more developed countries, and debt relief, are actions that can help, especially in the long run. Foreign assistance can provide short-run relief and, when properly designed, facilitate long-run development.**

Reduced barriers by developed countries to imports from developing countries will enable low-income nations to gain greater access to world markets. The foreign exchange earned can be used for development efforts and food imports when needed.



Rural Health Center in Colombia.

Debt relief is a dire need in many countries, particularly where past governments were not held accountable for how loans were spent, so that the funds were not invested productively. When bad debts arise, it is usually in the long-run best interests of both lender and borrower to share some of the burden of adjustment, to reduce expectation of loan repayment in line with the actual productivity of the loan. For more details on this important topic, see Chapter 19.

Foreign assistance includes food aid as well as technical and financial assistance. Gifts and loans of food at low interest rates can help solve part of the hunger problem if the food assistance is properly administered. Food aid can relieve short-term famines and be used in supplementary feeding programs and in other activities, such as food for work programs, to help generate wealth in developing countries. Much more important for the long run, financial and technical assistance can help developing countries expand their capital bases and improve methods for producing food and other products, allowing them to import or develop the new technologies they need to break out of poverty.

SUMMARY

In this chapter, the types and consequences of poverty, hunger, and malnutrition were examined. We now have much better information on the distribution and extent of poverty. Even though it is difficult to measure accurately the extent of hunger and malnutrition in the world,

it is known that chronic malnutrition affects more people than do famines. Malnutrition results in reduced physical and mental activity, stunted growth, blindness, anemia, goiter, cretinism, mental anguish, and death.

The causes of hunger are many, but virtually all these causes are related to poverty. Infections, diseases and parasites, poor nutritional practices, and seasonal variability in food supplies all contribute to the severity of malnutrition. Solutions to hunger and malnutrition include raising incomes; increasing agricultural production in developing countries; food intervention programs; improving health systems; political, social, and educational changes; and a series of international activities such as food aid and other foreign assistance, debt relief, opening of foreign markets, and price stabilization.

IMPORTANT TERMS and CONCEPTS

Anthropometry	Maldistribution of food
Chronic malnutrition	Oral rehydration therapy
Debt relief	Political upheaval
Dietary surveys	Poverty
Famine	Price stabilization
Food aid	Protein and calorie deficiency
Food balance sheets	Safety nets
Food fortification	Seasonal and cyclical hunger
Food price subsidies	Supplementary feeding programs
Foreign assistance	Transitory poverty
Kwashiorkor, marasmus, goiter, anemia, and cretinism	Vitamin and mineral deficiency
	Vulnerability

Looking Ahead

Hunger and malnutrition imply a need for food but not necessarily a demand for food unless that need is backed by purchasing power. Food demand is influenced by income, prices, population, and tastes and preferences. In the next chapter, we will examine tools that can help measure or project the extent to which various demand factors affect food consumption. We will explore how demand interacts with supply to determine prices. The tools discussed are the first of a set of theories and methods presented in this book that can improve your ability to analyze and not just observe food and development problems and policies.

QUESTIONS for DISCUSSION

- 1 What are the causes of transitory poverty? What can be done to alleviate the problem?
- 2 Why is it important to have information on the depth and severity of poverty in addition to the poverty prevalence?
- 3 Has poverty gone down globally over time?
- 4 Is famine more widespread today than in the past?
- 5 Is protein deficiency a more severe problem in developing countries today than is calorie deficiency? Why or why not?
- 6 If people in the United States moved to a diet in which they consumed more grain and less meat, would there be more food for people in poor countries of the world? Why or why not?
- 7 What are the principal causes and consequences of hunger?
- 8 How do we measure the adequacy of food availability in a country?
- 9 What are some solutions to hunger and malnutrition problems?
- 10 How might safety net programs contribute to long-term development?
- 11 Why and how does political upheaval contribute to famine?
- 12 What are the major interactions between health and nutritional problems?

RECOMMENDED READINGS

- Flores, Rafael, and Stuart Gillespie, *Health and Nutrition: Emerging and Reemerging Issues in Developing Countries*, IFPRI 2020 Vision, Focus 5, February 2001 (Available at website: <http://www.ifpri.org/index1.htm>).
- Foster, Phillips, and Howard D. Leathers, *The World Food Problem* (Boulder, Colorado: Lynne Reinner Publishers, 1999).
- Grosh, Margaret, Carlo del Ninno, Emil Tesliuc, and Azedine Ouerghi, *For Protection and Promotion: The design and implementation of effective safety nets* (Washington, D.C.: The World Bank, 2008).
- Mellor, John W., and Sarah Gavian, "Famine, Causes, Prevention, and Relief," *Science*, vol. 235 (January 1987), pp. 539–45.
- Pinstrup-Andersen, Per, and Rajul Pandya-Lorch, *The Unfinished Agenda: Perspectives on Overcoming Hunger, Poverty, and Environmental Degradation* (International Food Policy Research Institute, Washington, D.C., 2001), especially Parts 1 and 2 (Available at IFPRI website: <http://www.ifpri.org/index1.htm>).
- Sen, Amartya K., *Poverty and Famines: An Essay on Entitlement and Deprivation* (New York: Oxford University Press, 1981).

- Siegel, Paul B., and Jeffrey Alwang, *An Asset Based Approach to Social Risk Management*. SP Discussion Series 9926, Human Development Network, Social Protection Unit, the World Bank, Washington, October 1999, 67 pp. UN Standing Committee on Nutrition, *Fifth Report on the World Food Situation: Nutrition for Improved Development Outcomes* (New York: United Nations, 2004), 143 pp.
- UNDP, *Human Development Report 2007–2008* (New York: Palgrave Macmillan Press, 2007).
- World Health Organization, *World Health Report 2005, Make Every Mother and Child Count* (Geneva: WHO Press, 2005), 252 pp.