CHAPTER 2

FOOD SECURITY, DIETARY DIVERSITY, AND BIODIVERSITY

Food and Nutrition Security in Developing Countries

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Outline

• Definition of the concepts of food security, dietary diversity, and biodiversity
• Different levels of food and nutrition security: global food availability, national food availability, household food security, and individual utilization
• Causes of food and nutrition insecurity
• Selected indicators of food and nutrition security
• Community-based actions to address food and nutrition insecurity

Objectives

At the completion of this chapter you should be able to:

• Understand the relationship among the following core concepts:
  • Poverty
  • Food security (global, national, household, and individual)
  • Vulnerability to food insecurity
  • Food availability
  • Food access
  • Food utilization
  • Sustainability
  • Nutrition security
  • Dietary diversity
  • Biodiversity
• Discuss in depth the characteristics of the different levels of food and nutrition security
• Explain the risk factors for and causes of food insecurity at the global, national, household, and individual levels
• Describe indicators of food and nutrition insecurity
• Discuss community-based actions to address food and nutrition security
1. INTRODUCTION

The concept of food and nutrition security has evolved over time. Formerly, the emphasis was purely on the physical availability of food at the global and national levels, but the focus has now shifted to the provision of nutritionally adequate food for individuals and the role of poverty reduction in sustained access to food.

The term “food security” originally focused solely on the availability of food. The underlying reasoning was that if governments ensure that enough food is available for feeding their populations, then hunger will disappear. However, this proved to be a false assumption. During the 1972–1974 food crisis, highly unstable food supplies and prices on the world market emerged as the main problem. This led to the realization that food availability at the national level did not automatically translate into food security at the household level. The concept of food security was thus broadened to include the need for households to have both physical and economic access to the national food supply. In addition, a distinction was made between chronic and transitory food insecurity, giving the concept of food security a temporal dimension. During the 1990s the concept of food utilization also became prominent, with the realization that food security must eventually be considered at the level of the individual. Furthermore, it was recognized that environmental hygiene, safe drinking water, and a sufficient supply of micronutrients were essential to “nutrition security” — that is, an individual’s right of access to nutritionally adequate food. Twenty-first century thinking on food and nutrition security situates the goal of decreasing hunger and malnutrition in the context of sustainable development. Addressing food insecurity thus necessitates a holistic approach that includes the global reduction of poverty (FAO, 2008a; Frankenberger & McCaston, 1998; Weingärtner, 2009). This objective is articulated in the first of the eight Millennium Development Goals of the United Nations, described in section 2.6 of Chapter 1: “Eradicate extreme poverty and hunger.”

2. DEFINING THE CONCEPTS

Food security is more than simply access to enough food to prevent death by starvation. The current understanding of food security accordingly emphasizes the quality of the diet — on the need for dietary diversity and for food that supplies the micronutrients necessary to create and sustain health. Poor people generally lack the resources to either produce or purchase adequate amounts of nutritious food. It therefore follows that poverty is the main cause of food insecurity.

2.1 Forms of Poverty

Because so many of the components of poverty are difficult to measure quantitatively, we tend to think of poverty purely in economic terms, as a lack of adequate wealth. For example, an individual who earns less than US$1 per day is defined as poor, as is a family whose combined income falls below the national poverty line (the minimum income needed by households to cover food and essential non-food expenses). But the concept includes other forms of deprivation. Poor people may, for example, have little or no access to education or to medical treatment when needed. They may lack political freedom or be rendered powerless by the social system within which they live. Any person who is unable to satisfy his or her basic needs is said to be in poverty.

Food poverty refers to a household’s inability to access a nutritionally adequate diet. The food poverty line is based on the per capita cost of purchasing a food basket that provides a balanced diet sufficient to meet the average dietary energy requirements (ADER). A household that cannot afford to spend even this amount is regarded as poor. Critical food poverty refers to the proportion of the population whose income is below that required to access enough food to meet the minimum dietary energy requirements (MDER).

Poverty leads to malnutrition, and malnutrition reduces people’s ability to learn, work, and care for themselves and their families. Thus, not only does poverty produce malnutrition, but a lack of adequate nutrition is itself an underlying cause of poverty.

2.2 Food Security

The Food and Agriculture Organization (FAO) of the United Nations defines food security as a condition that exists “when all people, at all times, have physical, social and economic access to sufficient, safe, and
nutritious food that meets their dietary needs and food preferences for an active and healthy life” (FAO, 2008a). Household food security refers specifically to food security at the family level, with the focus falling on individual members of a household (FAO, 2009). Conversely, food insecurity can be defined as the “limited or uncertain availability of nutritionally adequate and safe foods” as well as the “limited or uncertain ability to acquire acceptable foods in socially acceptable ways” (Bickel et al., 2000). Although food insecurity may simply be caused by the unavailability of food, it may also result from insufficient purchasing power, a lack of the resources required for local food production, and/or the inappropriate distribution or inadequate use of food. Food insecurity may be a chronic condition, or it may reflect seasonal variations in food availability (for example, food shortages prior to the harvest season) or to transitory circumstances.

The four basic elements of food security are as follows (Riely et al., 1999; Weingärtner, 2009):

1. **Food availability** is achieved when sufficient quantities of food are consistently available. Although the term availability can refer to food supplies at the household level, it generally refers to food supplies at the regional or national level. National food availability depends on domestic food production, commercial imports and exports, food aid, and domestic food stocks.

2. **Access to food** presumes physical access and depends on the household’s purchasing power and ability to secure foods from the market or from other sources, such as household gardens or in-kind transfers of food.

3. **Food utilization** refers an individual’s ability to derive the greatest possible nutritional benefit from food. Food utilization is fundamentally a biological process, dependent not only on the intake of sufficient nutrients but on an individual’s overall health status. But food utilization is also influenced by factors such as the quality and safety of food, its manner of preparation, hygiene and sanitation, an individual’s food habits and preferences, the intra-household distribution of food, and good feeding and caring practices.

4. **Stability, or sustainability,** refers to the temporal dimension of food security – that is, to the capacity to maintain the conditions necessary to food security.

To achieve genuine food security, all four elements must be present. Access to food obviously presupposes that food is available, but availability does not guarantee access. In turn, food access is necessary but, in itself, insufficient to ensure adequate food utilization. For effective food utilization, households need a diet that provides sufficient energy and nutrients, as well as safe drinking water and adequate sanitation. In addition, knowledge within the household of food storage and processing techniques, basic principles of nutrition, proper child care, and illness management is crucial to food utilization (Riely et al., 1999; Weingärtner, 2009).

### 2.3 Vulnerability to Food Insecurity

Vulnerability refers to the risk of food insecurity and, by extension, malnourishment. It is determined not only by the degree to which an individual or group is exposed to factors that place them at risk of becoming food insecure but also by their degree of resilience – their relative ability to cope with events that create instability. Like food insecurity itself, vulnerability may be a temporary condition, arising from changes in the surrounding environment over which people have little or no control, such as a drought, an earthquake, or a war. But vulnerability is very often structural, in the sense that the risk of food insecurity is built into the circumstances of people’s lives. Structural vulnerability results when people must live with conditions that place them at risk and that are either chronic or very slow to change – persistent difficulties in finding employment, for example, or the presence of debilitating health problems, such as HIV/AIDS. Such people are in a precarious position, which undermines their ability to cope with stress, that is, shifts in circumstances that threaten their already tenuous economic status or otherwise upset the balance of their lives. People who are food secure may be exposed to the same risks, but they are able to withstand them (FAO, 2002).

### 2.4 Nutrition Security

Nutrition security is a somewhat broader concept than food security. To achieve nutrition security, individuals need more than just access to sufficient, safe, and nutritious food. They must also have safe water and adequate sanitation; the ability to access health care services; and knowledge of sound household and community practices in child care, food storage and preparation, and hygiene (UNICEF, 1990).
Nutrition insecurity can present as various forms of malnutrition. The term *malnutrition* refers to a range of conditions that result from deficiencies, excesses, or imbalances in the consumption of macro- and/or micronutrients. Although we usually associate malnutrition with a *lack* of nutrition (that is, undernutrition), it can also occur in tandem with *overnutrition*.

- **Undernutrition** reflects an inadequate food intake – one that is deficient in energy, protein, and/or vitamins and minerals – or poor biological utilization of the nutrients consumed, mostly as a result of frequent infections.
- **Overnutrition** reflects overall excess (eating too much) or an excess of certain food components such as saturated fats and added sugars (eating too many of the wrong things) in combination with low levels of physical activity, typically resulting in overweight and obesity. Although individuals suffering from overnutrition are almost always food secure, they are not necessarily nutrition secure.
- **Hidden hunger**, also known as micronutrient malnutrition, occurs when the diet is deficient in essential micronutrients, i.e., vitamins and minerals.

Infants and young children (under the age of 5) and women who are pregnant and lactating tend to be the most vulnerable to both food and nutrition insecurity. Other vulnerable groups include female-headed households, elderly people, people who have disabilities, individuals living with HIV/AIDS, and victims of events such as natural disasters or civil conflict (Riely et al., 1999; Millennium Project Task Force on Hunger, 2004).

## 2.5 Overlap of Food Insecurity and Nutrition Insecurity

Food insecurity and nutrition insecurity are closely linked, as Figure 2.1 illustrates. The outer oval represents a nutritionally insecure population, with the ovals within that oval representing specific subsets of that population – the food insecure, the hungry, the undernourished, and the overnourished. The way in which these ovals overlap illustrates the relationships among these various subsets.

Figure 2.1: Overlapping concepts in the context of food and nutrition insecurity.  
*Source: Benson, 2008.*

The “Hungry” oval refers to people who are involuntarily hungry, whether chronically or temporarily. As the figure indicates, all people who suffer from hunger are food insecure (whether chronically or temporarily), but...
not all food insecure people are hungry. In other words, hunger is a potential, but not a necessary, consequence of food insecurity (Bickel et al., 2000).

The overlap of the “Overnutrition” oval with the “Food insecure” oval reflects emerging evidence that obesity is in some cases a result of moderately food insecure households relying on inexpensive foods that tend to be high in fat and energy but poor in nutrients. Many poor people simply cannot afford to consume a balanced diet (Benson, 2008). Instead, people in lower socio-economic groups drift towards poor-quality, energy-dense foods because these foods are cheap (Kennedy et al., 2004). The result is a rise in obesity even in food insecure populations. (For more on the relationship between diet cost and diet quality, see Chapter 19 in this volume.)

Mason (2003) illustrated a positive association between child growth and household food security. However, while the inverse may also apply, poor child growth is not necessarily caused by food insecurity: it can be due to non-food-related factors as well. This is illustrated in Figure 2.1 by the section of the oval representing the undernourished population that does not overlap with the food insecure oval.

### 2.6 Dietary Diversity

Dietary diversity refers to the variety of foods and/or food groups in the diet. It can be assessed at various levels: national, household, and individual. At the household and individual level, dietary diversity scores are the sum of the different foods or food groups consumed over a specified time period (usually 24 hours).

At the household level, dietary diversity scores are useful indicators of the household’s economic ability to access a variety of foods (Kennedy et al., 2011). For most countries, in both rural and urban settings a positive correlation exists between dietary diversity and household per capita income (Kennedy, 2004).

Consuming a variety of foods is needed to ensure a nutritionally adequate diet. Dietary diversity scores can thus be used at the individual level to reflect the nutritional quality of the diet (Steyn et al., 2006). Dietary variety should, however, not be equated with diet quality. For example, consuming a variety of foods that are high in energy may contribute to overweight and obesity. Poor households often cope with poverty by adopting monotonous diets that are based mainly on starchy staples with little or no animal products and few vegetables and fruit. Such diets may meet energy needs but tend to be low in micronutrients.

![Figure 2.2: Percentage of total dietary energy supply derived from starchy foods for a selection of developing and industrialized countries (2003 to 2005). Source: FAO, 2010a.](image-url)

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The same can be true at the national level. Figure 2.2 compares the percentage of the dietary energy supply derived from starchy foods (cereals, roots, and tubers) in a number of developing countries and in two industrialized countries, the United Kingdom and the United States. The percentage of energy derived from starchy foods is significantly higher in developing countries – in all cases more than half the total, in contrast to roughly a quarter in the US and a third in the UK. When starchy foods exceed 70% to 75% of the total energy supply, there is cause for concern (FAO, 2001). People who live in countries where, on average, more than 80% of dietary energy comes from starchy foods (Lesotho and Bangladesh, for example) are therefore very vulnerable to micronutrient malnutrition.

Food insecurity and the “nutrition transition” (see Chapter 4) are characterized by a decrease in dietary diversity. Increasing the variety of foods across and within food groups is more or less universally recommended, and many countries publish food guidelines that emphasize the need for dietary diversity (see Chapter 14). All the same, achieving dietary variety can be difficult for lower-income people and may be outright impossible for the very poor.

2.7 Biodiversity

Biological diversity, or biodiversity, refers to the range of variation visible in all the forms of life of a region, from genes to species to ecosystems. The broader the range, the greater the biodiversity. The term agrobiodiversity applies the concept of biodiversity specifically to food production. It refers to “the cultivated plants and animals that form the raw material of agriculture, the wild foods and other products that are gathered by rural populations within traditional subsistence systems, as well as organisms such as pollinators and soil biota that are key to sustainable agroecosystems” (Johns & Eyzaguirre, 2006, p. 183).

Agrobiodiversity is of great value to the world as it means that a wide variety of strains of seeds for growing food crops are available. These can help farmers to increase crop yields. In addition, having a wide selection of strains available might be of especial value to help grow foods when the climate is changing. Unfortunately, a gradual decline in the use of indigenous and traditional foods has resulted in a concomitant decline in agrobiodiversity. One danger this problem presents is that many potentially strains of seeds may be lost. A closely related problem is that we now have a narrower food base. Of the thousands of plant species available to humans, maize, wheat, and rice now supply the bulk of energy needs. Whereas wealthier countries are able to import foods from all around the world, in developing countries the shrinking food base simply translates into a more restricted diet. Interventions focusing on the revitalization and mobilization of indigenous and traditional food systems and the reintroduction of indigenous foods into diets can potentially affect food and nutrition security (Johns & Eyzaguirre, 2006).

3. LEVELS OF FOOD AND NUTRITION SECURITY

An individual’s nutrition security is the final step in a sequence of food production and distribution, from the availability of food globally and nationally to access to food at the household level. Figure 2.3 depicts the levels at which the concept of food security applies and what it entails at each of these levels.

3.1 Global Food Availability

Global food availability refers to the total amount of food that is produced globally. Currently, global food availability would be more than adequate to meet the energy needs of all the world’s people, provided the food were equally distributed. The reality is, however, that vast numbers of people remain undernourished – some 925 million as of 2010, according to FAO estimates (see Figure 2.4). Undernourishment (food deprivation), defined as dietary energy consumption below the minimum energy requirement (see Box 2.1), is an indicator of food insecurity. The FAO’s estimate for food deprivation is based on the food available to households, not the actual consumption by individuals. It also focuses on energy and provides limited information on the nutritional quality of the food.

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Figure 2.3: Conceptual framework of food security, from global availability to individual nutrition security.

Source: Smith et al., 2000; Oshaug & Haddad, 2002.

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Box 2.1: FAO Estimates of Undernourishment

The FAO uses three main parameters to estimate the number of undernourished people per country: (1) the average amount of food available for consumption per person as derived from food balance sheets, (2) the level of inequality in access to that food (obtained from household budget surveys), and (3) the energy requirements of an average person.

Food balance sheets contain information on the country’s food supply (local production plus imports) and utilization, which includes human consumption, livestock feed, and exports, during a specific reference period. The per capita supply available for human consumption (as energy, protein, and fat) is calculated simply by dividing the total amount by the total population.

The dietary energy supply (DES) per person per day reflects the food available for human consumption. It provides an indication of the adequacy of the food supply in terms of energy requirements (FAO, 2008d).

The vast majority (98%) of the world’s undernourished people live in developing countries. In absolute numbers, the region with the most undernourished people is Asia and the Pacific. However, Africa has the highest proportion of undernourished people, at 30% in 2010 (FAO, 2010e). South Asia has enough food, but close to 50% of the population lives in extreme poverty. In this region, food access is the major problem rather than food availability. In sub-Saharan Africa (SSA), poverty is widespread, suggesting severe food access problems, but at the same time food availability is also a major problem (Smith et al., 2000). Of the 47 countries that experienced a food crisis in 2007 that required emergency assistance, 27 were in Africa, while 10 were in Asia and the remaining 10 in other parts of the world (FAO, 2008b).

International targets have been set to reduce global food insecurity. The World Food Summit aims to halve the number of undernourished people between 1990–1992 and 2015. In contrast, the Millennium Development Goal is to halve the proportion of undernourished people between 1990 and 2015. However, because of rapid population growth, the absolute number of undernourished people could in fact increase. Between 1990–1992 and 2004–2006, for example, the proportion of undernourished people declined from 34% to 30% in SSA and from 25% to 23% in South Asia (see Figure 2.5). Yet, during this period, the actual number of undernourished people increased from 169 million to 212 million in SSA and from 286 million to 337 million in South Asia.

The globalization of food production and supply poses particular problems for developing countries, in the form of the nutrition transition, a topic discussed in Chapter 4. High-input, high-yield agriculture and long-distance transport increase the availability and affordability of foods rich in refined carbohydrates and edible oils. In addition, the globalization of culture and commerce fosters a Westernization of food systems and diets in developing countries. Modern food systems thus play an important role in the nutrition transition, resulting in the double burden of undernutrition and overnutrition within one and the same country (FAO, 2008b). Local production systems shift away from subsistence agriculture, and the orientation is increasingly towards markets for both the sale and the purchase of food (Johns & Sthapit, 2004). Global food security now depends on global food systems, which are geared towards large-scale commercial farming, the processing and packaging of food products, corporate concentration in retailing and distribution (brand names, large supermarkets), and the growth of urban populations, which rely almost completely on purchased food (Ericksen, 2008).
Figure 2.4: Undernourishment in 2010, by region (in millions).
Source: FAO, 2010e.

Figure 2.5: Food insecurity in South Asia and sub-Saharan Africa.
Sources: FAO, 2010b, 2010c.

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From the perspective of public health nutrition, it is imperative that we move beyond an emphasis solely on the availability of food energy, in the form of cereal production and global reserves sufficient to feed the world’s people. We must also focus on the distribution of food among countries – that is, on national food availability – and on the nutritional value of this food.

### 3.2 National Food Availability

*National (domestic) food availability* refers to the amount of food available for consumption by a country’s population. This supply of food consists of total agricultural production (cash crops, livestock, and food crops), net food imports (imports minus exports), food aid, and food stocks. Food availability at the national level can be obtained from food balance sheets compiled by the FAO per country. The per capita dietary energy supply reflects the adequacy of the national food supply relative to the nutritional requirements of the population (see Box 2.1).

In the regions most affected by food insecurity (notably SSA and South Asia), agriculture is a major component of household survival. Approximately half of the population in SSA live below the poverty line, and two-thirds derive their livelihood from the agricultural sector. Families in Africa generally lack access to information and modern technologies and, as a result, they must generally rely on relatively unsophisticated agricultural practices. In the face of modern population pressures, however, traditional agricultural techniques can prove insufficiently productive and may lead to the depletion of natural resources (World Bank/IFPRI, 2006).

A country is self-sufficient if it is able to produce 100% (or more) of its national food requirements. The food self-sufficiency ratio (SSR), which is usually calculated for specific food commodities, represents the percentage of the overall supply of a given commodity that is domestically produced. A SSR of 100% indicates that the country is self-sufficient with regard to a specific food commodity, whereas a figure below 100% indicates the need to import the shortfall. Few countries are entirely self-sufficient, and most countries achieve adequate food supplies (also known as food self-reliance) through a combination of domestic production and imports. Developing countries therefore need the capacity to generate foreign exchange to enable them to buy foods from the world market, which, in turn, needs to offer a reliable source of affordable food supplies (Konandreas, 2000).

### 3.3 Household Food Security

#### 3.3.1 Access to food supply

Sufficient amounts of food may be available at the national level, but people must have both physical and economic access to this food. Unless they are able to generate enough food on their own to provide a balanced diet, they must be able to reach a place where food is available. Once they reach a marketplace, they must have enough money (or the equivalent in food vouchers) to buy food. A household’s ability to grow, gather, purchase, and store food is influenced by geographic location and by socio-economic status, and it can vary over time (Riely et al., 1999).

National food security is a prerequisite but no guarantee of household food security. South Africa is an example of a country that has sufficient food supplies at the national level yet a significant proportion of the population has inadequate access to food. High unemployment rates, an inadequate social welfare system, and high HIV infection rates all contribute to household food insecurity (du Toit et al., 2011).

*Physical access.* Households need physical access to a place where food is available. Households typically obtain food through

- producing their own crops or livestock for consumption,
- purchasing from markets,
- receiving food as a transfer from relatives, members of the community, the government, or foreign donors, and
- gathering in the wild (Riely et al., 1999).
Physical availability of food relates to local production, agricultural productivity, and the ability of markets to deliver food to consumers and agricultural inputs to farmers. In developing countries, availability through local food production is often affected by low agricultural productivity, seasonality, and inadequate adoption of appropriate technologies. In addition, people’s physical access to food is often restricted by inadequate infrastructure, such as roads, railways, and markets. Remote areas are particularly affected by difficulties in transportation and inadequacies in the food distribution markets (Millennium Project Task Force on Hunger, 2004).

**Economic access.** Regardless of the source of food, households must have the means to acquire appropriate foods. Economic access therefore refers to the affordability of food to the consumer. The majority of people worldwide, including those in low-income countries, obtain at least part of their food through markets. Households’ ability to purchase food depends on the households’ income and the price of food; factors that affect either food prices or household income influence people’s ability to buy food. Low-income households are more vulnerable to higher food prices because they spend a higher share of their income on food. In some of the lowest-income countries, households may spend as much as 60% of income on food, versus 15% or less for households in high-income countries (FAO, 2008b).

From 2006 to 2008, a sharp increase in the fuel price resulted in sharp increases in food prices. This was followed by a global economic recession during which real wages and household incomes decreased, jobs were lost, credit was cut, and remittances dropped. As a result, between 2003–2005 and 2009, the number of undernourished people globally increased from 848 million to 1.02 billion (von Grebmer et al., 2009). The increasing demand for crops such as maize and sugar cane in the production of biofuel also contributed towards high food prices (FAO, 2008c). The number of undernourished people declined to 925 million in 2010 (FAO, 2010e).

**Box 2.2: Households’ Coping Strategies During Periods of Food Shortage**

Households respond to a shock or a shortfall of food through consumption coping strategies and/or livelihood coping strategies. *Consumption coping strategies* refer to the immediate and short-term adjustment of food consumption, which can be reversed later. Generally, there are four types of consumption coping strategies:

- **Dietary change:** Households change their diet by eating cheaper and less preferred foods.
- **Food seeking:** Households attempt to increase the amount of food available through short-term, temporally non-sustainable strategies such as borrowing food, purchasing food on credit, begging for food, consuming wild foods, and consuming seed stocks intended for the next season.
- **Household structure:** Households reduce the number of people that they have to feed in the short term by sending some household members elsewhere.
- **Rationing:** Households attempt to manage the shortfall, e.g., by limiting portion sizes, reducing the number of meals, favouring certain household members over others, and not eating for whole days.

In contrast to the above, *livelihood strategies* include the longer-term alteration of income earning or food production patterns, and once-off responses such as selling assets. There are two types of assets: *liquid assets*, such as savings or jewellery, and *productive assets* are those important for generating income. Examples of livelihood strategies include the following:

- **Re-allocating resources to reduce risk,** e.g., during drought the household moves from crop production to non-farm wage employment
- **Selling assets,** which reduces future earning potential
- **Relying more on loans or transfers,** and less on current crop production and market purchases to meet immediate food needs
- **Participating in income-generating activities,** particularly by women
- **Migrating to areas where there are more job opportunities,** or back to the village or country of origin
- **Borrowing from formal or informal markets,** which reduces future earning potential and increases risks
Reducing expenditure on health, education, and durable and semi-durable goods so as to maintain expenditure on food, which may negatively affect health and development and thereby reduce future earning potential.

Sources: FAO, 2009; Maxwell et al., 2003; Maxwell & Frankenberger, 1992.

Socio-political access. Various social and political factors affect household food security. Households in developing countries may, for example, have unequal access to food because of unequal social conditions and exclusionary practices. Social conflict can also threaten the food access of affected people.

In many developing countries, gender inequality contributes to hunger. In conditions of gender inequality, women and girls are more poorly nourished throughout the life cycle, show higher rates of mortality, have less access to health care, and are subject to greater household food insecurity (ACC/SCN, 2004). Lower literacy rates and access to education for women are associated with higher rates of hunger (von Grebmer et al., 2009). Reducing gender disparities in key areas, particularly in education and health, and empowering women are essential for reducing poverty and hunger (see Box 2.3).

Box 2.3: Three Pillars to Achieve Gender Equality and Women’s Empowerment

The International Fund for Agricultural Development (IFAD) defines the following three pillars of gender equality:

**Economic empowerment:**
Improving women’s access to income-earning opportunities and productive assets

**Decision-making:**
Increasing women’s say in community affairs and strengthening women producers’ organizations

**Well-being:**
Improving access of rural people, especially women, to basic services and infrastructure


3.3.2 Access to an adequate food supply

The quality of food is a complex characteristic that determines its value or acceptability to the consumer. Beside the nutritional value of food, quality includes safety, organoleptic characteristics (such as appearance, colour, texture, taste), and functional properties. Food should also be culturally acceptable to the consumer.

**Nutritional adequacy.** The concept of *nutritionally adequate food* is an important part of the current definition of household food security. The adequacy of the diet should be considered quantitatively and qualitatively. The quantity of food consumed should be sufficient to fulfil the energy requirements, while the quality of the diet should address macro- and micronutrient requirements. The diet should thus include a variety of foods that are adequate in energy, protein, and vitamins and minerals. Besides the cereal-based staple foods, the diet should contain legumes, vegetables, fruit, and food of animal origin. Poor people may, however, lack the ability to access a large variety of foods. The findings of a national survey done in South Africa showed that households with low dietary diversity were the most impoverished (Labadarios et al., 2011).

**Food safety.** Microbiologically unsafe food increases the risk of food-borne infections, leading to, for example, diarrhoea. Food should be free from possibly harmful contaminants, parasites, and toxins (see Chapter 24).

During the last few decades, the street food sector – ready-to-eat food prepared and/or sold by vendors or hawkers – has expanded rapidly and represents a significant part of food consumption for millions of low- and middle-income urban consumers in developing countries. This food sector also provides job opportunities for
many people. Practising food hygiene at street level can be difficult in settings with low environmental and sanitary standards. Street foods are therefore a public health concern, especially regarding microbiological contamination. General guidelines for street foods are available (FAO/WHO, 1997).

Socio-cultural acceptability. Food and food practices reflect the social and cultural diversity of people and play a symbolic role in people’s lives. Food culture is a set of behaviours related to food that characterize a particular social group or culture, that is passed on from one generation to the next. Social and cultural factors, religious beliefs, and food preferences and taboos within communities all affect households’ access to food.

3.3.3 Access to a stable food supply

Stability, or sustainability, refers to the time frame over which food security is considered. Food insecurity may be a short-term (transitory) experience, longer-term, or even lifelong (chronic) condition. Transitory food insecurity can be either cyclical (e.g., seasonal) or temporary (e.g., the result of a drought or flood) (Maxwell & Frankenberger, 1992; FAO, 2008a).

In many parts of the tropics, food security has a strong seasonal dimension, with hunger being highest during the growing season because (1) farmers are unable to grow enough food for year-round consumption, (2) farmers lack the knowledge, technology, and equipment needed to store food for the hungry season, and (3) farmers and their families are unable to find employment in the non-farming sector to supplement their income and buy food from the market (Millennium Project Task Force on Hunger, 2004). For example, in Dinajpur, an urban area of Bangladesh, households showed higher rates of food insecurity and malnutrition during the monsoon season because of (1) an increase in morbidity during the rainy season, (2) a decrease in food availability during the pre-harvest season, and (3) fluctuating demand for female labour and its impacts on caring practices (Hillbruner & Egan, 2008).

To achieve food and nutrition security, food supply needs to be stable throughout the year and, equally importantly, sustainable over time. A host of economic, social, and environmental factors affect food security, and there are complex interactions between these factors. The three Ps – poverty, people, planet – can be linked to the economic, social, and environmental aspects of sustainable development. Thus protecting and enhancing the natural environment, including the biodiversity it contains, in such a way that future generations can also enjoy and utilize it is part of creating sustainable food security.

An increase in the efficiency and productivity of food systems is believed to reduce hunger and improve nutrition. Yet aspects of food systems can pose threats to the social, economic, and environmental pillars of sustainability, and can therefore undermine sustainable food security (see Box 2.4). Sustainable systems are those that make the best use of environmental goods and services while not damaging these assets (Pretty, 2008).

3.4 Individual Utilization

If sufficient and nutritionally adequate food is available and accessible, the household has to decide what food to purchase, prepare, and consume. Choice is determined by knowledge, culture, food preferences, and habits, and it affects food safety and caring practices.

Physiological access relates to the body’s ability to use nutrients for growth and development. Infection reduces the physiological access to ingested nutrients. A healthy physical environment, including safe drinking water and sanitary facilities, is critical to avoid diseases. In the absence of good care and a healthy and clean environment, availability of and access to food will not translate into nutrition security. Also, an understanding of proper health care, food preparation, and food storage processes is needed.

Box 2.4: The Green Revolution

The introduction of high-yield varieties of seeds and the increased use of fertilizers, pesticides, and irrigation are known collectively as the Green Revolution. In Asia cereal production doubled in Asia between 1970 and 1995, while cereal and energy availability per person increased by nearly 30%, and wheat and rice became cheaper.
The Green Revolution resulted in a significant increase in the agricultural productivity needed to make India self-sufficient in food grains. The Green Revolution technologies were, however, either too expensive or inappropriate for most of Africa, and they had limited impact in sub-Saharan Africa because of poor infrastructure, high transport costs, limited investment in irrigation, and pricing and marketing strategies that penalized farmers.

Although the Green Revolution helped large numbers of people to escape poverty and hunger, it also caused environmental damage because of excessive and inappropriate use of fertilizers and pesticides, and inappropriate irrigation practices. It further relied on a few major cereal varieties, which lead to a loss of biodiversity on farms.


3.5 Relative Role of the Different Dimensions of Food and Nutrition Security

The relative contribution of the three determinants of food security – availability, accessibility, and utilization – varies over time across and within settings, in response to economic crises, civil disturbances, or natural disasters. Kiess et al. (2001) used the term choice instead of utilization, reasoning that when accessibility and availability are ensured, utilization primarily represents household and individual choices, for food, health care, and other opportunities. Kiess et al. (2001) illustrated the relative contribution of the three determinants of food security in different settings using the examples of Bangladesh and Indonesia (see Box 2.5).

Box 2.5: Determinants of Food and Nutrition Security

**Bangladesh**

Availability of nutritionally adequate food, particularly foods of animal origin, fruits, and vegetables, is a major problem in rural areas. More than 35% of the Bangladeshi population fall below the poverty line. As a result, accessibility is also a major constraint for achieving food security. In this situation, food utilization (or food choice) is a minor determinant of food security.

**Indonesia**

Before the Asian economic crisis, availability and access to food were generally less important determinants of food security in Indonesia. The economic crisis in Indonesia in mid-1997 increased prices of food and other commodities and reduced employment opportunities. This lowered real income and purchasing power, making accessibility a more prominent determinant of food security.

**Developed countries**

Food availability and access is generally not a problem in developed countries, and food utilization (choice) is by far the biggest determinant.

Source: Kiess et al., 2001.
4. CAUSES OF FOOD AND NUTRITION INSECURITY
People are food secure when their consumption of food is sufficient, secure (not vulnerable to shortfalls), and sustainable. Therefore, factors affecting the sufficiency, security, and sustainability of foods consumed will affect food and nutrition security. The causes of food and nutrition insecurity differ between regions, and this is illustrated by, for example, the contribution of the different components to the Global Hunger Index (GHI), which is used by the International Food Policy and Research Institute (IFPRI) to measure hunger in countries. The GHI includes three equally weighted hunger-related indicators: (1) the proportion of the population which is undernourished (reflecting food deprivation or hunger; see Box 2.2), (2) the prevalence of underweight in children under the age of five, which reflects childhood malnutrition, and (3) the under-five mortality rate, which is partially a reflection of the fatal synergy between inadequate dietary intake and unhealthy environments. The index ranks countries on a 100-point scale, ranging from 0 (no hunger) to 100 (worst-case scenario), though neither of these extremes is achieved in practice (von Grebmer et al., 2009).

Regions with the highest food insecurity scores are South Asia (GHI of 23.0) and SSA (GHI of 22.1). The causes of food insecurity in these two regions differ. In South Asia, the prevalence of underweight in children under the age of five dominates, reflecting the low nutritional, educational, and social status of women. In contrast, in SSA, low government effectiveness, conflict, political instability, and high rates of HIV/AIDS are reflected in the high child mortality and high proportion of undernourished people (von Grebmer et al., 2009).

The causes of food and nutrition insecurity all relate to either insufficient national food availability or insufficient access to food by households and individuals.

4.1 At the National Level
Several global risks can potentially impact the availability of food at the national level. These include high and volatile food prices, financial and economic shocks, climate change, and epidemic outbreaks of human disease and crop and livestock disease (von Braun, 2009). Access to food within a country is affected by a range of factors: the general social, economic, and political environment prevailing at national level; the presence of natural shocks or conflict; the quality of commercial and trade policies; the commitment of the political leadership to hunger reduction; and the prevalence of institutions that enable participation of women and marginal groups in decision-making processes that affect their future (Millennium Project Task Force on Hunger, 2004).

Shocks at the community level can be either natural disasters or man-made disasters. Natural disasters are either “slow onset” (e.g., drought) or “sudden onset” (e.g., floods, cyclones, hurricanes, earthquakes; see Box 2.6). Man-made disasters are generally related to political instability, civil war, and ethnic conflicts, or to socio-economic crises (FAO, 2008b).

Box 2.6: Food Security Implications of the 2010 Haiti Earthquake

Haiti is the poorest country in the western hemisphere. More than half of the population are undernourished and live on less than US$1 per day. On January 12, 2010, a powerful earthquake struck Haiti. Early predictions were that an estimated 210,000 people were killed, 200,000 injured, 2 million in need of food aid, and 1.1 million in acute need of emergency shelter.

The earthquake caused destruction of productive assets and infrastructure. This led to widespread unemployment, which affected food security because of loss of income and purchasing power. Household income was also affected by the death or injury of income providers. Damage to hospitals and health centres resulted in a shortage of health care, thereby reducing the income earning capacity for injured populations. Compounding this, those in need of health care needed to travel long distances for care; the high cost of this reduced those resources that would normally be devoted to food and agriculture.

Displacement of large numbers of people to rural and urban areas outside of the metropolitan area exerted additional pressure on available food, natural resources (e.g., firewood), and the degraded soil, particularly in areas that under normal circumstances already experienced chronic food insecurity.

4.2 At the Household and Individual Level

Shocks at the household level include shocks in production (e.g., harvest failure), market (e.g., lost employment), or household expenditure (e.g., emergency medical costs resulting in less money available for food).

HIV/AIDS and food and nutrition security are becoming increasingly entwined in a vicious cycle. Food insecurity increases susceptibility to HIV exposure and infection, while HIV/AIDS exacerbates vulnerability to food and nutrition insecurity. SSA is the region most heavily affected by HIV/AIDS, with a total number of 22.4 million living with HIV in 2008. In this region, women are more vulnerable to HIV than men and account for approximately 60% of HIV infections (UNAIDS, 2009). Agriculture is the main source of livelihood for many people in SSA, with approximately 80% of subsistence farmers being women. Subsistence farmers in the region are particularly vulnerable to the impact of HIV/AIDS because the disease reduces the resources available for agriculture, specifically available labour, as a result of sickness, premature death, or caring for the ill. Additionally, less money is available and assets are sold because of medical and funeral costs. This reduces the household’s ability to buy food. In addition, households affected by HIV often switch to a monocrop system (producing only one crop, rather than a variety of crops) or shift from labour-intensive crops, such as vegetables, to less labour-intensive crops, such as roots. As a result, the household has less access to a variety of nutritious foods. The negative impact of AIDS on food security also occurs by way of long-term processes embedded in social, economic, and cultural systems. The long-term effects of HIV/AIDS decrease the household’s resilience to other shocks, thereby increasing the household’s vulnerability to food insecurity (Gillespie, 2008).

5. SELECTED INDICATORS FOR FOOD AND NUTRITION SECURITY

Food security is a complex and multidimensional concept for which there is no single, direct measure. Multiple or composite indicators are needed. Which indicator(s) to use depends on the level of food security (global, national, household, individual; see Figure 2.3) as well as the dimension (availability, accessibility, utilization, sustainability) of interest. Food security indicators can be either process or outcome indicators (Maxwell & Frankenberger, 1992).

Process indicators reflect food supply and food access, and some degree of vulnerability. Indicators reflecting food supply generally provide information on agricultural production, access to natural resources, institutional development and market infrastructure, and exposure to regional conflict or its consequences. Socio-economic data reflect the household’s access to food, although these indicators are location-specific (Maxwell & Frankenberger, 1992).

Outcome indicators are a proxy for food consumption, either directly or indirectly. Direct indicators of food consumption are, for example, food expenditure (household budget and consumption surveys), household perception of food security, and food frequency assessments. Indirect indicators include, for example, assessment of nutritional status. Nutritional status indicators do not always correlate directly with food availability and access because nutritional status is a result of several factors beyond food consumption (Maxwell & Frankenberger, 1992; Riely et al., 1999). Issues that need to be considered when selecting indicators for measuring food security, as well as for monitoring and evaluating food security programmes, are given in Box 2.7.

The Committee on World Food Security identified (1) core food security and nutrition status indicators for monitoring progress towards the World Food Summit goals on a global level, and (2) additional indicators relating to the food economy for monitoring the extent to which availability, stability, and access targets are being met (FAO, 2002). A short description for each of these indicators is given in Table 2.1. Many of the indicators listed in Table 2.1 are collected at the national level and not directly relevant to the community nutritionist. However, awareness of and ability to interpret these indicators is important for understanding food and nutrition security of communities, households, and individuals. In Table 2.2, some indicators applicable to community-level assessment are given. The indicators of nutritional status listed in Table 2.1 can also be applied in communities.
Box 2.7: Issues Surrounding the Selection of Food and Nutrition Security Indicators

Relevance and information use:
Indicators should be relevant to (1) local conditions and the food security context, and (2) when used to monitor and evaluate programmes, to the objectives, structure, and implementation plan of the specific programme. The indicators and the intended uses of the information should match.

Accuracy:
How close the defined variable is to, for example, the actual situation.

Credibility:
Indicators should be (1) universally understood and based on accepted practice and theory, (2) objective, (3) controllable, to minimize measurement errors, (4) precise (i.e., reliable, so repeated measurements under specified conditions should agree), and (5) of a defined and acceptable margin of error and confidence level.

Resources/cost:
Indicators must be feasible within resource constraints such as time, personnel, and logistics of data collection, processing, and analysis.

Comparability:
Comparisons between regions, programmes, or over time require that indicators are conceptually equivalent and are applied in the same way.

Time sensitivity/timeliness:
When used to evaluate programmes or show trends, indicators should be able to show change within the time frame of the programme.

Sources: Maxwell & Frankenberger, 1992; Riely et al., 1999.

Table 2.1: Selected indicators for food and nutrition security

<table>
<thead>
<tr>
<th>1. Food Security and Nutritional Status Indicators (Core Indicators)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1.1 Food consumption</strong></td>
</tr>
<tr>
<td>Average per person dietary energy supply (DES) (indicator of global, regional, and national food supply)</td>
</tr>
<tr>
<td>Cereals, roots, and tubers as percentage of the DES (provides information about the quality of the average diet of the population)</td>
</tr>
<tr>
<td>Percentage of population undernourished (indicator of national, regional, or global food insecurity)</td>
</tr>
</tbody>
</table>
### 1.2 Health status

<table>
<thead>
<tr>
<th>Metric</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Life expectancy at birth (indicator reflecting environmental and living conditions in a country, the health of its people, and the quality of health care)</td>
<td>The number of years a newborn infant would live if prevailing patterns of mortality at the time of birth were to stay the same during its lifespan. Life expectancy is lowest in countries with the highest prevalence of undernourishment.</td>
</tr>
<tr>
<td>Under-five mortality rate</td>
<td>The probability that a newborn baby will die before reaching age five, if current living conditions stay the same, expressed as per 1000 live births.</td>
</tr>
</tbody>
</table>

### 1.3 Nutritional status

[Nutritional status indicators reflect the consequences of prolonged food insecurity as well as the utilization dimension of food security, but do not consider the determinants of food insecurity as such.]

<table>
<thead>
<tr>
<th>Metric</th>
<th>Description</th>
</tr>
</thead>
</table>
| Proportion of children under 5 years of age that are underweight, stunted, or wasted (indicator of nutrition security) | Low weight-for-age (underweight)  
Low height-for-age (stunting) – measure of chronic malnutrition indicating general deprivation and poverty; quality of the diet often a bigger problem than quantity consumed  
Low weight-for-height (wasting) – measure of acute malnutrition due to an energy-deficient diet and/or chronic infections |
| Percentage of adults with body mass index (BMI) <18.5 (indicator of nutrition insecurity) | Low weight-for-height (underweight) – adults suffer from thinness as a result of inadequate energy intake and/or severe illness |

### 2. National Food Economy Indicators (Additional Indicators)

#### 2.1 Economic conditions

<table>
<thead>
<tr>
<th>Metric</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross national product (GNP) per capita</td>
<td>The market value of a country’s final output of goods and services produced in one year divided by the total population</td>
</tr>
<tr>
<td>Growth in GNP per capita</td>
<td>The change in GNP per capita over a period, expressed as a percentage of GNP at the start of the period</td>
</tr>
<tr>
<td>GNP per capita at purchasing power parity</td>
<td>Purchasing power parity (PPP) is a measure of the relative purchasing power of currencies of different countries for the same types of goods and services.</td>
</tr>
</tbody>
</table>

#### 2.2 Food availability

<table>
<thead>
<tr>
<th>Metric</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food production index by country</td>
<td>Based on the sum of price-weighted quantities, after deducting similarly weighted quantities of seed and feed</td>
</tr>
<tr>
<td>Volume of production, food use, trade, and stock changes for major food commodities, by commodity group and by country grouping</td>
<td>Obtained from food balance sheets</td>
</tr>
<tr>
<td>Ratio of the five major grain exporters’ supplies to requirements</td>
<td>A measure of the ability of the five major grain exporters to meet the import demand for wheat and coarse grains; ratio of the sum of local production, imports, and opening stocks to the sum of their domestic utilization of grains plus exports</td>
</tr>
</tbody>
</table>
2.3 Food access

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gini coefficient of income distribution</td>
<td>A measure of income inequality, with a range from 0 (perfect equality) to 1 (perfect inequality). A low Gini coefficient indicates a more equal distribution, while a higher Gini coefficient indicates more unequal distribution.</td>
</tr>
<tr>
<td>People living below national poverty line</td>
<td>The poverty line is the minimum income needed by a household to cover food and non-food expenses.</td>
</tr>
<tr>
<td>People living on less than US$1 per day</td>
<td>Indicator of poverty (and therefore economic lack of access to food)</td>
</tr>
</tbody>
</table>

2.4 Stability of food supplies and access

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Index of variability of food production</td>
<td>Total country production of food crops that are considered edible and that contain nutrients</td>
</tr>
<tr>
<td>Food price index</td>
<td>Change in the cost to the average consumer of acquiring a fixed basket of food</td>
</tr>
<tr>
<td>Changes in cereal production in low-income food deficit countries (with and without China and India)</td>
<td>Aggregate cereal production of some 80 low-income food deficit countries (countries which are considered to be the most vulnerable to fluctuations in food supplies and international prices). This indicator can be heavily affected by production in China and India; two different indicators are therefore measured – one including China and India, and the other excluding China and India.</td>
</tr>
<tr>
<td>Export price movements for wheat, maize, and rice</td>
<td>Monitors the international price for the three major cereals</td>
</tr>
</tbody>
</table>

2.5 Risks, hazards, and shocks

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of countries facing food emergencies</td>
<td>Identifies “hunger hotspots.” A food emergency can be due to either natural or man-made disasters. thus the indicator also takes into account which countries are receiving food assistance.</td>
</tr>
</tbody>
</table>

Sources: Smith et al., 2000; Maxwell et al., 2003; Millennium Project Task Force on Hunger, 2004; FAO, 2001; FAO, 2008a.

Table 2.2: Selected community indicators of food and nutrition security

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Household dietary diversity score (HDDS) (indicator of households’ economic ability to access a variety of food)</td>
<td>Kennedy et al., 2011</td>
</tr>
<tr>
<td>Individual dietary diversity score (indicator of nutrient adequacy)</td>
<td>Kennedy et al., 2011</td>
</tr>
<tr>
<td>Household Food Insecurity Access Scale (HFIAS) (indicator of households’ access to food)</td>
<td>Coates et al., 2007</td>
</tr>
<tr>
<td>Community Childhood Hunger Identification Project (CCHIP) hunger index</td>
<td>Frongillo et al., 1997</td>
</tr>
<tr>
<td>Radimer/Cornell hunger scale</td>
<td>Frongillo et al., 1997</td>
</tr>
<tr>
<td>Months of Adequate Household Food Provisioning (MAHFP) (indicator of household’s access to food over seasons)</td>
<td>Bilinsky &amp; Swindale, 2010</td>
</tr>
<tr>
<td>Coping strategy index (indicator of households’ behaviour during periods of food shortage)</td>
<td>Maxwell &amp; Caldwell, 2008</td>
</tr>
</tbody>
</table>

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To eradicate hunger, we need to (1) target people and areas suffering from hunger, (2) identify the causes of hunger, and (3) take remedial action to improve the situation. The Food Insecurity and Vulnerability Information Mapping System (FIVIMS) initiative (see www.fivims.org) was launched after the 1996 World Food Summit in Rome to better inform decision-makers about food insecurity and vulnerability. The approach used to establish a national FIVIMS is flexible, and depends on the country’s needs and priorities. The following important questions should be included in a national FIVIMS:

- Who are the food insecure and vulnerable people in the country?
- Where are they located?
- How many are they?
- How severe is their hunger?
- What are their livelihood systems?
- Why are they in this condition?
- What can be done about it? (FAO, 2002)

6. COMMUNITY-BASED ACTIONS TO ADDRESS FOOD AND NUTRITION INSECURITY

Policies at the national level, food aid programmes implemented during emergencies, and purely agricultural interventions are all important but are not discussed in this chapter.

This section focuses on community-based interventions or actions of interest to the community nutritionist. Interventions to strengthen food security must ensure the complementarities and synergies between food availability, access, and utilization. These interventions should therefore focus on actions to improve the households’ physical, economic, social, and physiological access to food. Details on how to implement community-based interventions are discussed in Chapters 16 and 17.

Community-based interventions to improve household food availability and dietary diversity are considered sustainable solutions to address household food and nutrition insecurity in developing countries. In these interventions, household food availability is increased through local production, thereby increasing the household’s access to diverse and micronutrient-rich foods. Such programmes can also lead to reduced household poverty, improved nutritional status of household members, and potentially empower women (see Box 2.8).

Food-based strategies at the community level generally focus on the production of nutritious food for household consumption. These strategies have the potential for income generation, provided that households produce a surplus and have easy access to markets at which to sell their produce (Low et al., 2007). Economically viable post-harvest products could further enhance market possibilities for locally produced crops (Low & van Jaarsveld, 2008).

To ensure that the gardening activities translate into improved dietary quality, home-gardening projects need to include a strong nutrition education and behaviour change component (Ruel, 2001) (see Chapter 15). Various entry points can be used for nutrition education and promotions. Community-based growth monitoring (see Box 2.9) and schools are examples.

School-based projects can be used to (1) promote consumption of fruits and vegetables, (2) teach learners how to establish and maintain home gardens, (3) introduce learners to food preparation and storage techniques, (4) provide nutrition information and thereby encourage learners to adopt more healthy dietary habits, and (5) stimulate the interest of learners in agriculture and nutrition (Bokeloh, 2009). The manual Setting Up and Running a School Garden is available at http://www.fao.org/docrep/009/a0218e/a0218e00.htm.

The best choice of intervention depends on the nature and the magnitude of the problem. A situation assessment prior to the intervention will indicate which elements of food insecurity are involved and who is affected. Analysis of the underlying causes of food and nutrition insecurity should be the core of any sustainable intervention that aims to prevent recurrence and does not create dependency.
Box 2.8: Homestead Food Production Programme in Asia

The homestead food production programme has been implemented by Helen Keller International (HKI) in Bangladesh, Cambodia, Nepal, and the Philippines in partnership with local non-governmental and governmental organizations.

Village model farms (VMF) are established to serve as (1) training and demonstration centres on improved agricultural techniques, technologies, and poultry production activities and (2) production centres for agricultural inputs such as low-cost quality seeds, seedlings, saplings, and chicks. VMF owners provide support to participating households, typically about 20 households per VMF owner, and these households are divided into two smaller groups to facilitate collaboration among households.

Households are assisted in establishing home gardens (growing a variety of vegetables and fruit) and small animal husbandry, mainly poultry. Linkages with local health and agriculture structures are established to provide additional services to the households and to capacitate local partners to provide sustained technical assistance after the three-year project cycle.

Nutrition education sessions at the village level focus on healthy eating during pregnancy and lactation, and optimal feeding of infants and young children. Dietary diversity and consumption of micronutrient-rich foods are also addressed. Cooking demonstration sessions are held that use locally grown foods.

From 2003 to 2007, the programme was implemented among approximately 30,000 households. Evaluation of the programme revealed the following:

- Improved availability and consumption of vegetables, fruits, and animal foods (egg and liver) in participating households
- Reduction in the prevalence of anaemia among women and children in some of the countries
- Increase in household income as a result of the food production activities
- Improved involvement of women in decision-making


Box 2.9: Community-based Growth Monitoring: The Ndunakazi Project

In the Ndunakazi project in South Africa, community-based growth monitoring activities served as a platform for the promotion and implementation of a home-garden project that focused on provitamin A-rich crops.

Growth monitoring sessions were held in households. Demonstration gardens, which served as training centres for gardening activities, were established at each growth monitoring site. During the monthly growth monitoring sessions, promotion of household production and daily consumption of vegetables and fruits rich in provitamin A was achieved through

- education on vitamin A nutrition,
- cooking of locally produced provitamin A–rich vegetables, and
- demonstrations of the planting process in the demonstration garden.

Many of the mothers were not familiar with the provitamin A–rich vegetables, and the vegetables cooked on growth monitoring days were used to (1) introduce the mothers and children to these vegetables, (2) teach the mothers various ways of preparation, and (3) give mothers the opportunity to observe their children eat and enjoy it. The latter motivated the mothers to plant and prepare these vegetables at home.

Sources: Faber et al., 2006; Faber et al., 2002.

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DISCUSSION AND REFLECTION QUESTIONS AND EXERCISES

1. Brainstorm and discuss factors that can put people in your country or community at risk of food insecurity. Group these factors into natural, economic, political, health, and technological risk factors. Can you also group these factors into national, community (household), and individual levels?

2. Consider this statement: “Different methods for assessing food security will give different results.” Explain and discuss the implications of this for policy-makers, researchers, and community nutritionists.

3. Compile a list of resources and services available in your community that could be mobilized and/or accessed for addressing household food insecurity.

4. Discuss the roles and responsibilities of (a) the state, (b) community and public health nutrition practitioners, and (c) citizens in addressing food (in)security.

5. Reflect on the following statement: “Poverty drives ecological deterioration when desperate people overexploit their resource space, sacrificing the future to salvage the present.”

6. Discuss the cartoon and its implications for food security.

7. Explain how a nuclear accident like the one in Fukushima, Japan, in 2011 is linked to food and nutrition security. Consider the different levels and the temporal aspects of food and nutrition security.

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**ADDITIONAL RESOURCES**


Food Insecurity and Vulnerability Information and Mapping System (FIVIMS). Available at: http://www.fivims.net.


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