

Chapter Two

Food Security and Nutrition: Linkages and Complementarities



Marie Ruel

Division Director of Food Consumption and Nutrition Division, International Food Policy Research Institute (IFPRI) Washington DC, USA



“If we can conquer space, we can conquer childhood hunger.”

Buzz Aldrin

Key messages

- Food security and nutrition security are related but distinct concepts.
- Food security refers to having enough of the right foods at all times, and depends on the availability of food globally and locally, and on the household's and individual's access and proper utilization.
- Good nutrition (or nutrition security) also requires having enough of the right foods, but in addition, it requires having access to adequate feeding, caregiving and hygiene practices, as well as access to health, water and sanitation services. Nutrition security thus depends on having access to a healthy diet which provides all nutrients required for a healthy life, and being healthy so that the body can make optimal use of these nutrients for its different functions.
- Food security is necessary, but not sufficient, to ensure nutrition and to prevent childhood malnutrition. Children also need their caregivers to provide them with appropriate feeding, caregiving, hygiene, and health-seeking practices in order to grow, develop and stay healthy.
- Infants, young children, pregnant and breastfeeding women are especially vulnerable to malnutrition; nutrition interventions must focus on the critical 'First 1,000 Days' window of opportunity.
- Achieving food and nutrition security is a multi-faceted challenge which requires a multi-sectoral approach; food systems can play a critical role in protecting both food security and nutrition if careful attention is paid to targeting the poor, reducing inequalities, - including gender inequalities -, and incorporating nutrition goals and action where relevant.

Food and nutrition security: concepts and definitions

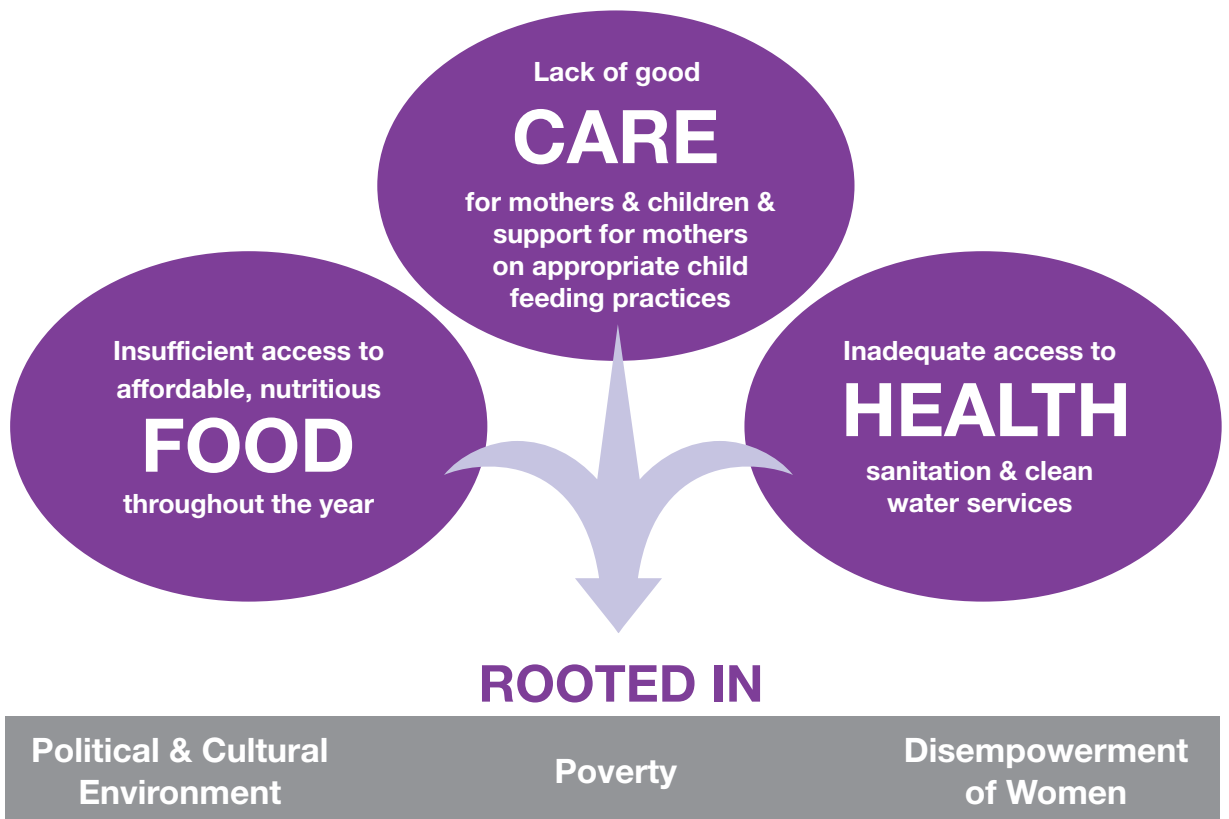
In the past half-century, the world has become increasingly aware of the challenges and threats to food security. This heightened awareness has been prompted by a range of well publicized humanitarian disasters and food price crises on the one hand and the burgeoning growth of the world's population and the changes in its dietary patterns on the other. Development organizations are increasingly concerned about food security and have focused their efforts on helping those who are not able to feed themselves sufficiently and adequately. Over the course of decades, these bodies have received the support of governments, private foundations and United Nations organizations. Many of their efforts have focused on provisioning food in situations of crisis or emergency, and increasingly on providing cash or food for development. Securing an adequate supply of food, however, is by no means the same thing as securing adequate nutrition. Investments in agricultural productivity and yields, for example, are not guaranteed to improve nutrition or health if they do not improve the poor's access both to enough calories and to

high-quality diets rich in essential nutrients. Even improving access to more and better food may be insufficient to prevent or reduce the persistently high rates of malnutrition found in the developing world if children are suffering from repeated episodes of diarrhea or other infections.

The distinction between food security and nutrition security is critically important because it affects what can be expected from the large, and in some cases growing, investments in boosting agriculture productivity and promoting global food security worldwide. For example, investments to stimulate agriculture production, especially those focused on staple cereals, although necessary, may not automatically result in better nutrition if they are not accompanied by complementary investments to improve access to health services for the poor.

Food security has been defined by the Food and Agriculture Organization of the United Nations (FAO) as existing “when all people, at all times, [have] physical, social and economic access to sufficient, safe and nutritious food to

The causes of malnutrition are interconnected



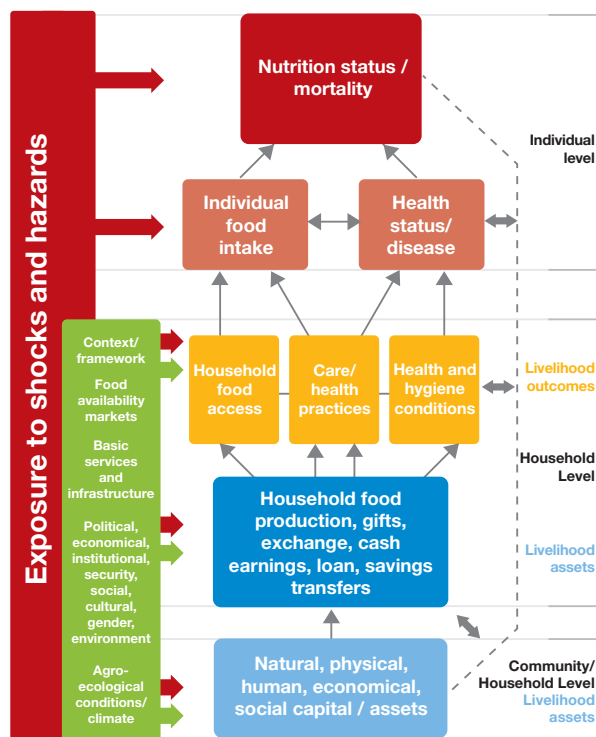
meet their dietary needs and food preferences for an active and healthy life” (FAO 1996, par. 1). Importantly, this definition stipulates that food should be available in sufficient *quantity* as well as in sufficient *quality*, should be *culturally acceptable*, and should be available *at all times* throughout the year.

Nutrition security, by contrast, exists when, in addition to having access to a healthy and balanced diet, people also have access to adequate caregiving practices and to a safe and clean environment that allows them to stay healthy and utilize the foods they eat effectively. For young children, for example, this means that they have enough of the right foods, and this includes breast milk for up to two years of age, along with appropriate quantity and quality of complementary foods starting at six months of age because breast milk can no longer fulfill all of the infant’s nutrient needs after that age. In addition, young children also need caregivers who have the time, education, knowledge, physical and mental health, and nutritional well-being to care for them adequately. Adequate caregiving means that caregivers are able to attend to all their children’s multiple needs, including adequate feeding, hygiene, health-seeking practices and supportive parenting. Finally, to be nutrition secure, young children must also be free of repeated (chronic) or acute infections, which interfere with absorption and utilization of food and nutrients for body functions.

Thus borrowing from both definitions, “food and nutrition security” can be defined as a situation that exists when all people at all times have physical, social and economic access to food, which is consumed in sufficient quantity and quality to meet their dietary needs, requirements for growth and food preferences, and is supported by an environment of adequate sanitation, health services and caregiving (United Nations Food and Agriculture Committee on World Food Security). This allows for appropriate utilization of food and nutrients by the body and therefore creates the conditions for a healthy and active life. Nutrition security therefore implies an optimal nutritional status.

To put this in more concrete terms, a person who has access to even the healthiest diet would not be able to benefit fully from that diet if he or she were ill or were living in the unsanitary conditions that foster illness. Poverty is often associated with insufficient food or foods of poor quality, in addition to suboptimal (or lack of) water and sanitation facilities, and compounded by an absence of knowledge of how to prevent contamination in the handling and preparation of food – which further compromises adequate nutrition, even if diets are adequate. People living in such circumstances are therefore drawn into a vicious cycle of infection which manifests itself

Linkages between food and nutrition security



WFP Food and Nutrition Security Conceptual Framework (based on UNICEF conceptual framework for causes of malnutrition and DfId sustainable livelihoods framework). Reprinted with permission from WFP (2009) *Comprehensive Food and Security Vulnerability Analysis Guidelines*, Rome, Italy: WFP Available from www.wfp.org

by repeated bouts of illnesses, leading to poor nutrition, which in turn exacerbates poor health and susceptibility to infections, and perpetuates poverty.

Many global, national and local factors compromise the choices that poor populations have regarding their food consumption and diets. These include global changes in the food systems such as food and oil price volatility, climate change and resulting water shortages, and natural disasters affecting agriculture productivity, as well as conflicts and emergencies. At the local level, bad harvests, poor agricultural and husbandry practices, inappropriate procedures for the packaging and storage of food, and inadequate distribution mechanisms affect poor farmers’ food production and income, as well as their purchasing power. Food and nutrition insecurity are the result of inequity.

Most vulnerable of all are infants and young children during their first two years of life, and women when they are pregnant or breastfeeding. The vulnerability of these two groups comes from the fact that they have very high requirements for essential nutrients (e.g. vitamin A, iron,

zinc, iodine, etc.) during these periods. For children, these nutrients are necessary for them to grow and for their brain to develop; for pregnant women, they are necessary because they have to provide extra calories and nutrients to their growing fetus; and for lactating mothers, they are necessary because the mothers are producing breast milk, and this requires consuming extra calories and micronutrients so that they can produce enough milk and for the milk to be of adequate quality.

The critical importance of this period (pregnancy, lactation and first two years of a child's life), which is now referred to as the "First 1,000 Days" from conception to the two years of age, was made clear in a groundbreaking piece of research published by The Lancet Journal in 2008 and further emphasized in a new Series on Maternal and Child

Nutrition published in the same journal in 2013. Both series highlight that not only is this 1,000-day period the time when mothers and children are most at risk of malnutrition, but that it is also the period when they can most benefit from interventions to prevent the negative consequences of malnutrition. In fact, what happens during the first 1,000 days determines the future of an individual, and nutritional damage that happens during this period is largely irreversible. Children undernourished during this period are shown to have delays in mental development, are less likely to perform well and to stay in school, have less skilled jobs and lower income in adulthood, and are at increased risk of developing problems of overweight and obesity and other chronic diseases such as heart diseases, diabetes and some types of cancers in adulthood.

“Food security exists when all people, at all times, have physical and economic access to sufficient safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life.”

-1996 World Food Summit



Mother working in agriculture (with child)

Source: One Acre Fund

The four dimensions of food security

The definition of food security highlights the fact that food security is a multi-faceted problem, which includes four key dimensions: availability, access, utilization and stability. The four dimensions of food security are defined as:

Physical AVAILABILITY of food	Food availability addresses the “supply side” of food security and is determined by the level of food production, stock levels and net trade.
Economic and physical ACCESS to food	An adequate supply of food at the national or international level does not in itself guarantee household level food security. Concerns about insufficient food access have resulted in a greater policy focus on incomes, expenditure, markets and prices in achieving food security objectives.
Food UTILIZATION	Utilization is commonly understood as the way the body makes the most of various nutrients in the food. Sufficient energy and nutrient intake by individuals is the result of good care and feeding practices, food preparation, diversity of the diet and intra-household distribution of food. Combined with good biological utilization of food consumed, this determines the nutritional status of individuals.
STABILITY of the other three dimensions over time	Even if your food intake is adequate today, you are still considered to be food insecure if you have inadequate access to food on a periodic basis, risking a deterioration of your nutritional status. Adverse weather conditions, political instability, or economic factors (unemployment, rising food prices) may have an impact on your food security status.

Source: United Nations Food and Agriculture Organization (FAO)

For food security objectives to be realized, all four dimensions must be fulfilled simultaneously.

The four dimensions of food security and their determinants

<p>Availability</p> <ul style="list-style-type: none"> • Domestic production • Import capacity • Food stocks • Food aid 	<p>Access</p> <ul style="list-style-type: none"> • Income, purchasing power, own production • Transport and market infrastructure • Food distribution 	<p>Utilization</p> <ul style="list-style-type: none"> • Food safety and quality • Clean water • Health and sanitation • Care, feeding and health-seeking practices 	<p>Stability</p> <ul style="list-style-type: none"> • Weather variability, seasonality • Price fluctuations • Political factors • Economic factors
--	---	---	---

Source: Adapted from FAO

Food security analysts have also defined two general types of food insecurity: *chronic* and *transitory* food insecurity.

These are defined on the basis of their temporality, severity and rate of recurrence.

	CHRONIC FOOD INSECURITY	TRANSITORY FOOD INSECURITY
Is...	long-term or persistent.	short-term and temporary.
Occurs when...	people are unable to meet their minimum food requirements over a sustained period of time.	there is a sudden drop in the ability to produce or access enough food to maintain a good nutritional status.
Results from...	extended periods of poverty, lack of assets and inadequate access to productive or financial resources.	short-term shocks and fluctuations in food availability and access, including year-to-year variations in domestic food production, food prices and household incomes.
Can be overcome with...	typical long-term development measures also used to address poverty, such as education or access to productive resources, such as credit. People may also need more direct access to food to enable them to raise their productive capacity.	transitory food insecurity is relatively unpredictable and can emerge suddenly. This makes planning and programming more difficult and requires different capacities and types of intervention, including early warning capacity and safety net programs (see Box 1).

Seasonal food insecurity is yet another term. This is used to refer to food insecurity of limited duration linked to cyclical patterns of inadequate availability and access to food. Seasonal

food insecurity is usually associated with seasonal fluctuations in climate, cropping patterns, work opportunities (labor demand), income, and patterns of diseases.

The causes and consequences of food insecurity

Food insecurity is not a new phenomenon. The effects of natural and man-made disasters have always placed a severe burden on food systems, and there have been few societies that have existed without the fear of famine, or the memory of it.

Famine is also a highly topical subject – as witnessed in the 2011 drought in the Horn of Africa. Figures compiled by the UK Department for International Development (DfID) suggest that between 50,000 and 100,000 people, more than half of them children under five, died as a result of the drought. A total of 13 million are believed to have been affected by the disaster, with livelihoods, livestock and local market systems all caught up in a complex chain of interdependency and suffering. According to a report published by Save the Children and Oxfam, and entitled *A Dangerous Delay*, many of the deaths could have been prevented had governments and humanitarian agencies been quicker to read the warning signs. “Waiting for a situation to reach crisis point before responding is the wrong way to address chronic vulnerability and recurrent drought in places like the Horn of Africa,” the report concluded. “The international community must change the way it operates to meet the challenge of recurrent crises ... Long-term development work is best placed to respond to drought.”

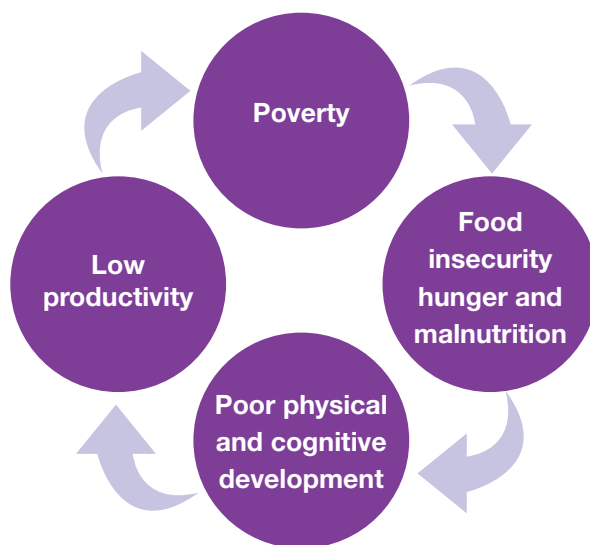
Even in situations in which natural and man-made disasters are not placing intolerable strain on food systems, however, challenges to food security remain in many parts of the world. Lack of water for irrigation, poor soil, inadequate agricultural practices and lack of appropriate tools and seeds can make it difficult to improve yields and efficiency in the production of nutritious foods. Lack of land itself is another major factor, as is, of course, lack of capital. Unsuitable transport systems and inappropriate storage practices can further compromise food stocks whose nutritional value and quality may already be questionable.

In addition to these factors, which affect the availability of food globally, there are cultural practices and beliefs that determine how food is allocated to different individuals within the household – for example the practice of men eating before women and children in some parts of the world (and consuming the choicest and most nutritious elements in a meal because they are the family breadwinner and perceived to need more food, and more of the high-quality foods, than other family members); or the cultural beliefs that some foods (such as eggs in Ghana) should not be given to young children because this may make them thieves when they grow up; or mangoes, which could be an excellent source of vitamin A for young children, but are not given to them in some cultures because these fruits are thought to cause diarrhea.

Another critical factor that determines whether households are food secure or not is women – their social status, their access to resources, and their ability to make key decisions regarding allocation of income and other resources, such as food, within the household. It has been shown over and over again that men and women use resources differently, and that when women have more resources under their control (e.g. income), they are more likely than men to protect the food security of their family and to invest in the health, education and nutrition of their children. For decades now, women have been referred to as being “the key to food security”; they are also critically important for protecting the health and nutrition of their children. Women’s education, their physical and mental health, and nutritional well-being, as well as the time they have available, are all essential ingredients for ensuring their family’s food security. These factors are equally important determinants of how women can take care of their young children’s needs, protect them from infectious diseases, and help them grow and develop into healthy adults, which in turn will equip them to more successfully achieve food security for their own family in the future.

It would be incorrect, however, to assume that food insecurity problems are limited exclusively to the developing

Food insecurity, malnutrition and poverty are deeply interrelated phenomena



Food insecurity, malnutrition and poverty are deeply interrelated phenomena

world. Food insecurity and deficiencies of essential nutrients such as iron are widespread among the poorest segments of the population in many affluent countries. As described in the chapter on obesity in this book, in developed countries, food insecurity often leads resource-constrained households to feed their families cheap, calorie-dense fast foods instead of fresh fruits and vegetables, meat and dairy, which are typically much more expensive. As a result, food insecure households in the developed world often have poor quality diets containing high levels of saturated fat, refined sugar and salt, which lead to severe problems of overweight and obesity not only in adults but also in children. Obesity and overweight lead to stigma and social problems, and more importantly, they are the most significant risk factors for a series of health problems including cardiovascular diseases, diabetes and some forms of cancer. Food insecurity and malnutrition are not just problems of poor countries; governments throughout the world need to find appropriate solutions to protect the food security and nutrition of their population.



How households cope with food insecurity, and the consequences for health and nutrition

Deterioration of household food security								
Livelihood	Diversification / change in livelihood activities	Reduced expenditure on non-essential or luxury items. Beginning to sell non-productive / disposable assets	Children drop out of school. Emigration (from rural to urban areas)	Increased use of child labor. Begin to borrow / purchase on credit. Become indebted	Selling of productive assets	Selling of all assets	Reduce expenditures on essential items (e.g. food, water etc.)	Engage in illegal / health-threatening activities as last resort coping
Food-related	Change to cheaper, lower-quality and less-preferred foods	Reduced diversity of food. Poor nutrient intake. Favor certain HH members over others for consumption	Reduced size / number of meals	Consume wild foods / immature crops / seeds. Send HH members elsewhere to eat (e.g., neighbors)	Begging for food	Skip entire days without eating	Eat items not eaten in the past / not part of normal diet (e.g. plants, insects etc.)	

Consequences for health and nutrition

Health outcome	Depletion of body nutrient stores and lowered immunity	Appearance of clinical symptoms such as wasting, night blindness, anemia, increased morbidity and failure to grow	Increased early childhood mortality	Increased overall mortality
-----------------------	--	---	-------------------------------------	-----------------------------

Changes in livelihood, food selection and consumption, and nutritional status and health outcome when households descend into stress and distress. Reprinted with permission from Klotz C, de Pee S, Thome-Lyman A, Kraemer K and Bloem MW. Nutrition in a perfect storm: Why micronutrient malnutrition will be a widespread health consequence of high food prices. Sight and Life Magazine(2008) 2: 6–13. Adapted from D. Maxwell, R. Caldwell. The Coping Strategies Index: Field Methods Manual, Nairobi: CARE Eastern and Central Africa Regional Management and World Food Programme, 2nd ed, Jan 2008.

Hunger¹ statistics

- 1) 870 million people in the world do not have enough to eat. This number has fallen by 130 million since 1990, but progress slowed after 2008.

(Source: *State of Food Insecurity in the World*, FAO, 2012)

- 2) The vast majority of hungry people (98 percent) live in developing countries, where almost 15% of the population is undernourished.

(Source: *State of Food Insecurity in the World*, FAO, 2012)

- 3) Asia and the Pacific have the largest share of the world's hungry people (some 563 million) but the trend is downward.

(Source: *State of Food Insecurity in the World*, FAO, 2012)

- 4) Women make up a little over half of the world's population, but they account for over 60 percent of the world's hungry.

(Source: *Strengthening efforts to eradicate hunger...*, ECOSOC, 2007)

- 5) 66 million primary-school-age children attend classes hungry across the developing world, with 23 million in Africa alone.

(Source: *Two Minutes to Learn About School Meals*, WFP, 2012)

¹ The term “hunger” is commonly used to refer to “food insecurity”

Malnutrition statistics

- 1) Undernutrition (including fetal growth restriction, stunting, wasting, and deficiencies of vitamin A and zinc along with sub-optimal breastfeeding) contributes to more than 3 million deaths of children per year – up to 45% of the global total.

(Source: *Lancet Paper 1* (Black et al 2013))

- 2) Roughly 100 million children under 5 years of age are underweight (16%)

(Source: *Lancet Paper 1* (Black et al 2013))

- 3) There are still 165 million children stunted in the world (26% or 1 in 4 children) and at least 52 million wasted (8%)

(Source: *Lancet Paper 1* (Black et al 2013))

- 4) In 2011, 43 million children younger than 5 years, or 7%, were overweight – a 54% increase from an estimated 28 million in 1990.

(Source: *Lancet Paper 1* (Black et al 2013))

Maternal and child undernutrition is the cause of more than 3 million deaths annually

(Black et al, *Lancet Series* 2013)



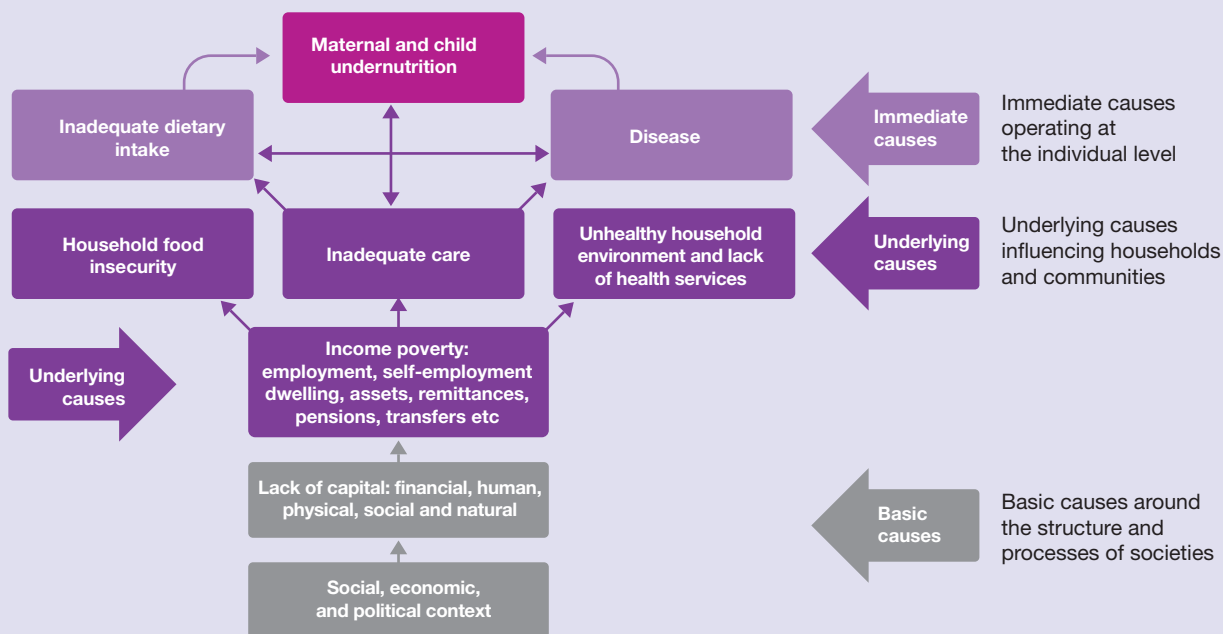
A girl happy to learn in a classroom in Kenya in 2009
Source: Mike Bloem Photography



Girl learning in an orphanage classroom in Port-au-Prince, Haiti
Source: Mike Bloem Photography

UNICEF Conceptual Framework

The UNICEF framework, which the nutrition community has been using for programming for the past 25 years, identifies three levels of causes of undernutrition



The UNICEF conceptual framework

More than two decades ago, UNICEF developed a conceptual framework that identifies the causes of undernutrition. The nutrition community has used it extensively ever since because it provides a useful visualization of the multiple factors that affect maternal and child undernutrition. The framework is particularly useful to illustrate the different levels of factors that affect nutrition – for example factors at the national, community, household and individual levels – and refers to basic, underlying and direct determinants of undernutrition. Some variations of the models also show examples of interventions that can be used to address some of the determinants of undernutrition at these different levels.

The UNICEF conceptual framework is as relevant today as it was then, but it is now influenced by recent shifts and exciting developments in the field of nutrition.

Strengthened by new evidence, an understanding of the short- and long-term consequences of undernutrition has evolved. There is even stronger confirmation that undernutrition can trap children, families, communities and nations in an intergenerational cycle of poor nutrition,

illness and poverty. More is known about the mechanisms that link inadequate growth due to nutritional deficiencies before the age of 2 with impaired brain development and subsequent reduced performance in school. And there is clearer, more comprehensive evidence of the need to promote optimal growth during this critical period to avoid an elevated risk of non-communicable diseases, such as cardiovascular disease, in adulthood and even in the next generation.

The UNICEF conceptual framework defines nutrition and captures the multifactorial causality of undernutrition (Figure 1). Nutritional status is influenced by three broad factors: food, health and care. Optimal nutritional status results when children have access to affordable, diverse, nutrient-rich food; appropriate maternal and child-care practices; adequate health services; and a healthy environment including safe water, sanitation and good hygiene practices. These factors directly influence nutrient intake and the presence of disease. The interaction between undernutrition and infection creates a potentially lethal cycle of worsening illness and deteriorating nutritional status.

Food, health and care are affected by social, economic and political factors. The combination and relative importance of these factors differ from country to country.

Understanding the immediate and underlying causes of undernutrition in a given context is critical to delivering appropriate, effective and sustainable solutions and adequately meeting the needs of the most vulnerable people.

Immediate causes of undernutrition

At the immediate level, the two main causes of undernutrition are a lack of appropriate food and nutrient intake, and disease. Undernutrition can result from consuming too few nutrients or from having repeated infections, which increase nutrient requirements and prevent the body from absorbing those consumed, or both.

The infection-undernutrition cycle

An estimated one third of deaths among children under age 5 are attributed to undernutrition. Undernutrition puts children at far greater risk of death and severe illness due to common childhood infections, such as pneumonia, diarrhea, malaria, HIV and AIDS and measles. A child who is severely underweight is 9.5 times more likely to die of diarrhea than a child who is not, and for a stunted child the risk of death is 4.6 times higher.

Undernutrition weakens the immune system, putting children at higher risk of more severe, frequent and prolonged bouts of illness. Undernutrition is also a consequence of repeated infections, which may further worsen the child's nutritional status at a time of greater nutritional needs. This interaction between undernutrition and infection creates a potentially lethal cycle of worsening illness and deteriorating nutritional status.

Critical nutrition interventions that break this cycle include promoting optimal breastfeeding practices, encouraging micronutrient supplementation and reducing the incidence of low birth weight. For example, infants not breastfed are 15 times more likely to die from pneumonia and 11 times more likely to die from diarrhea than children who are exclusively breastfed. Similarly, all-cause mortality is 14 times higher for infants not breastfeeding than for exclusively breastfed children.

Today's concerted focus on reducing stunting reflects an improved understanding of the importance of undernutrition during the most critical period of development in early life and of the long-term consequences extending into adulthood. Evidence from 54 low- and middle-income countries indicates that growth faltering on average begins during pregnancy and continues to about

24 months of age. This loss in linear growth is not recovered, and catch-up growth later on in childhood is minimal.

While the original UNICEF conceptual framework reflected a focus on children of preschool age, there is now more emphasis on policies and programs that support action before the age of 2 years, especially on maternal nutrition and health and appropriate infant and young child feeding and care practices.

Adequate maternal nutrition, health and physical status are crucial to prevent child undernutrition. Pregnancy increases nutrient needs, and protein, energy, vitamin and mineral deficiencies are common during pregnancy. Deficiencies are not solely the result of inadequate dietary intake: Disease can impair absorption of nutrients and reduce appetite, and environmental and psychosocial stress affecting the mother can contribute to child undernutrition. Poor maternal nutrition impairs fetal development and contributes to low birth weight, subsequent stunting and other forms of undernutrition.

Undernourished girls have a greater likelihood of becoming undernourished mothers who in turn have a greater chance of giving birth to low birth weight babies, perpetuating an intergenerational cycle. This cycle can be compounded further in young mothers, especially adolescent girls who begin childbearing before attaining adequate growth and development. Short intervals between pregnancies and having several children may accumulate or exacerbate nutrition deficits, passing these deficiencies on to the children.

Low birth weight is associated with increased morbidity and mortality: An estimated 60 to 80 percent of neonatal deaths occur among low birth weight babies (2005 estimate). In South Asia, an estimated 28 percent of infants are born with low birth weight.

(Source: Improving Child Nutrition, The achievable imperative for global progress. UNICEF 2013)

35 Food system interventions for better nutrition

Policy environment and development priorities		
FOOD SYSTEM ELEMENTS	NUTRITION OPPORTUNITIES	POLICY TOOLS
Production “up to the farm gate” (R&D, inputs, production, farm management)	<ul style="list-style-type: none"> • Sustainable intensification of production • Nutrition-promoting farming systems, agronomic practices and crops <ul style="list-style-type: none"> - Micronutrient fertilizers - Biofortified crops - Integrated farming systems, including fisheries and forestry - Crop and livestock diversification • Stability for food security and nutrition <ul style="list-style-type: none"> - Grain reserves and storage - Crop and livestock insurance • Nutrition education <ul style="list-style-type: none"> - School and home gardens • Nutrient preserving on-farm storage 	<ul style="list-style-type: none"> • Food and agricultural policies to promote availability, affordability, diversity and quality • Nutrition-oriented agricultural research on crops, livestock and production systems • Promotion of school and home gardens
Post-harvest supply chain “from the farm gate to retailer” (marketing, storage, trade, processing, retailing)	<ul style="list-style-type: none"> • Nutrient-preserving processing, packaging, transport and storage • Reduced waste and increased technical and economic efficiency • Food fortification • Reformulation for better nutrition (e.g. elimination of trans fats) • Food safety 	<ul style="list-style-type: none"> • Regulation and taxation to promote efficiency, safety, quality, diversity • Research and promotion of innovation in product formulation, processing and transport
Consumers (advertising, labelling, education, safety nets)	<ul style="list-style-type: none"> • Nutrition information and health claims • Product labelling • Consumer education • Social protection for food security and nutrition <ul style="list-style-type: none"> - General food assistance programs and subsidies - Targeted food assistance (prenatal, children, elderly, etc.) 	<ul style="list-style-type: none"> • Food assistance programs • Food price incentives • Nutrition regulations • Nutrition education and information campaigns
AVAILABLE, ACCESSIBLE, DIVERSE, NUTRITIOUS FOODS		
Health, food safety, education, sanitation and infrastructure		

Economic, social, cultural and physical environment

Gender roles and environmental sustainability

Source: FAO

What can food systems do to enhance food security and nutrition?

Food systems produce, market, store, trade, process, retail, and promote food for consumers to acquire and use to feed their families. Food systems also provide livelihood and income to large amounts of the population around the globe, including many of the world's poorest. The latest Food and Agriculture Organization (FAO)'s State of Food and Agriculture report, published in 2013, argues that "food systems – from agricultural inputs and production, through processing, marketing and retailing, to consumption – can promote more nutritious and sustainable diets for everyone" (p. 3). The report also highlights that while the nature and causes of food insecurity and malnutrition are complex and diverse, a common denominator for both conditions is a nutritionally deficient diet. For this reason, the food system provides an opportunity to address both food insecurity and malnutrition, but in order to do so, the food system needs to be re-shaped to be more nutrition-sensitive. The diagram

below presents the framework adopted by FAO, which highlights opportunities for incorporating nutrition considerations into different elements of the food system. More specific guidance has also been developed on how to improve nutrition through agriculture programs and policies.

"Of course, addressing malnutrition requires interventions not only in the food system, but also in the health, sanitation, education and other sectors. Integrated actions are needed across the health, education and agriculture sectors"

FAO, 2013, p. 3

Key recommendations for Improving Nutrition through Agriculture

Food systems provide for all people's nutritional needs, while at the same time contributing to economic growth. The food and agriculture sector has the primary role in feeding people well by increasing availability, affordability, and consumption of diverse, safe, nutritious foods and diets, aligned with dietary recommendations and environmental sustainability. Applying these principles helps strengthen resilience and contributes to sustainable development.

Agricultural programs and investments can strengthen impact on nutrition if they:

1. Incorporate explicit nutrition objectives and indicators into their design, and track and mitigate potential harms, while seeking synergies with economic, social and environmental objectives.
2. Assess the context at the local level, to design appropriate activities to address the types and causes of malnutrition, including chronic or acute undernutrition, vitamin and mineral deficiencies, and obesity and chronic disease. Context assessment can include potential food resources, agro-ecology, seasonality of production and income, access to productive resources such as land, market opportunities and infrastructure, gender dynamics and roles, opportunities for collaboration with other sectors or programs, and local priorities.
3. Target the vulnerable and improve equity through participation, access to resources, and decent employment. Vulnerable groups include smallholders, women, youth, the landless, urban dwellers, the unemployed.
4. Collaborate and coordinate with other sectors (health, environment, social protection, labor, water and sanitation, education, energy) and programs, through joint strategies with common goals, to address concurrently the multiple underlying causes of malnutrition.
5. Maintain or improve the natural resource base (water, soil, air, climate, biodiversity), critical to the livelihoods and resilience of vulnerable farmers and to sustainable food and nutrition security for all. Manage water resources in particular to reduce vector-borne illness and to ensure sustainable, safe household water sources.
6. Empower women by ensuring access to productive resources, income opportunities, extension services and information, credit, labor and time-saving technologies (including energy and water services), and supporting their voice in household and farming decisions. Equitable opportunities to earn and learn should be compatible with safe pregnancy and young child feeding.

7. Facilitate production diversification, and increase production of nutrient-dense crops and small-scale livestock (for example, horticultural products, legumes, livestock and fish at a small scale, under-utilized crops, and biofortified crops). Diversified production systems are important to vulnerable producers to enable resilience to climate and price shocks, more diverse food consumption, reduction of seasonal food and income fluctuations, and greater and more gender-equitable income generation.
8. Improve processing, storage and preservation to retain nutritional value, shelf-life, and food safety, to reduce seasonality of food insecurity and post-harvest losses, and to make healthy foods convenient to prepare.
9. Expand markets and market access for vulnerable groups, particularly for marketing nutritious foods or products vulnerable groups have a comparative advantage in producing. This can include innovative promotion (such as marketing based on nutrient content), value addition, access to price information, and farmer associations.
10. Incorporate nutrition promotion and education around food and sustainable food systems that builds on existing local knowledge, attitudes and practices. Nutrition knowledge can enhance the impact of production and income in rural households, especially important for women and young children, and can increase demand for nutritious foods in the general population.

These recommendations have been formulated following an extensive review of available guidance on agriculture programming for nutrition, conducted by FAO (see: <http://www.fao.org/docrep/017/laq194e/laq194e00.htm>), and through consultation with a broad range of partners (CSOs, NGOs, government staff, donors, UN agencies) in particular through the Ag2Nut Community of Practice. They are also referred to as “guiding principles” by some partners.

Agriculture programs and investments need to be supported by an enabling policy environment if they are to contribute to improving nutrition. Governments can encourage improvements in nutrition through agriculture by taking into consideration the five policy actions below.

Food and agriculture policies can have a better impact on nutrition if they:

1. Increase incentives (and decrease disincentives) for availability, access, and consumption of diverse, nutritious and safe foods through environmentally sustainable production, trade, and distribution. The focus needs to be on horticulture, legumes, and small-scale livestock and fish – foods which are relatively unavailable and expensive, but nutrient-rich – and vastly under-utilized as sources of both food and income.
2. Monitor dietary consumption and access to safe, diverse, and nutritious foods. The data could include food prices of diverse foods, and dietary consumption indicators for vulnerable groups.
3. Include measures that protect and empower the poor and women. Safety nets that allow people to access nutritious food during shocks or seasonal times when income is low; land tenure rights; equitable access to productive resources; market access for vulnerable producers (including information and infrastructure). Recognizing that a majority of the poor are women, ensure equitable access to all of the above for women.
4. Develop capacity in human resources and institutions to improve nutrition through the food and agriculture sector, supported with adequate financing.
5. Support multi-sectoral strategies to improve nutrition within national, regional, and local government structures.

The present key recommendations for Improving Nutrition through Agriculture target policy-makers and program planners. These recommendations are based on the current global context, and may be updated over time as challenges and opportunities to improve nutrition present themselves.

My personal view

Marie Ruel

Division Director of Food Consumption and Nutrition
Division, IFPRI. Washington DC, USA



Food security and nutrition security are two complex, interrelated phenomena that result from a series of factors – some that are common to both conditions and others that are not.

In spite of the commonalities and close linkages between the two phenomena, however, in my view, it is unwise to combine the two concepts into one named “food and nutrition security”. I would prefer to see food security and nutrition (or nutrition security) remain as two distinct, yet clearly related phenomena.

The first reason is that the combined concept of food and nutrition security (as defined in this chapter) is very broad and may be difficult to operationalize. It may be particularly difficult, for instance, to define policies and programs that would encompass all the factors that need to be addressed to support both food and nutrition security, let alone identifying the right set of indicators to properly measure the impact of these actions on relevant food security and nutrition outcomes.

Secondly, not all food security and agriculture-focused policies and programs necessarily need to be accountable for improving nutrition. In some cases, it may be more cost-effective to co-locate programs aimed at tackling poverty and food insecurity with programs specifically focused on improving nutrition and to target the same households and individuals for maximum impact.

Even more importantly, by combining nutrition with food security, we run the risk of seeing nutrition lose its momentum and become absorbed by (and lost within) the broader umbrella of food security. We need to move away from food security being perceived as synonymous to nutrition, and for this, we need to keep the concepts distinct from each other. We also need to correct the wrong perception that if more food could be produced and food security ensured, malnutrition would automatically disappear.

As highlighted in this chapter, more food and more of the right quality foods are necessary, but not enough, to improve nutrition: investments aimed at boosting agriculture production and productivity and at ensuring food security of all people need to be accompanied by renewed efforts to reduce the burden of infectious diseases and increase poor people’s access to health, water, sanitation and education services. Most importantly, progress in nutrition will be made if we can tackle inequality in all its forms, starting with gender inequalities.

Further reading

Quisumbing AR, Brown LR, Sims Feldstein H et al. *Women: the key to food security*. Food Policy Report. Washington, DC: International Food Policy Research Institute, 1995. And: *Women, still the key to food security*. IFPRI Issue Brief 33, 2005.

Food and Agriculture Organization. *The state of food insecurity in the world 2012. Economic growth is necessary but not sufficient to accelerate reduction of hunger and malnutrition*. Rome: Food and Agriculture Organization, 2012.

Food and Agriculture Organization. *The state of food and agriculture 2013. Food systems for better nutrition*. Rome: Food and Agriculture Organization, 2013.

Pinstrup-Andersen P. *Food security: Definition and measurement*. *Food Security* 2009;1(1): 5–7.

Pinstrup-Andersen P. *The food system and its interaction with human health nutrition. Leveraging agriculture for improved nutrition and health*. 2020 Conference brief 13. Washington, DC: International Food Policy Research Institute, 2011.

Ruel M T, Alderman H and the Maternal and Child Nutrition Study Group. *Nutrition-sensitive interventions and programs: How can they help accelerate progress in improving maternal and child nutrition?* Published online, *The Lancet*, 6 June 2013.