Maria Sassi

Understanding Food Insecurity

Key Features, Indicators, and Response Design

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ISBN 978-3-319-70361-9 ISBN 978-3-319-70362-6 (eBook)
https://doi.org/10.1007/978-3-319-70362-6

Library of Congress Control Number: 2017957192

Printed on acid-free paper

This Springer imprint is published by Springer Nature
The registered company is Springer International Publishing AG
The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

For Susanna

Wishing you a peaceful world based on the respect for human life.

Preface

The global food security challenge is straightforward: globally, one in nine people is undernourished; poor nutrition causes nearly half of the deaths in children under 5 years of age; and one in four of the world's children—one in three in developing countries—suffers from stunted growth (http://www.un.org/sustainabledevelopment/hunger/). Developed and developing countries are both affected by the problem of hunger and malnutrition. However, the vast majority of the world's food insecure people live in developing countries. In particular, South Asia is faced with the greatest hunger burden, and sub-Saharan Africa has the highest prevalence of undernourishment. Moreover, the international community is concerned about the possibility of satisfying food demand in the coming decades (Ingram 2011).

The 2008 global food price crisis and subsequent food price spikes renewed political, societal and scientific interest in the notion of food security worldwide (Barrett 2010). However, the dominant use of the concept of food security at the global or national level has concentrated much of this debate on supply issues: how to produce enough food to feed all people (Pinstrup-Andersen 2009). According to this view, increasing crop production and productivity is a strategic target to fight hunger and malnutrition. This prescription is of specific importance in lower income countries. In these economies, a large part of the population is rural and depends on agriculture for their income. Hence, stimulating additional food production increases small farmers' income, with possible positive implications on their food and nutritional status.

Food availability is necessary for food security, but it does not ensure a stable food access and utilisation to all people. Today, sufficient food is produced per capita at the global level; however, almost 800 million people remain food insecure, and 2000 million suffer micronutrient deficiencies. Therefore, food insecurity is not simply a technical problem related to food production but also a problem of access, an issue that can only be addressed through a change in perspective: the focus should shift from food insecurity at the global or national level to food insecurity at the household or individual level. At this level, hunger and malnutrition are related to poverty, inequality and a lack of political will—aspects that are currently exacerbated by new factors such as climate change, demand for biofuels and food

price volatility. From this perspective, the current challenge is how to ensure that the food insecure today will not remain food insecure in the future and how to ensure that other segments of the population and the next generation will not become food insecure (Bourgeois 2014).

If food insecurity is to be addressed and prevented, it must first be understood. This book aims to provide the basic elements needed to recognise the features of food insecurity and design responses. This understanding is of specific importance given the zero hunger goal set by the Sustainable Development Agenda for 2030, which can establish the nutrition of the population at the heart of the debate and solutions.

The importance of food access at the individual level to achieve food security is reflected in the technical explanation of this concept adopted by the international community at the 1996 World Food Summit, where this dimension was integrated based on the notions of availability, utilisation and stability. As argued by Pinstrup-Andersen (2009), this definition provides a useful goal towards which the world should strive and useful elements for monitoring, designing, implementing and evaluating policies, programmes and projects aimed at fighting hunger and malnutrition.

Therefore, the first chapter of this book introduces this technical concept and its implications. It also discusses the concept's evolution to incorporate the notion of nutritional security. This chapter proceeds to clarify the distinction between food security and food self-sufficiency, malnutrition, undernutrition and undernourishment. These terms are often used loosely or interchangeably, although they can be distinguished from one another. The final part of this chapter emphasises how the technical definition of food security relates to the juridical concept of the right to food and the political proposal of food sovereignty.

Building political will, designing effective policies and targeting resource allocation must be guided by reliable information that requires an appropriate measurement of food insecurity, its features and its causes. To this end, the second chapter of this book provides a set of conceptual frameworks suitable for identifying the information to be collected for the elaboration of appropriate indicators; the third chapter introduces the systems used to collect data and their evolution over time; and the fourth chapter presents the most adopted indicators for monitoring food security.

As institutional and policy lessons should integrate the results from quantitative investigations to inform appropriate food security interventions, the fifth chapter describes the evolution of food security approaches and policies by decade, starting in the 1940s, and discusses future challenges. Specific attention is given to the food insecurity challenge in the new millennium, with a particular focus on describing food crises and institutional and policy-related consequences.

Food security has specific features in the humanitarian context. Emergency food aid remains the most common response to food insecurity. However, the increasing complexity and persistence of emergencies and the decreasing trend with regard to available funds are supporting a shift in the approach and tools to food security in these situations. To incorporate new schemes into their responses, donors and aid

agencies are currently using the still ambiguous term of food assistance as an alternative to food aid. These aspects are discussed in the sixth chapter of this book, which clarifies the specific terminology of food aid and assistance and presents the instruments recently adopted in the food aid system.

This manual targets students and professionals who are seeking a comprehensive overview of standard definitions, approaches and principles related to food insecurity. It facilitates understanding of the complex multiple constraints that food insecure people face as well as information of specific importance for response design and policy.

This book would not have been possible without the stimuli and mutual learning that I enjoyed with students during my courses on food security in Europe and Africa. I am also grateful to several colleagues and friends who read the manuscript, provided valuable inputs and headed off any misunderstandings and gaps.

Pavia, Italy Maria Sassi

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Contents

Chapter 1
Food Security Basics

Abstract This chapter presents the technical definition of food security introduced by the 2008 World Food Summit and its evolution over time. It analyses the core concepts introduced by this definition and clarifies its distinguishing features with respect to those of the concept of nutrition security, food self-sufficiency, poverty, undernutrition, malnutrition and hunger. The dynamic aspect of the technical definition of food security is linked to the concept of vulnerability to food insecurity and resilience in a food security context. This chapter also addresses the juridical and political aspects of food security and compares them with the technical definition. At the end of this chapter, the reader will be able to describe the relevant features of the food security target and identify the most important elements for designing, implementing, monitoring and evaluating policies, programmes and project focused on fighting hunger and malnutrition.

1.1 Introduction

From a technical perspective, the concept of food security has evolved considerably over time (Maxwell and Frankenberger 1992; Clay 1997). One of the most accepted definitions is that stated in the Plan of Action of the Rome Declaration, which was adopted at the 1996 World Food Summit. According to this definition, food security "exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life" (Food and Agricultural Organization [FAO] 1996).

This concept introduces the following:

- The four basic and distinctive characteristics of food security, that is, food availability ("sufficient, safe and nutritious food"), access ("physical and economic access"), utilisation ("to meet dietary needs and food preferences), and stability ("[for] all people at all times");
- The individual level as the unit of analysis ("all people");

M. Sassi, *Understanding Food Insecurity*,
https://doi.org/10.1007/978-3-319-70362-6_1

– The distinction between chronic and transitory food insecurity ("at all times");
– The concept of a food requirement, which is understood as sufficient food not only for survival but also for and active and healthy participation in society.

This chapter analyses these core concepts to understand when to apply them and their links with other developmental issues. Section 1.2 opens this chapter by introducing the four pillars of the technical definition of food security and linking its dynamic aspect to the concepts of vulnerability to food insecurity, in Sect. 1.2.1, as well as resilience in the food context, in Sect. 1.2.2. Afterwards, in Sect. 1.3 the different levels of analysis of food security are presented. Chronic and transitory food insecurity are distinguished in Sect. 1.4, and the categorisation of the severity of the problem is presented in Sect. 1.4.1. Next, the concept of food security is compared with those of nutrition security in Sect. 1.5, food self-sufficiency in Sect. 1.6, poverty in Sect. 1.7, undernutrition, undernourishment, malnutrition and hunger in Sect. 1.8. This comparison seeks to clarify the distinguishing features of concepts that are often used interchangeably.

Finally, in Sect. 1.9 the juridical and political aspects of food security are addressed by introducing the right to food and food sovereignty and their relationships with the technical concept of food security.

1.2 Food Security and Its Dimensions

The technical concept of food security is rooted in the three basic, distinct, and interrelated dimensions: food availability, access to food, and food utilisation. Over time, a fourth pillar—food stability—has been added (Table 1.1) (Riely et al. 1999; Thomson and Metz 1996).

Food availability is reached when a sufficient quantity of safe and nutritious food is consistently available to individuals within a country—i.e., when such food is in reasonable proximity of them or within their reach. In addition, this quantity of food must meet the individuals' food preferences (FIVIMS 2003; Hussein 2002; Riely et al. 1999; Thomson and Metz 1996). Sufficient quantities of appropriate, necessary types of food can be ensured through domestic food production (household food production for subsistence and other types of domestic food output, such as that from commercial farms), commercial food imports, net food stocks, or food assistance. Therefore, food availability addresses the "supply side" of food security and depends primarily on the agricultural sector and the domestic and international distribution systems.

Available food should be of appropriate quality and meet people's tastes and cultural traditions. This aspect is called the adequacy of food, meaning that food must not contain adverse substances above the levels set by international standards and must meet cultural values with regard to food preparation and consumption (FAO 2008).

Table 1.1 Food security dimensions

Dimension	Definition	Key question
Food availability	Sufficient quantities of safe and nutritious food are consistently available to individuals within a country, are in a reasonable proximity to them or are within their reach	Is food actually or potentially physically present?
Access to food	Households and all individuals within them have adequate resources to obtain appropriate food for a nutritious diet	If food is available, do households and individuals have sufficient access to that food?
Food utilisation	Proper biological use of food, requiring a diet that provides sufficient energy and essential nutrients, potable water and adequate sanitation	If food is available and accessible, are households and individuals properly utilising the food?
Stability of food supply	Reliable supply of food products available for all people at all times	Is the food system stable, thus ensuring that the households and individuals are food secure at all times?

The second pillar of the technical concept of food security concerns both economic and physical access to food.

Economic food access implies that households and all the individuals therein have adequate resources to obtain appropriate food to maintain a nutritious diet. Such access depends on the ability of households to generate the income necessary to buy—or other resources to barter to obtain—enough food to feed the household's members (USAID 2012).

Therefore, considering the household level, the most important determinants of economic food access are the wage level, employment, and prices. When households are subsistence producers, the relevant factors for economic food access are the available productive assets and nonmarket transfers.

Physical access relates to food being accessible to everyone, everywhere. This dimension of food security is mainly linked to infrastructure, market and storage facilities, political stability, security and legal, cultural or religious prohibitions (FAO-FSAU 2005). For example, religious restrictions include food taboos that govern particular phases of the human life cycle, which may be associated with special events such as menstrual periods, pregnancies, childbirth, lactation, preparation for the hunt, battles, weddings, and funerals (Meyer-Rochow 2009).

Considering the constraining factors affecting food access, the most commonly adopted policies are pro-poor agricultural development interventions focused on resource-poor farmers; the introduction of employment and income-generating activities; and the implementation of public transfers and safety net mechanisms.

The definition of food security introduced at the 1996 World Food Summit was refined by the FAO in 2002. In the glossary of the FAO's annual report, food security is described as "a situation 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 2001). This definition introduces a new element: the social aspect of food access. This aspect refers to the necessity of also considering food accessibility according to factors such as ethnicity, religion, and political affiliation. These factors affect the quantities of food consumed, dietary diversity and the intake of nutrient-rich foods (see, for example, Briones Alonso 2015).

Food utilisation, the third pillar of the 1996 World Food Summit definition of food security, concerns the proper biological use of food required to provide sufficient energy and essential nutrients, potable water and adequate sanitation. The concept implies some knowledge within the households of storage and processing techniques, basic principles of nutrition, proper child care and illness management (FIVIMS 2003; Riely et al. 1999; Thomson and Metz 1996). In other words, people must have the knowledge and the access to basic sanitary conditions that allow them to choose, prepare and distribute food in a way that results in good nutrition (Feed the Future 2010). The most adopted policy interventions to enhance food utilisation are improved food preservation and preparation technologies; the establishment of proper food standards; the enhancement of public health; the provision of safe drinking water; the improvement of sanitation and hygiene and nutrition education; and increased awareness at the community level.

All three of the abovementioned pillars of food security must be satisfied simultaneously to achieve food security. In fact, food availability is necessary but not sufficient for access, and access is necessary but not sufficient for utilisation. The hierarchical nature of food security moves in the opposite direction. Food utilisation is an input to achieve food access for all, for example, through the consequences of an inappropriate diet on health, nutrition and more generally human capital. Access, in turn, is the basis of food availability; otherwise, natural, human and capital resources are likely subjected to depletion (Webb and Rogers 2003).

The fourth dimension of food security is the stability of food availability, access, and utilisation, which is reached when a reliable supply of food products is available for all people at all times (FIVIMS 2003), meaning that individuals must be food secure now and in the future.

The availability, access and utilisation pillars provide a static picture of food security. The stability pillar introduces the dynamic nature of the concept. Consequently, food security policies should be based not only on the current level of food security but also on the expectations for this state in the future (Fig. 1.1).

Given these considerations, the literature has introduced two dimensions of food security that have found practical applications in policy and programme design and implementation: the fear or the perception that there will be not enough food to eat (Maxwell 2001) and the risk that one of the three basic dimensions of food security can be disrupted. The latter is considered a cross-cutting issue: it can affect all the core pillars underpinning food security (Webb and Rogers 2003). In this respect, the following two concepts are key from a policy and programming perspective: vulnerability and resilience.

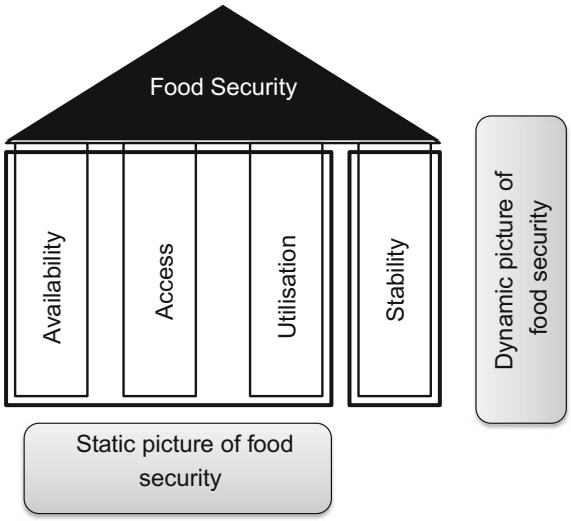

Fig. 1.1 Food security pillars and their static and dynamic nature

1.2.1 Vulnerability

People vulnerable to food insecurity are those who are capable of maintaining an adequate level of food intake today but who may be at risk of becoming food insecure in future (FAO 2008).

Vulnerability refers to the full range of natural factors or to factors resulting from human activity that puts individuals or households at risk of becoming food insecure. Some examples of these factors are provided in Table 1.2 by the degree of covariance.

The possible sources of risk operate at different levels: at the micro level, which is related to the individual and environmental characteristics of the family; at the meso level, which is at the community, village, or state level; and at the macro level, which includes factors acting at the global level.

Starting from a certain food security status at time t_0 in Fig. 1.2, the degree of vulnerability of an individual or a household to food insecurity is determined by three elements: the exposure to risk factors during a certain period (t_0–t_1), the ability to cope with or withstand such shocks over the same period (t_0–t_1), and the expected outcome in terms of the food security dimensions at time t_1 (Heitzmann et al. 2001; Devereux 2002).

Therefore, vulnerability can be addressed through risk management interventions. Following Holzman and Jorgensen (2001), these interventions consist of actions that can occur:

– Ex ante, i.e., before the realisation of the risk event; or
– Ex post, i.e., after the manifestation of the risk event.

Table 1.2 Possible sources of risk

Category	Micro	Meso	Macro
Natural		Rainfall, landslides, volcanic eruptions	Earthquakes, floods, drought, strong winds
Health	Illness, injury, disability	Epidemics	
Life cycle	Birth, old age, death		
Social	Crime, domestic violence	Terrorism, gangs	Civil strife, war, social upheaval
Economic	Unemployment, harvest failure, business failure	Resettlement	Balance of payment, financial or currency crisis, terms of trade shocks
Political	Ethnic discrimination	Riots	Political default on social progress, coup d'état
Environmental		Pollution, deforestation	

Source Holzman and Jorgenson (2001)

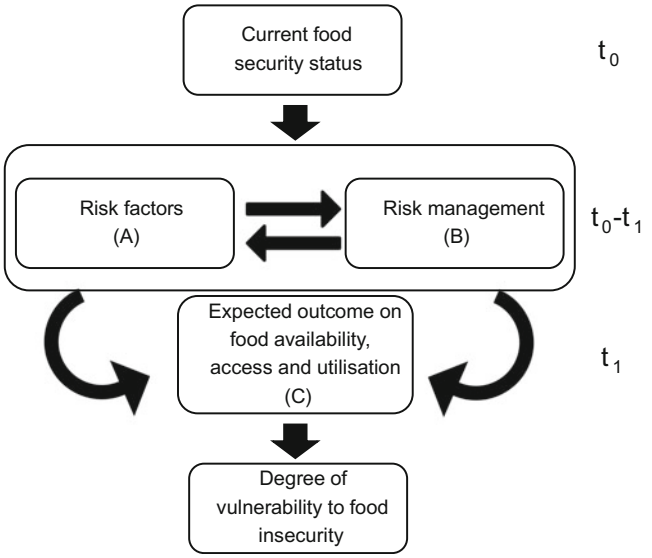

Fig. 1.2 Vulnerability to food insecurity

The former group is of particular importance in fighting food insecurity because it prevents the risk of its manifestation. The interventions can be formal or informal, with the latter group being adopted by households or communities.

Ex post risk management strategies can be organised into three categories:

- Risk prevention strategies (or risk reduction strategies), which prevent or reduce the likelihood of a risk occurring. They relate to block A in Fig. 1.2 and include policies regarding macroeconomics, the environment, health, education and training, the promotion of less risky production, and migration;
- Strategies to cope with (or lessen) risk exposure, which reduce risk exposure by helping the food insecure cope with the residual effects of the risk event so that they do not suffer irreversible negative effects. These strategies pertain to block B in Fig. 1.2 and include social assistance, subsidies, public works, household borrowing from banks, and charity;
- Risk mitigation strategies, which compensate for expected losses based on the expected outcome. In other words, they reduce the negative consequences associated with a risk event (block C in Fig. 1.2). They act on the "portfolio" of vulnerable people investing, for example, in the physical, financial, human and social capital and in the pension system. This investment has a double aim: the promotion of portfolio diversification via formal and informal insurance mechanisms aimed at sharing risk, such as marriage, shared tenancy, and insurance for old age; and hedging based on risk exchange, for example, among the extended family or stipulating a labour contract.

People are highly vulnerable to food insecurity when they are exposed to multiple shocks, when their incomes are low and uncertain, and when they own few assets (Maliro 2011). Therefore, strengthening people's sources of income and assets reduces their vulnerability to future adverse events.

These interventions are part of the resilience strategies aimed at improving the ability of people, communities or systems affected by disasters or crises to withstand damage and to recover rapidly (FAO 2008).

1.2.2 Resilience in a Food Security Context

Following to the food crisis of 2008, the research interest in resilience has increased, and many definitions have been developed.

For example, according to the United Nations (UN) International Strategy for Disaster Reduction (United Nations International Strategy for Disaster Reduction 2009), resilience is the "ability to prevent disasters and crises as well as to anticipate, absorb, accommodate or recover from them in a timely, efficient and sustainable manner. This includes protecting, restoring and improving livelihoods systems in the face of threats that impact agriculture, nutrition, food security and food safety".

For the European Union, resilience is "the ability of an individual, a household, a community, a country or a region to withstand, to adapt, and to quickly recover from stresses and shocks" (European Commission 2012).

The United States Agency for International Development defines resilience as "the ability of people, households, communities, countries, and systems to mitigate,

adapt to and recover from shocks and stresses in a manner that reduces the chronic vulnerability and facilitates inclusive growth" (USAID and DFID 2012).

These definitions have some elements in common; they recognise resilience in terms of the following three dimensions:

- Absorptive capacity, which refers to coping strategies that households and communities use to buffer themselves against shocks or to moderate the impact of shocks on their livelihoods and basic needs to enable them to continue in their current way of life;
- Adaptive capacity, which is the ability to learn from one's experience and to adapt one's responses to the impacts of a shock or stress that exceeds the absorptive capacity without making major qualitative changes in function or structure;
- Transformative capacity, which refers to the capacity to create a fundamentally new system (or way of life) when ecological, economic, or social conditions require it; when a severe shock occurs, the changes associated with adaptive capacity are not sufficient to prevent the collapse of livelihood systems (Béné et al. 2012).

Figure 1.3 shows the three capacities of resilience, the outcome they provide and their link with the intensity of shocks and stresses.

Béné et al. (2012) emphasise that building resilience requires interventions that strengthen the absorptive, adaptive and transformative capacities not only at the

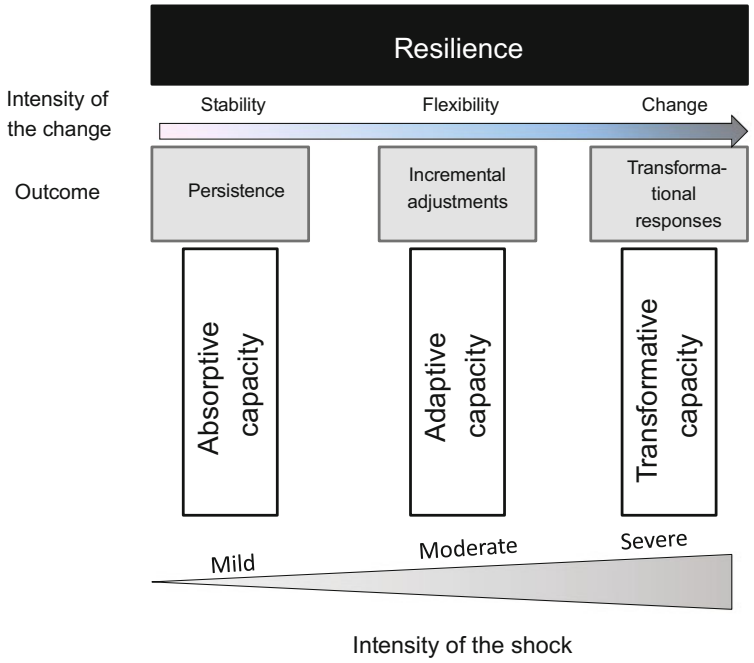

Fig. 1.3 Resilience dimensions, outcomes and shocks

individual or household level but also at multiple levels, including the community, county, and regional levels.

Based on the dimensions of the concept of resilience, organisations have elaborated their own strategies and actions in a food security context. For example, the resilience strategy adopted by the FAO is based on enabling the environment, watching to safeguard, applying prevention and mitigation measures to disasters and crises, and preparing and responding (http://www.fao.org/emergencies/how-we-work/resilience/en/) (Box 1.A).

Box 1.A—The four pillars of the FAO resilience strategy

With the four pillars of its resilience strategy, the FAO aims to achieve the following:

- To enable the environment, which suggests institutional strengthening and the governance of risk and crisis in agricultural sectors in order to maximise the food and nutritional impact of measures designed to improve resilience;
- To watch to safeguard, which promotes the greater integration of information on food and nutrition security and transboundary threats through early warning systems to better monitor threats, situation and context analysis and causal analysis;
- To apply prevention and mitigation measures to disasters and crises, which indicates the need for actions aimed at the protection, prevention, mitigation and building of livelihoods with technologies, approaches, and practices across all agricultural sectors;
- To prepare and respond, which recommends designing preparedness and response interventions, especially with regard to crises in agriculture, livestock, fisheries, and forestry, to ensure that the national and international response to the shock is adequate, timely and effective. (http://www.fao.org/emergencies/how-we-work/resilience/en/).

This strategy reflects the five priorities set by the Hyogo Framework for Action 2005–2015 (http://www.unisdr.org/files/1037_hyogoframeworkforactionenglish.pdf): ensuring that disaster risk reduction is a national and local priority with a strong institutional basis for implementation; identifying, assessing and monitoring disaster risks and enhancing early warnings; using knowledge, innovation and education to build a culture of safety and resilience at all levels; reducing underlying risk factors; and strengthening disaster preparedness for effective responses at all levels (International Strategy for Disaster Reduction 2007). This framework was adopted at the World Conference on Disaster Reduction in 2005, binding 168 governments to adopt a 10-year plan to reduce vulnerabilities and risks to hazards.

1.3 Levels of Analysis of Food Security

Food security can be analysed at the global, national/regional, household, or individual level (Table 1.3). Each level of analysis requires a specific policy answer. Moreover, food security at one level does not imply food security at a lower level (FIVIMS 2003; Thomson and Metz 1996).

Food security at the global level describes a situation in which sufficient food is produced in the world.

National/regional food security occurs when a satisfactory balance exists between food demand and supply at reasonable prices. In other words, this concept describes a situation in which no major upheavals have occurred in the food market in the recent past, food availability is adequate, and most of the population has access to food. According to the literature, most of the population is food secure when hungry people account for less than 5% of the total population.

Food security at the household level is reached when the household's entitlements are greater than or equal to its food needs in terms of energy requirements. This definition is based on two key concepts. The first concept is that of entitlements, which Sen introduced to indicate "the set of alternative commodity bundles that a person can command in a society using the totality of rights and opportunities that he or she faces" (Sen 1981).

Sen (1981) distinguishes between four categories of entitlements:

- Trade-based entitlements, which consist of what a person can buy with the commodities that he or she owns and with cash;
- Production-based entitlements, which are represented by the right to own what a person produces with his or her resources;
- Labour entitlements, which refer to the sale of a person's labour power;
- Inheritance and transfer entitlements, which relate to the right to own what is willingly given by others.

The second component of the definition of household-level food security is the concept of energy requirements. This concept is fundamental in characterising food security from a theoretical perspective and in measuring its state. The report of the FAO/WHO/UNU Expert Consultation on Energy and Protein Requirements defines energy requirements at the individual level as "the level of energy intake from food

Table 1.3 Levels of food security

Level of food security	Definition
Global	Sufficient food produced at the global level
National/regional	A satisfactory balance between food demand and supply at reasonable prices
Household	Household entitlements greater than or equal to food needs in terms of energy requirements
Individual	Individual food consumption meets individual food needs in terms of energy requirements

Table 1.4 Paradigm shift in food security level

Decade	Focus
1970s	Focus on supply, national self-sufficiency, and world food stocks or import stabilisation schemes (see, for example, United Nation 1975)
1980s	Importance of access and entitlement (see, for example, Sen 1981; Berg 1973; Joy 1973) but ambiguities about whether the unit of analysis should be the individual or the household
Since the 1990s	Prioritisation of access to food by individuals in the household and intra-household resource allocation

Source Author's elaboration from Maxwell (1996, 2001)

that will balance energy expenditure when an individual has a body size and composition and level of physical activity, consistent with long-term good health; and that will allow for the maintenance of economically necessary and socially desirable physical activity. In children and pregnant or lactating women, the energy requirement includes the energy needs associated with the deposition of tissues or the secretion of milk at rates consistent with good health" (FAO/WHO/UNU 1995).

This definition underlines the three basic components of food requirements.[1] They refer to the energy

- Expended for the functioning of an individual in a state of complete rest (the basal metabolic rate);
- Needed to digest food, to metabolise food and to store and increase food intake; and
- Required to perform physical activities related to both work and non-work[2] (Naiken 2002).

In the case of children, the energy required for growth should be added to the abovementioned components, and in the case of pregnant and lactating women, the energy required for the deposition of tissue and the secretion of milk should be considered to increase food requirements.

The final level of the analysis of food security is the individual level. At this level, food security is defined as a situation in which individual food consumption meets individual food needs, which are also expressed in terms of the energy requirements.

The FAO definition of food security stresses the individual level of analysis ("all people") because of an important paradigm shift (Table 1.4). As argued by

[1]In practice, the food requirement level employed is a normatively specified minimum energy consumption level given a minimum acceptable body weight for healthy people per age and sex group, as recommended by the WHO or other health agencies. These levels are periodically reviewed.

[2]The energy requirement components also change according to an individual's age, sex, body weight, body consumption, disease state, genetic traits and activity level.

Maxwell (1996, 2001), over time, concerns regarding issues of global and national food supply have gradually shifted towards problems related to household and individual access to food.

1.4 Food Insecurity Typologies According to Time

The FAO definition of food security ("at all times") draws an important distinction between chronic and transitory food insecurity (Table 1.5). To address this issue, we must first define food insecurity. According to the FAO (2002), it is "a situation that exists when people lack secure access to sufficient amounts of safe and nutritious food for normal growth and development and an active, healthy life". In other words, food insecurity occurs when food security is limited or uncertain.

Food insecurity is chronic in a situation of long-term inadequate access to sufficient food, which is associated with enduring conditions of poverty combined with a lack of coping mechanisms due to complex emergencies or a lack of assets and inadequate access to productive or financial resources (FIVIMS 2003; Thomson and Metz 1996). Chronic food insecurity may have several manifestations, including a lack of food access and food stocks, inadequate dietary rations throughout the year, malnutrition in children under five years of age, food purchases in small amounts and outstanding household debts.

This type of food insecurity can be overcome using the long-term development measures normally introduced to address poverty, including interventions aimed at improving education, access to productive resources, especially credit, and access to food to enable the chronically food insecure to increase their productive capacity (FAO 2008).

Food insecurity is transitory when inadequate access to food is temporary or occurs in the short term.

It can be temporary—when sudden and unpredictable shocks affect household entitlements—or cyclical (also called seasonal)—when there is a regular pattern of inadequate access to food (FIVIMS 2003; Riely et al. 1999; Thomson and Metz 1996).

Temporary food insecurity may be the result of natural disasters (e.g., hurricanes, floods, and earthquakes) or other short-term negative shocks and fluctuations in food availability and food access due to variations in domestic food production, food prices and household incomes. Typical manifestations include temporary displacement from one's home, although livelihoods are intact (e.g., crops are

Table 1.5 Food insecurity and time

Typology	Definition
Chronic	Long-term inadequate access to sufficient food
Transitory:	Temporary inadequate access to food
– Temporary	Household entitlements affected by sudden and unpredictable shocks
– Cyclical	Regular pattern of inadequate access to food

destroyed, but livestock and possessions are intact), and the sale of surplus assets (i.e., bulls and goats) rather than productive assets (i.e., cows).

The relatively unpredictable nature of temporary food insecurity makes planning and programming more difficult in these situations, requiring specific capacities and types of interventions that differ from those adopted for chronic food insecurity. Early warning capacity and safety net programmes are among the tools used to address temporary food insecurity (FAO 2008).

The main causes of cyclical or seasonal food insecurity are the inadequacy of household production to sustain the household for the entire year in poverty-stricken areas with one primary growing season. Such inadequate production is associated with seasonal fluctuations in the climate, cropping patterns, work opportunities and disease (FAO 2008). Therefore, seasonal food insecurity is predictable as chronic food insecurity and lasts for a limited period as temporary food insecurity.

Box 1.B provides an example of seasonal food insecurity for the case of Malawi.

Box 1.B—Seasonal food insecurity in Malawi

As described in Sassi (2015a, b), food consumption in Malawi is generally characterised by a significant risk of malnutrition. Most of the population depends on agriculture for income and food. Maize is the predominant crop and represents the main staple food that defines the country's food security situation. The price of maize serves as a proxy for the price of food, and its fluctuations are significantly affected by the dynamic seasonal structure of production (Sassi 2015a, b).

Figure 1.4 shows the crop and seasonal calendar for maize in Malawi, showing the hunger season from December to March every year.

The single main harvest each year does not provide adequate food to last from one season to the next. Thus, a large portion of the population depends on market food purchases when the stock is depleted. In this period, the maize price increases because of supply shortages and excess demand. The country suffers from seasonal food insecurity. The hunger season coincides with the onset of the rainy season when water quality deteriorates (Cornia et al. 2016). In fact, rain facilitates surface contamination of customary water sources, which increases the risk of waterborne diseases. In addition, stagnant water increases the risk of malaria transmission. The hunger season is also characterised by the beginning of the planting season when labour demand intensifies. In this period, women are also involved in agricultural practices and often leave their infants with grandparents or older children during the working day. This practice results in children's increased exposure to poor feeding and childcare practices.

Figure 1.5 explains the trend described above, showing the direct correlation between the seasonal component of the price of maize and underweight age under five years of age.

	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.
Weather	Rainy season	Dry season						Rainy season				
Summer season (main season)		Green harvest	Main harvest						Main planting season			
Winter season (in certain areas)	Winter planting						Winter harvest					
Hunger season										Hunger season		
Agricultural labour period								Peak agricultural labour				

Fig. 1.4 Crop and seasonal calendar for maize in Malawi. *Source* Abapted from Sassi (2015a, b)

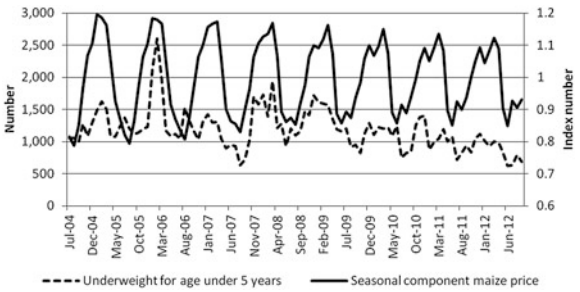

Fig. 1.5 Number of children in Malawi admitted to nutrition and rehabilitation units and seasonal price component, January 2003–December 2009 *Source* Sassi (2015b)

By contrast, a sharp decline in the price of maize is registered in the period immediately following the harvest when most households are forced to sell their produce to repay the debts accumulated in prior months to buy food and non-food items. In this period, there is a tension between the retention and extraction forces at the household level (Devereux 2008). In fact, households must balance the need to retain food for subsistence production and the need to sell it to meet non-food needs. In Malawi, the need to sell maize at a low price compromises the household's capacity to buy maize on the market when stocks are depleted and reduces the potential amount of maize stocked, thereby favouring the insurgence of the seasonal food insecurity.

The manifestations of cyclical food insecurity are rationed food or the consumption of unpalatable foods during the hunger season; reduced spending on non-food items, such as school fees, and the postponement of funerals and weddings; out-migration on seasonal basis, which is reversed during the planting season; and high malnutrition rates throughout the hunger season, which returns to normal levels after the harvest. Another typical response of households during the hunger season is to sell its livestock or assets, to increase its casual labour and to borrow to acquire food.

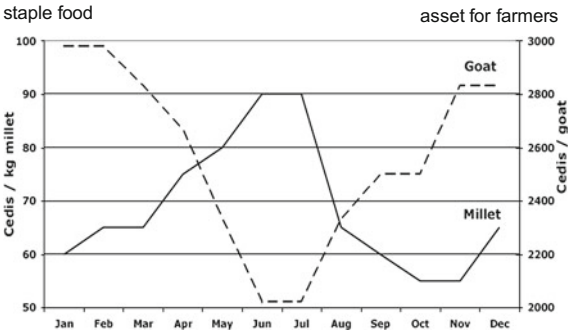

Fig. 1.6 Terms of trade between grain and livestock in northern Ghana, 1988. *Source* Adapted from Devereux (2008)

Selling assets often gives rise to the so-called exchange entitlement decline. Devereux (2008) provides an example of such a decline in Ghana, comparing the trend in the price of millet, the country's staple food, and goats, an important asset for farmers (Fig. 1.6).

The price scissors between the two prices indicates a decline in the terms of trade between the asset value and the food price.

More generally, during seasonal food insecurity, the effective demand for food is also constrained by the decline in the price of assets due to excess supply in the assets market.

In some cases, during seasonal food insecurity, households introduce survival strategies or desperate or negative coping mechanisms. For example, some engage in transactional sex and theft. Moreover, children are often taken out of school to join their parents in searching for casual labour opportunities, and this activity can last several weeks. These survival strategies destroy or reduce the production capital of the households.

Therefore, when not properly addressed, cyclical food insecurity is one of the main causes of chronic food insecurity.

Therefore, Devereux (2009) suggests an integrated intervention framework to fight seasonal hunger (Fig. 1.7).

The framework is articulated by three levels of intervention. The emergency assistance level is directed towards people who need immediate help because they are affected by seasonal hunger. The second group of interventions, social protection safety nets, prevents households from becoming food insecure. The last set of measures includes agricultural development interventions. These initiatives aim to improve access to key inputs in order to promote increased agricultural productivity. The final aim of these interventions is to allow the households to reach a stable level of income in order to avoid the need for social protection safety nets.

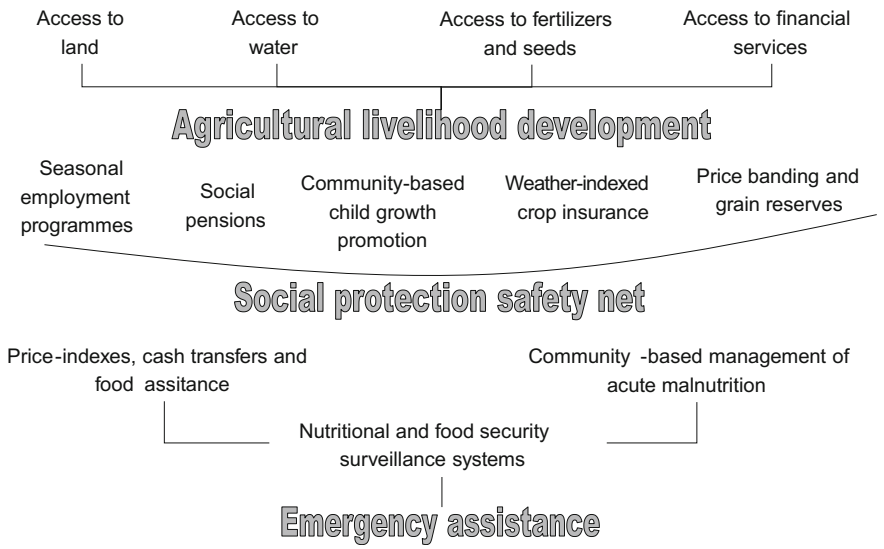

Fig. 1.7 Integrated framework to fight seasonal hunger. *Source* Adapted from Devereux (2009)

1.4.1 Severity of Food Insecurity

To determine the nature, extent, and urgency of the assistance needed by hungry people, the understanding of the time dimension of food insecurity should be combined with information regarding the severity of the problem.

Analysts have developed different classifications, scales and phases to identify the intensity of food insecurity (European Commission and FAO Food Security Programme 2008). For example, the Integrated Food Security Phase Classification (IPC) is part of a global effort to develop a common approach to food security analysis and response, which has been undertaken by 12 agencies: Action Against Hunger, CARE, the Permanent Inter-State Committee for Drought Control in the Sahel (CILSS), the FAO, the Famine Early Warning Systems Network, the Food Security Cluster, the Intergovernmental Authority on Development, the Joint Research Centre of the European Commission, Oxfam, Save the Children, the Central American Integration System, and the World Food Programme (http://www.ipcinfo.org/ipcinfo-about/ipcinfo-partnership/en/).

The IPC offers two kinds of information to decision makers. In fact, this tool presents a rigorous analysis of food insecurity and suggests objectives for responses in emergency and development contexts (http://www.ipcinfo.org/).

The IPC is a set of standardised tools that provides a common approach to classifying the severity and magnitude of acute food insecurity[3] situations. More

[3]Acute food insecurity is a severe and life threatening situation.

recently, this approach has been complemented by that used to address chronic food insecurity situations. Both classifications are based on the analysis of a range of food insecurity outcomes, including food consumption levels, livelihood changes, nutritional status, and the mortality rate. The information is triangulated with several determinants of food insecurity and is analysed in local contexts (for more information, see www.ipcinfo.org).

In Table 1.6, the IPC categorises the severity of acute food insecurity at the household by area level and five phases: none or minimal, stressed, crisis, emergency, and humanitarian catastrophe or famine. Famine is the most extreme situation and is associated with substantial loss of life, starvation, and destitution. Table 1.6 also provides the suggested priority response objectives by phase.

The IPC classification levels for chronic food insecurity are presented in Table 1.7.

The IPC scale organises chronic food insecurity according to four levels: minimal, mild, moderate, and severe. As in the case of acute food insecurity, Table 1.7 highlights the top response objectives.

The IPC scales for acute and chronic food insecurity are not mutually exclusive. In fact, areas or population groups can be in an acute, chronic condition. In this situation, the combined analysis of acute and chronic food insecurity provides decision makers with a comprehensive understanding of the context, which is essential to realize effective responses (FAO-FSNAU 2006).

1.5 Food and Nutrition Security

Food security and nutrition were referred to as separate goals for a long time. However, a broad consensus has emerged regarding the need to consider optimal nutrition and food security as the cornerstones of development, which can be achieve using a comprehensive rights-based approach that covers food availability, access, utilisation, and stability (FAO 2013). In 2012, the Committee on World Food Security acknowledged that the term "food and nutrition security" best reflects the conceptual linkages between food security and nutrition security, stating that "food and nutrition security exists when all people at all times have physical, social and economic access to food, which is safe and consumed in sufficient quantity and quality to meet their dietary needs and food preferences, and is supported by an environment of adequate sanitation, health services and care, allowing for a healthy and active life" (Committee on World Food Security 2012).

This definition adds the dimensions of adequate sanitation, health services, and care to the concept of food security (Fig. 1.8).

According to the World Health Organization (WHO), sanitation refers to the provision of facilities and services for the safe disposal of human urine and faeces and to the maintenance of hygienic conditions, such as the cleanliness of the

Table 1.6 IPC scale for acute food security

Phase name	Area classification	Household group classification	Priority response objectives
Phase 1 None/minimal	More than four in five households are able to meet essential food and non-food needs without engaging in atypical, unsustainable strategies to access food and income, including any reliance on humanitarian assistance	The household group is able to meet essential food and non-food needs without engaging in atypical, unsustainable strategies to access food and income, including any reliance on humanitarian assistance	Action required to build resilience and for disaster risk reduction
Phase 2 Stressed	Even with any humanitarian assistance at least one in five households in the area have the following problems or worse: minimally adequate food consumption and the inability to afford some essential non-food expenditures without engaging in irreversible coping strategies	Even with any humanitarian assistance, the household group has minimally adequate food consumption and is unable to afford some essential non-food expenditures without engaging in irreversible coping strategies	Action required for disaster risk reduction and to protect livelihoods
Phase 3 Crisis	Even with any humanitarian assistance, at least one in five households in the area have experienced the following or worse: the household has food consumption gaps with acute malnutrition that is high or higher than usual, or it is marginally able to meet minimum food needs, though only with the accelerated depletion of livelihood assets, which will lead to food consumption gaps	Even with any humanitarian assistance, the household group has food consumption gaps with acute malnutrition that is high or higher than usual or is marginally able to meet minimum food needs, though only with accelerated depletion of livelihood assets, which will lead to food consumption gaps	Urgent action required to protect livelihoods, reduce food consumption gaps, and reduce acute malnutrition

(continued)

Table 1.6 (continued)

Phase name	Area classification	Household group classification	Priority response objectives
Phase 4 Emergency	Even with any humanitarian assistance, at least one in five households in the area have experience the following or worse: large food consumption gaps resulting in very high acute malnutrition and excess mortality or an extreme loss in livelihood assets, which will lead to food consumption gaps in the short term	Even with any humanitarian assistance, the household group has large food consumption gaps resulting in very high acute malnutrition and excess mortality, or it experiences an extreme loss in livelihood assets, which will lead to large food consumption gaps in the short term	Urgent action required to save lives and livelihoods
Phase 5 Humanitarian catastrophe/ famine	Even with any humanitarian assistance at least one in five households in the area suffers from an extreme lack of food and other basic needs, and starvation, death, and destitution are evident [evidence of all three criteria of mortality, particularly CDR* > 2/10,000/ day, wasting (GAM** > 30%) and food consumption (near complete food consumption gap for > 20% of the population)]	Even with any humanitarian assistance, the household group suffers an extreme lack of food and/or other basic needs even with the full employment of coping strategies. Starvation, death, and destitution are evident	Urgent action required to prevent widespread death and total collapse of livelihoods

Note *CDR = Crude Death Rate; **GAM = Global Acute Malnutrition
Source Adapted from FAO-FSNAU (2006)

household environment (http://www.who.int/topics/sanitation/en/). Health services include all services involving the diagnosis and treatment of disease or the promotion, maintenance and restoration of health (http://www.who.int/topics/health_services/en/). Better sanitation and health services can prevent and properly treat the impact on nutritional status of diseases and especially infections, such as diarrhoea, malaria, intestinal parasites, and HIV/AIDS.

Table 1.7 IPC scale for chronic food insecurity

Phase name	Classification	Priority response objectives
Level 1 Low chronic food insecurity	– Considering years when the area does not experience Phase 3, 4, or 5 of food insecurity, less than 10% of the households have an inadequate quantity and quality of food throughout the year; and – The area has not had recurrent acute food security crises (or the equivalent) in the past 10 years	Objectives should be cross-cutting and holistic, addressing the structural and underlying causes of chronic food insecurity, and they should be tailored to the type of chronic food insecurity (ongoing, seasonal, and/or episodic acute crises) and causes (hazards and vulnerabilities). The higher the level is, the higher the geographic priority and level of investments required. Depending on the situation, more specific objectives can include – Increasing food system productivity and resilience; – Building and protecting livelihood assets and strategies; – Implementing safety net programmes; – Reducing disaster risk; – Implementing micronutrient enhancement programmes; – Ensuring the efficacy of policies and institutional structures; – Ensuring adequate resources and political will through advocacy
Level 2 Moderate chronic food insecurity	– Considering years when the area does not experience Phase 3, 4, or 5 of food insecurity, 10–20% of the households have an inadequate quantity and quality of food throughout the year; or – The area has had occasional acute food security crises (or the equivalent)	
Level 3 High Chronic Food Insecurity	– Considering years when the area does not experience Phase 3, 4, or 5 of food insecurity, less than 20–40% of the households have an inadequate quantity and quality of food throughout the year; or – The area has had frequent acute food security crises (or the equivalent)	
Level 4 Very high chronic food insecurity	– Considering years when the area does not experience Phase 3, 4, or 5 of food insecurity, more than 40% of the households have an inadequate quantity and quality of food throughout the year; or – The area has had very frequent acute food security crises (or the equivalent)	

Source: Adapted from FAO-FSNAU (2006)

The international community has recognised the importance of these achievements in its development goals. In 2000, Target 7c of the Millennium Development Goals (MDGs) aimed to "[h]alve, by 2015, the proportion of the population without sustainable access to safe drinking water and basic sanitation". In 2015, the Sustainable Development Goals introduced Target 6 to "[e]nsure access to water and sanitation for all".

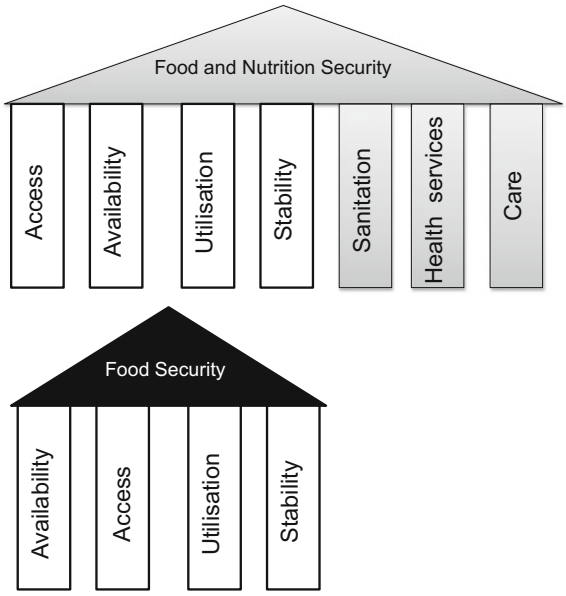

Fig. 1.8 Food and nutrition security

Today, Water, Sanitation and Hygiene (WaSH[4]) programmes are a broadly adopted response in this area. They include interventions aimed at promoting the safe disposal of faeces, hand washing with soap, the drinking water supply, drinking water treatment and safe storage, and food hygiene.

Care practices are the ways in which the dependent members of a household or a community are looked after and fed. These practices are the basis of optimal survival, growth, and development. They include psychological care, food preparation, hygienic practices, and home health practices, especially during periods of vulnerability, eating habits, and intra-household food distribution (FAO-FSNAU 2005). Within households, mothers and daughters are responsible for a large part of the family care practices. For this reason, the improvement of women's knowledge, education, and rights is vital to increase food and nutrition security (FAO 1997).

1.6 Food Security Versus Food Self-sufficiency

After the 2007–2008 food crisis, which resulted in higher and more volatile food prices, some governments in developing countries increased their interest in targeting food self-sufficiency. This target has been considered an effective way of

[4]The acronym WaSH was introduced in 1988 by the United States Agency for International Development (USAID). At that time, the letter H stood for "health", but it was changed to "hygiene" in December 2001 when the "Water, Sanitation and Hygiene Campaign For All" was launched at the Bonn Freshwater Conference.

improving the level of food security by reducing the country's dependence on international markets (Clapp 2015).

Therefore, the concept of food security is often associated with that of food self-sufficiency.

The definition of food self-sufficiency can be approached in two ways. One approach is auto-centric, and the other is pragmatic.

According to the former perspective, food self-sufficiency is defined as the extent to which a country can satisfy its food needs (particularly in terms of staple food crops) from its domestic production rather than from imports. Based on this definition, food self-sufficiency and food security differ on two fundamental points:

- Food self-sufficiency considers domestic production as the sole source of supply, while food security considers commercial imports and food aid as possible additional sources of commodity supply;
- Food self-sufficiency only refers to domestically produced food available at the national level, while food security brings in the dimensions of the stability of supply and access to food by the population (Thomson and Metz 1996).

In other words, food self-sufficiency is linked to an overall perspective of development that emphasises the need for self-reliance. By contrast, food security is consistent with a view of development that incorporates international specialisation and comparative advantage.[5]

Today, the extreme policy stance of food self-sufficiency does not apply in practice. In fact, we cannot find any country that has closed its borders to all food trade (imports and exports) and that has concentrated its efforts on the agriculture sector to produce enough food domestically to meet its requirements (Clapp 2015).

A more pragmatic definition of food self-sufficiency relates to a country that produces a proportion of its own food needs that approaches or exceeds its food consumption. This definition does not exclude trade. Instead, in a situation of food self-sufficiency, food production must be greater than or equal to consumption in terms of calories.

One of the most adopted indicators to measure this concept of self-sufficiency is the self-sufficiency ratio (SSR) adopted by the FAO. It is given by the following formula:

$$SSR = \frac{Production}{Production + imports - exports} * 100 \tag{1.1}$$

The SSR is computed in calories or volume and distinguishes between net importer or exporter countries. A value below 100 means that a country is a net importer. A value greater than 100 means that a country is a net exporter.

[5]A country has a comparative advantage in producing a good or service when the opportunity cost of producing that good or service is lower than that for any other country. International specialisation is a situation in which countries produce the goods and services for which they have a comparative advantage.

As the concept of food self-sufficiency refers only to the availability pillar, an SSR above 100 does not indicate a food security situation. In fact, food security depends also on accessibility, utilisation, and stability. Therefore, the SSR only expresses the capacity of a country to produce a sufficient quantity of food.

1.7 Food Insecurity and Poverty

Food insecurity is a cause and a manifestation of poverty (Committee on World Food Security 2000). However, these two interrelated concepts are very different (Clay et al. 1998). As the FAO definition of food security explains, food insecurity concerns something that determines a particular weakness that people have in relation to their access to food. By contrast, according to the 1995 UN definition, (absolute) poverty is "a condition characterised by severe deprivation of basic human needs, including food, safe drinking water, sanitation facilities, health, shelter, education, and information. It depends not only on income but also on access to services" (United Nations 1995).

Therefore, poverty describes a situation in which people are relatively short of almost every basic good and service, and they must choose between to buy food items or other goods and services (e.g., clothing, medical care, education) on a daily basis.

As illustrated in Fig. 1.9, food insecurity and poverty are deeply interrelated. Poverty contributes to low nutrition, causing poor physical and cognitive development, which is the basis of a decreased ability to work. This latter condition, in turn, fuels poverty.

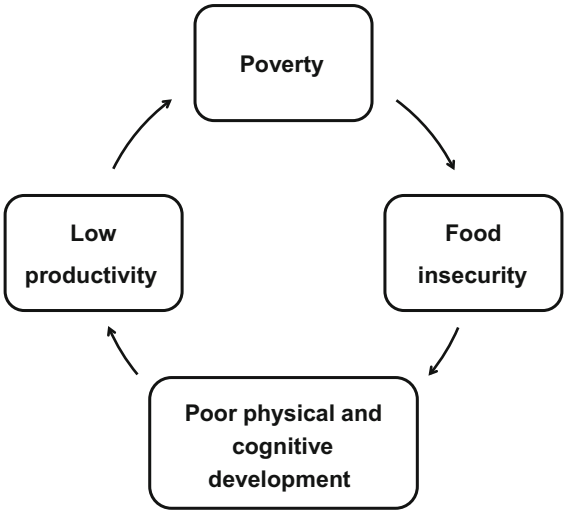

Fig. 1.9 Interdependency between food insecurity and poverty

The fact that food security is a cause and a manifestation of poverty has important implications for action. Fighting food insecurity is "instrumental to the eradication of other dimensions of poverty" (Committee on World Food Security 2011). Therefore, specific interventions aimed at addressing food insecurity are needed to overcome the problem.

By contrast, if poverty reduction is perceived as an essential condition to eliminate hunger, the priority interventions should be directed towards eradicating the causes of poverty over the short and medium term. With these interventions, even food insecurity should be addressed.

1.8 Food Insecurity, Undernourishment, Undernutrition, Malnutrition and Hunger

The terms food insecurity, undernourishment, undernutrition, malnutrition, and hunger are often used loosely and interchangeably, although they are distinct concepts (Fig. 1.10).

Undernourishment is a state, meaning that a person is unable to acquire enough food to meet his or her daily minimum dietary energy requirements over a period of at least one year (http://www.fao.org/hunger/en/).

The outcome of undernourishment is undernutrition. In fact, undernutrition is the result of a prolonged low level of food intake and/or poor absorption of food consumed due to repeated infectious diseases, irrespective of whether any specific nutrient deficiency is present. In other words, undernutrition depends on both the food intake level and health, sanitation, and care conditions. The manifestation of undernutrition includes being underweight for one's age, too short for one's age, dangerously thin for one's height and deficient in vitamins and minerals (http://www.fao.org/hunger/glossary/en/).

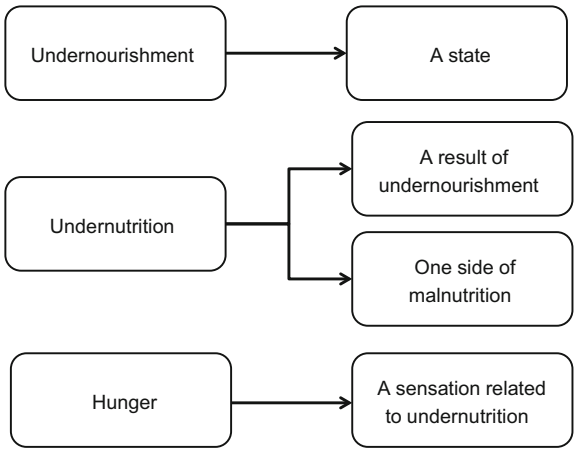

Fig. 1.10 Relationship between undernourishment, undernutrition, malnutrition and hunger

Undernutrition is one side of malnutrition. In fact, malnutrition results from a deviation from adequate nutrition, including undernutrition and overnutrition—the former determined by inadequate energy, protein and/or other micro and macro nutrients relative to the need (FAO 1999, 2000).

Finally, the meaning of hunger ranges from short-term physiological discomfort to a life-threatening lack of food and an uncomfortable or painful sensation caused by insufficient food energy consumption. In this latter aspect, hunger is referred to as food deprivation. For this reason, a hungry person is food insecure, but not all food insecure people are hungry. In fact, food insecurity can be determined by other causes, such as the poor intake of micronutrients (European Commission—FAO Food Security Programme 2008; Ballard et al. 2013).

1.9 The Right to Food and Food Sovereignty

The right to food is a human right first established in the Universal Declaration of Human Rights and subsequently included in many binding and non-binding instruments (Mechlem 2004). In 1996, the International Covenant on Economic, Social and Cultural Rights (ICESCR) defined (in Article 11) the right to adequate food as "the availability of food in a quantity and quality sufficient to satisfy the dietary needs of individuals, free from adverse substances, and acceptable within a given culture; the accessibility of such food in ways that are sustainable and that do not interfere with the enjoyment of other human rights" (Committee on Economic, Social and Cultural Rights 1999). This definition was ratified by 156 states.

The right to food is based on the food security pillars of food availability, access, utilisation, and stability, but it complements the technical concept with legal aspects of human rights and its principles of human dignity, accountability, empowerment, non-discrimination, and participation. In addition, while the concept of food security is based on the government's acknowledgement of the population's needs, the right to food refers to the acknowledgement of human rights (Fig. 1.11), which has important implications. Whereas policy goals change according to the political environment, human rights are not negotiable.

The right to food gives rise to three legal state obligations: to respect, to protect and to fulfil (Article 2 ICESCR).

The obligation to respect the existing access to adequate food requires governments to not take any direct or indirect measures that arbitrarily deprive people of their access to food. The obligation to protect means that states should enforce appropriate measures to prevent third parties, including individuals and corporations, from violating individuals of their access to adequate food. The obligation to fulfil means that governments must take positive measures to facilitate and provide for individuals' enjoyment of their food rights. More precisely, facilitation means that governments must pro-actively engage in activities intended to strengthen people's livelihoods and access to and utilisation of resources to enable the achievement of their food security. On the provision side, governments have the

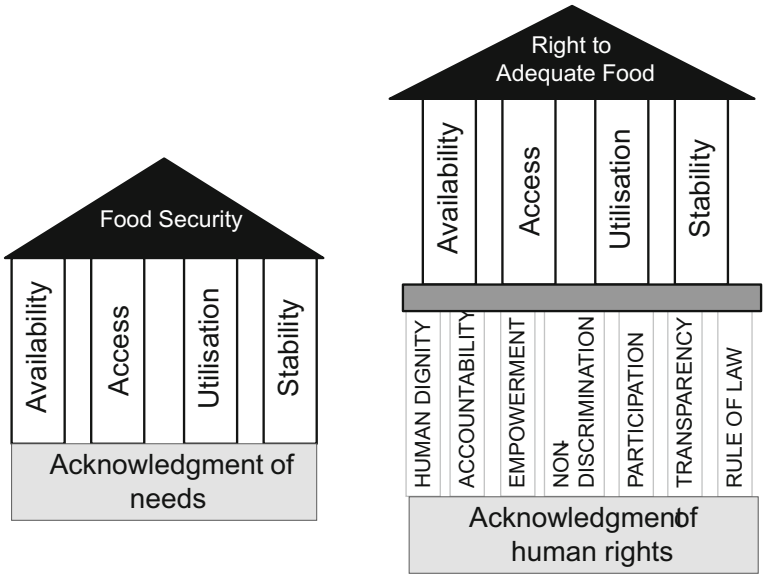

Fig. 1.11 Comparison between food security and the right to food. *Source* Adapted from FAO (2008)

obligation to directly fulfil the right to food whenever an individual or group is unable to enjoy this right for reasons beyond their control.

Therefore, the rights-based approach to food security emphasises the rights of human beings to food and obligates governments to establish the adequate pre-conditions to feed all people and to directly protect those who are poor and hungry.

The right to food is promoted by the political proposal of food sovereignty. This concept finds its roots at the end of the 1996 World Food Summit when non-governmental organisations (NGOs) and civil society organisations (CSOs) proposed a new model for achieving food security, a model "based on decentralisation, answering to the challenges of the current model based on the concentration of wealth and power that now threatens global food security, cultural diversity and the very ecosystem that sustain life on the planet".

In 2002, during the NGO/CSO Forum for Food Sovereignty held in parallel with the FAO World Food Summit: Five Years Later, this concept was defined as "a right of countries and peoples to define their own agricultural, pastoral, fishery and food policies which are ecologically, socially, economically and culturally appropriate. Food sovereignty promotes the right to food for the entire population, through small and medium-sized production, respecting: the cultures, diversity of peasants, pastoralists, fisherfolk, Indigenous Peoples and their innovation systems, their ways and means of production, distribution and marketing and their

Table 1.8 The six pillars of food sovereignty

1. Focuses on food for the people by (a) putting people's need for food at the centre of policies; (b) insisting that food is more than just a commodity	4. Establishes control at the local level by (a) putting control in the hands of local food suppliers; (b) recognising the need to inhabit and share territories; (c) rejecting the privatisation of natural resources
2. Values food providers by (a) supporting sustainable livelihoods; (b) respecting the work of all food providers	5. Promotes knowledge and skills by (a) building on traditional knowledge; (b) using research to support and disseminate this knowledge to future generations; (c) rejecting technologies that undermine local food systems
3. Supports localised food systems by (a) reducing the distance between suppliers and consumers; (b) rejecting dumping and inappropriate food aid; (c) resisting dependence on remote and unaccountable corporations	6. Works with nature by (a) maximising the contributions of ecosystems; (b) improving resilience; (c) rejecting energy intensive, monocultural, industrialised and destructive production methods

Source Adapted from Food Secure Canada (2012)

management of rural areas and landscapes. Women play a fundamental role in ensuring food sovereignty" (FAO 2006).

In 2007, at the Nyéléni Forum for Food Sovereignty, the so-called six pillars of food sovereignty were defined (Food Secure Canada 2012). They are described in Table 1.8.

The distinctive feature of food sovereignty is the right of people and states to determine their own food and agricultural policy that prioritises small farming. Therefore, food sovereignty and food security are not antagonistic concepts, but the right to define one's food policy goes beyond the concept of food security. It is one of the pillars of a modern state. On the other side, the emphasis on small farmers or, more generally, on how to production is a matter to be addressed through specific government policies (Gordillo 2013).

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Chapter 2
Conceptual Frameworks for the Analysis of Food Security

Abstract This chapter illustrates six conceptual frameworks suitable for identifying the information to be collected for the elaboration of appropriate indicators to assess the food security status and its features. The neoclassical framework investigates the different typologies of food deficit at the macro-level. Two other frameworks are presented as examples of conceptual structures that can be adopted for the identification of the causes of the individual and child malnutrition. One is mainly used in the academic literature and the other has been designed by UNICEF for the purpose of programming at the national, district, and local levels. Afterwards, the basic elements of the Sustainable Livelihood Approach and the Household Economy Approach are presented as livelihood-based frameworks. The first framework examines the influence of macro-level policy and institutions on household livelihood options, whereas the second is an instrument to predict short-term changes in the population's access to food to realize more effective decision making. The Resilience Index Measurement and Analysis Model is the last presented framework. It is used to investigate the household resilience to food insecurity. At the end of this chapter, the reader will be able to understand the standard elements of different conceptual frameworks for analysing food security.

2.1 Introduction

Assessing food security at the national, sub-national, household, or individual level requires a conceptual framework that defines the information to be gathered to quantify appropriate indicators. To this end, this chapter presents six conceptual frameworks for the investigation of different aspects of food security. A paragraph is dedicated to each of these frameworks. The objective of this chapter is not to provide definitive answers and guidelines. Instead, it is intended to stimulate readers to reflect on the basic aspects of the various approaches. For a comparison and critical analysis of the investigation of food security, see, for example, Burchi and De Muro (2016).

M. Sassi, *Understanding Food Insecurity*,
https://doi.org/10.1007/978-3-319-70362-6_2

Section 2.2 presents a typical neoclassical framework used to describe different types of food deficits that can be addressed by specific policy measures at the macro-level.

Section 2.3 discusses a conceptual framework that emphasises the links between the basic pillars of food and nutrition security at the individual level, while Sect. 2.4 the framework designed by the United Nations Children's Fund (UNICEF) as a tool for providing information on the causes of child malnutrition by assessing, analysing, and acting to improve the nutritional status of children.

Another group of conceptual frameworks provided by the literature are livelihood-based (for a comparison, see Carney et al. 1999). In this chapter, we analyse two of them: the Sustainable Livelihood Approach in Sect. 2.5 and the Household Economy Approach in Sect. 2.6.

According to the Sustainable Livelihood Approach, food security is one of the possible livelihood outcomes. This conceptual framework presents the main factors affecting household livelihoods and the typical relationships between these factors (DFID 2001).

The sustainable livelihood framework is an outgrowth of the Household Economy Approach. The Household Economy Approach has been designed as a livelihood-based framework in accordance with Amartya Sen's theory of exchange entitlements; this approach is a tool used to predict short-term changes in the population's access to food (Seaman et al. 2000; Holzmann et al. 2008).

Section 2.7 focuses on the conceptual framework for measuring food security resilience. The literature proposes several structures. They differ with respect to their purpose, scale, focus, and method of analysis (for a review see, for example, Sturgess 2016). In 2008, the FAO designed a resilience framework, the Resilience Index Measurement and Analysis Model (RIMA-I), which evolved into RIMA-II in 2015. We illustrate the conceptual framework at the heart of this approach, which is today applied in several empirical investigations.

The references to empirical studies in the literature clarify the possible application of each framework.

2.2 Food Insecurity Within a Neoclassical Framework

At the country level, a food economy can be described within a neoclassical framework based on the concepts of food production, supply, demand, requirements and prices.

Considering an open and price-taker economy, given a prevailing food market price,

- Food production is the volume of food produced domestically both for sale on the market and for subsistence;
- The total food supply incorporates food production for the domestic market and exports, modified by stock changes and food imports;

– Food demand includes the effective market demand and home consumption from subsistence production;
– Food requirements consist of the energy required for growth, as defined in the first chapter.

Within this framework, food security is a situation in which, at a certain market price, food supply and demand are sufficient to meet food requirements on a continuous basis. When this condition is not achieved, a food deficit emerges. More precisely, four types of food deficits can be characterised:

– A production deficit, when food production is unable to meet food requirements. As the balance can be reached through imports, this deficit is not necessarily an indication of food insecurity;
– An import deficit, when market production is lower than effective demand;
– A supply deficit, when the total food supply is insufficient to meet requirements, i.e., food supply insecurity exists;
– A demand deficit, which expresses the imbalance between effective demand and requirements and describes a situation of insufficient income and purchasing power that does not allow people to express their food requirements as effective demand.

These concepts related to food deficits are illustrated in Fig. 2.1, where the horizontal axis represents the quantity of food and the vertical axis represents the price.

The production curve, labelled AA′, shows the amount of aggregate food production that farmers are prepared to produce at varying food market prices. At the world market price 0P, food production is 0D. The segment 0A is the volume of subsistence production.

The total supply curve, labelled AA″, is the quantity of food that farmers are willing and able to sell at different prices. Up to 0P, the point where the domestic

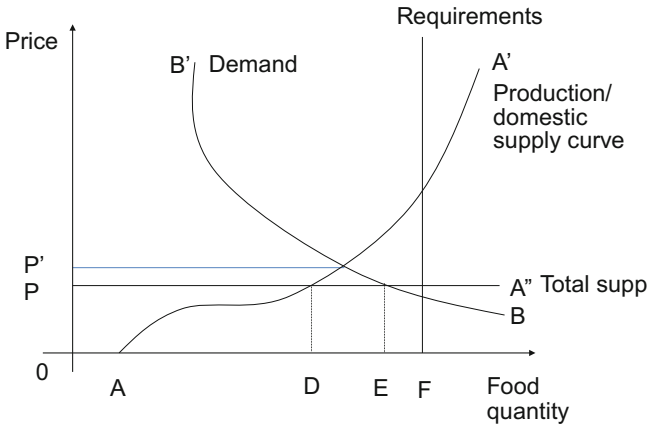

Fig. 2.1 Types of food deficits in an open and price-taker economy

market price reaches the level of the world market price, the total supply curve is identical to the production curve. Beyond this point, the supply curve flattens, becoming parallel to the horizontal axis. The curve is perfectly elastic because of the assumption of a price-taker economy in the world market.

The demand curve, labelled BB′, shows the amount of food that consumers are willing and able to buy at different prices. The shape of the curve depends on the price elasticity of demand, which affects the intensity of the impact of a price change on the real income and, in turn, on the number of households able to express their food needs as effective demand. At the world market price 0P, the volume of food demand is 0E, and DE represents food imports.

The food requirement 0F is the appropriate amount of energy intake from food in the economy.

In Fig. 2.1, the production deficit amounts to the segment DF. In fact, food production 0D is less than the food requirement 0F. The segment EF represents the demand and supply deficit, i.e., the difference between food requirement 0F and total food supply or demand 0E. The segment DE measures the import deficit, which is the gap between effective demand 0E and market production 0D.

This framework can be adopted to understand the implications of the changes in the parameters and in the variables based on the analysed curves resulting from the process of development or from the introduction of specific policy measures, especially at the macro-level.

2.3 Framework for the Analysis of the Links Among the Individual Food and Nutrition Security Pillars

This paragraph introduces a framework that links the basic pillars of food and nutrition security at the individual level, which is useful in informing policymakers' focus on the design of appropriate food security interventions.

Following Sassi (2015a, b), Fig. 2.2 highlights the possible pathways through which a certain food and nutritional status is achieved at the individual level. The framework consists of three blocks: the food economy, the household context, and the confounding factors.

At the bottom of the food economy part of the diagram, the household's assets consist of five forms of capital: natural, human (labour force and knowledge), financial, physical, and social. This resource endowment defines the set of productive activities that a household can pursue to realize its needed income. The income from these activities, integrated with public and private transfers or loans, determines the household's total income availability. The household's assets can also be sold to cope during periods of short-term food insecurity.

Household activities may include food production, cash crop production, and non-agricultural activities. The food produced can be partly consumed for subsistence and partly sold on the market, where the food price is set. These two parts of

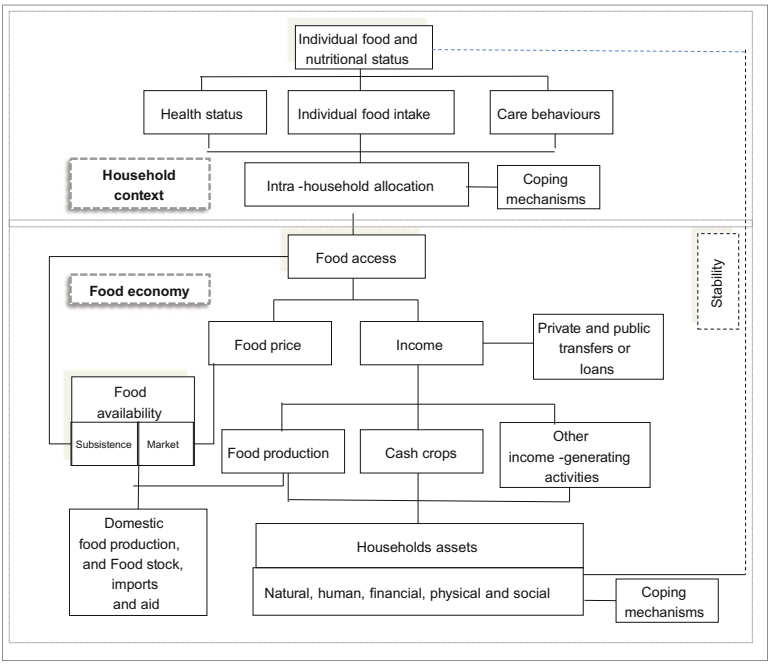

Fig. 2.2 Food security conceptual framework. *Source* Adapted from Sassi (2015a, b)

the household's production contribute to food availability in combination with domestic food stocks, commercial food imports, and food aid.

Food availability influences the food price, which determines the market purchases that the household can support with its income.[1] Food access depends on the food consumption level.

Household food access does not directly influence individual food and nutritional status. The latter depends on the household context. In fact, individual food and nutritional status depends on three major factors: intra-household dynamics, which affect the distribution of food within the household; health status; and care behaviours. These aspects are also affected by the coping strategies that households adopt to deal with insufficient food access in the short term. These strategies include eating less preferred food, limiting portion size, or skipping meals. Turning to the intra-household distribution, Pinstrup-Andersen (2009) indicates two reasons why household food security may not assure food security for all its members: the ability to acquire sufficient food may not translate into actual food purchases, and the allocation of food among household members may not be based on the needs of each member.

[1]The purchasing power of a household relative to the price of food is also called food affordability.

Food and nutrition security is a dynamic concept. It has a feedback effect on human resources affecting labour productivity and the potential to earn household income. This effect introduces the dynamic aspect of food security, which is represented by its stability pillar.

Finally, the confounding factors frame the diagram. Confounding factors are those outside the control of interventions. They may include the following:

- The physical environment, which consists of factors with a direct effect on the type of activities that households can undertake, particularly in rural areas, including weather and soil conditions;
- The policy environment, which embraces government and local policies that influence the agricultural sector because they stimulate or discourage food production or, more generally, the mechanisms governing when, where and how food can be accessed by households; and
- The social environment, including aspects such as cultural attitudes, social institutions, the livelihood system, household characteristics, and the level of education. For example, the existence of strong pressure groups may lead to wide swaths of the population being excluded from programme benefits.

According to the described framework, development projects aimed at affecting food security can be classified as interventions that are designed to improve the following:

- The overall social, policy, and physical environment, which includes the environmentally sustainable management of natural resources (soil, water, and forests), the setup of an appropriate institutional environment for the agricultural private sector, the introduction of adjustment or macroeconomic policies, and the strengthening of farmer associations;
- The level of and return to resources, which includes interventions in the field of education, research and development (R&D), and the provision of credit;
- The return to activities, such as those in rural infrastructures;
- Health care and nutrition practices and health status, for example, through better access to health services and drinking water.

The link between these interventions and food security at the household and individual levels is sometimes weak due to the existence of several constraining factors. Among these elements are the counterbalance effects exerted by factors not affected by the specific programme implemented and the lack of participation by beneficiaries (Hoddinott 1999). Therefore, the described food security conceptual framework provides only a priori information on the possible impact of interventions on food and nutritional status. For a deeper analysis, the strength of these links should be better understood.

An application of the described framework can be found in two papers by Sassi (2012, 2015a), where the framework is used to select the explanatory variables for child malnutrition in the Malawian regions and in the Dowa District of Malawi. These papers reveal the complex nature of child malnutrition in the investigated

areas and the importance of adopting a food and nutrition security approach in understanding and addressing the issue. The adopted perspective shows that child malnutrition is a chronic problem that is exacerbated by transitory food insecurity.

2.4 Framework for the Determinants of Child Malnutrition

The conceptual framework designed by UNICEF highlights the multifactorial determinants of child undernutrition (Fig. 2.3).

This tool is used for programming at the national, district, and local levels. It is designed to guide the assessment and analysis of the causes of child nutritional status and to identify the most effective multisector actions (UNICEF 1998).

The framework organises the causes of child undernutrition into three levels:

- Immediate causes, operating at the individual level;
- Underlying causes, affecting households and communities;
- Basic causes, acting on the structure and processes of entire societies.

The immediate causes of undernutrition are the result of diseases, a lack of dietary intake, or both. They are affected by factors operating at the household and

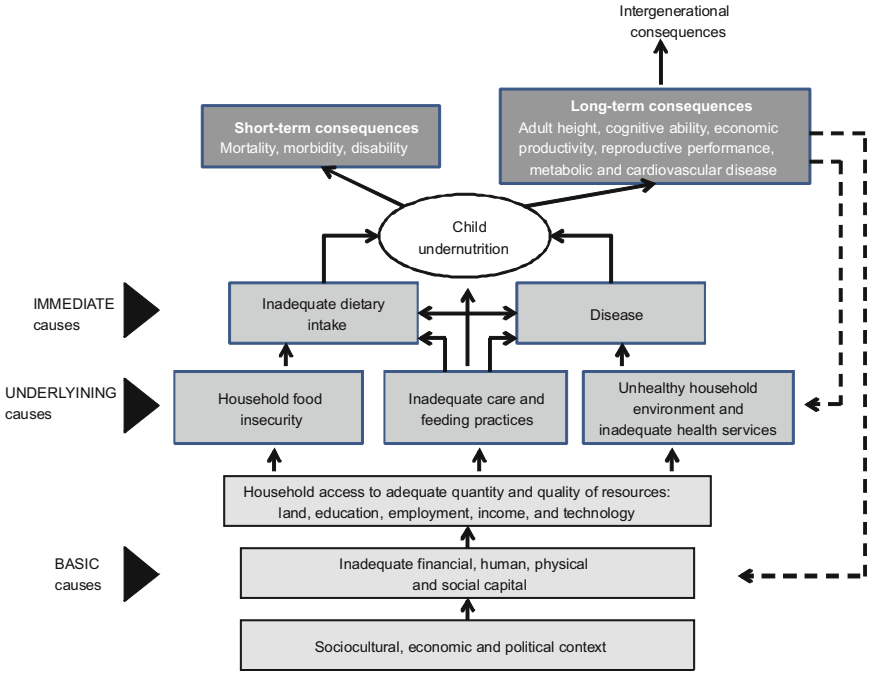

Fig. 2.3 UNICEF conceptual framework. *Source* Adapted from UNICEF (1998)

community levels, which are represented by the interrelated underlying factors of food, care and health (UNICEF 1992).

The efforts of households and communities to achieve food security can be constrained by available resources (or the lack thereof) and the sociocultural, economic and political factors that neglect human rights and perpetuate poverty. These events can have short- and long-term influences on childhood undernutrition.

As shown by the dotted lines in Fig. 2.3, the long-term consequences of child undernutrition have a backwards effect on the underlying and basic causes, thereby creating a vicious circle.

A specific vicious cycle is that related to intergenerational consequences. Young girls who experience poor growth become stunted women, and they are more likely to give birth to children with low birthweights. If these infants are female, they are likely to continue the cycle by being stunted in adulthood as well (UNICEF 1998; Cesani et al. 2014).

Cornia et al. (2016), Sassi (2014) provide examples of use of the conceptual framework designed by UNICEF. The first study investigates the sources of food price volatility and child malnutrition in Niger and Malawi, whereas the second examines the economic and health determinants of child malnutrition in the Malawian district of Salima. As in the application of the framework described in Sect. 2.3, this conceptual scheme is used to define the models to be tested. The contribution by Cornia et al. (2016) shows that in Niger and Malawi, child malnutrition is related not only to changes in international food prices but also to the impact of agricultural policies on domestic production and prices. These issues combine with persistent food price seasonality and recurrent and poorly addressed famine phenomena. The paper by Sassi (2014) highlights three major aspects: the relevance of seasonal events and climatic shocks to child malnutrition in Malawi, the urgent need to arrest the long-term cycle of this problem, and the differential responses of child malnutrition to food and health policies.

2.5 Sustainable Livelihood Framework

The sustainable livelihood framework refers to the Sustainable Livelihood Approach adopted to understand the context in which a household pursues its livelihood and food needs. This framework examines the influence of macro-level policy and institutions on household livelihood options (USAID 2012). Figure 2.4 shows this framework.

The key concept of the sustainable livelihood framework is the sustainable livelihood. Livelihoods refer to the capabilities, material and social assets, and activities required for a means of living (Chambers and Conway 1992).

A livelihood is sustainable when it can adapt to threats, can maintain or enhance its capabilities and assets, and does not compromise other livelihoods both locally and more widely, both now and in the future (Chambers and Conway 1992; FAO 2002).

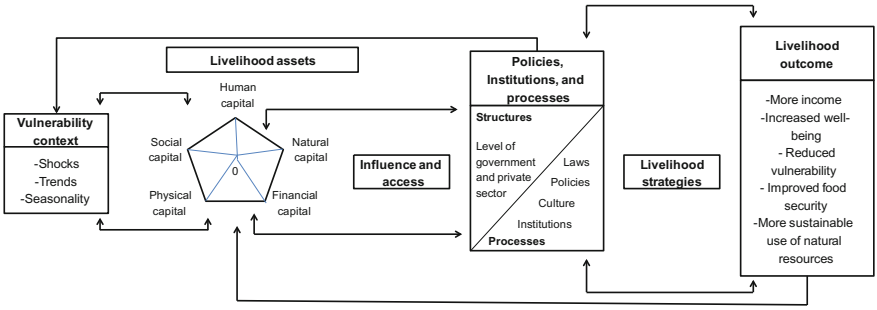

Fig. 2.4 Sustainable livelihood framework. *Source* Adapted from DFID (2001)

The sustainable livelihood framework reflects six principles: people-centeredness, micro-macro links, strength building, holism, dynamism, and sustainability.

The Sustainable Livelihood Approach is people-centred because people are put at the centre of the development process. The emphasis on micro-macro links underlines the need for the policy interventions to be based on local insights and to prioritise poor people and their livelihoods (Ashley and Carney 1999). This approach does not concentrate on problems, constraints and needs but on the households' perceived strengths and opportunities (FAO and DFID 2000), which are defined in the dynamic context in which households live and on which the approach is built. Therefore, the Sustainable Livelihood Approach becomes holistic and dynamic. Sustainability is regarded as a holistic concept because it includes economic, institutional, human, social, environmental and agro-ecological aspects.

The sustainable livelihood framework consists of five blocks: the vulnerability context; livelihood assets; policy, institutions and processes; livelihood strategies; and livelihood outcomes. They underline the main factors affecting people's livelihoods. In Fig. 2.4, the arrows describe the interactions and influences among the five blocks.

The vulnerability context block describes the external environment that negatively affects people's livelihoods and food security, including the following:

- Trends (also called stresses), which are changes occurring over a longer period that exert ongoing pressure on the household's livelihood and food security, including population, resource, economic, political and technological trends;
- Shocks, which are sudden negative events, such as human health, natural, economic, conflict and crop and livestock shocks;
- Seasonality, including seasonal changes in prices, production, health and employment opportunities (DFID 2001).

The reference to the concept of vulnerability in the name of this block clearly indicates that both food security and poverty are considered dynamic dimensions in this framework and that people's livelihoods are affected by the risks that they face and by their abilities to overcome such risks at different levels (Lovendal et al. 2004).

The livelihood asset block, also called the asset pentagon, schematically shows the state of the ownership and control of the combination of assets, or capital types, that people have with which to respond to vulnerability. Following DFID (2001), the five categories of core assets are as follows:

- Human capital, which represents the stock of skills, knowledge, and abilities embodied in an individual, household or population of a social group. These assets result from education, training and experience, and they are used in employment or otherwise contribute to the economy. This category of assets also includes two additional elements: intangible traits, such as ambition and persistence, and individual health status, which depends on health services, sanitation, clean water, and adequate food intake. These aspects influence the ways in which individuals apply their knowledge and capabilities to livelihood activities (USAID 2012).
- Natural capital, which is the stock of natural resources that people rely on and use to expand or enhance their livelihoods, such as land, forests, water, the environment, wildlife and biodiversity.
- Financial capital, which, within the livelihood framework, differs somewhat from that prevailing in the economic literature. In fact, financial capital includes not only available stocks (savings and credit) but also regular inflows of money, such as state transfers (pensions and other forms) and remittances, and all other assets held as a store of value, such as livestock.
- Physical capital, which includes the basic infrastructure. In other words, it includes changes in the physical environment that help people meet their basic needs, increase productivity (i.e., transport, water, shelter, energy, and access to information), and improve productivity goods, which are the instruments adopted by people to improve productivity (i.e., agricultural equipment and bicycles).
- Social capital, which is the attitude, spirit and willingness of people to collaborate and cooperate through mechanisms such as networks, to share trust, norms and values, and to engage in collective, civic or political activities to achieve mutual benefits.

In Fig. 2.4, point *0* in the asset pentagon represents zero access to assets, while the outer perimeter represents the maximum level of access to them. Figure 2.5 provides a hypothetical example of asset pentagons. The pentagon in Panel A indicates less ownership of human capital than does the pentagon in Panel B, where more limited ownership of financial capital is evident. The households in both groups have full control of the other assets.

Notably, the analysed approach should consider not only the quantity but also the quality of the assets that people own and control. For the calculation of the different typologies of livelihood assets see, for example, Su and Shang (2012), Shivakoti and Shrestha (2005).

Policies, institutions and processes comprise the second block of the sustainable livelihood framework. This block describes the structures and processes that affect access and the influence of livelihood strategies, the combination and type of

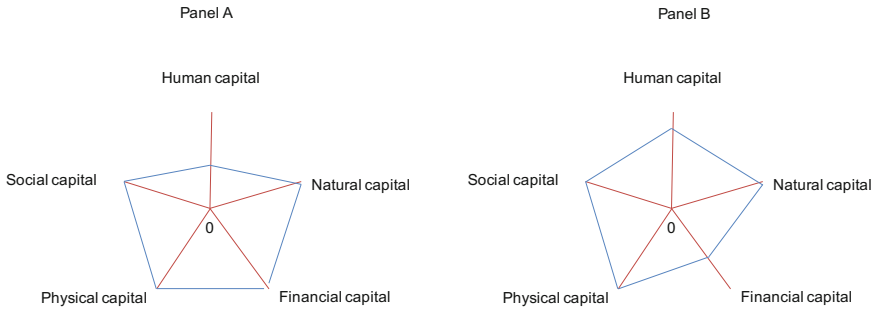

Fig. 2.5 Example of ownership and control of assets

livelihood assets and the vulnerability context. The structures, both public and private, act according to the processes, particularly to legislation (both international and domestic), policies, institutions, culture (in terms of societal norms and beliefs), and power relations. Power relations vary according to the age, gender, caste and class.

The block livelihood strategies includes the range and combination of capabilities, assets and activities that people choose to adopt to achieve their livelihood outcomes and to address the threats that influence the context in which they live and, in turn, make them vulnerable.

The livelihood outcome block identifies the achievements or outputs of the livelihood strategies (GLOPP 2008). The outcomes that people achieve with their assets and strategies may include higher incomes, greater well-being, reduced vulnerability, greater food security, and/or improved environmental sustainability. Therefore, food security is one of the possible livelihood outcomes and appears in a separate category because of its importance and policy priority. Moreover, food security depends not only on agricultural productivity and its sustainability but also—above all—on how people, especially poor people, gain access to livelihoods assets.

The assets under control of households affect food security indirectly through their impact on strategies and outcomes and directly according to the share of assets owned (or under one's control) and employed to access food. This relationship is explained in Table 2.1.

Table 2.1 Food security and the use of assets owned or under one's control

	Food secure household	Food insecure household
Use of a small proportion of assets owned or under one's control	Best off	Not overly difficult to improve
Use of a large proportion of assets owned or one's under control	Food secure but at great risk of becoming food insecure	Worst off

Source Adapted from USAID (2012)

Table 2.2 Livelihood interventions and food security

Livelihood phase	Livelihood intervention	Target	Description of the livelihood intervention
Income growth and stabilisation	Promotion	Household with low vulnerability to food insecurity engaged in income growth activities	Development-based interventions that involve improving the resilience of household livelihoods so that food and other basic needs can be met on a sustainable basis
Risk reduction and risk exposure reduction	Protection	Vulnerable households engaged in ex ante risk reduction strategies and ex post loss management	Interventions that involve protecting household livelihood systems to prevent the erosion of productive assets and replacing or rebuilding productive assets
Destitution or distress	Provision	People in an emergency or those who are chronically vulnerable	Food and health relief based interventions that involve providing food and meeting other essential needs for households in order to maintain nutritional levels and save lives

Source Adapted from International Recovery Platform & UNDP India (2010), USAID (2012)

Within the sustainable livelihood framework, livelihood interventions are categorised into three overlapping phases: livelihood provisioning, livelihood protection and livelihood promotion (International Recovery Platform and UNDP India 2010). Table 2.2 presents these interventions according to their livelihood phase.

In the acute phase of a disaster, livelihood provisioning activities typically consist of saving lives through the procurement of essential food and non-food items. Livelihood protection interventions have the specific objective of protecting, replacing and rebuilding livelihood assets, especially productive assets. Livelihood promotion interventions aim to strengthen livelihoods to improve resilience to future disasters and their sustainable use.

The Sustainable Livelihood Approach has gained broader adoption among development organisations. For a review of the key elements of the use of this conceptual method in 15 development agencies (bilaterals, multilaterals and non-governmental organisations), see, for example, Hussein (2002).

2.6 Household Economy Framework

In the early 1990s, Save the Children and the Global Information and Early Warning System of the FAO developed the Household Economy Approach as an instrument to predict short-term changes in the population's access to food to

realize more effective decision making. The features of the Household Economy Approach make this framework suitable for use in early warning and emergency needs assessments. However, it can also be adopted to identify appropriate means of assistance for longer-term development programmes or policy changes.

Focusing on a specific livelihood zone, average households, each of them representing a different wealth group, are based on an investigation aimed at providing information on the ways in which they obtain the needed food and cash; their assets, their opportunities and the constraints that they face; and the coping mechanisms that they can adopt in times of crisis (Berhanu et al. 2007).

The first concept at the heart of the Household Economy Approach is the livelihood zone.

Livelihood zoning consists of defining the geographical groups to which households belong. A livelihood zone is a geographic area in which households share the same patterns of access to food and income (Grillo 2009; Holzman et al. 2008).

Within a livelihood zone, households are grouped together according to the local definition of wealth: the holding of assets with a market value (Seaman et al. 2000). A wealth group includes households with similar capacities to exploit different food and income possibilities. Finally, for the households in each wealth group, the analysis of the livelihood strategies investigates their sources of food and income and their expenditure patterns.

Central to this approach is the understanding of people's normal economy and the opportunities that they have to react to the crisis. More precisely, the following four aspects are considered:

- The ways in which people in different social and economic circumstances obtain the food and cash that they need;
- Their assets, their opportunities and the constraints that they face;
- Their options in times of crisis;
- The connections among different groups and areas (Seaman et al. 2000; Holzmann et al. 2008). This conceptual framework is summarised by the following equation based on four elements:

$$\text{Baseline} + \text{Hazard} + \text{Coping} = \text{Outcome}$$

Figure 2.6 provides a better understanding of these elements.

The vertical axis represents food and income expressed as percentage of minimum annual food energy needs. The minimum annual food energy needs refer to the internationally accepted minimum energy requirement of 2100 kilocalories (kcal) per person per day, which is compared with the food and income sources converted into kcal per person per day.

The other two elements in Fig. 2.6 are the survival and livelihood protection thresholds. As shown in Fig. 2.7, the survival threshold includes the minimum food energy needs, the so-called food basket, and the non-food basket.

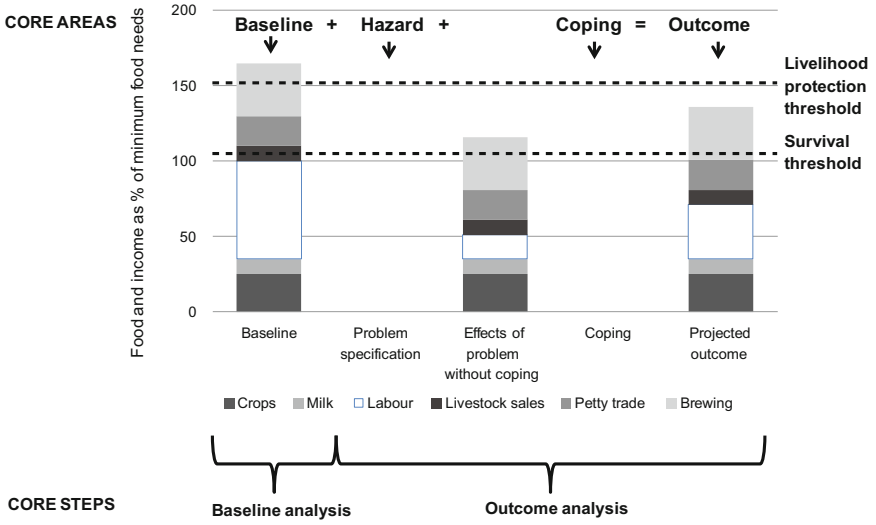

Fig. 2.6 Core areas and steps of the household economy approach. *Source* Adapted from Holzmann et al. (2008)

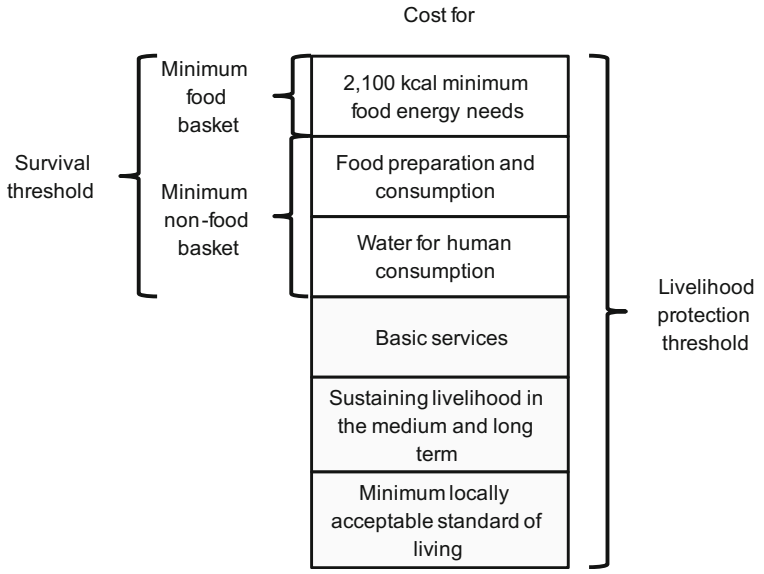

Fig. 2.7 Components of the survival and livelihood protection thresholds

The minimum non-food basket consists of two components. The first component is represented by the cost for food preparation and consumption, which includes items such as salt, soap, firewood for cooking and basic lighting (Seaman et al. 2000). The second element is the expenditure for access to water for human consumption.

The livelihood protection threshold adds the expenses for sustaining local livelihoods to the cost of the minimum food and non-food basket. These expenditures are in basic services, including regular medical and schooling expenses; the preservation of livelihoods in the medium and long term, such as the routine purchase of seeds and fertilisers; and the achievement of a minimum locally acceptable standard of living, including that required to obtain basic clothing, coffee and tea.

Turning to Fig. 2.6, the first bar provides a picture of the household's economy, its total access to food and its income in a normal year. The second bar shows the implications of a shock on household livelihoods if no coping mechanisms are introduced. The specific problem that the hazard triggers is part of the problem-specification step carried out between the first and second bars. The outcome, the third bar in Fig. 2.6, depends on the people's capacity to react to the hazard. It determines their access to food and their income sources after a shock. The projected outcome conveys the capacity of households to meet their basic needs after a shock, represented by the survival threshold, and to protect their livelihoods, measured by the livelihood protection threshold.

In the example depicted in Fig. 2.6, the shock is on the labour market. It reduces the amount of income from this source. After the introduction of the coping mechanisms, the household can meet its food and non-food basic needs because the third bar is above the survival threshold. However, this bar is below the livelihood protection threshold, meaning that the household is unable to fully protect its livelihood.

For an application of the Household Economy Approach see, for example, the baseline reports produced by the Food Security and Nutrition Analysis Unit–Somalia for the Somali livelihood zones (available at http://fsnau.org/products/baseline-reports).

2.7 Resilience Conceptual Framework

The nature of resilience implies a dynamic conceptual framework that can capture all possible positive and negative impacts of shocks on household well-being and the capacities activated to avoid long-lasting adverse effects.

The resilience conceptual framework at the heart of the RIMA-II adopted by the FAO (2016) is described in Table 2.8.

The state of food security at time zero, Y_0, is represented by a set of R_0 characteristics some of which depend on time, while others are time-invariant. These

characteristics contribute to household resilience and among them there are the following four pillars of resilience:

- Access to basic services, both in quantitative and qualitative terms;
- Productive and non-productive assets;
- Social safety nets, including formal and informal transfers;
- Adaptive capacity.

These four dimensions diverge from the most cited core components of resilience introduced by Béné et al. (2012) and described in Chap. 1, namely, absorptive, adaptive, and transformative capacities. In fact, the FAO adopted a practical classification to be used for analytical purposes.

Following an endogenous or exogenous shock, households activate a series of coping strategies, normally consisting of consumption smoothing, asset smoothing and new livelihood adoption. This aspect introduces the fifth pillar of resilience—sensitivity—which relates to household risk exposure, persistence and resistance.

Household resilience contributes to responses to shocks and allows households to return to their previous state of well-being, R_0, at time t_1 (see Fig. 2.8). Consequently, between time t_0 and t_1, the impact of the shock on the household's well-being can result in an increase or a decrease in Y (ΔY), which causes a positive or negative change in the resilience capacity (ΔR).

The household is the unit of analysis of the abovementioned conceptual framework. In fact, the FAO (2016) regards the household as a sub-system within the food system. This understanding fits the definition of a system provided by Spedding (1988), according to which a household can be considered a "group of interacting components, operating together for a common purpose, capable of

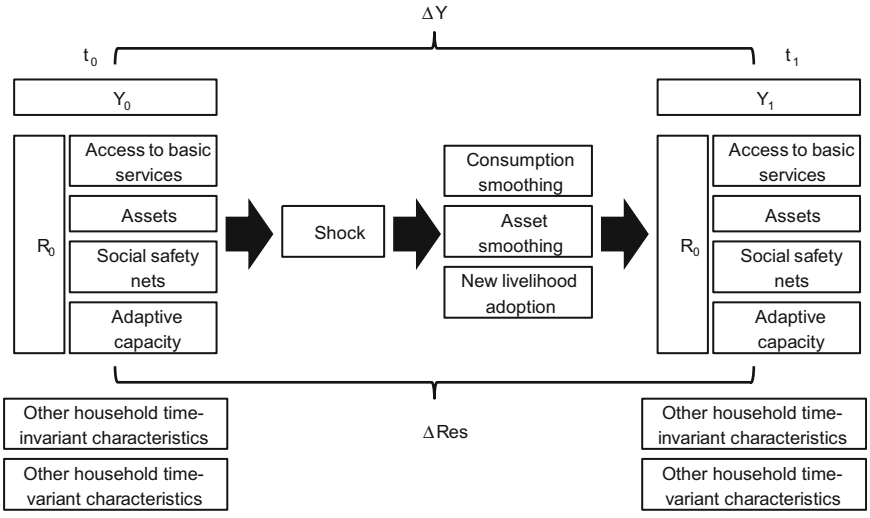

Fig. 2.8 Resilience conceptual framework. *Source* Adapted from FAO (2016)

reacting as a whole to external stimuli: it is affected directly by its own output and has a specific boundary based on the inclusion of all significant feedbacks". As argued by Alinovi et al. (2010a), the household is the central decision-making unit in time of shocks, which also becomes the interface with institutions and formal and informal social networks.

Alinovi et al. (2010a, b) use the resilience framework to investigate household resilience to food insecurity. In Alinovi et al. (2010a), resilience by household cluster in eight provinces of Kenya is compared. The investigation shows significant differences across provinces and among clusters with specific determinants of resilience among livelihood groups. Alinovi et al. (2010b) use the Palestinian case to clarify the meaning, scope and measurement of resilience in food systems and identify the relationship between resilience and concepts such as vulnerability and between resilience and food insecurity outcomes.

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Chapter 3
Food Security Information Systems and Sources of Food Security Data

Abstract This chapter focuses on the systems of collecting data. It starts with the description of the evolution and aims of food security information systems as methods of data collection that monitors people's access to food. This part is followed by the presentation of the main sources of food security data with the indication of the most relevant websites where this information is made available. These sources are organised into three categories: food balance sheets, nutritional household surveys, and nutritional dietary surveys. The food balance sheets present a comprehensive picture of the pattern of a country's food supply during a specified one-year reference period. The nutritional surveys provide the elements of the living standard of the national population, including the household consumption expenditure system, as well as the changes occurring during a one-year reference period. The nutritional dietary surveys collect individual food consumption data. At the end of this chapter, the reader will be able to understand the features of the different food security sources and where to find them online.

3.1 Introduction

The conceptual frameworks presented in Chap. 2 are a simplification of reality. They help us identify the factors affecting food security, their relative importance and their interactions. These aspects must be quantified to be better understood and to design sound policies aimed at addressing food insecurity. Therefore, suitable systems for collecting data are needed.

In this respect, in Sect. 3.2, this chapter provides a description of the evolution and aims of food security information systems, followed by the presentation of the main sources of food security data, which can be organised into three categories: food balance sheets (FBSs), nutritional household surveys (NHSs), and nutritional dietary surveys (NDSs) (Table 3.1).

Section 3.3 presents the FBSs. They are produced by the FAO and refer to official local sources and capture food security at the national level. These tools measure food availability and thus focus on the supply side of food security.

M. Sassi, *Understanding Food Insecurity*,
https://doi.org/10.1007/978-3-319-70362-6_3

Table 3.1 Features of food security sources

Source	Focus	Element of food security measured	Reference data	Level of investigation
Food balance sheets	Food supply	Food availability	Official local sources	National
Nutritional household surveys	Food acquisition	Food access	Data collected from people	Household
Nutritional dietary surveys	Food intake	Food consumption	Data collected from people	Individual

Section 3.4 introduces the features of the multipurpose nutritional household surveys that collect information from people. However, they gather information on food acquisition at the household level. Therefore, these instruments measure the food access pillar of food security.

Section 3.5 is dedicated to the description of the nutritional dietary surveys. They capture individual food intake directly from people, thereby measuring the food consumption element of food security.

3.2 Food Security Information Systems

A Food Security Information System (FSIS) is a method of data collection that monitors people's access to food in order to:

- Help prevent crises and avoid disastrous repercussions on food security in the short, medium and long term by supporting appropriate responses (the so-called primary aim);
- Contribute to managing food crises (the so-called secondary aim) (FAO 2000).

Modern FSISs are developed in the second half of the 1970s under the stimulus of the 1974 World Food Conference and the consequent 1996 World Food Security Committee, which underlined the need to support national food policies with suitable data and indicators (for an accurate description of the evolution of FSISs, see, for example, FAO 2000).

Until the mid-20th century, the most relevant information for food security assessment and policy was agricultural production.

The food crisis in the 1970s, primarily a result of the adverse weather conditions in food-producing areas and a less stable development environment, highlighted the need to provide assistance to the most vulnerable people and clearly demonstrated the need to properly characterise them. To this end, the monitoring of the nutritional status of young children was introduced as an appropriate policy variable in addition to control over agricultural production.

In 1974, the World Food Conference underlined that the information collected by the statistical systems was not useful for monitoring food security. Such data were highly compartmentalised, incomparable, and often unavailable and out-of-date. In light of these considerations, the conference established the FAO Global Information and Early Warning System (Heimo 2004). Moreover, some development partners preferred to establish, finance and supervise parallel information systems that would be able to provide them with timely information that they needed to target their food security aid and assistance.

The negative impacts of the structural adjustment programmes of the 1980s on food security resulted in donors combining their aid policies with targeted schemes to avoid major food crises. Their attention was focused on the information suitable to describe the problems related to accessing staple foods and to organise social aid.

Following the diminishing world grain surplus and a few negative experiences with large-scale distribution, food aid policies were revised, which redirected FSISs to better target and monitor the distribution of food aid.

Another important step in the evolution of FSISs followed the introduction of new technologies (particularly satellite systems) and communication systems (the Internet, fax, satellite cellular, etc.), which made managing the collected information easier.

Over time, food security added a new dimension: the urban. Thus, data were collected using variables to monitor urban and rural food security and vulnerable people. Furthermore, decentralised decision making and a broader area for concerted actions to include various actors associated food security (public, private and civil society) were needed. This exigency supported the ascendance of FSISs as centres for information exchange at all levels throughout countries.

At the World Food Summit in November 1996, the attention was focused on concrete indicators to monitor the undernourished in order to support governments in their efforts to reach the target of halving the number of hungry people by 2015. Therefore, a Food Insecurity and Vulnerability Information and Mapping Systems (FIVIMS) initiative, the secretariat of which is based at the FAO, was launched. FIVIMS is "a network of systems that assemble, analyse and disseminate information about the problem of food insecurity and vulnerability" (FIVIMS 2003).

The initiative signalled a definitive passage to the second generation of FSISs based on a multi-indicator approach to monitoring food insecurity and vulnerable people. In other words, supply-side indicators, referring to food production (or food availability), were implemented alongside demand-side indicators, regarding the economic and social sphere (or stability and access to food), and outcome indicators, related to nutrition and health status (or the biological utilisation of food).

The information collected can also contribute to managing food crises in several areas, as summarised in Table 3.2.

In October 2012, the Food Security Information Network (FSIN) was launched to share knowledge and good practices and to strengthen country and regional information systems for food and nutrition security (FSIN 2014). The World Food Programme (WFP), the FAO and the International Food Policy Research Institute (IFPRI) participate in the FSIN, which has three major objectives: to establish the

Table 3.2 Contributions of FSISs to food crisis management

Areas	Contribution
Warning	Information on the nature of the crisis, possible impacts, and areas and people affected
Definition of the actions	Reduction of the negative impact of a disaster
Management of relief and emergency aid	Identification of vulnerable groups and changes in their situations
More efficient management of food security stocks	Provision of data for better management of these functions
Identification of efficient supply methods	Transfer of market knowledge to better organise food supply for distribution
Definition of efficient ways of distributing food aid and assistance	Supply of information suitable for managing and monitoring distribution

Source Adapted from FAO (2000)

community of practice; to build the provision of access to harmonised standards, methods and tools; and to assist joint or collaborative efforts to strengthen national and regional capacities for food and nutrition security data collection, analysis, communication and dissemination, and decision making (http://www.fsincop.net/about/fsin-objectives-and-priorities/en/). The FSIN represents the last step in the evolution of the information systems for food security data collection.

3.3 Food Balance Sheets

FBSs present a comprehensive picture of the pattern of a country's food supply during a specified one-year reference period (details on this data source can be found at FAO 2001). They are produced by the FAO Statistics Division for 180 countries since the 1980s and are available at http://www.fao.org/faostat/en/#data/FBS.

For all potentially edible commodities, FBS provides information on

- Domestic food supply, expressed in terms of production, imports, exports, and changes in stock since the beginning of the reference period;
- Domestic food utilisation, consisting of food for human consumption, feed for livestock, seed, processing, waste, exports, and other uses (e.g., for non-food purposes);
- Per capita values for the supply of all food commodities, expressed in kilogrammes per person per year, and the related calories, protein, and fat content, all expressed in grams per capita per day.

FBSs are important for understanding of the relevant aspects of the food economy, such as the efficiency of production, the quality of the available food supply, and the effectiveness of food policies in increasing food supply. However, FBSs have

some limitations (Moltedo et al. 2014). As previously indicated, these tools do not consider food access and utilisation at the household or individual level. For this reason, FBSs cannot be used for analyses such as those concerning the dietary diversity of the population.

Moreover, the reference to the national level does not make the FBSs suitable for investigations of food security at the sub-national level. Finally, as the elements of FBSs are flow variables, i.e., measured over an interval of time, seasonal variations of food supply cannot be examined.

3.4 National Household Surveys

The main objective of NHSs, which were launched in the 1990s, is to provide reliable and scientifically founded data on income, expenditure, consumption and other elements of the living standard of the national population as well as the changes occurring during a one-year reference period. NHSs include the following:

- Household income and expenditure surveys;
- Household expenditure surveys;
- Household budget surveys;
- Living standard measurement study surveys.

In the household consumption expenditure section, these surveys collect data on the food acquired by households from different sources in terms of quantities and monetary values (Moltedo et al. 2014).

These surveys cover an entire country through questionnaires distributed throughout the year. Consequently, they allow us to investigate seasonality in household food access. However, food utilisation, including intra-household food distribution, is not covered by NHSs. The food acquired is only for personal consumption; thus, such surveys neglect the part for resale or other uses such as charity.

There are three major international household survey programmes (Development Initiative 2017). The World Bank has implemented a household survey programme that includes the Living Standard Measurement Study surveys since the 1980s (http://econ.worldbank.org/WBSITE/EXTERNAL/EXTDEC/EXTRESEARCH/EXTLSMS/0,,menuPK:3359053~pagePK:64168427~piPK:64168435~theSitePK:3358997,00.html). The Multiple Indicator Cluster Survey is another international household survey programme developed by UNICEF in the 1990s (https://www.unicef.org/statistics/index_24302.html). Finally, the Demographic and Health Survey is the nationally representative survey developed by the United States Agency for International Development in the 1980s.

3.5 Nutritional Dietary Surveys

NDSs aim to collect individual food consumption data. For each food item consumed in the last 1 to 15 days, these surveys collect qualitative descriptions and record the quantities consumed. They are conducted for specific purposes with a small size sample (Moltedo et al. 2014).

Table 3.4 compares the most important features of the NDSs and the two abovementioned sources of food security data.

Based on the project and its phase, NDSs assume specific features. In rapid appraisals, qualitative methods are applied to collect information on individual nutritional conditions. The adoption of a quantitative method is justified because rapid appraisals are used during the planning phase of a project, when time in the field is limited, the budget is constrained or there is limited availability of reliable secondary data (USAID 2010). Rapid assessment nutritional surveys can also be used for pre-feasibility studies to identify a project. However, in this case, the methodology adopted to assess individual nutritional conditions is quantitative. More precisely, anthropometric data is collected to obtain information on the type of nutritional problems (GTZ 1997). At the beginning of a project, baseline surveys acquire the

Table 3.4 Features of nutritional dietary surveys, nutritional household surveys, and food balance sheets

	Nutritional dietary surveys	National household surveys	Food balance sheets
Estimation of food consumption from…	Food intake	Demand perspective	Supply perspective
Unit coverage	Individuals	Private households	Private households and private establishments (hotels, residences, hospitals, military barracks, and prisons)
Level of estimates	Individual level	National and sub-national levels	National level
Seasonal variations in food consumption	Not captured	Captured	Not captured
Frequency	For specific purposes	Annually in some countries and infrequently in others	Annually
Coverage	Not conducted in many countries	Since the 1990s, conducted in an increasing number of countries	Almost all countries

Source Adapted from Moltedo et al. (2014)

Table 3.5 Summary of dietary assessment methods

Type of method	Content	Strengths	Limitations
Food records or food diaries	The subject (or observer) report all foods and beverages consumed for a specified period (usually one to seven days)	– Does not rely on memory – Easy to quantify amounts – Open-ended	– High participation burden – Requires literacy – May alter intake behaviour
24-hour dietary recall	With the aid of an interviewer, foods and beverages consumed the day before or 24 h prior to the recall interview are listed from memory	– Low respondent burden – No literacy requirement – Does not alter intake behaviour	– Relies on memory – Requires a skilled interviewer – Difficulty in estimating the amounts
Food frequency questionnaire or list-based diet history	Within a structured list of 50 to 150 individual foods or food groups, the respondent is asked to estimate the frequency of consumption based on specified frequency categories, which indicate the number of times that the food is usually consumed per day, week, month or year	– Relatively inexpensive – A preferable method for nutrients with very high daily variability – Does not alter intake behaviour	– Relies on memory – Requires complex calculations – Requires literacy – Limited flexibility for describing foods
Meal-based diet history	Assessment of the usual individual intake via a detailed list of the types of foods and beverages commonly consumed at each meal over a defined period, such as a "typical" week	– No literacy requirement – Does not alter intake behaviour – Open-ended	– Relies on memory – Requires a highly trained interviewer – Difficulty in estimating amounts
Food habits	Designed to collect either general or specific types of information, such as food perceptions and beliefs, food likes and dislikes, methods of preparing foods, use of dietary supplements, social settings surrounding eating occasions	– Rapid and low cost – Does not alter intake behaviour – Open-ended	– May rely on memory questionnaires – May require a trained interviewer

Source Adapted from FAO (1996)

information base against which to monitor and assess the impact of the project. In this context, the focus is on the type, prevalence, reasons, and causes of individual nutritional insecurity. Finally, follow-up surveys assess the impact of a project on the nutritional conditions in a community (GTZ 1997). The German Federal Ministry for Economic Cooperation and Development has commissioned an interesting initiative called Food and Nutrition Security, Enhanced Resilience. It is aimed at enabling poor households to feed themselves adequately and to consistently eat nutritiously, including during periods of famine (http://www.bmz.de/de/zentrales_downloadarchiv/themen_und_schwerpunkte/ernaehrung/Special_Initiative_ONE_WORLD-No_Hunger_Fact_sheet_food_and_nutrition_security.pdf). Nutritional Baseline Surveys are conducted in 11 African and Asian countries to measure the impact of the project. An example of these surveys can be found in Ludwig and Bau (2015).

The typical methods for assessing dietary intake in NDs are summarised in Table 3.5, which lists their major strengths and limitations.

One of the major problems in assessing dietary intake concerns selecting the length of the recall period because of its impact on accuracy in responses to questions. In fact, if this period is short, data collection may result in so-called telescopic errors, while if it is long, data collection may be subject to recall loss errors.

Telescoping implies that respondents mistakenly remember events taking place more recently than they actually did. Consequently, the respondent includes events in the recall period that occurred before or after it. Recall loss errors are probably the largest source of response errors and occur when a respondent does not remember events that occurred long before. Practice suggests that to avoid these errors, food diaries are the most appropriate tools for food consumption data collection. However, in this case, survey participants may become tired of the survey task (so-called respondent fatigue), resulting in the deterioration of the quality of the provided data. This aspect should also be considered during the design phase of the questionnaire to avoid an excessively long recall period.

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Chapter 4
Indicators for Monitoring Food Security

Abstract This chapter provides the elements for the interpretation of the indicators used for monitoring food security and the most adopted methodology to assess food security indicators at the household and individual levels. Focusing on the national level, this chapter illustrates the suite of food security indicators adopted by the FAO, the Global Hunger Index, a multidimensional indicator produced by the IFPRI, and the Food Insecurity Experience Scale developed by the FAO as a measure of the lived experience of food insecurity. This part is followed by the presentation of the consolidated approach to the computation of the Food Consumption Score, the spending on food index, the Dietary Diversity Index, the Coping Strategy Index, and the Household Hunger Scale: it also informs on their interpretation. At the end of this chapter, the reader will be able to understand and use the most adopted indicators for monitoring food security for the purpose of building political will, designing effective policies, and targeting resource allocation.

4.1 Introduction

The need to address constraints to food security requires the availability of accurate, rapid, and consistent indicators of food security (http://fic.tufts.edu/assets/Different-Indicators-of-HFS.pdf). The food security metrics at our disposal focus on the state or evolution over time of the four major pillars of this concept, i.e., availability, access, utilisation, and stability, or on a combination of them. These indicators are computed from data at the national, household, or individual level.

This chapter offers a compendium of metrics of food security at the national level and the consolidated methodology used to assess food security indicators at the household and individual levels.

Many institutions have developed indices of food security at the country level. In this chapter, we focus on those proposed by the FAO and IFPRI. The FAO adopts a suite of food security indicators by component and dimension to monitor the

M. Sassi, *Understanding Food Insecurity*,
https://doi.org/10.1007/978-3-319-70362-6_4

complex nature of food and nutrition security, while the IFPRI suggests the use of a multidimensional index—the Global Hunger Index (GHI). More recently, the FAO has developed a scale to measure the lived experience of food insecurity, the Food Insecurity Experience Scale, which was adopted for the 2030 Sustainable Development Agenda as one of the tools for monitoring Goal 2 (concerning the eradication of hunger). This scale captures the psychological aspects associated with anxiety regarding the ability to access food (Ballard et al. 2013).

Food security at the household level can be measured in different ways. The best indicator is represented by food consumption in kcal. However, data collection on detailed food intake is difficult and time-consuming. For this reason, some proxy measures are used. This chapter illustrates the most adopted: the Food Consumption Score (FCS), spending on food, the Dietary Diversity Index, the Coping Strategy Index, and the Household Hunger Scale.

The FCS and the Dietary Diversity Index measure dietary diversity and food frequency, while spending on food computes how much of the household's total income is spent on food items. Therefore, these three indicators focus on access to food. The Food Coping Strategy Index and the Household Hunger Scale capture food security indirectly by measuring food consumption behaviours.

The chapter is structured in four parts. Section 4.2 introduces the FAO suite by component, Sect. 4.3 the Global Hunger Index and Sect. 4.4 the Food Insecurity Experience Scale, respectively.

Section 4.5 is dedicated to the presentation of the household food security outcome indicators. More precisely, Sect. 4.5.1 focuses on the Food Consumption Score (FCS), Sect. 4.5.2 considers the indicator of spending on food and the Dietary Diversity Index, Sect. 4.5.3 presents the Coping Strategy Index, and Sect. 4.5.4 discusses the Household Hunger Scale.

4.2 Indicators for Monitoring Food Security at the National Level

In September 2011, the Committee on World Food Security organised a roundtable on how to measure hunger. Based on the recommendations that emerged, the FAO adopted a suite of indicators aimed at measuring the following components of food security:

- Determinants related to food availability, physical and economic access, and utilisation;
- Outcomes resulting from insufficient access to food and inadequate food utilisation;
- Stability and vulnerability in terms of exposure to risk and shocks (Table 4.1).

In this chapter, the descriptions of the indicators of food security at the national level are based on the information from the Statistics Division of the FAO (http://

Table 4.1 Food security index by component and dimension

Component	Dimension	Index
Determinants	Availability	– Average dietary energy supply adequacy – Average value of food production – Share of dietary energy supply derived from cereals, roots and tubers – Average protein supply – Average supply of proteins of animal origin
	Physical access	– Percentage of paved roads in total road network – Road density – Rail line density
	Economic access	– GDP per capita, PPP – Domestic Food Price Level Index
	Utilisation	– Percentage of population with access to improved drinking water sources – Percentage of population with access to sanitation facilities
Outcome	Access	– Prevalence of undernourishment – Share of food expenditure of the poor – Depth of the food deficit
	Utilisation	– Percentage of children under 5 years of age affected by wasting – Percentage of children under 5 years of age who are stunted – Percentage of children under 5 years of age who are underweight – Percentage of adults who are underweight – Prevalence of anaemia among pregnant women – Prevalence of anaemia among children under 5 years of age – Prevalence of vitamin A deficiency – Prevalence of iodine deficiency
Stability	Exposure to risk	– Cereal import dependency ratio – Percentage of arable land equipped for irrigation – Value of food (excluding fish) imports in total merchandise exports
	Shock	– Political stability and absence of violence – Domestic food price volatility – Per capita food production variability – Per capita food supply variability

www.fao.org/economic/ess/ess-fs/en/). This division compiles measures aimed at capturing various aspects of food insecurity in line with the suggestions made by the Committee on World Food Security in 2011. In this part of the chapter we do not include the technical details of computations, but we focus on the interpretation of the indicators, introducing methodological issues only when functional to their interpretation. The indicators are presented by component.

4.2.1 Determinants of Food Security

Concerning the determinants of food security, five indicators are recommended to measure food availability: average dietary energy supply adequacy (ADESA); average value of food production (AVFP); the share of dietary energy supply derived from cereals, roots and tubers; average protein supply; and average supply of proteins of animal origin.

The ADESA expresses the dietary energy supply (DES) as a percentage of the average dietary energy requirement (ADER). The DES underlines the availability of food for human consumption during a reference period expressed in terms of energy (kcal/person/day) (FIVIMS 2003). This indicator is normalised by the ADER, which is considered the proper normative reference for adequate nutrition in the population.[1] Therefore, the ADESA is an index of the adequacy of the food supply in terms of calories. Analysed together with the prevalence of undernourishment, the ADESA allows us to discern whether undernourishment is mainly due to the insufficiency of the food supply or to particularly bad distribution. For example, if an increase in the calories available per person does not result in a comparable reduction in undernourishment, increased food production and supply does not automatically resolve the problem of food insecurity.

The second indicator of food availability proposed by the FAO is the AVFP, which is represented by the total value of annual food net production. To make it comparable across countries, this measure is expressed in constant international dollars per capita. The AVFP allows us to estimate the economic size of the food production sector.

The other three indicators of food availability in the FAO's suite capture the diversity of the food supply or the quality of the diet:

- Share of the DES derived from cereals, roots and tubers expresses in kcal/caput/day as a percentage of the total DES;
- Average protein supply per capita at the national level;
- Average supply of proteins of animal origin per capita at the national level.

The second determinant of food security is physical access to markets, which is measured by three indicators of transport infrastructures: the percentage of paved roads in the total road network, the road density, and the rail line density. The last two indicators are computed as a ratio of the length of the country's total road and rail line networks to the country's land area.

The economic access to food is measured by the gross domestic product (GDP) per capita in purchasing power parity (PPP)[2] and the Domestic Food Price

[1]In developing countries, most ADERs fall between 2100 and 2400 calories. For a precise computation, see United Nations University, World Health Organization & Food And Agriculture Organization of The United Nations (2001).

[2]Following the definition of the Organisation for Economic Co-operation and Development (OECD), the PPPs "are the rates of currency conversion that equalize the purchasing power of

Level Index. These measures represent the two major determinants of economic access to food: the population's income and the purchasing power in terms of the number of food items that can be purchased with a unit of currency.

The fourth aspect of the determinants of food security is food utilisation, which is measured by the following indicators:

- The percentage of population with access to improved drinking water sources. This indicator only considers improved water sources, such as household connections, public standpipes, boreholes, protected wells or springs, and rainwater collection. Unimproved water sources (i.e., vendors, tanker trucks, and unprotected wells and springs) are excluded. The availability of at least 20 litres a person a day from a source within one kilometre of the dwelling is considered the cut-off value for reasonable access to improved drinking water sources.
- The percentage of population with access to sanitation facilities. The computation of this index is based on the disposal facilities that can effectively prevent human, animal, and insect contact, such as protected pit latrines and flush toilets.

Both indicators are critical to ensuring hygiene, proper food preservation and preparation and, in turn, effective food utilisation.

4.2.2 Food Security Outcomes

The access component of the food security outcome is measured by three indicators:

- Prevalence of undernourishment, which expresses the probability that a randomly selected individual from the population consumes an insufficient amount of calories to cover the energy requirement for an active and healthy life.
- The share of food expenditure of the poor, which is the proportion of food consumption to total consumption (food and non-food) for the lowest income quintile of the population (i.e., the 20% of the population with the lowest income) in the country, which indicates the economic burden imposed by the need to maintain food consumption. It is also an indicator of the vulnerability of poorer households to food price increases.
- The depth of the food deficit, which indicates how many calories are needed to lift the undernourished from their status, ceteris paribus.

On the utilisation side, the food security outcome is measured by four indices of anthropometric failure due to macronutrient deficiencies and four indices of micronutrient deficiencies. These indicators are also the most adopted measure of food utilisation or consumption at the individual level.

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different currencies by eliminating the differences in price levels between countries" (http://www.oecd.org/std/prices-ppp/purchasingpowerparities-frequentlyaskedquestionsfaqs.htm).

4.2.2.1 Indicators of Anthropometric Failure

Macronutrients are carbohydrates, proteins and fats. Their deficiency is the consequence of a reduction in macronutrient intake, which decreases a person's activity and increases his or her use of energy reserves (muscle and fat) or decreases his or her growth. Therefore, a malnourished person can be shorter (reduced growth over a prolonged period) and/or thinner than those in the well-nourished reference population (World Food Programme 2005).

Four anthropometric indicators measure these aspects, and three of them refer to child growth. The following indicators are the most widely used in assessing nutritional status and are internationally recognised as important public health measures for monitoring health in populations.

- The percentage of children under 5 years of age affected by wasting, which measures the proportion of children under five years of age whose weight-for-height is more than two standard deviations[3] below the WHO Child Growth Standards median[4] for the international reference population ages 0–5.[5] In other words, this index refers to the loss of body mass relative to body size.

Children whose weight-for-height is below minus three standard deviations are considered severely wasted.

Wasting or thinness is a symptom of acute undernutrition that may result from inadequate food intake caused by acute starvation, a recent episode of illness related to severe infectious diseases, such as diarrhoea, or a combination of both.

- The percentage of children under 5 years of age who are stunted, i.e., the percentage of children under five 5 years of age whose height-for-age is less than −2 standard deviations from the WHO Child Growth Standards median. Children are severely wasted when their weight-for-height is below minus three standard deviations of the median value.

[3]The standard deviation is given by the following formula:

$$SD = \frac{\sqrt{\sum |x - \bar{x}|^2}}{n}$$

where $\sum$ is the sum of the children's weight-for-height minus the WHO Child Standards median, and n is the number of children.

[4]For the median and standard deviations of the WHO Child Growth Standards, see de Onis et al. (2007).

[5]Normally, the percentage of children under 5 years of age affected by wasting is computed as the share of children whose Z-scores are two standard deviations (-2 SD) below the reference population. The Z-score is a measure of the dispersion of data given by dividing the difference between the measured value and the median of the reference population by the standard deviation of the reference population. The same computation method is followed for the other two anthropometric indicators.

Stunting reflects the failure to receive adequate nutrition over a long period of time (chronic undernutrition), and it is also affected by recurrent and chronic illness or poor socioeconomic conditions. Common consequences of stunting (or shortness) are delayed mental development, poor school performance and reduced intellectual capacity. As a result of this effect, economic productivity at the national level might be negatively influenced.

When stunting affects women, there is a high risk that they will deliver infants with low birthweights, who will be more likely to be smaller as adults. This process is called the intergenerational cycle of malnutrition we already discussed in Chap. 1.

– Percentage of children under 5 years of age who are underweight, i.e., the percentage of children with a weight-for-age less than −2 standard deviations from the WHO Child Growth Standards median among children aged 0–5 years.

Children whose weight-for-age is below minus three standard deviations from the median of the reference population are considered severely underweight.

The weight-for-age index is a composite indicator of height-for-age and weight-for-height. It considers both acute and chronic malnutrition.

Table 4.2 shows the cut-off values of public health significance suggested by the World Health Organisation (1995) for the three anthropometric indicators.

Figure 4.1 provides a visual comparison of the anthropometric measures for children.

– The percentage of adults who are underweight, i.e., the percentage of adults whose Body Mass Index[6] (BMI) is below the international reference standard of 18.5.[7] This indicator expresses a situation of acute starvation, severe diseases or chronically unfavourable conditions (World Health Organization—Department of Nutrition for Health and Development 2005); it can also be adopted to measure a long-term nutritional imbalance (United Nations 2003).

4.2.2.2 Indicators of Micronutrient Deficiency

The literature underlines a close relationship between malnutrition (because of a lack of food) and specific micronutrient deficiency diseases (the result of consuming

[6]The BMI is evaluated as a power-type index according to the following formula:

$$BMI = \frac{Weight}{Height^2}$$

The literature shows a strong relationship between food consumption and BMI (Shetty and James 1994).

[7]A BMI above 25 indicates overweight.

Table 4.2 Cut-off values for public health significance

Indicator	Cut-off value and public health significance
Wasting	<5% Acceptable 5–9% Poor 10–14% Serious ≥ 15% Critical
Stunting	<20% Low prevalence 20–29% Medium prevalence 30–39% High prevalence ≥ 40% Very high prevalence
Underweight	<10% Low prevalence 10–19% Medium prevalence 20–29% High prevalence ≥ 30% Very high prevalence

Source World Health Organization (1995), World Health Organization—Department of Nutrition for Health and Development (2005)

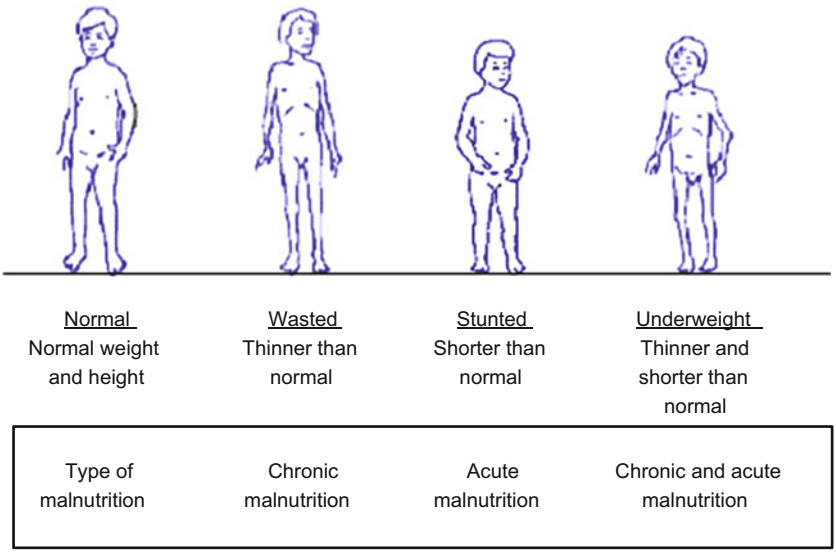

Fig. 4.1 Child anthropometric measures. *Source* Adapted from http://conflict.lshtm.ac.uk/page_115.htm

micronutrient-poor foods) (World Food Programme 2005). These diseases are normally related to acute or prolonged emergencies when populations depend on a limited, unvarying food source.

The recommended indicators for measuring this aspect of food insecurity are related to the most common micronutrient deficiencies:

- The prevalence of anaemia among pregnant women and among children under 5 years of age. The causes of anaemia are iron deficiencies, acute and chronic infections that result in inflammation and haemorrhages, and deficiencies of other vitamins and minerals (http://www.who.int/nutrition/nlis_interpretation_guide.pdf). Anaemia increases the risk of maternal and child mortality. The cut-off value for public health significance is 40%. A prevalence of anaemia greater than or equal to this level signals a severe public health problem (World Health Organization 2008).
- The prevalence of vitamin A deficiency. Vitamin A deficiency results from inadequate dietary intake of vitamin A to satisfy physiological needs, which may be exacerbated by high rates of infection, especially diarrhoea and measles, or inflammation. This deficiency is common in developing countries, but it is rarely observed in developed countries.

Vitamin A deficiency is associated with significant morbidity and mortality from common childhood infections, and it is the world's leading preventable cause of childhood blindness (http://www.who.int/nutrition/topics/vad/en/). The cut-off value for public health significance is 20%. A prevalence of vitamin A deficiency greater than or equal to this level signals a severe public health problem.

- The prevalence of iodine deficiency in schoolchildren aged 6–12 years. Iodine deficiency poses a threat throughout the lifecycle and jeopardises children's mental health. Moreover, it causes complications in pregnancy, including spontaneous abortions, stillbirths and congenital anomalies. The cut-off value for public health significance is 20%. A prevalence of iodine deficiency greater than or equal to this level signals a severe public health problem.

4.2.3 Stability

The indicators of stability or vulnerability are organised into two groups: those referring to exposure and those referring to shocks.

The first category includes the following:

- The cereal import dependency ratio (CIDR), which is a proxy measure of the cereal self-sufficiency of a country and the potential impact of shocks in the international trade market for cereals. This ratio informs us about how much of the available domestic food supply of cereals has been imported and how much comes from the country's own production. It is computed as follows:

$$CIDR = \frac{CM - CX}{CP + CM - CX} * 100$$

where CM is the amount of cereal imports; CX is that of exports; and CP is the country's cereal production. Therefore, the indicator measures how much of the available domestic supply of cereals (CP + CM − CX) has been imported and how much comes from the country's own production.

The maximum value that CIDR can assume is 100. The greater the indicator, the higher the dependence of a country or region on cereal imports. A negative value indicates that the country is a net exporter of cereals.

This indicator is limited because it does not consider re-exported cereals. Consequently, it should be carefully interpreted when applied to a country with significant levels of cereal re-exports. (http://www.fao.org/docrep/016/i2493e/i2493e06.pdf).

- The percentage of arable land equipped for irrigation. This indicator measures the dependence of a country's agriculture on irrigation and, in turn, on the vulnerability of the sector to water stresses and climatic shocks (such as droughts), which will affect food supply.
- The value of food (excluding fish) imports of the total merchandise exports, which indicates a country's exposure to changes in international trade conditions.

The following four indicators are on the shock side of the stability aspect of food security: political stability and the absence of violence, domestic food price volatility, per capita food production and supply variability.

The index Political stability and the absence of violence provides a measure of political shocks that might have impacts on national food security. This indicator measures the quality of the governance and suggests the perceived likelihood that the government will be destabilised or overthrown by unconstitutional or violent means, such as politically motivated violence and terrorism (Kaufmann et al. 2010).

Domestic food price volatility[8] is an indicator of double importance. As food represents a large share of farmers' incomes and poor consumers' budgets, price volatility (low prices for farmers and high prices for consumers) negatively affects their real income, increasing their level of poverty. The literature also suggests that smallholder farmers are discouraged from investing in measures aimed at increasing productivity when prices are volatile and thus unpredictable (FAO 2011a).

Finally, per capita food production and supply variability capture the extent to which food production and supply diverge from the average value.

[8]Food price volatility is based on the 8-month rolling standard deviation method. In other words, the annual volatility indicator is obtained by computing the average of the standard deviation of the month-to-month growth rates calculated over the previous 8 months.

4.3 Global Hunger Index

The GHI is a multidimensional tool computed by the IFPRI every year to monitor hunger on global, regional and country levels and to raise awareness and understanding among regions and countries about the differences in fighting hunger in different parts of the world (Von Grebmer et al. 2015).

The GHI is a multidimensional index that reflects the multidimensional nature of hunger. It is computed by considering the food and nutritional status of the overall population and children in a country. The components of the index are as follows:

- The percentage of the population that is undernourished (PUN), which is measured by the FAO and is considered an indicator of insufficient food;
- The percentage of children under five 5 years of age who suffer from wasting (CWA) according to UNICEF, the World Health Organization, and the World Bank;
- The percentage of children under five 5 years of age who suffer from stunting (CST) according to UNICEF, the World Health Organization, and World Bank. Measuring the prevalence of wasting in children under five years old, this indicator allows food security to be considered in terms of not only caloric intake but also diet quality and utilisation;
- The percentage of children under five years old who die before the age of five (CM) according to the UN Inter-Agency Group for Child Mortality Estimation; the indicator captures the effect of the combination of inadequate nutrition and an unhealthy environment on children, the most vulnerable segment of the population. This percentage allows the GHI to reflect micronutrient deficiencies.

The computation of the GHI follows a three-step process (Von Grebmer et al. 2015; http://library.ifpri.info/files/2016/09/BK_2016_GHI_appendix_b_w.pdf).

First, the abovementioned indicators are quantified. Then, a standardised score is attributed to each of them. This score is slightly above the highest country-level values observed at the global level for the specific indicator from 1998 to 2013 (Table 4.3).

The standardised components of the GHI are computed as illustrated in the second column of Table 4.4.

The third step in the computation of the GHI consists in the aggregation of the standardised components of the index weighting them according to the weights presented in the third column of Table 4.4. The applied formula is the following:

$$GHI = \frac{1}{3} * \frac{PUN}{80} * 100 + \frac{1}{63} * \frac{CWA}{30} * 100 + \frac{1}{3} * \frac{CST}{70} * 100 + \frac{1}{3} * \frac{CM}{35} * 100$$

The GHI takes values included between 0, the best score indicating no hunger, and 100, the worst score.

IFPRI classifies the countries according to the GHI severity scale presented in Table 4.5.

Table 4.3 Score and observed maximum values by GHI component

Indicator	Score value* (%)	Observed maximum value (%)
Percentage of population that is undernourished	80	76.5
Percentage of children under five years old who suffer from wasting	30	26.0
Percentage of children under five years old who suffer from stunting	70	68.2
Percentage of children under five years old who die before the age of five	35	32.6

*The score value is above the observed maximum level due to include the possibility this value to be exceeded in the future

Table 4.4 Computation of the standardised component of the GHI and their weights

Component	Computation	Weight
Standardised PUN	(PUN/80) * 100	1/3
Standardised CWA	(CWA/30) * 100	1/6
Standardised CST	(CST/70) * 100	1/6
Standardised CM	(CM/35) * 100	1/3

Table 4.5 GHI severity scale

GHI	Hunger severity
≤ 9.9	Low
10–19.9	Moderate
20–34.9	Serious
35–49.9	Alarming
$50 \leq$	Extremely alarming

Source Adapted from Von Grebmer et al. 2015

The GHI incorporates the most recent available data, and it is computed for countries for which data on all indicators of its components are available. Moreover, the index measured hunger in countries in which hunger is a relevant phenomenon (Von Grebmer et al. 2015).

4.4 Food Insecurity Experience Scale

In 2013, the FAO launched a project called "Voice of the Hungry" to provide up-to-date, policy-relevant and actionable information about food insecurity (http://www.fao.org/in-action/voices-of-the-hungry/en/). The project developed the Food Insecurity Experience Scale as a measure of the food access dimension in the population, based on data collected at the individual or household level (Ballard

et al. 2013). The 2030 Sustainable Development Agenda adopted the individual-level scale as the indicator (2.1.2) of zero hunger, i.e., Goal 2 (see Chap. 5, Sect. 5.8.2.1).

The Food Insecurity Experience Scale is based on item response theory and the results of ethnographic studies conducted to understand the lived experience of hunger in different regions of the world (Radimer et al. 1990, 1992; Wolfe et al. 1998; Radimer 2002; Coates et al. 2006). The empirical investigations revealed that food insecurity follows a four-phase process according to the level of severity.

The first phase is characterised by uncertainty and anxiety or worry that the ability to procure food might be compromised. This psychological aspect is one of the new elements introduced by this scale, along with the diet quality and quantity deprivation captured by subsequent phases. In fact, the quality of the diet deteriorates as the situation worsens. For example, the diet is less balanced, healthy, and nutritious or more monotonous. When the severity of food insecurity increases further, the quantity of the food consumed decreases. Finally, the severe food insecurity phase is characterised by hunger due to not eating (Ballard et al. 2014).

These phases are represented in Fig. 4.2 along a continuous scale.

The Food Insecurity Experience Scale captures these aspects by directly asking individuals or households eight yes/no questions about their constraints in terms of their inability to obtain food due to a lack of resources (Table 4.6).

Table 4.7 provides an explanation of the intended meaning of each question and includes the scores.

The FAO is leveraging the Gallup® World Poll for the data collection of the Food Insecurity Experience Scale in almost 150 countries on yearly basis. The World Poll uses a nationally representative sample of adults, i.e., those older than 15 years of age.

This information is used for global monitoring of food insecurity. To this end, the FAO refers to two thresholds:

– A moderate level of food insecurity, which includes individuals who have experienced food insecurity at moderate and severe levels. These levels correspond to Q5 (You ate less than you thought you should because of a lack of money or other resources?) and Q8 (You went without eating for a whole day because of a lack of money or other resources?), respectively. Both questions are

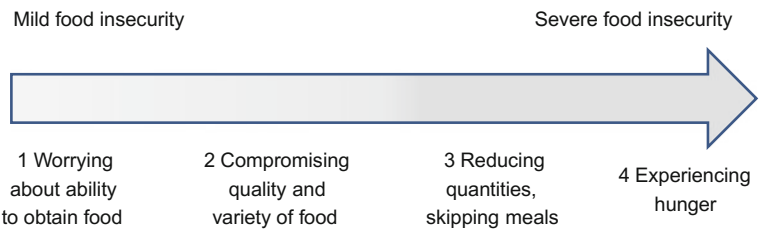

Fig. 4.2 Food insecurity severity along a continuous scale. *Source* Ballard et al. (2014)

Table 4.6 The 8 food insecurity experience scale questions by the domain of the theoretical construct of food security and the assumed level of severity

Question*: During the last 12 months**, was there a time when…	Domain of food insecurity construct	Assumed severity of food insecurity
Q1. You were worried that you would run out of food because of a lack of money or other resources?	Uncertainty and worry about food	Mild
Q2. You were unable to eat healthy and nutritious food because of a lack of money or other resources?	Inadequate food Quality	
Q3. You ate only a few kinds of foods because of a lack of money or other resources?		
Q4. You had to skip a meal because you did not have enough money or other resources to obtain food?	Insufficient food quantity	Moderate
Q5. You ate less than you thought you should because of a lack of money or other resources?		
Q6. Your household ran out of food because of a lack of money or other resources?		
Q7. You were hungry but did not eat because there was not enough money or other resources for food?		Severe
Q8. You went without eating for a whole day because of a lack of money or other resources?		

*This table presents the individual-referenced questions. If households are the targets, the subject "You" is substituted with "You or others in your household"

**The reference to the past 12 months avoids the influence of seasonal effects. However, the module causes a one-month reference period

Source Author's elaboration based on Ballard et al. (2013)

considered in the moderate level of food insecurity to avoid misinterpretations in the case of a reduction only in the moderate food insecurity (Q5). In fact, the movement of some individuals from a moderate level to a severe level might be responsible for this change.

– A severe level of food insecurity, where individuals have experienced a severe level of food insecurity. Q8 (You went without eating for a whole day because of a lack of money or other resources?) captures this level.

The FAO computes the probability of belonging to each of the abovementioned food insecurity classes to make the global Food Insecurity Experience Scale comparable with scores at the country level.

The prevalence of the Food Insecurity Experience Scale substitutes for the prevalence of undernourishment in monitoring the global progress towards food security. The most relevant differences between the two indicators are summarised in Table 4.8.

Table 4.7 Scores and explanations of the intended meaning of the eight food insecurity experience scale questions

Question: During the last 12 months, was there a time when…	Score	Explanation of intended meaning
Q1. You were worried that you would run out of food because of a lack of money or other resources?	0 No 1 Yes 98 Don't know 99 Refused	This question refers to the state of being worried, anxious, apprehensive, afraid or concerned that about potentially not having enough food or running out of food (because there was not enough money or other resources to obtain food) The worry or anxiety is due to circumstances affecting the respondent's ability to procure food, such as a loss of employment or another source of income or other reasons for not having enough money; insufficient food production for one's own consumption; disrupted social relationships; a loss of customary benefits or food assistance; and environmental or political crises The respondent or household does not need to have actually run out of food to answer affirmatively to this question, the rationale being that even the concern and the consequent possible coping strategies are manifestations of food insecurity, even in cases when actual food consumption is not compromised
Q2. You were unable to eat healthy and nutritious food because of a lack of money or other resources?	0 No 1 Yes 98 Don't know 99 Refused	This question asks the respondent whether he or she was not able to obtain foods that they considered healthy or those that contribute to a nutritious or balanced diet (because there was not enough money or other resources to obtain food) The answer depends on the respondents' opinions of what they consider to be healthy and nutritious foods This question refers to the quality of the diet, not the quantity of foods eaten

(continued)

Table 4.7 (continued)

Question: During the last 12 months, was there a time when…	Score	Explanation of intended meaning
Q3. You ate only a few kinds of foods because of a lack of money or other resources?	0 No 1 Yes 98 Don't know 99 Refused	The question asks if the respondent or any other adult in the household had to eat a diet with a limited variety of foods or if they had to eat the same foods or just a few kinds of foods every day because there was not enough money or other resources to obtain food. The implication is that the diversity of foods consumed would likely increase if the household had better access to food This question refers to the quality of the diet, not the quantity of foods eaten. The lack of money must be stressed to identify conditions of food insecurity rather than customary habits to limit the variety of food for other reasons (i.e., health or religion)
Q4. You had to skip a meal because you did not have enough money or other resources to obtain food?	0 No 1 Yes 98 Don't know 99 Refused	This question asks about the experience of having to miss or skip a major meal (for example, breakfast, lunch or dinner, depending on norms for the number and times of meals in that culture) that would normally have been eaten (because there was not enough money or other resources to obtain food) This question refers to the insufficient quantity of food
Q5. You ate less than you thought you should because of a lack of money or other resources?	0 No 1 Yes 98 Don't know 99 Refused	This question asks about eating less than what the respondent considered he or she should eat, even if he or she did not skip a meal (because the household did not have money or other resources to obtain food) The answer depends on the respondents' opinions or perceptions of how much *they* think they should be eating This question refers to the quantity of foods eaten, not the quality of the diet

(continued)

Table 4.7 (continued)

Question: During the last 12 months, was there a time when…	Score	Explanation of intended meaning
		This question does *not* refer to special diets to lose weight or fasting for health or religious reasons
Q6. Your household ran out of food because of a lack of money or other resources?	0 No 1 Yes 98 Don't know 99 Refused	Any experience when there was no food in the household because its members did not have money or other resources (for example, the household's production or bartering) to obtain food
Q7. You were hungry but did not eat because there was not enough money or other resources for food?	0 No 1 Yes 98 Don't know 99 Refused	This question asks about the physical experience of feeling hungry, specifically feeling hungry and not being able to eat enough (because of a lack of money or resources to obtain enough food) It does not refer to dieting to lose weight or fasting for health or religious reasons
Q8. You went without eating for a whole day because of a lack of money or other resources?	0 No 1 Yes 98 Don't know 99 Refused	This question asks about a specific behaviour—not eating anything all day (because of a lack of money and other resources to obtain food) It does not refer to dieting to lose weight or fasting for health or religious reasons

Source Adapted from Ballard et al. (2013)

Table 4.8 Differences between the Food Insecurity Experience Scale and the prevalence of undernourishment

	Food Insecurity Experience Scale	Prevalence of undernourishment
Estimated food insecurity features	Population that has difficulty accessing food at different levels of severity	Adequacy of dietary energy intake in the population
Data source	Direct interviews with population	National-level estimates of food availability and consumption and energy needs

Source Based on http://www.fao.org/3/a-bl354e.pdf

Moreover, the Food Insecurity Experience Scale complements the anthropometric data in evaluating progress towards the eradication of hunger and malnutrition and allows us to identify vulnerable people before malnutrition becomes manifest (Ballard et al. 2013).

4.5 Household Food Security Outcome Indicators

4.5.1 Food Consumption Score

The FCS is the index recommended by the Vulnerability Analysis and Mapping of the World Food Programme for food security analysis at the household level. The description of this measure is based on the technical guidance sheet of the World Food Programme (2008).

The FCS is a score calculated using the frequency of a household's consumption of different food groups in the 7 days before the survey. It is a composite score based on the following:

- Dietary diversity, which is the number of different foods or food groups eaten over a reference period without considering frequency of consumption;
- Food frequency, which indicates the number of days that a specific food item or food group is eaten at the household level over the past 7 days. A food group is a grouping of food items with a similar caloric and nutrient content;
- Relative nutritional importance in terms of the energy, protein and micronutrients provided.

The calculation of the FCS follows a six-step approach.

In the first step, the 7-day food frequency data are gathered through questionnaires. Sometimes, this tool also collects information on the sources of the food items consumed. An example of a questionnaire is illustrated in Box 4.A.

Box 4.A—Questionnaire for food consumption data collection Question: I would like to ask you about all the different foods that your household members have eaten in the **last 7 days**. Could you please tell me **how many days** in the past week your household has eaten the following foods?

Food item	Days eaten in past week (0–7 days)	Sources of food*	
		Primary	Secondary
1—Maize			
2—Rice			
3—Bread/wheat			
4—Tubers			
5—Groundnuts & pulses			
6—Fish (as main food)			
7—Fish powder (used for flavouring only)			
8—Red meat (sheep/goat/beef)			
9—White meat (poultry)			
10—Vegetable oil, fats			
11—Eggs			
12—Milk and dairy products (as main food)			

(continued)

(continued)

Food item	Days eaten in past week (0–7 days)	Sources of food*	
		Primary	Secondary
13—Milk in tea in small amounts			
14—Vegetables (including leaves)			
15—Fruits			
16—Sweets, sugar			

*Food source codes
Purchase = 1; Own production = 2; Traded goods/services, barter = 3; Borrowed = 4; Received as gift = 5; Food aid = 6; Other (specify) = 7
Source Adapted from World Food Programme (2008)

The second step consists of using the collected 7-day food frequency data to group all the food items into the nine specific food groups listed in Table 4.9 with examples of food items for each group.

The third step in the computation of the FCS consists of summing up all the consumption frequencies (number of days) of food items in the same group (see Table 4.6 for a list of the food groups). The value of each group above 7 must be recorded as 7. For example, if the value of the frequency is 9, it must be recorded as 7.

Fourth, the consumption frequency obtained for each food group is multiplied by a weight to create a new weighted food group score. The weight's value increases as the level of energy, quality protein and the range of micronutrients provided by the food group increase.

Table 4.9 Standard food groups and examples of food items

Food group	Example of food items
Main staple	**Cereals and grains**: Maize, rice, sorghum, pasta, bread/cake and other cereals **Roots and tubers**: potato, yam, cassava, sweet potato, taro and/or other tubers
Pulses	**Legumes and nuts**: Beans, peas, groundnuts and cashew nuts
Vegetables	**Orange vegetables** (vegetables rich in vitamin A): carrot, red pepper, pumpkin, orange sweet potato **Green leafy vegetables**: spinach, broccoli, amaranth and/or other dark green leaves, cassava leaves **Other vegetables**: onion, tomato, cucumber, radish, green beans, peas, lettuce, etc.
Fruit	**Orange fruits** (fruits rich in vitamin A): mango, papaya, apricot, peach **Other fruits**: banana, apple, lemon, tangerine
Meat and fish	Beef, goat, poultry, pork, eggs and fish
Milk	**Milk and other dairy products**: fresh/sour milk, yoghurt, cheese, other dairy products
Sugar	Sugar and sugar products, honey
Oil	Vegetable oil, palm oil, shea butter, margarine and butter
Condiments	Spices, tea, coffee, salt, fish power, small amounts of milk for tea

Source Adapted from World Food Programme (2008)

Table 4.10 Weights by food group and justification

Food group	Weight	Justification
Main staple	2	Energy dense/usually eaten in larger quantities, protein content lower and poorer quality than legumes, micronutrients
Pulses	3	Energy dense, high amounts of protein but of lower quality than meats, micronutrients, low fat
Vegetables	1	Low energy, low protein, no fat, micronutrients
Fruit	1	Low energy, low protein, no fat, micronutrients
Meat and fish	4	Highest quality protein, easily absorbable micronutrients, energy dense, fat. Even when consumed in small quantities, improvements to the quality of diet are large
Milk	4	Highest quality protein, micronutrients, vitamin A, energy. However, milk could be consumed only in very small amounts and should then be treated as a condiment; therefore, re-classification in such cases is needed
Sugar	0.5	Empty calories. Usually consumed in small quantities
Oil	0.5	Energy dense but usually no other micronutrients. Usually consumed in small quantities
Condiments	0	By definition, these foods are eaten in very small quantities and are not considered to have an important impact on the overall diet

Source Adapted from World Food Programme (2008)

The weights and the logic behind their calculations are described in Table 4.10.

In the fifth step, the FCS is calculated based on information regarding the frequency of consumption for each food group (x_i) and the respective weights. The adopted formula as follows:

$$\begin{aligned} FCS = {} & 2 * x_{staple} + 3 * x_{pulses} + 1 * x_{vegetables} + 1 * x_{fruit} + 4 * x_{meat\&fish} + 4 \\ & * x_{milk} + 0.5 * x_{sugar} + 0.5 * x_{oil} \end{aligned}$$

In the last step, the FCS is recoded from a continuous to a categorical variable using the thresholds indicated in Table 4.11.

A household with an FCS between 0 and 21 has a poor food security profile. This profile is borderline when the FCS is between 21.5 and 35, while it is acceptable when the FCS is greater than 35.

The thresholds can be increased to 28 for the poor profile and to 42 for the borderline profile in populations with a high frequency of sugar and oil consumption.

When interpreting the FCS, its inability to capture seasonal changes and intra-household food consumption and to quantify the food gap should be considered.

Table 4.11 Food Consumption Score thresholds

FCS	Profile	Justification
0–21	Poor	The threshold 21 comes from the expected daily consumption of staple and vegetables (staple frequency * weight + vegetable frequency * weight = 7 * 2 + 7 * 1 = 21)
21.5–35	Borderline	The threshold 35 comes from the expected daily consumption of staples and vegetables complemented by the frequent consumption, i.e., 4 days per week, of oil and pulses (staple frequency * weight + vegetables frequency * weight + oil frequency * weight + pulses frequency * weight = 7 * 2 + 7 * 1 + 4* 0.5 + 4 * 3 = 35)
>35	Acceptable	

Source Adapted from World Food Programme (2008)

4.5.2 Spending on Food and the Dietary Diversity Index

The Spending on Food Index estimates the share of food expenditure relative to the total household income during a reference period (normally 30 days). Food expenditure includes home-produced food. The poorer the household, the larger the share of income spent on food and the higher its vulnerability to food insecurity.

According to the share of food expenditure relative to total expenditure, households can be classified according to the food expenditure share groups illustrated in Table 4.12.

Hungry people spend a large share of their budget on macronutrient-dense staples, such as wheat and rice. These staples are an easily accessible source of calories at a cheap price. As a result, their diet lacks adequate proteins and micronutrients. This aspect is not highlighted in the Spending on Food Index, but it is considered the Dietary Diversity Score, which is a qualitative measure of food consumption developed by the Funded Food and Nutritional Technical Assistance (FANTA) Project established by the United States Agency for International Development (USAID). The Dietary Diversity Score reflects the household's or individual's access to a variety of foods. Therefore, this indicator can be considered a proxy for the nutrient adequacy of an individual's diet.

The Dietary Diversity Score consists of a simple count of how many food groups are consumed by a household or an individual during the reporting period. There

Table 4.12 Vulnerability to hunger by share of food expenditure relative to total expenditure

Food expenditure share group	Share of food expenditure relative to total expenditure
Low vulnerability	<50%
Medium vulnerability	50–65%
High vulnerability	65–75%
Very high vulnerability	>75%

are different versions of the Dietary Diversity Index. This paragraph refers to the FAO's approach (FAO 2011b).

The FAO proposes two dietary diversity indicators, the Household Dietary Diversity Score and the Women's Dietary Diversity Score. Both refer to a 24-hour recall period, but other valid timeframes are the previous 3 or 7 days. The FAO adopts a recall period of 24 h mainly to limit recall error.

This indicator uses a standard list of 16 food groups for all countries and contexts. Often in addition to the primary source of food procurement (own production, gathering, hunting, and fishing; purchased food; borrowed, bartered, or exchanged for labour; a gift from friends or relatives; food aid; other), information is collected through a questionnaire.

Information for each food group gathered with bivariate (yes/no) items. To calculate the Dietary Diversity Score, the 16 food groups are aggregated into 12 main groups for the Household Dietary Diversity Score (Table 4.13) and 9 for the Women's Dietary Diversity Score (Table 4.14).

All food groups have the same relative weight of 1, i.e., the same importance, with each food group consumed providing 1 point. The Household Dietary Score and the Women's Dietary Score are obtained by summing up the number of food groups consumed. For this reason, the Household Dietary Score falls between 0 and 12, and the Women's Dietary Score falls between 0 and 9.

For analytical purposes, no cut-off points are established in terms of a number of food groups indicating adequate or inadequate dietary diversity for both scores.

Table 4.13 Food groups for the computation of the Household Dietary Diversity Score

Food groups in the questionnaire	Food groups for household dietary diversity score
1. Cereals	1. Cereals
2. White roots and tubers	2. White roots and tubers
3. Vitamin-rich vegetables and tubers	3. Vegetables
4. Dark green leafy vegetables	
5. Other vegetables	
6. Vitamin A-rich fruits	4. Fruits
7. Other fruits	
8. Organ meat	5. Meat
9. Fresh meats	
10. Eggs	6. Eggs
11. Fish and seafood	7. Fish and seafood
12. Legumes, nuts and seeds	8. Legumes, nuts and seeds
13. Milk and milk products	9. Milk and milk products
14. Oil and fats	10. Oil and fats
15. Sweets	11. Sweets
16. Spices, condiments, beverages	12. Spices, condiments, beverages

Source Abapted from FAO (2011b)

Table 4.14 Aggregation of food groups for Women's Dietary Diversity Score

Number in the questionnaire (see first column of Table 4.7)	Women's dietary diversity score
1, 2	1. Starchy staples
4	2. Dark green leafy vegetables
3, 6	3. Other vitamin A-rich fruits and vegetables
5, 7	4. Other fruits and vegetables
8	5. Organ meat
9, 11	6. Meat and fish
10	7. Eggs
12	8. Legumes, nuts and seeds
13	9. Milk and milk products

Source Adapted from FAO (2011b)

However, using the mean score as the cut-off value or ranking the scores into thirds or quantiles is recommended. The households with scores below the mean or in the lowest quantile have a less diversified diet.

4.5.3 Food Coping Strategy Index

The Food Coping Strategy Index measures the frequency and severity of coping behaviours adopted by households to address insufficient food in the short term. It is based on a list of behaviours (coping strategies) that households adopt in the past 7 days when they do not have adequate food and do not have the money to buy food. The Coping Strategy Index combines the following:

- The frequency of each strategy, i.e., the number of times that each strategy was adopted (How often is the coping strategy used?);
- The severity of each strategy, i.e., how seriously does the introduced mechanism cope with the food consumption problem (What degree of food insecurity is suggested?).

There are two versions of the Coping Strategy Index:

- A context-specific or full Coping Strategy Index;
- A reduced Coping Strategy Index.

The context-specific Coping Strategy Index is based on a set of coping strategies that reflect location- or group-specific behaviours, which is useful for understanding localised food security situations (Maxwell and Caldwell 2008).

However, experience indicates that a subset of five questions from the full Coping Strategy Index adequately represents regular behaviours across different contexts. For this reason, these behaviours can be considered universal in times of

Table 4.15 Universal severity weights by coping behaviour

Coping strategy	Universal severity weight
Eating less-preferred foods	1
Borrowing food/money from friends and relatives	2
Limiting portions at mealtime	1
Limiting adult intake	3
Reducing the number of meals per day	1

Source Adapted from Maxwell and Caldwell (2008)

reduced or declining access to food. Therefore, a reduced Coping Strategy Index was constructed to allow comparative analysis across different contexts or income or livelihood groups.

The five standard coping strategies are as follows:

- Eating less-preferred foods;
- Borrowing food/money from friends and relatives;
- Limiting portions at mealtime;
- Limiting adult intake; and
- Reducing the number of meals per day.

The index is constructed by multiplying the frequency of each strategy by the standard weight to measure the severity of the strategy. The weights are called universal severity weights and are shown in Table 4.15 with the associated coping strategy.

The maximum value assumed by the reduced Coping Strategy Index is 56, corresponding to the adoption of all coping behaviours 7 times a week. There are no universal thresholds for the index. However, the higher the reduced Coping Strategy Index, the more severe the coping applied by the household.

The Coping Strategy Index provides a snapshot of the current extent of food insecurity. For this reason, the index is useful for programmatic decision making, as a measure of the impact of humanitarian food assistance programmes and as an early warning indicator of an impending food crisis (USAID 2008).

4.5.4 Household Hunger Scale

The Household Hunger Scale is a household food deprivation scale recommended to measure household food security in areas with a high level of hunger. It is based on three questions about a household's perceptions of varying degrees of hunger. These perceptions are measured by the number of times that a household has experienced hunger in the 30 days prior to the survey. The discussion of this index is based on the manual of Ballard et al. (2011).

The submitted questions are shown in Table 4.16.

Table 4.16 Household Hunger Scale module

No.	Question	Response option
Q1.	In the past [4 weeks/30 days], was there ever no edible food of any kind in your house because of a lack of resources to obtain food?	0 = No (skip to Q2) 1 = Yes
Q1a.	How often did this occur in the past [4 weeks/30 days]?	1 = Rarely (1–2 times) 2 = Sometimes (3–10 times) 3 = Often (more than 10 times)
Q2.	In the past [4 weeks/30 days], did you or any household member go to sleep hungry because there was not enough food?	0 = No (skip to Q3) 1 = Yes
Q2a.	How often did this occur in the past [4 weeks/30 days]?	1 = Rarely (1–2 times) 2 = Sometimes (3–10 times) 3 = Often (more than10 times)
Q3.	In the past [4 weeks/30 days], did you or any household member go an entire day and night without eating anything because there was not enough food?	0 = No (skip to the next section) 1 = Yes
Q3a.	How often did this occur in the past [4 weeks/30 days]?	1 = Rarely (1–2 times) 2 = Sometimes (3–10 times) 3 = Often (more than 10 times)

Source Adapted from Ballard et al. (2011)

The scoring options for the responses are reported in Table 4.17.

After recoding and attributing a score to each response, the Household Hunger Scale is computed by summing up the scores of each question as follows:

$$\text{HHS} = \text{Score of response Q1a} + \text{Score of response Q2a} + \text{Score of response Q3a}$$

The Household Hunger Scale can range from 0 to 6. The higher is the Household Hunger Scale, the more severe the hunger in the household. The recommended

Table 4.17 Scoring options for the household hunger scale module

Response	Score
Never	0
Rarely or sometimes	1
Often	2

Source Adapted from Ballard et al. (2011)

Table 4.18 Household hunger scale categorical indicators

Household Hunger Score	Household hunger categories
0–1	Little to no hunger in the household
2–3	Moderate hunger in the household
4–6	Severe hunger in the household

Source Adapted from Ballard et al. (2011)

thresholds for categorising households according to different levels of hunger are shown in Table 4.18.

The Household Hunger Scale is used for a variety of objectives, including the monitoring of progress towards meeting international development commitments and the development and implementation of policies and programmes. This score is also used as an indicator in early warning or nutrition food security surveillance systems and to inform standardised food security/humanitarian phase classifications (https://www.spring-nutrition.org/publications/tool-summaries/household-hunger-scale).

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Chapter 5
The History of Food Security: Approaches and Policies

Abstract This chapter reviews the evolution of food security approaches and policies by decade, starting in the 1940s, emphasising the role of stakeholders. A specific attention is dedicated to food insecurity in the new millennium with the description of the food crisis and their institutional and policy consequences. In this context, the new architecture of the food security intervention sets by the international community is presented This chapter concludes examining the future challenges related to the need for political will, sound governance and participation.

At the end of this chapter, the reader will be able to understand the institutional and policy lessons in the field of food insecurity to be used to integrate information from quantitative investigations for the design of appropriate interventions aimed at fighting hunger and malnutrition.

5.1 Introduction

The analysis of the history of food security until the new millennium is described by different contributions in the literature. Among them, the most cited are those of Swaminathan (quoted in Hall 1998) and Maxwell (1998).

Swaminathan, examining the history of India, articulates the progress in perceived food insecurity in four phases:

- The 1940s–1960s and the importance of the physical availability of food;
- The 1970s and the role of economic access to food;
- The 1980s and the concern on food security at the individual level;
- The 1990s and the relevance of micronutrients.

Based on lessons from the past, Swaminathan concludes that food security today requires an interdisciplinary approach. Moreover, the food security issue must be considered a problem of physical, social, economic and environmental access (Hall 1998).

M. Sassi, *Understanding Food Insecurity*,
https://doi.org/10.1007/978-3-319-70362-6_5

Maxwell (1998) starts his analysis in 1974, emphasising five phases in the evolution of the food security agenda under the influence of the changing global economy. Based on his thoughts, the following periods can be underlined:

- 1974–1980 and the concern on global food security;
- 1981–1985 and the emphasis on food entitlement and structural adjustments;
- 1986–1990 and the shift in attention from food security to poverty;
- 1996– and the search for a new direction to return to food production or towards concerns regarding consumption and access.

In the new millennium, the choice of a new direction indicated by Maxwell is even more urgent than it was in the second half of the 1990s. In fact, the new millennium opened with a dramatic and complex global food crisis that required new responses at the local and global level and the design of a new architecture of the interventions by the international food security system.

Today, food security is treated as a multi-objective (holistic view) and multilevel (macro- and micro-level) phenomenon. The history of food security also highlights that political will at the national and international level is a precondition for addressing hunger and malnutrition, which represents the main challenge in the years to come.

This chapter proposes the description of the history of food security from the 1940s. A paragraph is dedicated to each decade. The utilised sources are from United Nations agencies, NGOs and CSOs. Therefore, this chapter also notes the role of these stakeholders in this intervention area, where they cooperate even if they sometimes have different points of view.

The chapter is organised as follows. Section 5.2 describes the international focus on physical availability of food that characterised the 1940s. Section 5.3 presents the evolution of thinking towards the targets of self-sufficiency and surplus disposal at the international level that dominated the 1950s. Section 5.4 discusses the supply-side considerations of the approach to food security of the 1960s. Section 5.5 illustrates the implications of the economic shocks in the 1970s, and Sect. 5.6 considers the consequences for developing countries in the 1980s of the subsequent introduction of the structural adjustment programmes, whose features are described in Sect. 5.6.1. Section 5.7 outlines the increase in the crises and emergency situations suffered in the 1990s that made food an instrument for managing these emergencies. It also describes the global response to the context through a large number of summits (Sect. 5.7.1), among which particular importance is given to the World Food Summit (Sect. 5.7.2). Section 5.8 focuses on the new millennium and the global food crisis and presents the features of the different phases of the crisis. More precisely, Sect. 5.8.1 illustrates the distinguishing aspects of the 2008 food crisis, and Sect. 5.8.2 discusses those of the 2011 food price spike, focusing on the response at the country and international levels. Concerning international commitment, Sect. 5.8.2.1 presents the targets set by the international community, Sect. 5.8.2.2 discusses the consequent approaches and principles adopted, and Sect. 5.8.2.3 addresses the institutional setup and financial issues.

The final part of this chapter, Sect. 5.9, discusses the next steps towards the zero hunger goal and specifically focuses on the need for political will, sound governance and participation.

5.2 The 1940s and the Concern About Physical Availability of Food

The quest for food security became a matter of international concern in the 1940s at the end of the Second World War due to its deep negative impacts on agriculture and food production on a global scale.

In 1945, the FAO was established with the mandate "to raise the levels of nutrition and standards of living, to improve agricultural productivity, and to better the condition of rural population" (http://www.fao.org). Three years later, the FAO estimated per capita food production as 5–15% lower than the pre-war level with significant differences among regions (FAO 1948). The most affected geographic areas were those where the conflict had occurred. Excess food supply in several large producer countries, i.e., Argentina, Australia, Canada and the USA, coexisted with acute scarcity in Asia and the Pacific, Europe, North Africa and the Soviet Union.

In 1948, the severity of the food shortage pushed the UN to declare access to food as a fundamental human right (http://www.un.org/en/universal-declaration-human-rights/).

In this period, the international concern focused on the Asian problems of an "insurmountable nature" (FAO 1948). In the region, the war exacerbated the food security impacts of factors such as high population density, the strong dependence on the agricultural sector, which employed three-quarters of the population on mostly small farms, and political instability. Food security deteriorated with the decline in per capita calorie intake. Moreover, Asia passed from a traditional food surplus area to a net food import region.

By contrast, the perceptions of Africa, the other critical continent, were optimistic. The continent was recognised as the last economically advanced in the world, but it was considered to have major opportunities in terms of both economic and agricultural development. This development process was perceived as just a matter of time (FAO 1948).

Finally, Latin America was depicted as a region that was undergoing rapid economic growth, mainly through development strategies based on industrial growth and import substitution. Agriculture still dominated the Latin American economy. The demand for food was increasing dramatically, especially in cities, due to population growth and increases in real incomes. Moreover, the solid performance of the agricultural sector allowed the region not only to cope with the increasing food demand but also to remain a net food exporter.

In this context, because no conceptual and theoretical framework existed to analyse largely agrarian peasant societies, the development economics reflected post-war economic thinking in developed countries (FAO 1993). Thus, according to the dominating approach, food security was considered only a problem of physical availability at the national level, and this understanding informed policies until the end of the 1970s.

This view was influenced by Malthus' natural law of population,[1] according to which the necessary and sufficient condition to guarantee food security in a country is the balance between the availability of the food supply and the food demanded by its population (Malthus 1966).

Therefore, the action focused on the supply side of the food security problem to keep food production and supply outstripping the increasing demand and growing population needs. In addition, food transfers, price stabilisation policies, food stock maintenance strategies, and technological progress were understood as key interventions for those battling the decreasing availability of additional land for agriculture.

5.3 The 1950s and Self-sufficiency and Surplus Disposal

The 1950s were years of a growing political and economic bipolarism, widening the gap between rich and poor countries and societies, and a lack of resources and technology to improve the living standards in developing countries (FAO 2000).

The market conditions in developed countries suggested the need for the government's direct participation in the economy and resource planning. In fact, markets and price signals were considered able to support the process of mobilising and reallocating resources during post-war recovery (Stern 1989). Furthermore, the economic success of the industrialisation policy in the Soviet Union and the transformation of developed economies—from mainly agricultural to primarily industrial economies—emphasised the role of the industrial sector in the development process. Consequently, the prevailing growth strategy was based on government-led industrial growth, and agriculture was regarded as a resource reservoir (FAO 1993). Agriculture was considered subject to diminishing returns on capital and labour and relatively unresponsive to price and was seen to play a doubtful role in the foreign exchange rate. For these reasons, the sector was taxed

[1]The Malthusian theory suggests that there is a natural tendency for population growth to surpass that of all possible means of production, mainly in land and, in turn, in food output (Malthus 1966). In fact, while the former grows geometrically, the latter increases arithmetically. Progress can play a role in increasing land productivity, but Malthus emphasises that its rate "is slow and hesitant". As a result, a growing share of the population would be subject to miserable hunger. In this context, death is regarded as the only factor capable of rebuilding the equilibrium between the population and resources.

and the revenues were transferred to the industrial sector, mainly through parastatal agencies (Stern 1989).

The war experience and the food shortages emphasised the importance of maintaining an adequate domestic food supply and avoiding excessive dependence on imports.

In the early 1950s, particularly in areas where a vigorous post-war recovery process was under way, the demand for all goods increased significantly, and goods were mainly imported from the USA. The strong increase in imports made dollars scarce, prompting a consequent payment crisis in the developing world. Many food-deficit countries were forced to introduce severe restrictions on their overall and food imports, which fuelled a drive towards food self-sufficiency (or "reasonable levels" of it) at the national level. Self-sufficiency became a common feature of many development plans, even where it was clearly out of reach. Moreover, the national availability of food was the key indicator of the level of food security.

The second aspect characterising the food security approach during the 1950s was the disposal of agricultural surplus at the international level. In 1953, the FAO discussed how to dispose of surpluses on the world agricultural market without causing distortions. The idea of using surplus food commodities to alleviate food emergencies and to stimulate development gained ground and led to the introduction of food aid as a form of development assistance (FAO 2000). Food aid took the shape of bilateral surplus disposal programmes and became the most relevant instrument for achieving food security. However, little attention was given to coordination in the use of food aid and to the accountability of said use.

In 1954, the FAO published a pioneering study on food aid titled "Disposal of Agricultural Surplus",[2] in which the organisation launched new ideas for the use of the food surplus as alternatives to the traditional mechanism of the simple transfer of extra production. Among the suggested innovative mechanisms, the FAO proposed food-for-work projects and special feeding programmes for the most vulnerable target groups (FAO 1954). In doing so, the FAO anticipated the "new approach" to the use of food aid as it is applied today. However, this perspective did not garner the support of donors for many years.

5.4 The 1960s and Agricultural Production Technique Progress and Assistance in Economic Development

In the 1960s, the supply-side considerations still dominated the approach to food security. As in the previous decade, the primary objective was to increase food supply availability in developing countries. Food aid remained crucial, but technical

[2]The publication followed the 1953 FAO conference, which led to the establishment of the Committee on Commodity Problems at the FAO. This committee was appointed to provide a regular forum for intergovernmental consultations on surplus disposal issues.

assistance became increasingly important as an instrument for fighting hunger and malnutrition. Hence, in the 1960s, food security concerns shifted from simple humanitarian objectives and surplus disposal towards technological progress in the agricultural sector.

The rapid advance of agricultural technology was one of the main features of the decade. This period was indeed characterised by high expectations with regard to the possibilities offered by the consequent rapid growth in agricultural productivity in fighting rural poverty and hunger and in sustaining economic and social development (FAO 1963, 1968).

The decade was dominated by "modernisation theory", according to which the route from underdevelopment to development required the application of capitalism and technological development in developing countries. With respect to food and agriculture, the most important consequence of modernisation theory was the application of the "diffusion of innovation model" in which development was regarded as a trickle-down process. Proponents of this model assumed that "high-status" large farmers would be the first adopters of agricultural innovations developed in research centres and transferred to agricultural extension services and that small holders would eventually accept them.

The Asian case is a good example in this regard. In the region, a combination of resources and efforts focused on irrigation development, the increased use of fertilisers and improved seeds were at the heart of the continent's Green Revolution. During the late 1960s, the yields of the major food crops (rice, wheat, maize) showed impressive improvement, which served as the foundation for economic growth, especially in China and South East Asia.

In the 1960s, a revival of the neoclassical thought[3] rediscovered the role of agriculture in development[4] and called for free markets and trade regimes, which,

[3]The neoclassical resurgence in development economics is connected to the empirical evidence showing that free markets, more trade liberalisation and a growing agricultural sector are key factors for development and that exports respond to incentives; thus, export pessimism is unfounded (Little 1982).

[4]Johnston and Mellor (1961) underlined five ways in which agriculture could contribute to economic growth:

"(a) Economic development is characterized by a substantial increase in demand for agricultural products, and failure to expand food supplies, in pace with the growth of demand can seriously impede economic growth;

(b) Expansion of exports of agricultural products may be one of the most promising means of increasing income and foreign exchange earnings, particularly in the early stages of development;

(c) The labour force for manufacturing and other expanding sectors of the economy must be drowning mainly from agriculture.

(d) Agriculture, as the dominant sector of an underdeveloped economy, can and should make a net contribution to the capital required for overhead investment and expansion of secondary industry.

(e) Rising net cash incomes of the farm population may be important as a stimulus to industrial expansion".

combined with the abovementioned technological progress,[5] would be conducive to economic and industrial growth and crucial in providing food to the rapidly increasing populations in developing countries.[6]

Neoclassical economists hoped that the liberalisation process in the international market would favour the production of export-oriented cash crops to the detriment of the subsistence economy and the production of food crops for local consumption. Moreover, this perspective focused insufficient attention on the need for poverty alleviation and income generation for the poorest.

Trade issues become central in these years as underlined by the establishment of the United Nation Conference on Trade and Development (UNCTAD) in 1964 and the conclusion of the Kennedy Round of the General Agreement on Tariffs and Trade (GATT) in 1967. UNCTAD failed to support developing countries in improving their positions in international markets, and the Kennedy Round did not include the agricultural sector, even though an agreement was reached among developed countries to contribute 4.5 million tonnes of grain in annual food aid. However, at the end of the 1960s, from a political perspective, UNCTAD emphasised issues that are still key aspects in developing countries (FAO 2000), including the access of primary commodities to developed countries' markets; the volume, terms and conditions of development aid; the trade expansion, economic cooperation and integration among developing countries; and the world food problem.

Despite mainstream theory, the 1960s did not reduce the growing interest and apprehension about malnutrition and hunger issues and about development scenarios in the poorest countries. This situation was affected by China's dramatic food shortages following the failure of the "Great Leap Forward" programme, which caused between 20 and 30 million of deaths during the 1958–1961 period.

In 1961, the FAO and the UN created the World Food Programme "to explore methods of using the surplus of food production in the developed countries to aid economic development in developing countries and to combat hunger and malnutrition" (FAO 1962). The establishment of the World Food Programme marked the beginning of multilateral food aid and the continuation of bilateral surplus disposal programmes already implemented in the 1950s. In 1963, the World Food Congress (WFC) called on all governments, international agencies and other organisations to consider the elimination of hunger as the most important target of development assistance efforts, as suggested by the "basic needs" approach (FAO 2000). However, in line with this dominant approach, the solution to the problem of hunger would have to come from much more rapid growth in food production in the developing countries themselves, emphasising the importance of overcoming the

[5]As farmers were considered profit maximisers, the policy target was to enhance the opportunities for their rational behaviour to manifest itself and lead to increased production and improved productivity (Schultz 1965).

[6]This position was opposed by structuralists, who supported import-substitution industrialisation policies.

technical and economic constraints faced by agricultural development in poor countries.

In 1967, several governments signed the Food Aid Convention (FAC), legally binding them to provide minimum specific quantities of food aid in cereals in addition to the individual share negotiated in the Kennedy Round.

5.5 The 1970s and the Shocks

The 1970s undeniably represented a "breaking point" in the path followed for the previous 20 years: a series of shocks introduced instability and uncertainty in the international order, which had previously been characterised by relatively stable economic growth and predictable markets and prices.

In particular, five exogenous factors shaped the economic environment in developing countries: two oil crises, the first in 1972–73 and the second in 1979, which meant a sharp rise in the crude oil price and a consequent energy crisis; a drastic increase in the global prices of cereals in 1973; deterioration in the terms of trade for tropical agricultural commodities; the breakdown of the Bretton Wood System with the devaluation of the US dollar and increased volatility in world financial markets; and a sharp increase in world liquidity due to oil-exporting countries' recycling of oil revenues through commercial banks, on the one hand, and the money created in developed countries in an attempt to inflate away oil price increases, on the other hand (FAO 2000, 1993; ODI 1997). Furthermore, the adverse weather conditions in food-producing areas were among the major causes of the decline in food production, especially in 1972 and 1974. This situation implied a rapid reduction in food stocks, particularly in exporting countries. As a result, food prices rose worldwide, with dreadful consequences for the food security status of the poor. Africa was the most devastated by the food crisis. Following catastrophic droughts, Africa was traumatised by two dramatic famines: one in Sahel, which was at its worst in 1973, and the other in Ethiopia, which lasted from 1972 to 1974.

The world food crisis signalled a shift from an era with an abundant supply of cheap food and high production capacity to one with volatile food supply and prices.

In the 1970s, the international community and policymakers were thus concerned with self-sufficiency measures, and national and international food stocks were supported to stabilise food availability on various levels (Davies et al. 1991).

In addition, the approach to agricultural development was driven by the urgency to increase food production (FAO 1993) with massive investments in the improvement of conventional agriculture.

In 1974, a World Food Conference was organised to address the growing perception that the world was moving irreversibly towards food scarcity and to suggest

suitable mechanisms to protect the food supply from major crop failure. Government leaders proclaimed that "every man, woman and child has the inalienable right to be free from hunger and malnutrition" and set an ambitious goal of eradicating hunger from human society within a decade. A consensus was reached about the need to increase food production and productivity in developing countries and to establish a more effective system of world food security, including an early warning system, the Global Information and Early Warning System (GIEWS); more effective stocking policies; and the coordination of world food stocks. Emergency food relief and price stabilisation policies were also considered extremely important to improve the situation. During the conference, the adoption of the concept of forward planning for food aid was recommended. In addition, donor countries were called on "to provide commodities and/or financial assistance that will ensure in physical terms at least 10 million tonnes of grain a year as food aid, starting from 1975, and also to provide adequate quantities of other food commodities" (FAO 2000). The FAO set up the World Food Council to monitor the world food security situation and the Committee on World Food Security. The latter was established as an inclusive international and intergovernmental platform for all stakeholders to work together to provide policy recommendations and guidance on a wide range of food and nutrition security and nutrition issues (http://www.fao.org/cfs/en/).

The World Food Conference also called for the establishment of the International Fund for Agricultural Development (IFAD) to finance agricultural development projects mainly for food production in developing countries and the Consultative Group on Food Production and Investment, which aimed to promote the advancement of agricultural science and innovation to enable poor people to improve their food security status, productivity and resilience (http://www.cgiar.org/our-strategy/). Maxwell (1998) labelled the period as the "global food security" age because of the strong international interest on the issue.

Throughout the 1970s, the food security debate still focused primarily on the collective ability of the world's nations to produce enough food to feed the rapidly expanding population. However, economic access to food started to be considered equally important. Furthermore, the World Food Conference also stressed the importance of reducing the population growth rate and rural unemployment and underemployment by diversifying agriculture and expanding on-farm and off-farm income-generating activities.

In 1979, the World Conference on Agrarian Reform and Rural Development (WCARRD) reaffirmed the need for greater attention to rural development as an integral part of development strategies and actions against poverty. Once again, in the 1970s, special attention was given to equity, the distribution of wealth and political power; to access to land; and to the reform of tenancy laws. Economic growth alone was perceived as insufficient to guarantee balanced and sustainable development and to eliminate poverty.

5.6 The 1980s and the Lost Decade

The 1980s are perceived as a "lost decade" for many developing countries, especially in Africa and Latin America. This period was characterised by a long-lasting economic recession that affected many countries, with negative consequences for their overall and agricultural development. Particularly in developing countries, the persistent deterioration of macroeconomic conditions hampered progress in agricultural trade, food security and development assistance (FAO 2000).

Until the late 1970s, the international economic situation was characterised by plentiful liquidity in financial markets and by the adoption of expansionary fiscal and monetary policies in many developing countries. However, following the second oil shock in 1979, developed countries shifted to more severe monetary and fiscal policies that resulted in higher real interest rates, a grave slowdown in their economies, and a subsequent decline in trade volumes and the growth rate of imports from developing countries.

The decrease in the import demand in developed countries maintained the cut in the international commodity prices. International credit diminished sharply and developing countries witnessed a sudden decline in capital inflows from industrialised countries. Many of these developing economies had borrowed heavily in the 1970s, investing in low productivity projects. Therefore, the loans could no longer be repaid. In 1982, the debt crisis began with Mexico and then evolved into a deep recession in Latin America and much of the developing world.

The high interest rates, low export revenues, and rising debt burden experienced in developing countries resulted in the deterioration of their balance of payment, increased budget deficits and the worsening of their credit worthiness, meaning a consequent reduction in their access to credit from the private sector. The policy reaction of some countries was an overvaluation of their currency, the imposition of import restrictions and the cutting of their domestic budgets, reducing the expenditure on infrastructure and social programmes. In addition, agriculture was taxed both directly and indirectly by macroeconomic and sectoral policies, which slowed down its growth.

5.6.1 The Structural Adjustment Programmes

The situation in developing countries, particularly their high debt, raised international concerns regarding their development possibilities and led to a neoliberal policy response based on structural adjustments. A strict economic policy based on world market orientation and foreign trade arose in the 1980s. The free market "mantra" of the 1980s (Stiglitz 2002) was part of the new "Washington

Consensus",[7] a consensus between the International Monetary Fund, the World Bank and the U.S. treasury about appropriate policies for developing countries, which signalled the entrance of a new approach to economic development and stabilisation. With the structural adjustment programmes the International Monetary Fund and World Bank imposed "conditionalities" on developing countries who sought to obtain further credit. These conditionalities were regarded as tools by which governments of the poorest countries could restore their previous economic situations. In other words, loans from the World Bank and International Monetary Fund were made conditional on these countries' acceptance of comprehensive policy reform packages of macroeconomic stabilisation and structural adjustments. The former was aimed at reducing the domestic budget and current account deficits, and the latter aimed at enhancing efficiency and removing bottlenecks through medium-term supply-side policies (Sassi 1994). The main elements of the structural adjustment programmes were as follows:

- Devaluation of overvalued currencies;
- Removal of tariffs and customs on imported and exported goods to improve exports;
- Elimination of state-regulated prices;
- Privatisation;
- Removal of subsidies (on food as well);
- Sharp reduction in public spending to cut the government budget deficit (including a reduction in the expenditure on education and health systems).

The overall effect of the structural adjustment programme strategy was the topic of many discussions and criticisms, as there were few successful cases (like Ivory Coast) and many examples of countries that made very little progress when following this strategy (See, for example, Cornia et al. 1987; Claassen and Salin 1991;

[7]The phrase "Washington Consensus" was identified by John Williamson in 1990 "to refer to the lowest common denominator of policy advice being address by the Washington-based institutions to Latin America countries of 1989" (http://scienzepolitiche.unipg.it/tutor/uploads/williamson_on_washington_consensus_002.pdf). It can be summarised in ten propositions:

- Fiscal discipline;
- Redirection of public expenditure policies toward more efficient sectors in terms of economic return and improvement in income distribution;
- Tax reform;
- Interest rate liberalisation;
- Competitive exchange rate;
- Trade liberalisation;
- Liberalisation of inflows of direct investment;
- Privatisation;
- Deregulation;
- Secure property rights.

Since then, the term has been used to signify market fundamentalist policies, an ideology of reliance upon market forces and the reduction of state interventions and expenditures to a minimum level (Williamson 2000).

FAO 1989). A growing consensus recognised that the immediate social costs of these policies were intolerable. The structural adjustment programmes indeed provoked severe social shocks to many developing countries: real wages decreased; the provision of public social services sharply declined; and unemployment increased, especially in the urban sector. Specifically, concerning food, the partial or total removal of subsidies on bread and other staple commodities hardly affected the poor especially in the urban areas; as Kracht and Schulz (1999) noted, structural adjustment policies did not advocate policies of cheap food.

Agriculture in developing countries was negatively affected by the crisis and the measures implemented to address it. Only big market-integrated farmers could benefit from these policies, while small food crop producers were damaged by lower commodity prices, higher interest rates and the reduction of public support for agriculture. In the poorest and least competitive countries, agricultural performance worsened due to the increase in the prices of inputs and income losses. The position of developing countries in international agricultural trade deteriorated mainly due to the collapse in commodity prices and the introduction of farm-protectionist policies in developed countries (including the strong subsidisation of exports). In 1986, against this background, the Uruguay Round of the General Agreement on Tariffs and Trade (GATT) was launched to focus specific attention on agricultural trade.[8]

5.6.2 The Food Security Approach

In the mid-1980s, the gravity of the economic crisis, its negative consequences on the poor, the increase in the level of poverty and the prolonged famine in Africa (1983–1985) led to a renewed emphasis on the concept of food security. As suggested by Maxwell (2001), this was the golden age of this issue.

The 1980s marked a turning point in the international academic perception and approach to the concept of food security: food emergencies were no longer regarded as a shortfall in food supply; they were instead acknowledged as a loss of access to

[8]After 7 years of negotiations, the Final Act of the Uruguay Round was signed, establishing the creation of the World Trade Organization to replace the GATT. For the first time since the end of the Second World War, agriculture and textile were included concretely in the negotiations, leading to a substantial reduction in agricultural tariff barriers on an international level. Moreover, the differential treatment of developed and developing countries gave the latter a longer period of transition to reduce trade barriers and certain preferences with regard to import duties.

The results of the Uruguay Round have been strongly criticized when analysed from the perspective of developing countries; according to many, developed countries have been the major winners in these agreements, and the relatively smaller gains of developing countries have been unequally distributed, negatively affecting the poor countries exporting mainly tropical products, and countries previously benefiting from preferential treatment (such as the poorest countries in Africa under the Lomé Convention with the European Union), which lost their preferential margin (FAO 2003).

food for poor people (see, for example, World Bank 1986; Drèze and Sen 1989). Adequate food availability at the national level clearly did not automatically translate into food security at the individual and household level. The Nobel winner Sen (1981), with the introduction of the entitlement approach, initiated a shift in thinking that helped broaden food security analysis from a narrow focus on national and global food supply to include the access dimension, a problem faced by millions of households and individuals.[9] Empirical evidence supported this view showing that even if the availability of food supply is still important, individual's inability to access to food is the greater constraint.[10]

Therefore, policymakers began to clearly understand that production did not assure consumption and that people needed access to food (Maxwell 1998). Production-oriented approaches, even if necessary, were considered insufficient to improve food security (FAO 2000). The new concept of food security focused not only on food supply but also on three fundamental concepts: food availability, supply stability and access to food. The household and individual levels began to be the focus of discussions, debates that stressed the importance of entitlements and vulnerability and that called for multisector and multilevel food security planning. In the 1980s, the food security debate also benefited from pioneering investigations on intra-household food security status. They started to elucidate the fact that access to food by individuals is linked to their control over income and household resources (Maxwell 1998). These findings stimulated the introduction of the issue of gender inequality in access to food and the role of women in the achievement of food security, which will be further developed in the 1990s.

The importance of nutritional security as a fundamental component of food security also arose during the 1980s. Earlier approaches to food security relied simply on target consumption levels (mostly in terms of daily calorie intake); however, the new focus on individuals clearly showed that this approach was

[9]In his 1981 essay, Amartya Sen writes that "Starvation is the characteristic of some people not having enough to eat. It is not the characteristic of there being not enough food to eat. While the latter can be cause of the former, it is but one of many possible causes. Whether and how starvation relates to food supply is a matter for factual investigation" (Sen 1981).

He continues by underlining that "there has been a good deal of discussion recently about the prospect of food supply falling behind the world population. There is, however, little empirical support for such a diagnosis of recent trends. Indeed, for most areas in the world—with the exceptions of parts of Africa—the increase in food supply has been comparable to, or faster than, the expansion of population: But this does not indicate that starvation is being systematically eliminated, since starvation is a function of entitlements and not of food availability as such. Indeed, some of the worst famines have taken place with no significant decline in food availability per head" (Sen 1981).

[10]Sen (1981), analysing Ethiopia and Sahel's famine in the 1970s, demonstrated that diminishing access to food was the major cause of food insecurity in both cases. Access to food depends on individual's access to resources, technology, markets, social networks and food transfer programmes; Sen referred to the opportunities to produce or obtain food by any of these means as entitlements.

inadequate. Nutritional requirements vary depending on age, job, size and behavioural characteristics. Moreover, micronutrients deficiencies were largely understood to be important factors of malnutrition as well as calorie deficiencies.

5.7 The 1990s and Food as a Tool for Managing Emergencies

The beginning of the 1990s coincided with one of the most important moments in modern history: the end of the Cold War and the emergence of a new international order. New hopes for the possibility of closer international collaboration and cooperation raised positive expectations for the future, even if some events discredited these expectations.

For many developing countries, the 1990s, or at least the first part of this decade, were years of economic revitalisation compared with the ruinous performance of the 1980s. However, this period also registered a sharp increase in the number of crises and emergency situations, particularly in the Middle East, Eastern and Central Europe and especially Africa.[11] Despite a group of African countries experiencing a process of growth, the continent suffered a long-term period of recession that brought many countries in the region to extreme social and economic difficulties. In the 1990s, Africa witnessed a dramatic increase in the number and length of civil wars and ethnic conflicts, a boom in the incidence of AIDS, especially in southern Africa, and a notable decline in the level of capital inflows, both in terms of official development assistance and foreign direct investments.

In the late 1990s, following to the financial crisis in Asia and Latin America and the collapse of the former Soviet Union, a growing international consensus recognised the need to move away from the neo-liberal policies imposed by the Washington Consensus; it was clear that the strategy inadequately addressed the development and growth in developing countries. Joseph Stiglitz, former chief economist at the World Bank, launched this process by calling for a

[11]Several African countries improved their economic performance; however, Africa has been through a long-term recession period that has brought many countries in the region to extreme social and economic difficulties. In the 1990s, the country witnessed a dramatic increase in the number and length of civil wars and ethnic conflicts, a boom in the incidence of AIDS, especially in southern Africa, and a notable decline in the level of capital inflows, both in terms of official development assistance and FDI. All these factors have seriously undermined the little economic progress experienced in the 1990s.

In 1997, Asia suffered the consequences of a terrible financial crisis, which spread from Thailand to all East Asia, affecting Latin America as well. However, by the end of the 1990s, Asian countries have regained their positive economic performance. The same cannot be said about Latin America, which also experienced an earlier crisis in Mexico (1994); the neo-liberal policies of the International Monetary Fund and the World Bank were often pointed to as the main cause of the difficult economic and social situation still present in some Latin America countries, particularly Argentina.

"Post-Washington Consensus" based on the need to acknowledge and address market imperfections, and its main target would be poverty eradication. According to this view, development was considered a comprehensive process of which economic growth was only one part; the attention was not focused on a country's economic performance but on its people and their needs. Some aspects became crucial, including the role of government and investment in social services, in health and education policies. Moreover, it was understood that a specific strategy was needed for each country—a strategy owned and prepared by the country and by its people.[12] Because of this approach, developing countries were required to prepare a Poverty Reduction Strategy Paper (PRSP) to gain access to the credit provided by the World Bank and International Monetary Fund. In the PRSPs, the promotion and achievement of households' food security often became a direct target and agriculture and rural development played a key role in the poverty reduction process.

In the first half of the 1990s, poverty reduction became the priority of development strategies, and, as Maxwell (1998) noted, displaced the target of food security. Many donors cut or completely removed their funds from food security initiatives, and famines were observed to be more associated with war and crises. Food security, to the extent that it was prominent in the first half of the 1990s, was not a policy issue but a problem of food supply management in complex political emergencies, in which social and political breakdowns were the main features. Food security was linked to relief, and emergency food aid was the major form of food security intervention. Relief, development and rehabilitation were part of the same strategy, which was mainly applied in war zones (Maxwell 2001). The importance of specific food policies for development was obfuscated.

However, in the mid-1990s, the record-low levels of global food reserves contributed to a new wave of awareness concerning the issue of food security and the ability of the world to feed itself.

Despite the initial loss of interest by donors in food security, the issue expanded greatly in the food security literature and discussions in the 1990s. The analysis concentrated on the relationship between food security and market-oriented economic growth, demographic trends, poverty reduction, social welfare in developing countries and, at the micro level, the need to improve individual income measures and to consider gender bias within households. Individuals and households continued to be the centre of attention of the food security approach and analysis. As Maxwell and Wiebe (1999) noted, a complete definition of food security should

[12]According to Stiglitz, "Trying to get government better focused on the fundamentals—economic, policies, basic education, health, roads, low and order, environmental protection—is a vital step. Nevertheless, focusing on the fundamentals is not a recipe for a minimalist government. The state has an important role to play in appropriate regulation, industrial policy, social protection and welfare. However, the choice is not whether the state should be involved. Instead, it is often a matter of how it gets involved. More importantly, we should not see the state and markets as substitutes … the government should see itself as a complement to markets undertaking those actions that make markets fulfil their function better" (Stiglitz 1998).

incorporate the three dimensions of access to food: access to sufficient food to meet everyone's needs, an individual's ability to generate sufficient food without sacrificing his or her endowments, and societies' ability to protect individuals from shocks such as job loss due to financial crises. Maxwell (1998) added that discussion should concern not only food security strategies but also the complexity of livelihood strategies in difficult and uncertain environments.

5.7.1 The Global Summits

A high number of global summits on development issues characterised the 1990s. The United Nations conferences in the 1990s stimulated and affirmed the commitment of states and governments to establish plans of action to address global issues, including food security (Amalric 2001). In terms of the goals set up in the 1990s, the following conferences were the most relevant:

- The 1990 World Summit for Children (www.unicef.org/wsc/), which addressed nutritional issues in children under five years old;
- The 1992 International Conference on Nutrition, which set the ambitious target of eliminating hunger and famine-related deaths and reducing all forms of malnutrition (FAO and WHO 1992); and
- The 1996 World Food Summit, which reaffirmed everyone's right to have access to safe and nutritious food consistent with the right to adequate food and the fundamental right of everyone to be free from hunger (www.fao.org/docrep/003/w3613e/w3613e00.htm).

During this decade, of particular importance was the contribution of the NGO working group to the Rio conference held in 1992, whose debate resulted in the publication of the "NGO Food Security Treaty" (NGO Documents for the Earth Summit, 1992). The preamble of the document analysed why food insecurity has increased despite significant increases in food production. The following were underlined as the main causes:

- Undemocratic and inequitable distribution of and access to resources;
- Chronic poverty;
- Two prevailing approaches to food security promoted by the World Bank and International Monetary Fund, on the one hand, and by bilateral and multilateral agencies, on the other hand; and
- Dependency on food imports.

Based on the principles listed in the second section of the treaty, NGOs and CSOs agreed to advocate for food security as a central objective of the agricultural and food policies of local and national governments, intergovernmental agencies, NGOs and community groups.

At the same time, they worked within their communities to ensure the viability of small and family farms and the diversity of products and production practices; to

actively promote democratic and just forms of land ownership and land tenure systems, including community control over land use, access and ownership and water resources and over food-related decisions and strategies; to work to promote infrastructure facilities such as transportation, storage, communications, water, and energy; to enhance the capacities of women and men, enabling them to fully participate in the economic activities of the community, leading to food security; to promote traditional knowledge and practices of sustainable agriculture, biodiversity, and food security strategies and techniques (such as beneficial seeds and plants), as well as policies, which preserve and reinforce that knowledge and those practices; to promote funding priorities that lead to, insofar as possible, independently sustainable food security systems.

The 1996 World Food Summit was based on the position expressed by NGOs in the treaty: the Summit raised issues already identified in this document.

5.7.2 The World Food Summit

The 1996 World Food Summit sent an important political message, which is contained in the "Rome Declaration on World Food Security": the international community adopted a target to halve the number of undernourished people in the world by 2015 through combined efforts at the regional, national and international levels.

Notably, this target was much more modest than that adopted by the 1974 World Food Conference, which sought to completely eliminate hunger. With this target, the 1996 Summit accepted that 400 million people would still be hungry in 2015. Furthermore, the summit did not call for new initiatives, new institutions and new resources to fight hunger. Instead, the leaders of the 185 countries and the European Union represented at the conference focused on a more effective allocation of available resources and noted the lack of firm commitments and actions.

In this respect, the prominent role of the CSOs must be underlined, as they stimulated the creation of regional and global networks on food security, a structure that remained active in the summit follow-up. In addition, in the final declaration, they recommended the development of a "Code of conduct of the right to adequate food". This code of conduct was made available in 1997, was recognised by the high commissioner, and was supported by several governments. The CSOs also suggested the establishment of a Food Security Convention with the aim of regulating trade and emergency aid stocks at the global level to design policies to support people suffering from hunger and malnutrition (Aid Workers Network 1995).

The World Food Summit emphasised the importance of monitoring progress towards food security. To this end, it established the FIVIMS with the specific aim of monitoring global and national efforts and achievements in reaching the goals fixed by the summit.

The outcome of the World Food Summit reflected the context in which it was held. Strident interest groups put ample pressure on the negotiations and, through the media, on public opinion on topics such as biodiversity, genetic manipulation, trade liberalisation and political changes. The major international organisations and institutes presented contrasting pessimistic and optimistic forecasts concerning the future of food security.[13] The importance of focusing on food production (shifting back to the Malthusian tradition) or on access was hotly debated. Furthermore, the economic revolution known as globalisation dominated the summit.[14] Its objectives, policies and actions reflected these ideas and attempted to synthesise different positions.

A major limit of the summit was the absence of a concrete capacity to increase the willingness of governments to follow up on the commitments made (Amalric 2001).

5.8 The New Millennium and the Food Crisis

The events at the beginning the new millennium sent an explicit message about the crisis of the global agri-food system. This crisis combined with financial turmoil, economic downturns and recession, unsustainable public debt and social unrests and riots.

A signal of the severity of this crisis is demonstrated by the trend in the global food price index. After a low and stable level was reached at the end of the 1990s and in the early 2000s, the international food commodity price index surged upward from 2006 to 2008, and it reached a new peak in 2011 higher than that in 2008 (Fig. 5.1). High and volatile food prices characterise the current context.

The financial crisis that emerged with the food price crisis partly distracted attention from the 2008 food price spike. Only at the end of 2010, with the Middle East and North Africa protests, i.e., the Arab Spring, did some attention return to this question. On April 16, 2011, the Development Committee of the World Bank and International Monetary Fund stated that without interventions aimed at changing certain tendencies in the global agri-food system, the crisis might recur

[13]For example, the FAO and the World Bank were cautiously optimistic about the future of food security, underlined the key role of knowledge and, more precisely, technology in providing food demand. The IFPRI presented a mixed future characterised by significant advances in some countries, such China, but no improvement in South Asia and sub-Saharan Africa, which were particularly plagued by child malnutrition. The most pessimistic forecasts were from the Worldwatch Institute and were connected to land degradation and population-related pressures on the agricultural system. On the topic, see, for example, Alexandratos (1995), Brown (1995, 1996), Carnell (1997), Dyson (1999, 1994), FAO (1995), Klaus (1996), and Rosergrant et al. (1997).

[14]Globalization is a non-continuous process of rapid global economic integration boosted by technological progress, particularly in transport and communications; thus, it is facilitated by lower transaction costs and lower barriers to movements in capital and goods (Bruinsma 2003; Kohler 2003; World Bank 2002).

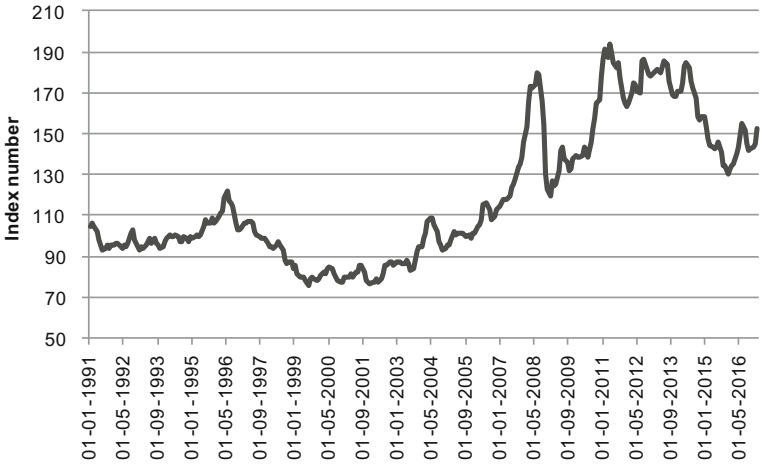

Fig. 5.1 Food commodity price index—monthly data (Jan 1991–Nov 2014) 2005 = 100. *Source* Author's elaboration based on the International Monetary Fund data

(http://www.imf.org/en/News/Articles/2015/09/28/04/51/cm041611a). This declaration sets the need for appropriate agricultural and food policies at the heart of the food and nutrition security discourse and notes new challenges for these policies.

To understand these aspects, the features of the different phases of the food crisis must be considered.

5.8.1 The 2008 Food Crisis

The 2008 food crisis was characterised by some distinguishing features.

First, it had a complicated nature and, in turn, difficult to solve. In fact, it was the result of shocks on many grain price determinants on the demand, supply and expectation sides. Among these factors were demand growth; financial market speculation on the cereal markets; the introduction of cereal export restrictions; climatic shocks; the cereal productivity slowdown; the depreciation of the US dollar; rising oil and fertiliser prices; the decline of cereal stocks; and the increase in cereal demand for bioenergy (Rezitis and Sassi 2013). These factors also underlined the global nature of the 2008 food crisis. Therefore, its solution requires not only local efforts but also a global commitment.

The first response to this situation was at the household level. The causes of surging food prices represented cumulative shocks and stresses that eroded households' coping capacity, pushing an increasing number of them below the poverty line and below the food security line. This negative impact also occurred because the emergency, relief and development interventions could not counterbalance the pressure exerted by these adverse events. The consequence was a

dramatic increase in the number of undernourished people, which exceeded 1 billion in 2009. Moreover, after 30 years of reduction, the prevalence of undernourishment also increased (FAO 2010). Among the developing regions, sub-Saharan Africa showed an alarming situation; in some countries, more than 50% of the total population was undernourished. This rising number and incidence of undernourished people were the cost of the failure of the policy interventions for the food crisis management.

In the second half of 2008, food commodity prices started to decline, along with the number and proportion of undernourished people. The situation fuelled enthusiasm of a possible end to the food crisis. On this point, two considerations should be highlighted.

First, prices were declining, but they were still higher than their levels in 2005, 2006 and 2007. Therefore, the problem of high food prices persisted.

Second, a reduction in the number of undernourished people means that we can feed more people, which is a positive achievement. However, particularly children affected by hunger and malnutrition suffer from severe health, poor growth and developmental damage, which reveal the long-term negative effect of food insecurity—its human cost. This cost also has economic implications. The development perspective of some countries, especially in sub-Saharan Africa, where more than 40% of children under five years old are undernourished, will suffer from the impact of the hunger shock. The FAO (2004) estimates that, on a global scale, every year that hunger persists at the current level will cause deaths and disability, which will cost developing countries US 500 billion or more in future productivity. In addition, the 2008 food price shock also raises important questions, including who is going to pay for the health and social security costs related to the long-term effects of child malnutrition.

The 2008 food crisis was particularly aggressive in developing countries for two major reasons.

The increase in food commodity prices on the international markets was transmitted into the domestic market of many developing countries, especially those dependent on food imports, making the inflationary pressure more severe (World Bank 2001). Food price and inflation increases in low-income countries represent severe threats to food security and the poor. The household food expenditure share relative to per capita income is high in low-income countries; it may account for 70% or more of their income (FAO 2008). Therefore, it can be easily understood how a peak in food prices can negatively affect not only the level of food insecurity but also the level of poverty in those countries. Therefore, these households must spend an increasing share of their income on food, and for a growing number of them, their income cannot provide an adequate level of food intake. Consequently, these households introduce coping mechanisms to protect their assets and future viability, such as withdrawing children from school, selling livestock or assets, finding casual employment, and eroding the household's protective and productive capital.

Therefore, poor and vulnerable people must be protected from the worst effects of these shocks to ensure that they have appropriate access to food. In addition, the

price transmission mechanism from international to domestic markets must be considered a critical control point that needs to be properly managed with a specific set of policies, particularly macroeconomic policies, such as monetary policies and interventions aimed at improving domestic infrastructure. In other words, the current emphasis on agricultural interventions for food security, even if vital to this purpose, is not enough: coordination among appropriate policies is needed.

Another distinguishing feature that characterised the 2008 food crisis is the net food trade position of developing countries, especially the least developed countries. Since the 1990s, they have become net food importers. The increase in food commodity prices in the international market has resulted in the deterioration of their food trade balance and the increase in their dependence on food from international markets.

This burden is particularly severe for less developed countries that cannot increase their agricultural productivity to fill this gap or use non-food export revenues for food-deficit reduction.

For these countries, the increase in food prices means that, in the coming years, they will have to spend an additional $20 billion on food imports. Covering this cost will mean increasing aid by 20% at a time when many aid donors are failing to meet their commitment to spend 0.7% of the gross national product on Official Development Assistance, as promised at the UN General Assembly in 1970 (Oxfam 2010). Only 5 countries reached this target during the first price spike, namely, the Netherlands, Denmark, Norway, Luxembourg, and Sweden. Therefore, a food crisis can be managed; however, doing so comes at a very high cost, and commitment should be maintained and reinforced.

In light of these considerations, the key role of agriculture for food security becomes clear. Agriculture produces food and is the major source of income in developing countries. Therefore, the sector is important for food availability and especially for economic access to food.

In this context, smallholder farmers deserve special attention. Eighty-five per cent of farmers in developing countries producing on less than 2 hectares (FAO 2014). Moreover, these households represent half of the undernourished households at the global level. Mixed crop/livestock smallholding systems produce about half of the world's food. The development of a sustainable small-scale local food production system can enhance the income and resilience of rural producers, make food available to consumers and maintain or enhance environmental quality (G8 2011).

Capital is the major driver of this agricultural development process. However, considering the period from 1975 to 2007, the capital stock per worker in agriculture has decreased in sub-Saharan Africa and South Asia, where the number and prevalence of hungry people are highest (Von Cramon-Taubadel et al. 2011). Moreover, the 2008 price spike emerged in a period when donors' interests in providing assistance to agricultural development were declining (https://www.tcd.ie/iiis/policycoherence/development-cooperation-trade-reform/trends-agricultural-aid.php).

In 2011, in the situation described above, a new crisis manifested itself as the financial crisis intensified.

5.8.2 The 2011 Food Price Spike

The food and financial crises developed from different underlying causes, but they were intertwined in complex ways. They both negatively affected financial and economic stability, food security, and political security. The result was the further deterioration of relevant aspects at the heart of food security, such as an increase in agricultural input prices, especially those of fertilisers, a rise in unemployment, reduced salaries and remittances, and cuts in public expenditures, particularly those related to services. This scenario reinforced the need to coordinate integrated policies with a new policy approach to address the effects of the food and financial crises on food security.

The combined action of the food and financial crises represented a turning point in the approach to food insecurity both at the country level and the international level.

As underlined by Demeke et al. (2009), several countries questioned the de facto paradigm that had guided their policies and strategies during the previous decades: the Washington Consensus. They introduced three types of policies: trade-oriented policies aimed at reducing prices and/or increasing domestic supply responses; consumer-oriented policies to directly support consumers and vulnerable groups; and producer-oriented policies focused on supporting farmers to increase their production. Generally against the liberalisation process undertaken, these policies attempted to isolate domestic prices from world prices; they moved from a food security-based strategy to a food self-sufficiency-based strategy; they attempted to shunt the "normal" international trade processes either by acquiring land abroad to secure food and fodder procurement or by engaging in trade agreements at the regional level; they showed distrust towards the private sector, given what was prescribed by the Washington Consensus.

In this period, we also assisted in a new international commitment. First, the failure of the response at this level was clear. In 2010, for example, Oxfam stated that "If promises could feed people, there would not be one single hungry person left on Earth" (Oxfam 2010). In the same year, the UN Secretary General declared that "The shortfalls towards the achievement of the MDGs are not because they are unreachable or because time is short, but rather because of unmet commitments, inadequate resources, lack of focus and accountability, and insufficient interest in sustainable development. This has resulted in failure to deliver the necessary finance, services, technical support and partnership" (http://www.undp.org/content/undp/en/home/presscenter/pressreleases/2010/03/16/los-objetivos-de-desarrollo-del-milenio-deben-cumplirse-dice-el-secretario-general-de-la-onu.html).

Despite this convergent view of NGOs and international organisations regarding the failure of the international response to the food crisis, in the new millennium, the international community agreed upon a new architecture for food security interventions (Fig. 5.2).

This new architecture was the result of a series of international summits that discussed the targets, principles, approaches, institutions, and financial issues related to the international commitment to fight hunger (Fig. 5.3).

Fig. 5.2 A new architecture for food security interventions

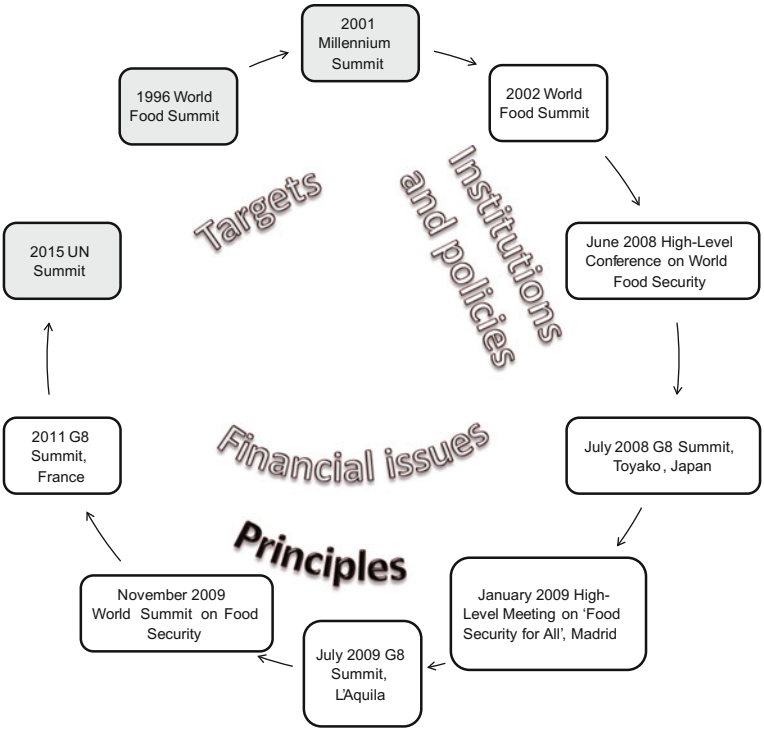

Fig. 5.3 Main steps in the definition of the new architecture for the food security intervention

5.8.2.1 Targets

In 2001, the Millennium Declaration, adopted by 189 countries at the UN Millennium Summit, represented an unprecedented declaration of solidarity and determination to free the world of poverty, to promote human dignity and equality and to achieve peace, democracy and environmental sustainability. This declaration laid the foundation for a global partnership based on mutual responsibilities between developing and developed countries. Furthermore, the Millennium Declaration was intended to ease the constraints on people's abilities to choose to adopt a new approach, which has at the centre of its development objectives not only, as in the past, economic growth but also—and most important—human well-being and poverty reduction.[15] Of the eight goals[16] of the MDGs emanating from the declaration, the first obligated countries to eradicate extreme poverty by addressing two specific targets: halving the proportion of people whose income is less than $1 a day (Target 1) and the proportion of people who suffer from hunger (Target 2) between 1990 and 2015.

This second target is less ambitious than that set by the World Food Summit (i.e., to halve the absolute number of hungry by 2015). According to the expected rate of world population growth, the target established by the Millennium Summit requires the reduction of hungry people to 580 million by 2015, while that fixed by the World Food Summit was 400 million (De Haen 2005a). However, according to the UNDP (2003), the MDG 1—Target 2 presented two challenges: ensuring access to plentiful food and increasing the productivity of food-insecure farmers, especially those in Africa.

In September 2015, the 1993 United Nations member countries adopted a new global development framework, the "2030 Agenda for Sustainable Development". Of the 17 Sustainable Development Goals, Goal 2 made a step forward in fighting hunger by adopting a "zero hunger" target to "[e]nd hunger, achieve food security and improved nutrition and promote sustainable agriculture" by 2030. This goal includes the five targets illustrated in Table 5.1, along with the proposed indicators.

To meet this ideal benchmark of ending hunger by 2030, agriculture is the key element, and the availability and access pillars of food security are emphasised. Utilisation and stability are lacking aspects in a context in which the new faces of food insecurity, such as the urban malnutrition, must be addressed.

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[15]The commitment to the Millennium Declaration has been reaffirmed in Mach 2002 at the International Conference on Financing for Development held in Monterrey, Mexico, and in September 2002 at the World Summit on Sustainable Development in Johannesburg, South Africa (www.un.org/esa/ffd).

[16]The eight Millennium Development Goals are to eradicate extreme poverty (Goal 1), to achieve universal primary education (Goal 2), to promote gender equality and empower women (Goal 3), to reduce child mortality (Goal 4), to improve maternal health (Goal 5), to combat HIV/AIDS, malaria and other diseases (Goal 6), to ensure environmental sustainability (Goal 7), and to develop a global partnership for development (Goal 8).

Table 5.1 Targets and indicators of Goal 2 of the SDGs

Targets	Indicators
2.1. By 2030, end hunger and ensure access by all people, particularly the poor and people in vulnerable situations, including infants, to safe, nutritious and sufficient food all year round	2.1.1. Prevalence of undernourishment
	2.1.2. Prevalence of moderate or severe food insecurity in the population, based on the Food Insecurity Experience Scale
2.2. By 2030, end all forms of malnutrition, including achieving, by 2025, the internationally agreed targets on stunting and wasting in children under 5 years of age, and address the nutritional needs of adolescent girls, pregnant and lactating women and older persons	2.2.1. Prevalence of stunting (height for age <−2 standard deviation from the median of the World Health Organization (WHO) Child Growth Standards) among children under 5 years of age
	2.2.2. Prevalence of malnutrition (weight for height >+2 or <−2 standard deviation from the median of the WHO Child Growth Standards) among children under 5 years of age, by type (wasting and overweight)
2.3. By 2030, double the agricultural productivity and incomes of small-scale food producers, in particular women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets and opportunities for value addition and non-farm employment	2.3.1. Volume of production per labour unit by classes of farming/pastoral/forestry enterprise size
	2.3.2. Average income of small-scale food producers, by sex and indigenous status
2.4. By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality	2.4.1. Proportion of agricultural area under productive and sustainable agriculture
2.5. By 2020, maintain the genetic diversity of seeds, cultivated plants and farmed and domesticated animals and their related wild species, for instance, through soundly managed and diversified seed and plant banks at the national, regional and international levels, and promote access to and fair and equitable sharing of benefits arising from the utilisation of genetic resources and associated traditional knowledge per international agreements	2.5.1. Number of plant and animal genetic resources for food and agriculture secured in either medium- or long-term conservation facilities
	2.5.2. Proportion of local breeds classified as at risk, not at risk or at an unknown level of risk of extinction
2.A. Increase investment, for instance, through enhanced international cooperation, in rural infrastructure, agricultural research and extension services, technology development and plant and livestock gene	2.A.1. The agriculture orientation index for government expenditures
	2.A.2. Total official flows (official development assistance plus other official flows) to the agriculture sector

(continued)

Table 5.1 (continued)

Targets	Indicators
banks to enhance agricultural productive capacity in developing countries, particularly the least developed countries	
2.B. Correct and prevent trade restrictions and distortions in world agricultural markets, for instance, through the parallel elimination of all forms of agricultural export subsidies and all export measures with equivalent effects, in accordance with the mandate of the Doha Development Round	2.B.1. Producer support estimate 2.B.2. Agricultural export subsidies
2.C. Adopt measures to ensure the proper functioning of food commodity markets and their derivatives and facilitate timely access to market information, including on food reserves, to help limit extreme food price volatility	2.C.1. Indicator of food price anomalies

Source https://sustainabledevelopment.un.org/sdg2

5.8.2.2 Approaches and Principles

Based on the declaration of the World Food Summit—Five Years Later at the International Conference of Financing for Development held in Mexico in 2002, three UN agencies, the FAO, the IFAD and the WFP presented a "twin-track approach" to combat hunger (FAO 2003), whose main components were incorporated into the recommendations of the Hunger Task Force of the UN Millennium Project. The following are two key areas of intervention:

- Strengthening of the productivity and incomes of hungry and poor people;
- Providing direct access to food and the creation of social safety nets for the hungry.

Concerning the former element of this approach, rural and agricultural development is prioritised for its positive link with food security and poverty eradication: the vast majority of poor and hungry people live in rural areas, where their livelihoods depend on agriculture. This important aspect implies reintroducing agriculture and rural development in the development agenda. Furthermore, agriculture and rural development play a crucial role in the achievement of most of the SDGs.

This strategy was confirmed by the thirty-third session of the FAO Conference held in November 2005 (www.fao.org) and supported by the UN Agency at the World Trade Organization (WTO) meeting in Hong Kong in December 2005 (De Haen 2005b).

In 2009, L'Aquila Global Food Security Initiative promoted the introduction of a new approach to fight food insecurity, which was articulated in five principles:

- Principle 1—Investment in country-led plans and processes;
- Principle 2—A comprehensive approach to food security that includes support for humanitarian assistance, sustainable agriculture development and nutrition;
- Principle 3—Strategic coordination of assistance;
- Principle 4—A strong role for multilateral institutions;
- Principle 5—Sustained commitment of financial resources.

These principles underlined the urgent need recognised by the donors at the G8 Summit to invest in the twin-track approach towards food security using a cross-cutting and inclusive approach that supports national plans and involves relevant stakeholders at different levels (from the global level to the local level).

5.8.2.3 Institutions and Financial Issues

In 2008, the G8 Summit in Japan launched a Global Alliance for Agriculture, Food Security and Nutrition, a multi-stakeholder effort to increase the efficiency of the interventions to fight hunger at both the local and global levels. Moreover, accountability was included on the agenda for the first time, creating a group of experts to report on donors' fulfilment (Oxfam 2010). The World Food Summit—Five Years Later underlined the need to work together to accelerate the global effort towards hunger elimination, and, for this reason, the final declaration at the summit was entitled "The International Alliance Against Hunger". The delegates' awareness of a common effort stimulated the establishment of this global partnership, which was first promoted by the three UN food agencies and was then expanded to include representatives of NGOs and CSOs to realize the following:

- Contribute to the achievement of the MDGs, especially by strengthening national and global commitments and actions to end hunger;
- Express the aspirations of poor and hungry people;
- Engage with poor and hungry people as full partners to find and implement solutions that make a real difference in their lives and the lives of generations to come;
- Facilitate dialogue about the most effective measures to reduce hunger;
- Promote a mutually supportive action involving governments and other stakeholders in the fight against hunger (The International Alliance Against Hunger 2004).

The second body of the new architecture is the Committee on World Food Security. In 2009, this body was reformed to increase its legitimacy as a decision-making body for the global governance of food security (Committee on World Food Security 2005).

In the same year, a new body was created as an essential part of the reform of the Committee on World Food Security. The High-Level Panel of Experts for Food

Security and Nutrition (HLPE) was established as a scientific and knowledge-based pillar of the Global Partnership for Agriculture, Food Security and Nutrition (http://www.fao.org/fileadmin/user_upload/hlpe/hlpe_documents/HLPE_Key_elements_EN.pdf).

The HLPE is the interface of the Committee on World Food Security and "aims to improve the robustness of policymaking by providing independent, evidence-based analysis and advice at the request of Committee on World Food Security" (http://www.fao.org/cfs/cfs-hlpe/en/).

Additionally, the Consultative Group for International Agricultural Research (CGIAR) was reformed to better support the Global Alliance for Agriculture and Food Security, thereby contributing to research on a food-secure future.

The financial commitment of the international meetings was one of the most critical elements. The funds that were declared necessary to fight hunger and to support related programmes were not fully provided.

This aspect represents one of the problems that must be solved to make the new international food security architecture work. Among other challenges, two relate to the twin-track approach. An open issue is the integration of the support for safety net programmes with that for social protection systems and their integration in poverty reduction and food security policies. In addition, concerning the increase in agricultural production, what kind of agriculture to support (i.e., for food or non-food production), how to produce food (for example, openness to genetically modified organisms), where to produce food (i.e., in developed countries maintaining developing countries' dependence on international markets), and, most important, by whom the agricultural production would be obtained (the food insecure and vulnerable people or those with an already stable access to adequate food) have yet to be determined.

5.9 The Need for Political Will, Sound Governance and Participation

The analysis of the history of food security has underlined the increasing concern regarding this issue at the international and national levels and among the stakeholders. However, the progress towards reducing hunger has not been enough. Without progress does not increase, reaching the SDGs' targets by 2030 will be difficult if not impossible (FAO 2005; De Haen 2005b). What is not working? The improvement in governance at the global, national and sub-national levels is regarded as a critical aspect to reduce hunger in the current age of globalisation (Paarlberg 2002; Runge et al. 2003).

According to the UNDP (1996), governance is "the exercise of political, economic and administrative authority to manage a society's affairs". Thus, a precondition for initiating the process of building sound governance to end hunger is a strong political will, which is the desire of those in power to act for the benefit of

food-insecure people (Beckmann and Byers 2004). In this respect, the later international summits represented and should be understood as an important stimulus for the development of a clear project to develop political will.

According to Beckmann (2005), the first major component of this project relates to governments' decisions and policies that affect hungry people. Government officials who are sensitive to this issue are important, but the most relevant challenge concerns institutionalising the political commitment to reduce hunger by building government institutions that embody this commitment. Even non-governmental institutions, both at the national and international levels, play a key role by applying pressure that pushes progress forward to relieve hunger and eradicate poverty. Therefore, a commitment building at the grassroots level, among poor people, is essential, and such work should emerge and influence the national level. Beckmann (2005) also underlines that this project cannot be developed without an adequate amount of money and level of know-how, which should pertain to an understanding of how to build political will.

Once political will exists, institutional reforms at the global, national and sub-national levels can emerge, and this institutional setup can become operational.

According to Runge et al. (2003), global institutions should be restructured along their horizontal, vertical and psychological dimensions.

The two areas linked to food security where the breadth of international institutions, coordinating with the private sector (horizontal dimension), need to expand are human health and nutrition (e.g., vaccination programmes, anti-infectious diseases efforts) and environmental protection (e.g., soil, water, genetically modified organisms). These areas suggest the need to revitalise the FAO, the WFP, Codex Alimentarius Commission, and the IFAD and to strengthen their interactions with other organisations, such as the WTO and UNCTAD, on specific issues.

The vertical dimension concerns the authority and control that the international institutions and organisations exercise in relation to the national and sub-national governments, i.e., international governance. The locus of responsibility for many, if not most, key decisions affecting food security will clearly remain at the national level.

Finally, the psychological dimension calls for aspirations, expectations, and confidence that the global food system can assure food security and the possibility of reforms: ending hunger in the new millennium is a question of mind over matter, a question of the willingness to commit oneself to a global project of reform and economic growth uninterrupted by the use of food as a political weapon. This capacity is based on five major pillars: the expansion of educational opportunities, increased support for regulatory, environmental, and scientific interventions in food systems, and additional technical support, particularly in trade negotiations.

As far as national and sub-national governance is concerned, certain fundamental standards must be met before any headway can be made against hunger and poverty. Food insecurity largely reflects a failure of governance at the national level. According to Paarlberg (2002), in countries with poor income growth and food insecurity, governments underprovided some of the most basic public goods to all citizens, including those who live in rural areas. For instance, internal peace, the

rule of law and public investment in infrastructure and research are considered essential elements. Donors and international financial institutions should also prioritise this kind of intervention: market-oriented policies are important only if they do not compromise the supply of these public goods.

In this context, NGOs, CSOs and the private sector are the other key stakeholders. They can stimulate local participation and partnership with local governments to develop local strategies to achieve national food security (De Asisn and Jairo 2001).

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Chapter 6
Food Aid and Food Assistance

Abstract This chapter describes the food security features in the humanitarian context focusing on the new way of working requested by the complexity of the current emergency situations and consisting in the passage from food aid to food assistance. To this purpose, the chapter introduces the concept of food aid and its distinguishing features followed by the description of the different typologies of emergency situations and the presentation of the concept of food assistance. Afterwards, the focus shifts on the schemes commonly adopted within the food assistance framework: cash transfers and food-related programmes. At the end of this chapter, the reader will be able to understand the debate on the new way of working, the humanitarian-development nexus, and its implications for policies and practices in the international food aid system.

6.1 Introduction

The dominant humanitarian response to populations affected by shocks that cause emergencies is the provision of food (Maxwell et al. 2008; Barret 2006). However, International Development Goals and the specific features of the current context have caused some to reflect on the role of food aid.

In recent years, we have assisted to the emergence of structural problems in the global economy, to an increase in the number and severity of weather-related disasters and to the persistence of internal conflicts in some countries. These events have contributed to the growth of major humanitarian emergencies that, in turn, have become more complex and articulated (Harvey et al. 2010a). In the meantime, the funds for food aid have decreased (the so-called donor fatigue); food aid today is approximately two-thirds lower than it was 30 years ago; and the use of cash transfers, social protection and safety nets has increased. These circumstances have made the already often unclear borders between different types of food aid even blurrier. Moreover, in-kind food aid has been largely substituted by local and regional procurements.

M. Sassi, *Understanding Food Insecurity*,
https://doi.org/10.1007/978-3-319-70362-6_6

This change in approach and programme tools in response to a changing context resulted in a shift from food aid to food assistance (World Food Programme 2012). However, the concept of food assistance still lacks a clear definition.

An increasing number of donors and aid agencies use the term food assistance as an alternative to food aid in order to incorporate a wider range of tools for use in an emergency context (besides simply direct in-kind food provision). They consist of a set of measures that vary considerably according to the stakeholders; they might include different combinations of interventions such as cash transfers, food-related programmes, agricultural and livestock support, food subsidies and fee waivers.

The debate surrounding food assistance is not only focused on the type of instruments to be included in the toolbox. The more protracted nature of some internal conflicts and the recurrent crisis have fuelled the question between policymakers and aid actors regarding how to link short-term life-saving interventions and long-term attempts to reduce chronic poverty and food insecurity or vulnerability (Mosel and Levine 2014; Alinovi et al. 2008). Food security is one of the main fields concerned by the transition from humanitarian aid to long-term development within a linked relief, rehabilitation and development approach, today called humanitarian-development nexus (http://www.fao.org/3/a-ae504e.pdf; http://www.unocha.org/story/new-way-working).

This chapter does not enter into an analysis of the ambiguity of the food assistance concept nor attempt to determine how to link emergency food aid and development. Instead, it aims to provide useful instruments for understanding this debate and its implications for policies and practices in the international food aid system.

To this end, Sect. 6.2 clarifies food aid terminology, followed, in Sect. 6.3, by a description of the specific emergency situations to be addressed. Section 6.4 introduces some of the definitions of food assistance and considers the specific features of safety net programmes. The remaining two paragraphs present the schemes commonly adopted within the food assistance framework. More precisely, Sect. 6.5 focuses on cash transfers and Sect. 6.6 on food-related programmes.

6.2 Food Aid

Food aid consists of an external food transfer, free of charge or under highly concessional terms, by one country directly to the beneficiaries in another country or indirectly to these beneficiaries through the government to assist the recipient country in meeting its food needs (FAO—Commodity Trade Division 2002; FAO 1999).

This definition highlights the three distinguishing characters of food aid:

- International sources, which differentiate food aid from food transfers financed by local governments and make it an entry into the balance of payment;
- Concessional terms of the resources transferred (i.e., conditions of price, sale or payment more favourable than those achievable in the open market), which differentiate food aid from commercial international trade; and
- A form of food, which differentiates food aid from non-food aid, such as financial or technical assistance (Barrett and Maxwell 2005).

Food aid can be classified according to two criteria: distribution channels and the use of food aid.

Food aid distribution channels are governments, international organisations and NGOs. On the one hand, when food aid is granted and distributed on a government-to-government basis, it is called bilateral; on the other hand, if distributed by an international organisation or through NGOs, it is multilateral.

Food aid can be sourced through

- Direct transfers, when food aid donations originate in the donor country;
- Triangular transactions, when food aid is purchased in a country other than the donor country and is used as food aid in another country;
- Local purchases, when food is procured in the recipient country.
- Depending on its use, food aid is grouped into the following three categories:
- Programme or non-project food aid;
- Project food aid; and
- Emergency (i.e., relief or humanitarian) food aid (World Food Programme 2005).

Sometimes programme and project food aid are called development or non-emergency food aid.

The flexibility and complexity of these types and their interpretation by analysts and agencies mean that the classification of food aid is not always clear. However, some basic components can be underlined.

Programme food aid is sold at concessional prices or is donated. In the former case, it represents a form of foreign aid, which is provided on a government-to-government basis both as loans or grants with money borrowed at lower-than-market interest rates. Its management and use are subject to some form of agreed-upon policy conditionality with the donor. Recipient countries typically use the transferred money to purchase food.

Programme food aid is also a form of in-kind aid. In fact, food is grown in the donor country for distribution or sale abroad. The food received is typically monetised, and it is destined for sale on the local market; in this case, the recipient government controls proceeds according to the agreement with the donor (FAO 2001). When proceeds from the sale are employed to develop food security or food buffer stocks, food aid reduces the risk linked to temporary food shortages; therefore, it is a key instrument for prevention.

According to the FAO (1999), programme food aid plays an important role in

- Supporting balance of payments by substituting for commercial food imports that, in the absence of the programme, would have to be undertaken;
- Sustaining the government's budget to the extent that the sales revenues from monetisation are used for purposes that would have otherwise been financed by public resources;
- Stabilising food supplies in a context where food production and supply are subject to high fluctuations.

Project food aid is provided on a grant basis to the recipient government, its agents, a multilateral development agency or NGOs operating in the recipient country. Such aid supports specific beneficiary groups to improve their nutritional status or particular development activities (Barrett and Maxwell 2005), such as the promotion of agricultural or economic development, better nutrition and food security. Examples of project food aid are food-for-work and school feeding programmes and maternal and nutrition centres. Often, the food received is monetised, and proceeds are used to support related programmes, which makes differentiating project food aid from programme food aid increasingly difficult.

Emergency food aid is targeted and freely distributed in the short term to people who are not able to meet their food requirements because of an acute shock or emergencies and when the local capacities to cope with these issues are limited. Often programme food aid and project food aid are used during emergencies, making the distinction between these types of food aid unclear. However, emergency food aid remains and will continue to be the most common form of humanitarian response (World Bank 2016).

6.3 The Concept of Emergency

Humanitarian food aid is strongly linked to emergencies. This concept varies according to the donors, aid agencies, and academics involved, resulting in a conceptual challenge with significant implications for food security policy and programming; different definitions require different interventions.

The most widely accepted definition of an emergency requiring food aid responses is provided by the WFP (2005): emergencies are "urgent situations in which there is clear evidence that an event or series of events has occurred, which causes human suffering or imminently threatens human lives or livelihoods and which the government concerned has not the means to remedy, and it is a demonstrably abnormal event or series of events which produces dislocation in the life of a community on an exceptional scale".

According to this interpretation, food emergencies include sudden natural disasters due to climatic or other environmental conditions; armed conflict, war, political upheaval, or economic crisis; disease; and extreme poverty and population

displacement, all of which have severe consequences for food access or availability conditions.

In recent years, humanitarian crises are often exacerbated by natural disasters that generate complex emergencies. Large quantities of emergency food aid are delivered in such situations.

A complex emergency is "a humanitarian crisis in a country, region or society where there is a total or considerable breakdown of authority resulting from internal or external conflict and which requires an international response that goes beyond the mandate or capacity of any single agency and/or ongoing UN country programme" (UNHCR 2001).

The current context is also characterised by the protracted nature of crises in several countries; in these situations, food insecurity is the major manifestation. Protracted crises are "those environments in which a significant proportion of the population is acutely vulnerable to death, disease and disruption of livelihoods over a prolonged period of time. The governance of these environments is usually very weak, with the state having a limited capacity to respond to, and mitigate the threats to the population, or provide adequate levels of protection" (Harmer and Macrae 2004).

The second part of the definition of a protracted crisis partly overlaps with that of fragile states characterised by a "lack of political commitment and insufficient capacity to provide basic services to poor people" (http://stats.oecd.org/glossary/).

The different nature of the described crisis suggests the need for different interventions by the international community. A complex emergency brings humanitarian issues to the forefront and requires a greater emphasis on emergency food responses. In a fragile state, the developmental aspects related to the capacity of the government to deliver services to its citizens are prioritised. The protracted crisis requires the right balance of relief, rehabilitation and development interventions.

6.4 Food Assistance and Safety Nets

As previously underlined, there is no agreement on a single definition of food assistance. Box 6.A provides a selection of these definitions. For one, the FAO considers the local governments in collaboration with NGOs and members of civil society to be the most important providers of food assistance. External aid is recommended only when necessary. Concerning instruments, the FAO's definition of food assistance includes all actions indispensable to improve the nutritional well-being of people without adequate access to food.

The other two notions of food assistance indicated in Box 6.A are of a technical nature, and they are used according to the operational purposes of the specific aid agency. In this respect, the different set of tools adopted evidently also reflects the specific capacity and mandate of the agencies.

Box 6.A—Examples of food assistance definitions

"Food assistance is all actions that national governments, often in collaboration with non-governmental organisations and members of civil society, and with external aid when necessary, undertake to improve the nutritional well-being of their citizens, who otherwise would not have access to adequate food for healthy and active life".

FAO (1996b)

"Food assistance refers to the set of instruments used to address the food needs of vulnerable people. The instruments generally include in-kind food aid, vouchers and cash transfers".

World Food Programme (2009)

"Humanitarian food assistance aims to ensure the consumption of sufficient, safe and nutritious food in anticipation of, during, and in the aftermath of a humanitarian crisis, when food consumption would otherwise be insufficient or inadequate to avert excessive mortality, emergency rates of acute malnutrition, or detrimental coping mechanisms. This includes ensuring food availability, access to nutritious food, proper nutrition awareness, and appropriate feeding practices. Food assistance may involve the direct provision of food, but may utilise a wider range of tools, including the transfer or provision of relevant services, inputs or commodities, cash or vouchers, skills or knowledge".

European Commission (2010)

Broadly speaking, the more recently elaborated definitions of food assistance recognise the importance of safety nets programmes. Therefore, safety net programmes are not only integrated systems of institutionalised national measures aimed at reducing poverty through the redistribution of wealth or protecting households or individuals against income shocks; they are also programmes directly implemented by international agencies and NGOs in a humanitarian context to fight transitory (including food emergencies) and chronic hunger (World Food Programme 2004).

Based on the evidence reached by new theories of the social costs of uninsured risks and unmitigated inequalities, safety nets programmes, as well as the wider category of social protection measures of which they are one component, are regarded as key elements of effective long-term poverty and hunger reduction strategies (for a literature review, see, for example, Ravallion 2003). In other words, theoretical and empirical works suggest that these interventions can effectively compensate for market failures (i.e., when a market economy fails to allocate resources efficiently) that contribute to the perpetuation of poverty and hunger, particularly in a context characterised by high inequalities. Growth takes time to manifest itself and its effects may be unevenly distributed (World Food Programme 2004). Thus, economic growth strategies should be combined with social protection measures, such as safety nets (Holtzman et al. 2003), which protect entitlements

and, in turn, are important instruments for linking relief, rehabilitation and development, strengthening the humanitarian-development nexus.

The World Bank (2001) considers four specific cases in which safety nets play a particular role.

In economic crisis and natural disaster settings, such programmes must be able to respond in a timely and flexible way to the changing needs of individuals and households facing shocks without relying extensively on administrative discretion, which tends to cut public spending in the social service sector in these situations. Especially in a humanitarian emergency, when many people are unable to maintain a balance between food requirements and their actual food intake, food safety nets remain a key response (World Food Programme 2006).

In very low-income countries—where the severity of poverty is high, the number of poor people is high, income and access to basic needs are well below an acceptable minimum, and the public budget is scant—the size of safety nets should be chosen carefully and be functional to the long-term objectives of human, physical and social capital formation.

In a post-conflict context safety net programmes should be selected to help, alongside other actions and approaches, societies rebuild and prevent future conflicts.

Finally, in transition economies, the key issue for such schemes is how to maintain an adequate mix of appropriate assistance for the poor and vulnerable while adhering to tighter budget constraints and changing government and institutional structures.

Safety nets can be both informal and formal. Informal safety nets are private arrangements that protect household income. Formal safety nets are designed to provide or substitute for income, and they include measures aimed at transferring income to those in need, such as cash transfers, food-related programmes, prices and other subsidies, public works, microfinance and other credit mechanisms. These instruments ensure that people have access to essential public goods such as user fees.

As previously highlighted, cash transfers and food-related programmes are the most adopted food assistance tools.

The introduction of safety nets programmes in the humanitarian toolbox has benefited from changes in technology, the growing possibility of accessing financial services, and the emergence of governmental social safety nets (ODI 2015). For example, during the 2011 famine in Somalia, aid agencies used the extensive network of money transfer agents operating in the country, the hawala, to provide cash instead of in-kind aid. In Lebanon, refugees use smart card vouchers and automated teller machine (ATM) cards to withdraw money to purchase goods on local markets. In the Philippines, cash was transferred to people affected by Typhoon Haiyan in 2013 through an extension of an already existing social protection programme.

6.5 Cash Transfers

Cash transfers were first introduced as a substitute for food aid in response to the 2004 tsunami in the Indian Ocean (Bailey 2013). According to European Civil Protection and Humanitarian Aid Operations (ECHO), these transfer consist of "the provision of money to individuals or households, either as emergency relief intended to meet their basic needs for food and non-food items, or services, or to buy assets essential for the recovery of their livelihoods" (European Commission 2013). In other words, cash transfers increase the purchasing power of disaster-affected people.

With cash transfers, beneficiaries have the freedom to choose how to use the cash received to enhance their welfare. Therefore, the humanitarian system is better aligned with people's needs and uses a fast, efficient, and largely secure tool (http://www1.wfp.org/cash-based-transfers). The literature suggests that the nutritional status of the beneficiaries of cash transfers normally improves due to their ability to purchase locally rooted and seasonally appropriate food. This tool also has the potential to stimulate production and consumption and, in turn, to strengthen the local markets.

Cash transfers can be unconditional or conditional programmes. When they are unconditional, the beneficiaries receive the transfer without doing a specific activity, and no restriction is placed on their expenditures. In the case of conditional cash transfers, money is provided to beneficiaries conditional on socially desirable outcomes, such as improving school attendance and health care services. In this way, the partnership with governments is reinforced. Cash-for-work programmes are an example of conditional cash transfer programmes. They provide short-term employment in public projects (such as rehabilitating irrigation canals, clearing nurseries or rebuilding infrastructure) to the beneficiaries who receive a wage as a form of payment (Mercycorps 2007). Another example is cash-for-training programmes, particularly vocational training programmes aimed at developing the technical capacities and skills of beneficiaries.

Cash can be transferred through several context-specific mechanisms, for instance, directly through cash-in-hand or cash in envelopes or indirectly through traders, money transfer agents, bank or microfinance institute accounts, mobile banking systems, smart cards, cheques, and mobile money transfers (Harvey et al. 2010b).

Cash transfers are not appropriate for all situations. In particular, local economies and markets may be able to react to the increased demand for a variety of commodities and services consequent to cash distribution, which is why this tool is not adopted in the early stages of sudden onset emergencies. However, protracted crises and the transition towards recovery and development create opportunities for cash transfers. For example, as illustrated by Sassi (2015), the most important elements that make the Somali environment particularly conducive to cash programming are the ability of markets to operate in an extremely insecure context, the presence of hawala, who have substantial experience in international money

transfers from managing a considerable amount of remittances from the diaspora, and the informal credit culture deeply ingrained in the population. In addition, food insecurity is rarely the result of a failure of the market system; it is the result of livelihood failure, especially loss of income, following a drought (Dunn et al. 2013).

6.6 Food-Related Programmes

Food-based safety net programmes provide food, either directly or through cash-like instruments, which can be used to purchase food to support adequate consumption and to assure livelihoods (i.e., through the provision food through employment in public works), increase purchasing power (i.e., by distributing food stamps, coupons, or vouchers), and relive deprivation (i.e., by means of food supply to households or individuals). They increase the household's real income or help strengthen its purchasing power (Lorge and Coates 2002). In fact, the income saved by consumption can be allocated to other uses.

The following are the most common types of food-based transfers:

- Supplementary feeding programmes;
- Food-for-work programmes;
- Food stamp programmes; and
- Consumer food price subsidies.

Supplementary feeding programmes provide a direct transfer of food to the target households or to individuals who have special nutritional requirements to supplement energy and other nutrients missing from their diet (Gillespie 1999). These programmes primarily target children under 5 years old, but they are also extended to the pregnant and lactating women. Supplementary feeding programmes include the following:

- School feeding, this is the provision of a meal or snack to children at school or as "dry ration" to take home. The programme can encourage participation in education and enhance the attention and learning capacity of children affected by short-term hunger during the day (FAO 1996a; World Bank 2001);
- Rehabilitation (or therapeutic) feeding of the severely malnourished, especially children;
- Supplementary feeding of pregnant or post-partum women and infant children, usually in conjunction with the provision of health services aimed at incentivising their participation in those public services.

Supplementary feeding programmes can be targeted or blanket (Navarro-Colorado et al. 2008). They are targeted to prevent those already moderately malnourished from becoming severely malnourished. The blanket type of these programmes provides a supplementary food ration for everyone in a demographic

group, for example, pregnant women or elderly people, irrespective of whether they are malnourished.

Food-for-work programmes are special types of public works schemes. They provide food rations in exchange for a given amount of work done. They directly address the problem of undernutrition by raising the calorie intake. Food-for-work schemes have three dimensions: food security, employment creation and development. However, the employability component of this tool implies that the beneficiaries can only be households with able-bodied members (Lorge and Coates 2002).

According to the rationale of safety nets programmes, food-for-work programmes act as income-generating activities. However, they have long been used as crisis safety net programmes, particularly during seasonal unemployment or climate-induced famine, as a sort of employment of last resort: they protect households when other sources of employment fail (FAO 1996a). In addition, food-for-work schemes have a development component when there is also a programme of infrastructure building. In this case, these programmes can contribute to food security in both the short and the long term.

A very common phenomenon connected to food-for-work programmes is the informal monetisation of the food received, which consists of selling part of the food received to generate some cash income to be used for other purposes. The negative implication of monetisation could be the downward pressure on local food prices with a loss of real income for local producers because of an artificial increase in the food supply in local markets. This problem can possibly be overcome by paying a wage part in kind and part in cash.

Food stamp programmes are a method of targeting subsidies by providing stamps, vouchers or coupons, denominated in value or quantity terms, to target people. The beneficiaries can use them for to purchase any or a few specific food items or to receive a discounted price (Lorge and Coates 2002). This use gives the food stamps a "near-money property" (FAO 1996a). For this reason, they are also called near-cash transfers.

Two types of vouchers are widely adopted in emergency situations: value-based and quantity-based vouchers (World Bank 2016). The former type limits the choice of food items to those available in the chosen shop, as in the case of cash transfers. By contrast, quantity-based vouchers refer to a pre-defined basket of food items and work as a decentralised system of local in-kind procurement. Therefore, vouchers display characteristics of both cash and in-kind transfers.

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