Chapter 1

Food insecurity: Concepts, measurement and causes

This chapter reviews the concept and definition of food insecurity, its various dimensions and how it has been measured in different contexts.

1.1 Introduction

The challenge of eliminating hunger and malnutrition has received increased global attention since the food price spikes and volatility of 2008. Meeting that challenge and overcoming hunger and malnutrition in the longer term is more about raising incomes of the poor than about food price fluctuations or other specific sources of risk (OECD, 2013a). At the same time, unpredictable events such as those of 2008 can in the shorter term have dire consequences for the food security of large numbers of people who are not perceived as trapped in chronic undernourishment.

Many of the recent concerns about food security relate in fact to perceived threats to current levels of food security, due for instance price shocks and natural disasters. These threats focus on the stability dimension of food security, so-called transitory food insecurity. This publication explores effective policy responses to this risk environment as part of a broader policy strategy designed to improve availability, access and utilisation of food. A case study on Indonesia highlights the issues involved.

The report is organised as follows. This chapter reviews the concept and definition of food insecurity, its various dimensions and how it has been measured in different contexts. Chapter 2 presents an analytical framework intended as a tool for designing policies to deal with the risks of transitory food insecurity. The point of departure for this framework is the key idea that risk is a defining characteristic of transitory food insecurity; hence, an evaluation of the risks of different types of food insecurity must precede the analysis of the performance of different policy instruments in dealing with it. Guidelines for the application of this analytical framework in three stylised steps are also presented. The underlying formal risk model is set out in Annex 2A.

Chapter 3 covers the implementation of the first step (*preparatory analysis*) in the Indonesian context. This step involves identifying the available data bases and modelling tools needed to analyse the relevant policy options. The current food security situation in Indonesia is described, drawing on the available data sources. Two annexes follow this section. Annex 3A gives details of a LA-AIDS household demand system estimated for Indonesia for this study, while Annex 3B outlines an existing general equilibrium model INDONESIA-E3. Both models are used in the policy impact analysis.

Chapter 3 also reports on the second step (*risk assessment*) that was undertaken by means of a consultation process among experts and stakeholders, together with a review of available scientific and statistical evidence. The main threats to food security stability are identified and are then summarised in the form of five stylised scenarios. Annex 3.C presents some additional scenarios that were identified by experts but not retained right through to the final policy dialogue stage of the analysis. The results of the policy analysis are also presented in this chapter; it examines and compares the simulated impacts of Indonesia's main agricultural and food policy instruments, plus several hypothetical instruments not currently in use, in both the reference scenario (absence of a transitory shock to food security) and in the five scenarios involving a specific food security shock.

Chapter 4 draws on this analysis to evaluate the performance of the current portfolio of policy instruments for dealing with transitory food insecurity, and makes a number of policy recommendations.

1.2 A global concern

The recent instability of international food prices and supplies has increased global awareness about hunger, and governments and political leaders have expressed their concerns about global food security and the risks of food insecurity (Box 1.1). Food security is the core focus of international organisations such as the Food and Agriculture Organisation (FAO) and the World Food Programme. According to a recent United Nations report, the world as a whole is on target to achieve the first Millennium Development Goal target of halving the proportion of the world population suffering from hunger, but still immediate additional efforts are required, especially in countries which have made little headway (UN Millennium Development Goals Report, 2014).

Box 1.1. Increasing global awareness of food security and the management of its associated risks

At the OECD Ministers meeting in Paris in February 2010, priority was given to "an integrated approach to food security... involving a mix of domestic production, international trade, stocks, safety nets for the poor and other measures". This integrated approach seeks to avoid situations of food insecurity caused by a variety of circumstances.

The world commodity price spikes of 2008 and 2011 raised international interest in price volatility and its impact on food security. At the G20 summit in November 2010, leaders requested FAO, IFAD, IMF, OECD, UNCTAD, WFP, the World Bank and WTO (and later IFPRI and UN HLTF), "to develop options… on how to better mitigate and manage the risks associated with the price volatility of food… to protect the most vulnerable". The resulting report, *Price Volatility and Agricultural Markets: Policy Responses,* was co-ordinated by FAO and OECD and was a main input to G20 discussions in June 2011. A portfolio of possible instruments to manage diverse price and production risks, including different types of insurance, future contracts, options and co-operative solutions were outlined. Several ideas from this report were reflected in the June 2011 Ministerial declaration "Action Plan on Food Price Volatility and Agriculture".

The Action Plan recognises that "managing the risk... in developed and developing countries would provide an important contribution to... strengthen food security". An important outcome was the creation of the Agricultural Market Information System (AMIS), an initiative designed to enhance food market transparency and foster co-ordination of policy action when responding to international price volatility.

The Action Plan also argues for including risk management when developing policies, and for developing an "Agriculture and Food Security Risk Management Toolbox" for vulnerable countries, firms and farms. Annex 5 of the Action Plan expands on the idea of this toolbox, focusing on the need to integrate risk assessment into agricultural development programmes and on "government level risk" tools such as the New Price Risk Management (APRM) product of the IFC, counter-cyclical instruments for vulnerable countries, and hedging strategies for humanitarian agencies and the WFP. A risk management toolbox is proposed to address food security concerns including instruments for farmers, such as insurance, and for governments. It also highlights the importance of risk assessment for development and food security policies.

Two follow-up reports on risk management were issued for the September 2011 financial/development G20 ministerial: a progress report on the risk management advisory mechanism and a report on the state of play of multilateral and regional development banks (MDB, 2011). The latter report focused on "government-level risk management solutions" and followed "a holistic approach to risk management". It reported on a list of financial instruments provided by the MDB to help government manage risks, such as on currency exchange rate, commodity prices, and catastrophes.

The June 2012 Los Cabos declaration of G20 leaders, under the heading of enhancing food security, endorsed the initiative to create the Platform for Agricultural Risk Management (PARM). The G20 development group meeting in February 2013 endorsed the conceptual note of PARM drafted in collaboration between several international organisations (including OECD) and development agencies. The approach emphasises risk assessment and a holistic approach. PARM began to operate in 2014, hosted by the International Fund for Agriculture Development (IFAD) in Rome.

Eliminating hunger and malnutrition is one of the most intractable problems humanity faces. OECD (2013a) distilled from previous work the main priorities for ensuring long-term global food security and concluded that, while price levels matter, they are not the fundamental problem. The persistence of global hunger – the chief manifestation of food insecurity – is a chronic problem that pre-dates the current period of higher food prices. Indeed, there were as many hungry people in the world in the early 2000s, when international food prices were at an all-time low, as there are today.

Global food security is a complex chronic problem. Eliminating global hunger is more about raising the incomes of the poor than an issue of food prices (OECD, 2013a), and this challenge requires a combination of consistent, long-term policies oriented towards economic development and social protection. At the same time, the fears and concerns about increasing food insecurity as a result of price hikes or other shocks are also legitimate, since stability is another important dimension of food security, along with regular availability, access and utilisation. The policy challenge is how to respond to concerns about stability without compromising the long-term improvements in chronic food insecurity.

The experience of the 2008 international price spike has increased policy and public awareness about the potential impacts of these events on food security. In various emerging economies, food security is endorsed as a main objective of agricultural policies. This is particularly true as concerns rice markets and Asian countries. For instance, India, China and Indonesia have developed self-sufficiency policy objectives and some countries, including Indonesia, are expanding the scope of these objectives. Stressing the need to increase domestic production and promote self-sufficiency seems to imply that

trade disruptions are perceived as the main threat to food security. Past experience has shown, however, that such an approach can result in agricultural policies that are dominated by distorting forms of support, including price support, which in turn threaten the food security of poor consumers. These negative consequences are particularly acute when food shortages occur for other reasons, like an economic downturn or a natural disaster.

Food security concerns are also reflected in action by regional organisations but with a different emphasis. The APEC Policy Partnership on Food Security (PPFS), formed in 2011, is a forum for discussing issues related to food security, bringing together individuals from the private and public sectors to help facilitate investment, liberalise trade and market access, and support sustainable development. The first component of the 2008 ASEAN Integrated Food Security (AIFS) Framework is labelled Emergency/Shortage Relief and focuses on stability, including food assistance programmes, diversification and the ASEAN Plus Three (ASEAN+3) Emergency Rice Reserve (APTERR).

This publication focuses on the stability dimension of food security and presents a framework for the rigorous assessment of a whole range of risks threatening food security in a given country. A portfolio of measures to deal with risks should include policies that are effective and efficient across different scenarios of food security threats. In essence, this means managing a whole set of threats in order to stabilise food security whilst at the same time not compromising efforts to improve chronic levels of food insecurity. Having said this, the present contribution does not address the core issue of eliminating structural poverty, and the need to improve economic development and access to health and sanitation. These latter issues are beyond the scope of the work reported here.

1.3 Definition of food security[1]

Amartya Sen, the 1990 Economics Nobel laureate, observed that "for many years, rational discussion of the food problems in the modern world was distracted by undue concentration on the comparative trends of population growth and the expansion of food output" (Drèze and Sen, 1990, p35). This Malthusian pessimism has not been vindicated by history, but it often comes back in public discussions on food security and, at the country level, can lead to policies aiming at self-sufficiency in food production. The broader entitlements approach proposed by Drèze and Sen does not specify a particular cause of famine, just a framework that identifies it as a widespread failure of entitlements for a substantial part of the population. The causes are diverse, including droughts, floods, general inflationary pressure, sharp recessionary loss of employment, war, and can occur even without a decline in food output or availability per head. Food production is not only a source of food supply, but for large sections of the population it is also the main source of livelihood. This explains why sudden falls in food output tend to go hand in hand with a collapse of entitlements.

These ideas were influential in framing the current FAO definition of food security, the main elements of which were formulated during the 1996 World Food Summit:

> *Food security 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. Household food security is the application of this concept at the family level, with individuals within households as the focus of interest. Food insecurity exists when people do not have adequate physical, social or economic access to food as defined above. (*FAO, 2003).

This definition stresses both the *physical availability* of food and the *economic means* to procure it —the entitlement problem (Sen, 1981). Two further dimensions are also implicit in this definition: *utilisation* (appropriate diet and good food practices that maximise the nutritional contribution of food consumed), and *stability* to ensure that the first three conditions (access, entitlement, and utilisation) are met at all times and not merely on a periodic basis.

These four dimensions as defined by FAO (2006)[2] are set out in Table 1.1, which highlights that stability is a cross-cutting dimension of food security and hence requires managing the risk of interruption or deterioration in food availability, access or utilisation.

Table 1.1. The four dimensions of food security in the FAO definition

Food		Stability
Availability	The availability of sufficient quantities of food of appropriate quality, supplied through domestic production or imports (including food aid).	To be food secure, a population, household or individual must have access to adequate food at all times. They should not risk losing access to food as a consequence of sudden shocks (e.g. an economic or climatic crisis) or cyclical events (e.g. seasonal food insecurity). The concept of stability can therefore refer to both the availability and access dimensions of food security.
Access	Access by individuals to adequate resources (entitlements) for acquiring appropriate foods for a nutritious diet. Entitlements are defined as the set of all commodity bundles over which a person can establish command given the legal, political, economic and social arrangements of the community in which they live (including traditional rights such as access to common resources).	
Utilisation	Utilisation of food through adequate diet, clean water, sanitation and health care to reach a state of nutritional well-being where all physiological needs are met. This brings out the importance of non-food inputs in food security.	

Source: Text from FAO (2006), Briefing Note "Food Security". Table adapted by OECD.

There are individuals or households that are chronically food insecure because of a continuously inadequate diet due to their structural inability to acquire food, usually due to poverty. There are other individuals and households that suffer a transitory or temporary decline in their access to adequate food. This temporary or transitory disruption can be due to shocks that affect income, assets or infrastructure and it has been denominated "transitory" food insecurity by the World Bank (1986). The use of this term highlights the different nature of the stability dimension of food security. The risk of transitory lack of access to food is due to potential shocks affecting individuals who normally have adequate access to food. This risk can be managed through appropriate strategies that allow the reduction or mitigation of their effects and their potential long lasting consequences. Long-term exposure to risk can cause households to lapse into chronic food insecurity (e.g. if they are forced to sell their assets).

The response to chronic levels of food insecurity should be medium- to long-term policies generating broad-based income growth with lasting impacts in reducing global hunger. Policies and investments that stimulate income growth are likely to reduce the need for short-term fixes that cope with consequences of low incomes but do not tackle the underlying causes (OECD, 2013a). Improving availability requires investing in productivity growth, innovation and infrastructure. Improving access to food requires social protection systems appropriate to the development stage of each country. Improving diets and utilisation requires education, information, direct nutrition intervention, and better access to health services and sanitation. The main driver of these three dimensions of food security is inclusive and sustainable economic development, supported by innovation, competitiveness and appropriate social policies.

By contrast, transitory disruptions that threaten food security have short- to medium-term emergency and stability dimensions. A country can find itself in an emergency situation due to a specific shock that requires a rapid response: a price spike of a staple food or sudden food inflation, a severe drought that produces crop failure, or an economic slowdown reducing the income of the poor, a local natural disaster like an earthquake that destroys assets and livelihoods. The framework set out in this report is not concerned with the management of disasters and emergencies themselves, but rather with the portfolio of policies that can respond to transitory shocks to food availability and access. Many countries are prone to potential events that could occur at any time and plunge large segments of the population into extreme food insecurity of unspecified duration. This defines the stability dimension of food security that is the focus of this report. Policies in place need to be capable of managing of potential risky scenarios that threaten food security due to various alternative causes, whilst also being compatible with a policy environment that stimulates income growth and that reduces food insecurity across all scenarios including those where there is no particular shock.

1.4 Indicators of food insecurity

Given the multidimensional nature of food security, it is not possible to monitor all four food insecurity dimensions simultaneously with a single indicator (Cafiero, 2013). Therefore, several indicators have been developed to measure different aspects of food insecurity (OECD, 2013a), most of which are based on estimates of the share of the population that is under a given threshold of a relevant variable, such as calorie consumption, food expenditure or anthropometric measures indicating child malnutrition. According to Sibrián (2009), the most appropriate variables to measure food insecurity include dietary energy consumption (i.e. food consumption measured in energy units, e.g. kcal) to measure food deprivation, expenditure or income available to meet dietary energy needs to estimate food poverty, and weight- or height-for-age to quantify child under-nutrition.

Poverty, undernourishment and malnutrition are links in a vicious circle. This is why the first of the Millennium Development Goals (MDGs) is to eradicate extremes of both poverty and hunger. The World Bank (2004) emphasises that poverty is a root cause of hunger. The website of the World Health Organisation (WHO) Global Database on Child Growth and Malnutrition points out that[3] "…malnutrition is frequently part of a vicious circle that includes poverty and disease. These three factors are interlinked in such a way that each contributes to the presence and permanence of the others. Socioeconomic and political changes that improve health and nutrition can break the cycle; as can specific nutrition and health interventions. Malnutrition usually refers to a number of diseases, each with a specific cause related to one or more nutrients, for example protein, iodine, vitamin A or iron. In the present context malnutrition is synonymous with protein-energy malnutrition, which signifies an imbalance between the supply of protein and energy and the body's demand for them to ensure optimal growth and function". The existence of this vicious circle is well known in the literature as is the statistical analysis attempting to quantify the links between poverty and malnutrition (e.g. Gebhart 1920; Radhakrishna et al., 2004). However, these studies also find significant differences between poverty and malnutrition in terms of their prevalence and trends.

The definitive choice of a particular indicator of food insecurity depends on the particular aspect of food insecurity one wishes to examine (Box 1.2). Inevitably, the ability of these indicators to capture transitory shocks to food security depends to a large extent on the availability of the relevant data and the frequency of their measurement.

The FAO undernourishment index, the indicator most commonly used to measure food deprivation, is a macro indicator of the prevalence of undernourishment defined as the share of the population that consumes fewer calories than the minimum daily energy requirement. The WHO publishes an annual index of underweight children under five for a large number of countries. This type of indicator is, however, not sensitive to short-term changes such as sudden increases in food deficiency for those most deprived, and is unable to capture transitory crisis or droughts (Cafiero and Gennari, 2011; Masset, 2011). In general, the indicators of food security that are able to capture transitory shocks must be based on specific national or local surveys with frequently gathered information on the distribution of a relevant variable across individuals. Household level expenditure surveys with a food consumption module and a panel of households that can be followed over time are the most appropriate information source to assess the extent of food insecurity across individuals and how it changes due to different transitory factors. Such surveys typically allow the distribution of expenditure and calorie intake to be analysed across the whole sample, and although they rarely include information on nutritional outcomes such as underweight, they can already provide a very detailed and representative picture of the food security profile of the population. This degree of detail in the distribution is not possible with the FAO method of estimating the number of undernourished persons based on an imposed log-normal distribution. The advantage of this latter method is that it can be applied to countries that do not conduct a household consumption survey. However, the two methods are likely to produce different absolute numbers of undernourished persons. To avoid a futile debate about the absolute numbers and focus the discussion on the variability, the undernourishment threshold can be

calibrated and applied to the survey distribution to replicate the official rate of undernourishment estimated by FAO.[4]

The use of food insecurity indicators to measure "transitory" food insecurity is also challenging. At the individual or household level, the identification of chronic or transitory undernourished can only be done using panel data. Chronically food-insecure individuals or households are those that are below the threshold of a given indicator for several years in a row. Normally only a few years of panel data are available and this limits the time horizon for "chronic" food insecurity can be measured at household level. Transitory undernourished households or individuals in a given year are those that are below the threshold in that year, but above in other years in the sample.

Box 1.2. Main indicators of food insecurity

There are three types of indicator that are most commonly used to monitor food insecurity: child malnutrition, prevalence of undernourishment and food poverty. Prevalence of undernourishment, as measured by the FAO, is estimated as the proportion of people in a given population who do not consume enough food to meet their daily energy requirement to live a healthy and active life. The measurement method is set within a probability distribution framework. FAO assumes that food consumption expressed in kcal per capita per day is log-normally distributed. The parameters of the log normal energy consumption distributions are calibrated in each country from available data, most often food balance sheets for the average energy availability and household surveys for the variance. The percentage of undernourished population (also referred to as the chronically hungry) is measured as the area under food consumption distribution curve below the minimum requirement cut-off point measured in kcal/person/day, which is specific for each country. The FAO uses a related indicator to monitor the Millennium Development Goal of halving the number of undernourished. Another related Food Security Indicator in the FAO statistics is the depth of food deficit, which measures (in kcal) the gap between the average dietary energy consumption of the undernourished population (food-deprived) and the average dietary energy requirement, scaled up to the population as a whole by the total number of food-deprived persons. This indicator captures both the availability and access dimensions of food insecurity. Other similar indicators can be developed focused on a minimum intake of different nutrients (e.g. proteins) rather than energy (see NutVal.net, an initiative from the World Food Programme WFP and the UN Refugee Agency UNHCR).

Food poverty is defined as the proportion of the population living on less than the cost of their dietary energy needs. The cost of the dietary energy needs — the food poverty line — is estimated based on the assumption of the energy requirement for a healthy life of a representative individual in a given population (usually 2 100 calories per capita per day) and the cost of a food basket required to meet that energy requirement, taking into account the need for a properly balanced diet and the food habits of a given population. The share of the population whose expenditures (or income) fall under the food poverty line is considered food poor. This indicator captures the access dimension of food insecurity.

Child malnutrition is typically assessed through anthropometric indicators, which are related to body size and composition. Each indicator is compared to a reference population to establish whether a child is malnourished or not. There are three types of indicator: weight-for-age to measure underweight, height-for-age to measure stunting and weight-for-height to measure wasting. A child is considered malnourished, or more specifically under-nourished, if any of these indexes is lower than the threshold level established based on the values of these indicators in the reference population. The WHO's index of the prevalence of underweight is estimated as the proportion of children aged 0-5 years whose weight-for-age falls more than two standard deviations below the median of the reference population. Given their focus on nutritional status, the child malnutrition indicator measures the consequences of food insecurity regardless of the underlying reason for food insecurity: availability, access and (or) utilisation. The FAO publishes related indicators it its Food Security Indicators database under the "utilisation" heading.

IFPRI has developed a Global Hunger Index (GHI) that combines with equal weights *undernourishment, child underweight* and *child mortality*.

Source: Cafiero (2013), FAO (2008), Ravallion and Bidani (1994), Sibrián (2009), Setboonsarng (2005), IFPRI (2013) and OECD (2013a).

1.5 Stability of food security at household and government levels

The FAO definition of food security covers two levels of governance of food security: a household level and a government level. At the household level, members of the household must have access at all times to sufficient, safe and nutritious food. Various events, from unemployment to price spikes, can put at risk the availability, access and utilisation of food at this micro level. Among (farm) households, net sellers and net buyers of food face different risks. Risk management strategies can help both farm and non-farm households to manage their risks (OECD, 2013b).

Household risks are mainly related to potential shocks in purchasing power and income, including shocks in production for farm households. These shocks are managed at the level of individual households where income and assets can typically be pooled, and it is thus only at this level that an appropriate assessment of risks be made. Income diversification and market risk management tools are potential options that can be used by households. The work reported in OECD (2013b) analyses these aspects for farm households, but additional issues related to food consumers in rural or urban areas are raised for non-farm households (see Table 1.2. below). Following the OECD agricultural risk management framework (OECD, 2009; OECD, 2011), it is the responsibility of the household to manage its risks, including food insecurity risk using household, community (Townsend, 2013) or market instruments. However, it is beyond the capacity of households to cope with catastrophic events (rare, damaging and systemic); here, government has the responsibility of ensuring that they do not generate high food insecurity, and of facilitating households' access to efficient risk management tools.

At government level, policies are implemented to improve both the "chronic" level of food insecurity and the stability of food security in the face of typical risks. Most societies demand an acceptable level of food security that they can afford, and the stability objective requires managing different threats to this minimum acceptable level. The set of policies must be able to respond to risk from different sources, from high world market price volatility to domestic crop failure. In short, risk assessment and management at the household level is crucial, but a stable aggregate food security environment is also needed, and there are also important interactions between aggregate and individual vulnerability of rural and urban households that policy makers need to consider. In the current climate of heightened awareness of food insecurity risk, some countries may need to consider enhancing the linkage between risk assessment and management at household level and government policy at the macro level.

The stability dimension of food security at the government level implies managing risks of transitory increases in the total number of undernourished. This is the main focus of the framework for the analysis of transitory food insecurity presented in this study. Taking food availability as an example, risk comes from a shortfall in food supply due, for instance, to a significant crop failure. Government policies need to be able to manage, in a coordinated way, food supplies coming from production, imports and stocks so that the whole set of trade and agricultural policies play a role in responding to availability risks. As for access, it is the role of the government to enhance households' access to efficient risk management strategies, whether through economic diversification or the use of community or market insurance or, in the most extreme cases, public safety nets that can be scaled up in the case of a crisis. Finally, as for utilisation, direct nutritional intervention may be needed.

Risk management techniques and strategies are appropriate tools for analysing and managing situations of perceived risks or threats to stability of availability, access and utilisation of food, and they can also contribute to development and income growth objectives. The first step in analysing the management of risks threatening food security at government level is a rigorous assessment of food insecurity risks facing the country. Sources of risk need to be identified and analysed, and probabilities and correlations need to be assessed. A portfolio analysis will typically require a diversified set of policies that can respond to a variety of events or scenarios. However, consistent policy design requires the impact of each policy across *all* risk scenarios be examined, including its impact on the level of chronic food insecurity and poverty. A typical example of an inconsistency to be avoided is a tariff on a staple food that is supposed to increase self-sufficiency and reduce the perceived food security risk from trade, but which also permanently increases the cost of food for the poorest consumers.

Food insecurity is perceived as a major risk in many countries, and some OECD countries argue that food security objectives motivate their policies.[5] The perception of food insecurity is usually the result of a general fear of potentially devastating and catastrophic effects that such insecurity could have in the country concerned or on a global scale. Elsewhere, it is likely that food security will remain a major priority for many governments when designing or reforming their agricultural policies, particularly in emerging economies in Asia that have increasing resources to spend on their relatively shrinking agricultural sectors.

Table 1.2. The stability dimension of food security at household and government

Examples of main risks[1] and potential strategies

		Farm households: Producers	Non-farm households: Consumers	Aggregate or national
Stability of AVAILABILITY	*Threat:*	*Insufficient farm production*	*Lack of food in the markets*	*Insufficient production + imports + stocks*
	Potential strategy:	Improved techniques, diversification, risk management	Storage, food aid	Trade and agricultural policies
Stability of ACCESS	*Threat:*	*Low food prices or insufficient income*	*High food prices or low income (e.g. unemployment)*	*Lack of entitlements for a section of population*
	Potential strategy:	Income diversification, market risk management tools, cash transfer, food aid	Income diversification, market risk management tools, cash transfer, food aid	Enhanced risk management tools and safety nets
Stability of UTILISATION	*Threat:*		*Lack of food safety / unhealthy diets* *Lack of access to potable water*	
	Potential strategy:		Schooling, education, investment Direct nutrition interventions	

1. The risks in this table do not refer to trends, structural issues or threats to these trends and structural features.

It is rare, however, that a government's pursuit of food security objectives is based on a rigorous assessment of the likelihood and circumstances of food insecurity threats. The risk of food insecurity typically remains undefined or loosely defined. There are nevertheless some countries, such as the United Kingdom, that have engaged in a systematic assessment of threats to its food security.[6] Risk assessment at this aggregate level needs to involve not only experts, but also government and stakeholders. Their perceptions are the main drivers of policy choices and need to be surveyed and contrasted with the available evidence, as well as the views of the experts. This participatory approach facilitates the evaluation of such risks, underpins the communication of their likelihood and potential damage, and enhances the understanding of the set of measures and strategies to manage the risks of food security. Effective risk assessment cannot be done from an external, distant perspective, but requires the collaboration of those directly affected by food security threats. A crucial step in the framework proposed here consists in identifying scenarios or events that represent a threat to food security or a food insecurity risk, and to assess the likelihood and impact of each scenario. Table 1.3 provides examples of the wide range of threats, including macroeconomic risks that are not discussed here but should be considered in a full risk assessment process. Some of those risks include conflict and war, which are hard to predict, as well as being very difficult to prevent or cope with, and hence particularly difficult to include in this analytical framework.

Each threat can be represented by a stylised scenario that describes a real food insecurity risk that can be documented with rigorous scientific information concerning its likelihood and eventual impact. Each scenario needs to be understood as a category of events rather than a single event, covering a range of similar threats. It is a simplified representation of perceived risks with the purpose of facilitating assessment and a rigorous dialogue about best policy responses.

Once risks have been fully assessed, the policy analysis can identify possible policy responses and their impact in different risk scenarios. The analysis of household data is very useful for quantifying the impact of different scenarios and policy responses on household food insecurity.

Table 1.3. Examples of threats to food security

	Political	Technical	Demographic/ economic	Environmental
Availability	Wars, export restrictions, embargoes, breakdown of international trade	Inappropriate farming practices	Population growth, increased demand, high world prices, difficulties in the balance of payments	Floods, droughts, plant and animal diseases (increased by climate change?)
Access	Civil conflicts, government restrictions	Lack of transport	Economic downturn, unemployment, food inflation	Extreme weather events
Utilisation	Regulatory failures	Contamination	Longer supply chain	Pest and diseases

Source: Adapted from DEFRA (2010).