Monitoring Food Security

Technical Guidance Sheet 2

Indicators Compendium

September 2012







Monitoring Food Security,

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Monitoring Food Security Technical Guidance Sheet 2: Indicators Compendium provides guidance for technical staff on the analysis of primary and secondary data for key indicators used in Food Security Monitoring System (FSMS).

This guidance sheet was prepared by Wanja Kaaria, Vagn Mikkelsen, Rama Mwanundu and Francesco Slaviero. Ceren Gurkan contributed to the sections on market related issues, in particular to the section on the Terms of Trade.

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Contents

Ac	Acknowledgements			
Ac	rony	/ms	2	
Introduction			3	
1.	Ris	k Analysis and Early Warning Indicators	8	
	1.1.	Environmental Conditions	9	
		1.1.1. Drought/Short-term dryness	9	
		1.1.2. Seasonal Forecasts	10	
		1.1.3. El Niño/La Niña	11	
		1.1.4. Flooding	11	
	1.2.	Economic Conditions	12	
	1.3.	Governance	12	
		1.3.1. Covernment policies and actions	12	
		1.3.2. Connets	13	
2.	Foo	d Security Indicators	14	
	2.1.	Food Availability Indicators	14	
		2.1.1. Food production	14	
		2.1.2. Wholesale prices	17	
		2.1.3. Interpretation of production estimates and wholesale prices	17	
	2.2.	Food Access Indicators	18	
		2.2.1. Food consumption	18	
		2.2.2. Coping strategies	23	
		2.2.3. Terms of trade (ToT)	26	
		2.2.4. Price analysis	30	
		2.2.5. Market conditions	30	
		2.2.7. Expenditure analysis	41	
	9 9	Food Utilization Indicators	40	
		2.2.1 Mid-upper arm circumference (MIJAC)	49	
		2.3.2. Body mass index (BMI)	49	
		2.3.3. Disease prevalence	53	
	2.4.	Use of Secondary Information	55	
3.	Foo	d Security Trends Analysis	56	
Ar	nnex	Examples of Terms of Trade calculations	57	

List of Tables

Table 1	FSMS Main Features in Food Security Monitoring	6
Table 2	FSMS Early Warning Issues	7
Table 3	FSMS Core Indicators	7
Table 4	Risk Analysis and Early Warning Parameters	8
Table 5	Example of Balance Grain Supply / Demand	15
Table 6	Presentation of Production Estimates	16
Table 7	Food Consumption Score Module	19
Table 8	Food Groups Weights	20
Table 9	FCS, Food Groups and Weighting	21
Table 10	Household Food Consumption Thresholds	22
Table 11	Reduced Coping Strategy Index (CSI) Module	24
Table 12	Reduced CSI Template completed	25
Table 13	Market Prices and Food Security	32
Table 14	Price Data Needs and Sources	36
Table 15	Indicators of market conditions	37
Table 16	Module on Food Availability for Purchase	38
Table 17	Module on Changes in Food Volumes on the Market	39
Table 18	Income Sources Module	43
Table 19	Expenditures Module	47
Table 20	Mid-Upper Arm Circumference Module	50
Table 21	Categorical Thresholds in MUAC	51
Table 22	Body Mass Index (BMI) Module	52
Table 23	Categorical Thresholds for BMI	52
Table 24	Disease and MUAC Module	53
Table 25	Somalia, Luuq district: Disease Prevalence	55

List of Figures

Figure 1	Trend Analysis for Food Consumption Groups	22
Figure 2	Mean CSI compared over Time	26
Figure 3	Zambia, Lusaka: Real and Nominal Prices	33
Figure 4	Real Price Formula	34
Figure 5	Price Five-Year Average Formula	34
Figure 6	Niger, Niamey: Millet Nominal Retail Prices	35
Figure 7	Primary Income Sources of Households	45
Figure 8	Sources of Remittances	46
Figure 9	Food Expenditure Pie Chart	49
Figure 10	Afghanistan: Unskilled Labour Rate	57
Figure 11	Afghanistan: Wheat Flour and Bread Prices	58
Figure 12	Afghanistan: ToT for Labour/Wheat Flour & Labour/Bread	58
Figure 13	Ethiopia: Price of Shoat	59
Figure 14	Ethiopia: Price of Sorghum	59
Figure 15	Ethiopia: ToT (1 Head of Shoat/Quintal of Sorghum)	60

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^{1.} The consultation was attended by representatives from the Bangladesh, Kenya, Swaziland and Zimbabwe Governments, the Southern African Development Community, the *Comité permanent Inter-Etats de Lutte contre la Sécheresse dans le Sahel, Action Contre la Faim,* FAO, FEWS-NET, USAID, the International Livestock Research Institute, the International Research Institute for Climate and Society and the Joint Research Center.

Acronyms

Af	Afghanistan afghani
BMI	Body Mass Index
Br	Ethiopian birr
CFSAM	Crop and Food Security Assessment Mission
CFSVA	Comprehensive Food Security and Vulnerability Analysis
CILSS	Comité permanent Inter-Etats de Lutte contre la Sécheresse dans le Sahel
CPC	Climate Prediction Center (NASA)
CPI	Consumer Price Index
CSI	Coping Strategy Index
ECMWF	European Centre for Medium-Range Weather Forecasts
EFSA	Emergency Food Security Assessment
ENSO	El Niño/Southern Oscillation
FANTA	Food and Nutrition Technical Assistance
FAO	Food and Agriculture Organization of the United Nations
FCS	Food Consumption Score
FEWS NET	Famine Early Warning System Network
FSMS	Food Security Monitoring System
GDP	Gross Domestic Product
GIEWS	Global Information and Early Warning System
IDP	Internally Displaced Person
IFAD	International Fund for Agricultural Development
ILRI	International Livestock Research Institute
IRI	International Research Institute for Climate and Society
ISFNS	Information Systems for Food and Nutrition Security
MEI	Multivariate ENSO Index
MUAC	Mid-Upper Arm Circumference
NDVI	Normalized Difference Vegetation Index
NGO	Non-Governmental Organization
OCHA	United Nations Office for the Coordination of Humanitarian Affairs
RCOF	Regional Climate Outlook Fora
SCDC	Snow Cover Depletion Curves
ТоТ	Terms of Trade
UNDP	United Nations Development Programme
USAID	United States Agency for International Development
VAM	Vulnerability Analysis and Mapping
WFP	United Nations World Food Programme
WRSI	Water Requirement Satisfaction Index
ZMK	Zambian kwacha

Introduction

The WFP corporate strategy on Information Systems for Food and Nutrition Security (ISFNS) aims at developing information systems that respond to the needs of decision-makers. It seeks to promote long-lasting, national multistakeholder partnerships and to respond to a growing demand for in-depth analysis of the structural and emerging factors that cause food and nutrition insecurity.

WFP's support to information systems is defined by four pillars, based on the organization's operational and technical strengths: a) in-country food security and nutrition assessment and monitoring; b) capacity development at country level; c) the development of standards, methods and tools; and d) the delivery of statistics, information and analysis. These pillars are aligned with WFP's Strategic Plan.

Overview of FSMS

WFP defines food security monitoring as a system that tracks and reports on household vulnerability to food insecurity, the objectives being to:

- monitor and analyze trends of food availability, access and utilization;
- · identify and monitor risks and opportunities for household food security; and
- provide timely and relevant information for decision-making.

Thus, the role of an FSMS is to flag a deteriorating or improving food security situation. It does not necessarily explain why changes in food security are occurring – it simply indicates that something is happening.

Following the 2009 FSMS stocktaking exercise and subsequent in-house and stakeholder consultations,² there was an agreement on the need to strengthen food security monitoring.

Recommendations were also made to ensure FSMS are designed as "lite" and flexible. They should have a few indicators sensitive to detecting and measuring food security changes at national, sub-national, community and household level. They should also require limited human and financial resources. The consultation meetings endorsed the need for FSMS to provide regular information, building

^{2.} See WFP, June 2009. Stock Taking Report. WFP, June 2009. Stakeholder Consultation Report.

wherever possible on existing systems, with sufficient national ownership and preferably as a collaborative process with partners including governments, UN agencies and NGOs.³

FSMS reports should be prepared regularly: in most cases a quarterly report is ideal. Where possible, data should be compared with baselines, which could be those established by a CFSVA, National Household Surveys, food production statistics, or wholesale and/or retail price levels.

These guidance sheets describe how to implement an FSMS that is both sufficiently comprehensive and "lite". They attempt to address challenges related to system sustainability, the effectiveness and harmonization of reporting, the selection of indicators, and the implementation of a national FSMS.

There are four guidance sheets that will be consolidated into one set of guidelines. They are briefly presented below:

- **TGS1 FSMS Reporting Structure and Content:** guidance on how to structure an FSMS report and how to present data for each information domain/indicator.
- **TGS2 FSMS Indicator Compendium:** a compendium of a core set of indicators for FSMS, meant to measure progress or setbacks against benchmarks over time.
- **TGS3 Survey Methodology for Monitoring Food Security:** survey methods and tools to generate primary data in the context of regular food and nutrition security monitoring.
- **TGS4 Supporting the Implementation of a National FSMS:** a conceptual framework and practical tools for the capacity development of an FSMS operated by a national organization.

About this Guidance

This guidance sheet offers a compendium of FSMS indicators to ensure that practitioners have a common understanding of the approach, indicators used, information collected and procedures for analysis. It also points out where more information is required. This consistency is particularly important to allow for comparative analysis at regional and global levels.

^{3.} Collaboration and partnerships should be reflected on the cover page, e.g. through logos. A list of sources should be included at the end of the report.

With a view to harmonizing FSMS products, this document provides tools for analysing, interpreting and reporting on food security indicators. The guidance focuses on a core set of indicators to measure progress or setbacks against benchmarks over time, incorporating risk analysis and early warning to identify factors that might contribute to food insecurity. Monitoring risks to food security and livelihoods, providing early warning of a critical situation and analysing medium- to long-term trends will allow WFP and other security stakeholders to improve their anticipation of, preparation for and response to future crises.

Guidance on data collection and analysis based on many of the proposed FSMS indicators is already provided in existing WFP materials such as the Comprehensive Food Security Vulnerability Analysis (CFSVA) guidelines, the Market Analysis Tools and the Emergency Food Security Assessment (EFSA) Handbook. Practitioners are encouraged to consult these sources for more details and to refer to additional documentation by other food stakeholders and research institutions. However, much of the existing guidance requires some reorientation for the purpose of monitoring.

Purpose and Features of an FSMS

Key features of an FSMS

An FSMS aims to capture the major changes in food security by measuring key indicators covering important food security dimensions. These dimensions are: Hazards and Schocks, Food Availability, Access and Utilization.

The choice of indicators is guided by the specific purpose for which they are intended; they should provide straightforward information that is easy to communicate and understand.

The following criteria are used to select FSMS indicators:



These criteria should be balanced since too little information could make the system less sensitive and less effective, while too much tends to make it bulky, inflexible and less time sensitive. An FSMS should incorporate available information about critical factors related to food security (such as crop forecasts, migrations and conflicts) and should ascertain the extent to which food availability, access and utilization targets are being met.

The most important features of an FSMS are presented in table 1.

Features	FSMS monitoring
Frequency	Periodic (quarterly) ⁴
Main actions	Monitoring food security
Focus	Keeping track of food security indicators to capture changes at community and household levels
Information sources	 a) Regularly collected primary data on households and individuals b) Secondary sources (government agencies, sub-regional organisations, projects, NGOs)
Undertaken by	Field staff, community workers, informants, enumerators, etc.
Reporting to	WFP's VAM Unit and other partners.

TABLE 1. FSMS MAIN FEATURES IN FOOD SECURITY MONITORING

FSMS indicators

At a technical consultation in May 2009, FSMS stakeholders from governments, NGOs, research institutions and donor organizations reviewed and approved a list of core indicators and other parameters to measure food security and assess risks. Indicators were ranked according to the usefulness of the information they provide, based on the following five criteria: cheapness, lightness, utility, expeditiousness and the skills required ("CLUES"). This list was specifically structured for designing an FSMS (see tables 2 and 3)⁵.

^{4.} In some cases, the monitoring report may be issued on a monthly basis.

^{5.} See WFP, 2009. Stock Taking Report for the outcome of the FSMS global technical consultation.

TABLE 2. FSMS EARLY WARNING ISSUES

Hazards and shocks

- Rainfall anomaly
- · Pasture conditions and access to pasture land
- Seasonal perspectives on crop and livestock population
- Inundations and floods
- Pest invasion (e.g. locusts, crop disease)
- Livestock disease
- Price trends
- Conflicts

TABLE 3. FSMS CORE INDICATORS

Food security					
Food security dimensions	Information domains	Indicators			
Availability	Agricultural production	Crop production			
		Yield estimate (crop modelling)			
	Prices	• Staple food prices (nominal wholesale)			
Access	Food consumption	 Food Consumption Score (FCS) 			
	Coping	 Coping Strategies Index (CSI) 			
	Purchasing power	 Food prices (real retail) 			
		Livestock prices			
		Wage rates			
		Terms of Trade (ToT)			
	Main income sources	Income in cash or in kind			
	Expenditures	 Food and non-food expenditures 			
Utilization	Malnutrition	Mid-upper arm circumference (MUAC)			
		 Body mass index (BMI) 			
		 Underweight (weight for age) 			
	Disease	Prevalence of malaria, diarrhoea			

This compendium outlines how to collect and analyse most of these indicators. It is organized around the following domains

- Hazards and shocks
- Food availability
- Food access
- Food utilization

1. Risk Analysis and Early Warning Indicators



Risk is the probability of consequences resulting from interactions between natural or human-induced hazards and vulnerable conditions. Exposure to risk is determined by the frequency and severity of these hazards, and their socioeconomic and geographic scope.

Indicators for risk analysis and early warning can be used to detect phenomena that may negatively impact food security and nutrition and to monitor such occurrences over time. Therefore the indicators selected should focus on the potential hazards and shocks that are most relevant to the country and its communities. The indicators presented below are parameters suitable for identifying deteriorating food security in populations exposed to hazards or shocks. Information related to risk analysis and early warning is normally available from secondary data sources.⁶

Hazards and shocks				
Environmental conditions	Economic conditions	Governance		
Rainfall anomaly / differences	Macro-economic data: Growth rate Inflation rate External balance Remittances	 Coordination of food security programme and disaster management Sector support and social protection measures 		
Seasonal rainfall forecast (medium-term climate outlook)	• Consumer price index (CPI) i.e. real prices, cost of food basket	 Trade policies Regulation of exports and imports Import tariffs 		
Normalized difference vegetation index (NDVI)	• Food imports	 Government policy and actions in domestic food markets: Strategic food reserves Price stabilization measures Safety-net programmes 		

TABLE 4. RISK ANALYSIS AND EARLY WARNING PARAMETERS

^{6.} For further information, please refer to FSMS TGS 1, Annex 1.

Hazards and shocks				
Environmental conditions	Economic conditions	Governance		
• <i>El Niño</i> Southern Oscillation (ENSO)	Migration patterns	 Conflicts/IDPs/refugees: Number of IDPs, refugees and returnees, small arms flow, number of incidents Assistance provided (food, cash, health, etc.) Access to economic / productive resources 		
 Inundation and floods 				
Cyclones, hurricanes and earthquakes				
Pest / locust outbreak				
Pasture and water shortages				
Livestock diseases / death				

1.1. Environmental Conditions

1.1.1. Drought/Short-term dryness

Drought and dry spells can lead to slow-onset disasters; monitoring should begin when the rainy season begins. The starting point is the seasonal forecast that is normally prepared by meteorological agencies. Not all countries experience drought, but many are affected by early or late onsets of the rainy season, and by dry periods. Note that for this kind of indicator to have any consistency in measuring the risk of food insecurity, the information collected must be as up-todate as possible.

The emphasis on rainfall in FSMS reporting should be based on anomaly or deviation from the norm (for a specific period of time) and not simply on absolute rainfall figures. This is especially important for food security analysis, since even the most up-to-date rainfall figures do not tell us anything unless they are considered in relation to seasonal contexts and specifically to the crop calendar.

Rainfall Indicators

- Decadal or monthly rainfall as compared with the medium-term average (e.g. last year) and the long-term average (e.g. over the last ten years) pointing to a rainfall anomaly
- Indication of early or delayed onset of the rainy season, and of dry spells in relation to the vegetation profiles of the area's major crops

There are various ways of comparing rainfall data. Graphs, charts and probability maps displaying rainfall cut-offs between near-normal, above-normal and below-normal rainfall can be used. There are also maps that present the maximum and minimum extremes of rainfall in different regions. Time series rainfall information should be assessed (preferably 15-to-20-year periods) and whenever possible its variability should be compared with normalized difference vegetation index (NDVI) trends in order to forecast crop yields in greater detail (sources include national meteorological agencies, FAO and FEWS NET).

1.1.2. Seasonal Forecasts

A number of international institutions produce seasonal forecasts of rainfall and temperature for periods of between one and four months.⁷ Sources of information include the International Research Institute for Climate and Society (IRI), the European Centre for Medium-Range Weather Forecasts (ECMWF), the United Kingdom's Met Office and the United States National Weather Service Climate Prediction Center (CPC)⁸. However, these forecasts may not be the most useful for FSMS reports. In the case of rainfall, the forecasts are usually made for the total rainfall in a three-month period. They do not indicate rainfall distribution within that period, which is another important factor in crop production. These forecasts are also made for broad geographical areas and therefore may not be detailed enough.

WFP staff should contact local institutions for information on seasonal forecasts. Regional climate outlook fora (RCOF) provide regional seasonal forecast information, which may then be refined by national meteorological services — see the World Meteorological Organization's webpage for details.⁹

Bear in mind that the forecasts produced by different institutions may not be consistent. However, a high degree of consistency between the different forecasts may indicate a reliable forecast.

^{7.} These forecasts are always expressed in reference to a historical scenario or distribution. For instance, the rainfall for a given three-month period may be expressed as the likelihood of being above or below average, or as the likelihood of exceeding the median or mean rainfall.

^{8.} www.iri.columbia.edu/climate/forecast/net_asmt; www.ecmwf.int/products/forecasts www.metoffice.gov.uk/science/specialist/seasonal/category/ www.cpc.ncep.noaa.gov/products/african_desk/rain_guidance/index.shtml

^{9.} www.wmo.int/pages/prog/wcp/wcasp/clips/outlooks/climate_forecasts.html



Early Warning Indicators: There are a number of indicators available for agroclimatic monitoring, including the NDVI, the water requirement satisfaction index (WRSI), snow cover depletion curves (SCDC) and temperature anomaly maps. FSMS can include information on these indicators through in-country collaboration with an institution that has the capacity to prepare maps or charts. The FSMS then interprets them in the context of food security.

As an alternative, early-warning data are available on the Internet (see the FEWS NET website and the Africa Data Dissemination Service at http://earlywarning.usgs.gov/adds).

WFP's Spatial Analysis Unit is also a useful source of information on early warning. It develops maps on food insecurity and emerging vulnerability and provides technical analysis to help incorporate agro-climatic trends into food security monitoring. The Spatial Analysis Unit can provide technical support to monitoring staff on agro-climatic issues and events.

1.1.3. El Niño/La Niña

El Niño Southern Oscillation (ENSO) is usually monitored using the Multivariate ENSO Index (MEI), which is based on six variables including sea-surface temperature, surface air temperature and sea-level pressure. The updated MEI is always included in CPC's regular updates on *El Niño/La Niña*. However, the MEI alone does not serve as an indicator of the impact of *El Niño/La Niña* in a particular geographic region because there is no direct relationship between MEI and rainfall.

The likely impact of ENSO on rainfall is considered in regional forecasts as well as those prepared by national meteorological agencies. A monthly update for Latin American countries is prepared by Centro Internacional para la Investigación del Fenómeno de El Niño (CIIFEN).¹⁰

1.1.4. Flooding

Flooding can be either a quick-onset event (flash flood, surge) or a slower kind of inundation. Unlike drought and ENSO, an FSMS would normally report on floods after their occurrence.

Flooding Indicators

- Number of people affected and extent of physical damage (e.g. dwellings, roads, crops, animals)
- Return to pre-flooding situation

Note that flooding is amply covered by the various early-warning services established by United Nations agencies.

^{10.} www.ciifen-int.org.

1.2. Economic Conditions

The recent food- and fuel-price crises, and the global economic crisis have led to an increased interest in the impact of these crises on community and household food security. WFP, FAO and others have undertaken considerable research on these types of crises and have developed indicators for monitoring their occurrence and impact at household level.

Macro-economic indicators are presented below. Indicators for Prices, Terms of Trade and sources of income are presented in Chapter 2.

Macro-economic Indicators

- Growth rate as the rate of change in gross domestic product (GDP), which indicates how a national economy is evolving in terms of aggregated measures (goods and services produced).
- Inflation rate as the rate of change in price levels over time (e.g. consumer price index).
- External balance as amount of surplus or deficit in the country's current account (exports minus imports).
- Remittances
- Food imports

1.3. Governance

1.3.1. Government policies and actions

The impact of government policies depends on the conditions in each country and the various interventions undertaken by governments in relation to food security. During and immediately after the global food-price crisis of 2007/08, many governments intervened in food markets by introducing new regulatory measures for external trade in agricultural commodities. However, even before the crisis, many governments had already implemented policies and programmes related to production, markets and safety nets.

If a government implements a policy of producer price support and market interventions for the main food staples, it would be of interest to report on issues like price guarantees to producers, grain buffer stocks and strategic reserves. The actual implementation of such measures is likely to vary from one year to another. Indicators to be monitored include the level of guaranteed floor price for producers, the provision of subsidized inputs, the role of government procurement agencies, the areas and products (normally food grains) subject to intervention and the sale of stock in open markets. Safety nets may be linked to government procurement measures — indicators to be monitored include the distribution of food grains to specific groups, the sale of basic food items at a subsidised price through a ration-book system, the sale of basic food items through government shops, the estimated cost of food subsidies and the number of beneficiaries.

1.3.2. Conflicts

Conflicts affect people's livelihoods and food security through displacements: people become internally displaced persons (IDPs) or they are pushed across borders as refugees. Typical FSMS indicators relate to the number of people displaced, loss of income, food sources and assets. In the case of long-term displacement, it would be of interest to have data about the displaced people's access to economic and productive resources (agricultural land, employment, etc.) and their integration with the local population. Conflict situations are diverse and one set of indicators may not be adequate.

An FSMS report also provides information on displacements subject to rapid change, such those occurring during armed conflicts; it is important to indicate changes in the number of people displaced. In some cases, the causes of displacement will be eliminated or contained. This will lead to the return of some displaced people to their place of origin, which should also be covered in an FSMS report.

Conflict Context Indicators

- Geographical areas hosting displaced people or refugees
- Number of IDPs and refugees, disaggregated by type of settlement (camps or local communities)
- Assistance provided (food, cash, health, water, sanitation, shelter)
- Access to economic and productive resources
- · Security conditions, including ability to move
- Number of IDPs and refugees who have returned to their place of origin
- Conditions of settlement (return package, housing, access to health and education services, water and sanitation)
- Small arms flow

2. Food Security Indicators



The three pillars of food security are (i) increasing the availability of food; (ii) improving access to food; and (iii) enhancing the nutritional adequacy of food intake.

- **Food availability** is achieved when sufficient quantities of food are available within a country through domestic production, commercial imports, national stocks and food aid.
- **Food access** is ensured when households are able to acquire adequate amounts of food. Access depends on their own production, household income, the distribution of income within households and the price of food.
- **Food utilization** refers to household food preparation and use in maintaining a balanced diet and intra-household distribution, along with individuals' ability to absorb and metabolize nutrients.

Food insecurity is defined by situations where the conditions of food availability, food access and food utilization are not satisfied. The risk of food insecurity is the probability that any of these three elements may be disrupted.

The main indicators of each food security dimension and their corresponding information domains are listed in Table 3. Note that an FSMS report will only cover all core indicators when information, capacity and tools of analysis are available.

2.1. Food Availability Indicators

2.1.1. Food production

DEFINITION OF FOOD PRODUCTION

Production is an indicator of food availability that provides an estimate of the harvest of main food staples. Food availability is primarily a concern in the agriculture-based economies of developing countries. Staple food production is largely rain fed and is often subject to considerable fluctuation caused by hydrometeorological conditions. Production estimates are based on area and yield estimates during and after the agricultural season.

COLLECTION OF PRODUCTION ESTIMATES DATA

Production estimates are usually available from ministries of agriculture, which are the main sources for FAO publications. Joint FAO/WFP Crop and Food Security Assessment Missions (CFSAM) provide more detailed information for a few countries. An FSMS is expected to generate regular reports during the year, so it is important that country offices and the VAM Unit take into account crop calendars, particularly in countries with more than one agricultural season. This information is available from FAO Global Early Warning System on Food and Agriculture (GIEWS) country briefs (Africa, Asia and Latin America), WFP's Comprehensive Food Security and Vulnerability Analysis (CFSVA) and FEWS NET (covering 20 countries, mainly in Africa). Ministries of agriculture also have this kind of information, often with more detail on regional variations.

Agricultural seasons are of particular importance for reporting on the impacts of *El Niño* and *La Niña*, which are likely to be variable over the long term.

In countries with more than one agricultural season, the impact (e.g. low or erratic rainfall) could be less severe in the first main season and more severe in the second, or vice versa. Since seasonality is a basic condition of rain-fed agriculture, an FSMS should not only report on production estimates but also on the outlook for the coming harvest and household food stocks. Since household stocks are gradually depleted after the harvest, food security is more likely to deteriorate. In countries with one agricultural season, the most critical period is in the months before the next harvest.

A food balance sheet provides an estimate of per capita consumption based on domestic production, imports, stock variation, exports and utilization. A cereal balance considers domestic production, stocks, exports, utilization and import requirements for the marketing year. Food balance sheets are prepared by FAO's Statistics Division, while cereal balances are prepared by GIEWS. An example of a cereal grain balance calculation is shown below.

	Total (x 1,000 mt)
DOMESTIC AVAILABILITY	13 800
Opening stocks	50
Production	13 300
- main season	13 000
- secondary Season	300
TOTAL UTILIZATION	14 010

TABLE 5. EXAMPLE OF BALANCE GRAIN SUPPLY / DEMAND

(continue....)

(...continue)

	Total (x 1,000 mt)
Food use	10 944
Feed use	300
Seed use	650
Losses	1 390
Exports	70
Closing stocks	656
IMPORT REQUIREMENT	210
Commercial imports	50
Food aid received and pledged	60
Uncovered deficit	100

Source: FAO/GIEWS, 2004. Overview of Methodology on Crop and Food Supply Assessments, FAO/GIEWS, Rome.

Although food balance sheets are useful for establishing a general idea of national food availability and consumption, FSMS reports should not include them unless a recent update is available. GIEWS prepares cereal supply/demand balances for the marketing year, which generally follow the production year (for African countries only). These are more appropriate for monitoring purposes because they provide data on shortfalls in relation to estimated national demand and the need for imports. In some countries, these balances are updated regularly; it would be useful to include them in FSMS reports when they are available.

ANALYSIS OF PRODUCTION ESTIMATE DATA

FSMS reporting on national production should focus on major food staples. It should provide updates on the annual estimate compared with previous agricultural years and the five-year average. Since estimates of the current year are likely to be revised during the season, a final estimate is not released until some months after the harvest. Thus, FSMS reports should either give regular updates on the basis of available information or final estimates when they become available.

Сгор	2008/09 (mt)	2007/08 (mt)	Change (%)	2003/05 – 2007/08 average	Change (%)
Rice					
Sorghum					
Wheat					
Potato					

TABLE 6. PRESENTATION OF PRODUCTION ESTIMATES

In countries with more than one cropping season, care should be taken to differentiate between seasons (e.g. maize-main crop, maize-second crop) and clearly explain which season is being reported on. This is especially important for Asian, East and Central African and Central American countries.

2.1.2. Wholesale prices

Wholesale or market prices of staple foods are indicators of their availability, as opposed to retail prices, which are indicators of access. Prices are normally available from ministries of agriculture or national statistical offices. Choose two or three main markets, depending on the circumstances in the country, and report prices on a monthly basis. Main markets are often located close to urban centres, like the *Dawanau* grain market in Kano, Nigeria; however, they may also be found in major surplus-producing areas like *Gedaref* in Sudan or *Mbeya* in Tanzania.

Note that monitoring staple-food prices alone provides little insight into food security. When considering wholesale prices as a proxy indicator for availability, it is also important to consider factors that impact availability, such as production, imports and food aid.

2.1.3. Interpretation of production estimates and wholesale prices

Wherever agriculture is the main economic activity, production has a direct impact on household food security, for example through the replenishment of household food stocks and availability of produce for sale. Seasonality and food-price trends also play an important role: wholesale prices are an indicator of availability in local and national markets. The recent food-price crisis shows that international commodity price trends do affect local market prices, although the overall impact results from a combination of factors, including variability in national production and cross-border trade. An FSMS report should assess these factors when describing price trends.

F

Caution on production estimates: Production estimates are subjective and largely based on observations by the staff of ministries of agriculture. Although yield estimates may be derived from objective measurement (e.g. through crop cutting), crop areas are mostly the result of an overall assessment within a district or sub-region that compares findings with those of the previous season. Therefore, overestimation or underestimation is common. Where crops are grown under irrigation in larger schemes, production estimates tend to be more reliable.

2.2. Food Access Indicators

2.2.1. Food consumption

DEFINITION OF FOOD CONSUMPTION SCORE

Food consumption can be divided into two components: dietary diversity and food frequency. *Dietary diversity* specifies the food groups a household consumes over a reference period, while *food frequency* gives the number of days in which a particular food group is consumed over a reference period.¹¹ According to the World Health Organization, food strategies must not only ensure food security for all, they must also guarantee the consumption of adequate quantities of safe and high-quality foods that make up a healthy diet.

The food consumption score (FCS), devised by WFP, is a composite score used as a proxy of food consumption and therefore of food access. It is based on the dietary diversity, food frequency and nutritional importance of the food groups consumed.

COLLECTION OF FOOD CONSUMPTION DATA

The unit of analysis used for FCS is the household, and specifically the food groups consumed by household members over a reference period. Data is collected through a household survey using a questionnaire administrated to a sample of households. The WFP food-consumption module recommends using a standard seven-day recall period, which ensures both good time coverage and reliability of the respondent's memory.¹²

The information collected over the seven-day recall period includes:

- the types of foods eaten;
- the frequency of consumption of food items of the same group (in number of days over the past seven days);
- the main sources of food (either the main source or the two main sources).

See table 7 for an example of questionnaire used to calculate the FCS.

^{11.} WFP, 2009. EFSA Handbook, second edition, p. 62.

^{12.} According to the Food and Nutrition Technical Assistance (FANTA), a 24-hour recall of food intake provides detailed data on food consumption at household level. However, it is very cumbersome since it collects general information such as eating occasions (definition of meals or snacks, or the time food was consumed), household members present at each meal and visitors consuming each dish. For further information see FANTA, 2005. *Measuring Household Food Consumption: a Technical Guide.* Available at http://www.fantaproject.org/focus/household.shtml.

TABLE 7. FOOD CONSUMPTION SCORE MODULE

Food sources and consumption				
Question: I would now like to ask you a few questions about food consumption in your household.				
a.	Yesterday, how many times did the older children and adults (above 13 years) in this household eat?	times		
b.	Yesterday, how many times did the children (6-13 years) in this household eat?	times		

Question:

Could you please tell me how many days in the past one week your household has eaten the following food sand what the source was (use codes on the right, write 0 for items not eaten over the last seven days and if several sources, write up to two)

	Food item	Number of days eaten last seven days	Food sources (write up to two)	
C1	Maize		,	Food
C2	Rice	_	,	sources
C3	Sorghum	_	,	codes
C4	Millet	_	3	1 – Own
C5	Wheat	_	,	production
C6	Cassava	_	,	(crops, animals)
C7	Potatoes		3	2 = Hunting,
C8	Yams		,	fishing, gathering
C9	Bread, mandazi, chapati, etc.	-	,	3 = Exchanging
C10	Matoke		,	for food
C11	Beans and peas	_	,	4 - Borrowing
C12	Vegetables	_		4 = Borrowing
C13	Groundnuts, sim sim, sunflower	-	,	5 = Purchase 6 = Gift (food)
C14	Fresh fruits	_	,	from family /
C15	Fish	_	,	friends
C16	Meat (including chicken and pork)	-	, <u></u>	7 = Food aid (WFP, NGOs)
C17	Blood (if appropriate)	_	;	
C18	Eggs	_	;	
C19	Oil, fat, butter, ghee	_	,	
C20	Sugar		,	
C21	Milk		,	
C22	Condiments	—	,	



Caution on food items: (i) The list of food items should be country specific but it should allow for re-grouping into standard food groups. (ii) It is important to include condiments in the list (enumerators should be trained on how to differentiate food from condiments). FCS can be underestimated if food and condiment classifications are misinterpreted.

ANALYSIS OF FCS

Composite FCS is calculated by listing food items according to specific food groups. A weight is assigned to each food group based on its nutrient density, as shown in the following table. For instance, beans, peas, groundnuts and cashew nuts are given a weight of 3, reflecting the high protein content in beans and peas, and the high fat content of nuts. Sugar is given a weight of 0.5 because of its absence of micronutrients and the fact that it is usually eaten in relatively small quantities.¹³

Food groups	Woight	lustification
Food groups	weight	Justification
Main staples	2	Energy dense, protein content lower and poorer quality than legumes, micronutrients (bound by phytates ¹⁴)
Pulses	3	Energy dense, high amounts of protein but of lower quality than meats, micronutrients (inhibited by phytates), 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 (no phytates), 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 may be consumed in small quantities as a condiment; reclassification in such cases is needed.
Sugar	0.5	Empty calories. Usually consumed in small quantities.

TABLE 8. FOOD GROUPS WEIGHTS

^{13.} See WFP, 2009. EFSA Handbook, second edition, p. 64.

^{14. &#}x27;Phytate' or phytic acid in the form of salt is the principal storage form of phosphorus in many plant tissues, especially in bran and seeds. It has binding and chelating effects and could provide an antioxidant or inhibit the absorption of some minerals. Its chelator effects can contribute to mineral deficiencies in people whose diets rely on these foods for their mineral intake.

Food groups	Weight	Justification
Oil	0.5	Energy dense but usually no other micronutrients. Usually consumed in small quantities.
Condiments	0	By definition, eaten in very small quantities and not considered to have an important impact on overall diet. ¹⁵

FSC is calculated as follows:

- Step 1: Sum all the consumption frequencies of food items in the same group and recode the value of each group above 7 as 7 (in the example shown in table 9, the re-grouped frequencies in the food group 'Cereals and tubers' exceeds 7, and it is therefore recoded as 7).¹⁶
- *Step 2*: Multiply the value obtained for each group by its weight to create new weighted food-group scores.
- *Step 3*: Sum the weighted food-group scores to determine FCS.

Food item	Food group	Weight (A)	Days eaten in past 7 days (B)	Score (AxB)
Maize, rice, sorghum, millet, bread and other cereals	Cereals and tubers	2	8	14
Cassava, potatoes and sweet potatoes				
Beans, peas, groundnuts and cashew nuts	Pulses	3	1	3
Vegetables, relish and leaves	Vegetables	1	2	2
Fruits	Fruit	1	0	0
Beef, goat, poultry, pork, eggs and fish	Meat and fish	4	0	0
Milk, yoghurt and other dairy products	Milk	4	1	4
Sugar and sugar products	Sugar	0.5	4	2
Oils, fats and butter	Oil	0.5	2	1
Composite score				26

TABLE 9. FCS, FOOD GROUPS AND WEIGHTING¹⁷

^{15.} In countries where it is common to use food as condiments (e.g. dried fish, dried meat used as powder on the meal), it is advisable to collect data on these foods separately. Otherwise, households may respond that they have consumed fish even if they have simply spread a small amount on their meal.

^{16.} See WFP VAM Unit, 2008. Food Consumption Analysis, Technical Guidance Sheet, version 1, p.8.

^{17.} See WFP, 2009. EFSA Handbook, second edition, p. 64.

The maximum FCS is 112, which would indicate that each of the food groups was consumed every day for the last seven days.

The household score is compared with the appropriate threshold for the household's food consumption. WFP applies the following thresholds:

FCS thresholds	Household profiles
0-21	Poor food consumption
21.5-35	Borderline consumption
>35	Acceptable food consumption

TABLE 10. HOUSEHOLD FOOD CONSUMPTION THRESHOLDS

REPORTING ON FCS

A higher FCS indicates better food consumption in terms of dietary intake (food frequency) and dietary diversity; a lower FCS indicates deteriorating household food consumption. FCS can change quickly because it is affected by seasonality; bear this in mind when comparing FCS across time.

FCS should be interpreted in relation to other food access indicators, such as the coping strategies index (CSI) and livelihoods.

It is important to report on FCS trends in order to flag an improving or worsening situation. The main areas of focus are:

- *frequencies* (percentages of households or individuals within each food consumption profile, and percentages of households or individuals consuming food groups that are good sources of specific nutrients);
- scores (mean scores); and
- *trend analysis* for food consumption groups.

Figure 1 is a good example of how to report an FCS trend analysis. The graph shows the percentages of sampled households that fall into the respective food consumption profiles by region, for all the rounds taken from 2007 to 2009.





Caution on FCS: (i) FCS does not consider foods consumed outside the home, which may be important in urban areas. (ii) FCS provides no indication of the quantity of each foodstuff consumed or of intra-household food consumption. (iii) The analysis of dietary diversity and frequency provides important information on household food consumption. However, FCS alone cannot reflect the current food security situation: it must be considered together with other indicators.

2.2.2. Coping strategies

DEFINITION OF COPING STRATEGIES

Coping strategies reflect the activities to which people resort to obtain food, income, and/or services when their normal means of livelihood have been disrupted (CFSVA Guidelines, 2009).

The determinants of the household coping capacities include physical assets, levels of production, income and consumption, and the ability to diversify sources of income and consumption in order to mitigate shocks. Coping strategies can therefore entail a spectrum of activities such as eating less preferred or less expensive foods, borrowing food or relying on help from friends and relatives, and reducing the number of meals eaten in a day. Other actions like migration, begging, child labour and prostitution can also be considered coping strategies since they may lessen the impacts of food insecurity in the short term. However, they also disrupt household resources and assets, thereby weakening household resilience. In general, household food security is largely determined by household members' coping strategies.

The coping strategy index (CSI) can be used to analyse coping strategies and as a proxy indicator of food access. CSI reveals the severity of the strategies that households use to manage shortfalls in food consumption.

The 'reduced' CSI should be used for an FSMS because it is calculated using standard food consumption-based strategies and severity weighting. The advantage of the reduced CSI is that it **measures the same set of behaviour and uses the same universal weights** across countries and regions.¹⁸ This normalizes behaviours and severity scores, **facilitating the comparison of food security across populations**. By always measuring the same behaviours, the reduced CSI has greater applicability, so it can be used to compare the severity of crises and it assists in the geographic targeting of resources. Research has confirmed that the reduced CSI correlates with other food security indicators as well as the original, context-specific CSI.¹⁹ The index is also quicker and easier to administer, more straightforward to analyze and rapid enough to provide real-time information to programme managers.

^{18.} WFP, 2009. EFSA Handbook, second edition, p. 79.

^{19.} FAO, 2008. Coping Strategies Index, Field Methods Manual, second edition.

COLLECTION OF CSI DATA

CSI is usually measured at household level since households are the social unit through which most individuals access food.²⁰

The reduced CSI uses a seven-day recall period because it is easier for respondents to remember than a thirty-day recall period. The most important information collected relates to how often a household uses strategies to cope with difficulties in obtaining food.

The reduced CSI examines the five most common behavioural changes in response to food shortages, which are:

- eating less-preferred or less-expensive foods;
- borrowing food or relying on help from friends and relatives;
- limiting portion sizes at meal times;
- · limiting adult intake so that small children can eat; and
- reducing the number of meals per day.

Table 11 provides an example of a reduced CSI module that could be used in a sample household questionnaire.

TABLE 11. REDUCED COPING STRATEGY INDEX (CSI) MODULE

In the past seven days, if there have been times when you did not have enough food or money to buy food, how often has your household had to:	Frequency (0-7)
1. Rely on less-preferred and less-expensive foods?	
2. Borrow food, or rely on help from a friend or relative?	
3. Limit portion sizes at meal times?	
4. Restrict consumption by adults in order for small children to eat?	
5. Reduce number of meals eaten in a day?	

ANALYSIS OF REDUCED CSI DATA

Calculating the reduced CSI requires filling in the frequency of the measured behaviours and then multiplying them by their respective severity weights. The sum of the totals for each strategy yields the reduced CSI's total household composite score, as shown in Table 12.

^{20.} Ibid., p. 4.

In the past seven days, if there have been times when you did not have enough food or money to buy food, how often has your household had to:	Frequency	Universal severity weight	Weighted score = frequency X weight
Relative frequency score			
a. Rely on less-preferred and less-expensive foods?	5	1	5
b. Borrow food, or rely on help from a friend or relative?	2	2	4
c. Limit portion sizes at meal times?	7	1	7
d. Restrict consumption by adults in order for small children to eat?	2	3	6
e. Reduce number of meals eaten in a day?	5	1	5
Total household score – reduced CSI	Sum of the for each	ne totals strategy	27

TABLE 12. REDUCED CSI TEMPLATE COMPLETED

Coping strategies should be analysed in the context of additional information. This extra information helps distinguish between seasonal fluctuations and a downward spiral of progressively more drastic coping strategies caused by deteriorating food security. Natural disasters, armed conflicts and other sudden events increase people's exposure to risks. Focus-group interviews should record the circumstances surrounding the coping strategies being adopted by communities and households.

INTERPRETATION OF THE CSI SCORE

The higher the CSI, the more food insecure is a household. The high score means that the household (or aggregate of households) is employing coping strategies more frequently and/or that it is using more severe coping strategies than a household (or aggregate of households) with lower CSI scores.²¹

A CSI score by itself may not mean much so it needs to be assessed within an analysis of trends. To take an example: one household obtains a reduced CSI score of 25 and another a score of 40. The household with a score of 40 clearly used a higher number of and more severe strategies than the household with a score of 25 in order to meet its food consumption requirements. For an FSMS, however, it is more important to determine whether their CSI scores have increased or fallen.

REPORTING ON THE CSI SCORE

There are a variety of ways to report the CSI score. If there is a lack of welldocumented CSI thresholds, trends are the most reliable way to assess whether a situation is changing. For instance, comparing the scores of the same household

^{21.} WFP/CARE/Feinstein International Center/TANGO/USAID, January 2008. The Coping Strategies Index – Field Methods Manual, second edition, p.14.

over time gives a useful indication of changes in food security, while comparing different households at the same time provides a comparison of their relative food security. One can also report total scores and compare these with other locations where data have been collected. In some cases, CSI thresholds might show a strong correlation to FCS, validating these two indicators in a specific context.

In addition, the composite indicator can be combined with other food security indicators; combining them both enriches the analysis and validates the indicator against other food security indicators. CSI can be reported as a mean score in a bar graph, as shown in Figure 2.





Caution on CSI: a CSI score alone does not explain much about the absolute level of household food security. Instead, it allows a comparison of the relative food security of different households whose CSIs were calculated during the survey.

2.2.3. Terms of trade (ToT)

DEFINITION OF ToT

The ToT indicator is useful for monitoring food access and identifying an impending food security problem. ToT is an important measure that provides information on household purchasing power. It is defined as the ratio of two prices, in this case a commodity being sold and a food staple being purchased.²²

Since many households rely on selling commodities for income and buying commodities for food consumption, price fluctuations can have severe consequences for their ability to access staple foods.

^{22.} ToT calculations are used in economics to analyse countries' trade positions. In this context, ToT would be equal to the ratio of a country's export prices to its import prices.

ToT uses price information tracked over time to detect variations in household purchasing power; it is a simple indicator of household access to food. When ToT declines, households are less able to buy food with their traditional income sources, especially when these sources involve selling commodities, animals or animal products, or labour.

For example, if households growing cash crops or raising livestock face declining ToT, it means that they can obtain less of a staple food from the sale of a unit of their cash crop or head of livestock. In other words, their purchasing power is reduced and their food security is likely to deteriorate.

A household's purchasing power can also be analysed using disposable household income. Disposable household income is defined as the gross income of all household members minus paid-income transfers, social contributions and taxes. The amount is subsequently adjusted to the composition of the household and number of household members, and then deflated with the consumer price index (CPI).²³ This standardized household income is also termed 'purchasing power'. Monitoring changes in purchasing power using this approach is complex and only provides a macro-level indication of purchasing power.

However, measuring purchasing power using ToT is relatively simple and it is a good indicator of food access. Generally, ToT establishes a ratio between the unit price of a household income source (labour, produce, livestock) and the unit price of a staple food. The ratio of these two prices, reported on a regular basis, provides information on the amount of food that can be purchased for the unit value of a particular income source, and on the variation of this ratio over time.

CALCULATING ToT

To ensure that ToT is a good indicator of food security, it is important to monitor commodity prices, which tend to vary over time as a function of market supply and demand. Seasonal price fluctuations are common in many developing countries, and government market interventions and food aid may also influence commodity prices.

• Choosing items to calculate ToT

The choice of the two items to be used in ToT calculations depends on the country, the livelihood group of interest and the main income source and food staple. These

^{23.} Changes in CPI are used to assess price changes associated with the change in the cost of the food basket (including a variety of goods and services) of a typical urban consumer.

are often region-specific, although for urban and peri-urban areas the main income source would normally be casual labour. CFSVAs provide extensive information on livelihood groups and food consumption, which facilitates the choice of items on which to base the ToT calculation.²⁴

If the concern is the vulnerability of livestock owners in a region where poor people depend on the sale of livestock to buy staple food, the most relevant ToT indicators are livestock and the main staple. In the case of unskilled wage earners, ToT should be the ratio of the price of the hourly or daily wage to the main staple. In this case, ToT indicates the amount of the staple that can be purchased with an hour or day of labour. For households dependent on cash crops, the ToT is calculated using the price of the cash crop and the price of the food staple.

It is important to state clearly which items are being used and why. For example, in the very dry Upper East region of Ghana, sorghum is grown as a food and cash crop, while cassava is commonly consumed.²⁵ In this case, ToT would be calculated using the prices of sorghum and cassava. In the pastoral areas of Mali, the main income source is the sale of livestock, while sorghum and millet are staple foods, so ToT would be calculated using the prices of livestock (e.g. goats) and of sorghum or millet. Seasonal migration is common in many rural areas of Mali (e.g. in the Kayes and Tombouctou regions) and generates remittances to families in the places of origin. In this situation, it is best to calculate ToT using the rural or urban daily labour rate — depending on the destination of migrants — and a staple food like rice or sorghum.²⁶

• Calculating ToT

With the information available on livelihood groups, income sources and food consumption, calculating ToT is fairly simple following these steps:

- *Step 1:* Define the livelihood group of interest (from CFSVAs, national household surveys, etc).
- *Step 2:* Determine the main cash income source of the livelihood group, such as daily labour, or the sale of cash or food crops, or livestock.
- *Step 3:* Determine the main staple food consumed.
- Step 4: Obtain price data on a monthly basis.

^{24.} National household surveys may also contain information on livelihoods and food consumption that can facilitate the choice of items.

^{25.} Information on livelihood groups, income sources and food consumption is from WFP, 2009. *Republic of Ghana - Comprehensive Food Security and Vulnerability Analysis*. Available at http://documents.wfp.org/stellent/groups/public/documents/ena/wfp201820.pdf.

^{26.} Information on livelihoods and food consumption is from WFP, 2009. République du Mali, Étude de Base de la Sécurité Alimentaire et de la Nutrition. Available at http://documents.wfp. org/ stellent/groups/public/documents/ena/wfp202667.pdf.

In a barter situation, ToT is calculated as the number of units (of the staple food) that one can obtain for one unit of one's own produce.

ToT = units of staple food/units of livelihood product

For example, when three bags of sorghum are traded for two goats, ToT = 3 bags/2 head = 1.5 bags/head.

However, since these products usually have market prices, ToT is typically calculated as the price of one unit of one's own produce (the item sold) divided by the price of one unit of the staple food product purchased.

ToT= unit price of livelihood product/unit price of staple food

For example, if one bag of sorghum costs US20/bag and one goat sells for US30/head, then ToT = (US30/head)/(US20/bag) = 1.5 bags/head. Proper analysis of ToT requires the use of prices that reflect those paid by the respondent households.

• Data Sources

The calculation of ToT is based on current prices as reported by various agencies at least once a month. Wherever WFP (often in collaboration with government agencies) has established a regular reporting system, ToT can be calculated using data reported to WFP country offices, regional bureaux and Headquarters. In other cases, data sources vary from country to country and can include:

- · labour rates: ministry of labour or national statistical office;
- cash crop prices (wholesale or producer prices): ministry of agriculture, national statistical office and WFP data;
- livestock prices: ministry of livestock production (or agriculture), national statistical office and WFP data; and
- consumer or market prices of grain, processed products or food: national statistical office and WFP data.

Accuracy of ToT calculation: it is appropriate to use wholesale prices for cash crops that represent income sources, since households (production units) face producer prices. ToT is less accurate when only retail (or consumer) prices are considered for cash crops that are sources of income for producers. The ToT indicator expresses a ratio between two prices, which may show divergent trends. It is desirable to show the trends in both prices in separate tables or graphs before presenting ToT to allow for a better interpretation of what drives changes in ToT.

DATA ANALYSIS OF ToT

The annex contains two examples of ToT calculations for Afghanistan and Ethiopia which show how to analyse and illustrate different livelihoods and food consumption profiles. The price trends of the commodity being sold and the commodity being purchased should be shown in two separate graphs. A third graph should then give the results of the ToT calculation, as in the examples.

INTERPRETATION OF ToT

ToT is a proxy indicator of food access and purchasing power so its limitations must be well understood for it to be properly interpreted, especially in food security monitoring.

Caveats for ToT: (i) conclusions relating to overall purchasing power or household food access depend on the item chosen to indicate household income and the item chosen to indicate consumption. (ii) The actual impact on households largely depends on the possibilities for substitution of products and the coping strategies applied. In a rural setting, these include a wider range of options (out-migration, reliance on self production, etc.) than are available to urban households. (iii) ToT does not take into account the fact that households faced with rising food prices often substitute their preferred food with less-preferred foods.

REPORTING ON ToT

ToT can be calculated for any situation where the choice of items is based on available knowledge of livelihoods, income sources and food consumption. Rising ToT means that household purchasing power is improving. Conversely, when the price of the item sold declines and the price of a staple food increases, there is a dramatic decline in purchasing power. When the two prices move in the same direction, ToT is particularly useful because it gives more information about household food access than simple price monitoring.

Nonetheless, even though ToT provides an insight into household purchasing power based on specific items, it does not tell the whole story.

2.2.4. Price analysis

RELEVANCE OF PRICE ANALYSIS IN MONITORING SYSTEMS

Food prices provide a great deal of information on both food access and availability. Prices are a measure of availability when they affect macro-level food supply (import prices) and a measure of food access when they affect household purchasing power: consumer food prices determine how much food a household can buy given its level of income (see ToT in the previous section).²⁷

The usefulness of tracking prices depends upon the appropriateness of the commodities chosen. Monitoring prices can provide almost real-time analysis of an evolving crisis, and it can flag potential supply and demand problems when prices are compared to a pre-established reference point. Tracking prices over the long term can help to identify normal movements and seasonal fluctuations in prices (lean season versus post-harvest season), and price movements that might identify supply and demand problems.²⁸

Monitoring prices and determining whether they are higher or lower than normal is not usually enough. It is important to understand the cause of abnormal price deviations in order to distinguish between problems of availability and those of access.

CALCULATING AND ANALYSING PRICES

Using the information available from markets, real prices are calculated following these steps:

- Step 1: Choose the commodities
- Step 2: Choose the type of retail prices
- Step 3: Choose real or nominal prices
- Step 4: Calculate real prices

Step 1: Choose the commodities

The choice of the items to be considered for price trend analysis depends on the country, the livelihood group of interest and the main income source and food staple. These are often region-specific, although for urban and peri-urban areas, the main income source is normally casual labour. For this reason, wages have been identified as a price to monitor.

If the issue of concern is the vulnerability and food security of livestock owners (pastoralists) who depend on the sale of livestock as their main income source, livestock prices should be closely monitored. The evolution of staple food prices should also be monitored because vulnerable households spend most of their income on staple foods. Monitoring must be consistent in this case, focusing on staple foods that

^{27.} FEWS NET, 2009. Adjusting Prices for Inflation and Creating Price Indices. FEWS NET Market Guidance No.3.

^{28.} For further information regarding the basics of market analysis and prices, refer to the WFP Technical Guidance Sheet, *The Basics of Market Analysis for Food Security*. More detailed information about real prices, seasonality and forecasting can be found in the forthcoming Market Analysis Tool *Real Prices, Seasonality and Forecasting*; however, this document focuses on real prices and seasonality (the issue of forecasting should be taken up with economists or econometricians on a country-by-country basis).

constitute an important part of household food consumption and expenditure. This could involve more than one food staple, depending on consumption patterns.

Step 2: Choose the type of retail prices

After choosing commodities, it is necessary to identify the correct prices to track. Prices are different along the market chain and reflect different aspects of markets and the economy. To understand how the evolution of staple food prices is impacting consumers, retail (consumer) prices must be monitored. If the interest is in the income of a particular livelihood group, the analysis must aim to capture trends in the prices that this group receives for the sale of its commodities — this includes pastoralists and wage labourers. In addition, when looking at livestock prices, it is important to study the price per head of animal and not per kg of meat. Monitoring meat prices may be important, but it better reflects food access than income.

When focusing on wage labourers, consider what type of remunerated work they are undertaking, whether casual daily labour, agricultural labour, non-agricultural labour or work in a particular sector such as manufacturing. The wage rates being tracked must match the main income-earning activities within the community of interest. In urban Bangladesh for example, many wage labourers work in the garment industry; therefore, the wage rate of interest would be the one specific to the garment sector and not simply the daily casual wage.

Food security dimension	Types of prices
Food access	Retail food prices
	Farm-gate prices (of food and cash crops where appropriate)
	Livestock prices
	Wage rates (of labour typically practised by livelihood group of interest)
Food availability	Wholesale food staple prices

TABLE 13. MARKET PRICES AND FOOD SECURITY

Step 3: Choose real or nominal prices

This stage takes into account factors such as seasonality and inflation. Prices that are typically collected from the market and that reflect the current price situation are referred to as 'nominal' prices. The evolution of these prices includes seasonal patterns and inflation. Analysing trends in nominal prices can be misleading if inflation is very high, as the value of the currency changes over time.

The graph below shows how an analysis of nominal prices alone could lead to the conclusion that prices are increasing beyond their normal levels. The evolution of

maize prices in Lusaka, Zambia from June 1993 to June 1998 seems to indicate that prices increased from ZMK15,000/100kg to ZMK35,000/100kg. However, if we adjust for inflation and look at real price patterns, it is clear that maize prices were following their usual seasonal pattern. If the monitoring system analysed only nominal prices, there might have been a warning regarding low availability or supply of maize on the market, which was not the case.



While consumers face nominal prices on the market when they purchase food, their purchasing behaviour is in real terms. In other words, consumers understand whether the same amount of money allows them to purchase less food than the month before. Therefore, when analysing price trends, prices need to be adjusted for inflation and seasonality by deflating nominal prices with a standard-of-living measurement index, typically the consumer price index (CPI), which measures the cost of a typical basket of goods purchased by households (grain, flour, vegetables, drinks, fuel, school fees, clothing, medical expenses, etc.).²⁹

The cost of this basket of goods is normalized to a base year, which is equal to 100. CPI is typically divided into food and non-food inflation, whose weights are determined by household budget. These weights determine the factors driving inflation in a particular context. For example, if the 2009 CPI of a particular country is 143.5 and the base year is 2005 (2005 CPI = 100), the cost of the same basket of goods is 143.5 instead of 100 currency units. In other words, prices are 43.5 percent higher than they were in 2005. Since CPI is based on a particular household, it is important to use the CPI corresponding to the population in the catchment area of a market. Therefore, an urban-based CPI should not be used to deflate rural market prices, and the CPI of a particular district should not be used to deflate prices from another district.

Similarly, wages should be monitored as real wages adjusted for inflation. This is because nominal wage rates may appear to be increasing, but the increase may be a result of inflation. In fact, if inflation is increasing at a higher rate than wages,

^{29.} For further information on nominal and real prices, and CPI, please refer to the MARKIT Tool on Price Analysis (forthcoming) or FEWS NET, 2009. Adjusting Prices for Inflation and Creating Price Indices.

household purchasing power is actually falling (they are able to buy fewer essential items with the same amount of money).

Step 4: Calculate real prices

To calculate real prices from nominal prices, it is necessary to have monthly timeseries nominal prices from markets of interest and a monthly time-series CPI that corresponds to these prices (with 100 equal to the reference year). Real price is calculated by dividing the local price by the corresponding CPI for each month.

FIGURE 4. REAL PRICE FORMULA

$$P_{\text{real price in Jan 2009}} = \frac{P_{\text{nominal price in Jan 2009}}}{CPI_{\text{January 2009}}} \times 100$$

This formula translates non-comparable monetary figures into directly comparable real figures.

PRICE TREND ANALYSIS

Trend analysis allows us to determine whether prices are increasing or decreasing. When these price evolutions are compared to a pre-established 'normal' reference with the five-year average, it is also possible to ascertain whether or not these changes are normal. Real-time price monitoring (including wages, livestock prices and wholesale and retail staple-food prices) can help to flag problems in supply and demand.

Once real prices for the selected commodity are calculated, the time series should be charted (as shown in figure 3) to understand whether changes in prices are a result of inflation or whether they reflect actual supply and demand behaviour.

It is also possible to compare the evolution of prices in a current year to price evolution over a pre-established reference period. The reference period is generated by calculating the monthly average of prices over a long period (e.g. five years) in which there were no severe shocks. Therefore, any given five-year period should not include 2008 as it marked the peak of the food-price crisis.

FIGURE 5. PRICE FIVE-YEAR AVERAGE FORMULA

$$P_{\text{Avg Jan 2000-2005}} = \frac{P_{Jan2000} + P_{Jan2001} + P_{Jan2002} + P_{Jan2003} + P_{Jan2004} + P_{Jan2005}}{5}$$

This calculation should be carried out for each month of the year using real prices. These five-year averages can then be graphically compared to the evolution of real prices in 2006, 2007 and onward, as shown below. Comparing current real price changes to the long-run average takes seasonality and inflation into account, and it establishes a reference price for each month of the year. However, it is often very difficult to obtain regular and accurate CPI for monitoring rural communities and markets; in these cases, it is advisable to use the CPI from nearby or central markets. If necessary, monitoring can be conducted on a nominal basis or nominal prices can be deflated using the five-year average as long as inflation is not a major factor (such as in Zimbabwe or Ethiopia). Furthermore, if CPI is not available and the currency is not stable, the local currency should be converted into a more stable currency like the United States dollar, and then deflated in order to control for inflation. This is only possible when the exchange rate is reliable.

In the following example, prices in Niger in the 2008/09 season were considerably higher than the long-term average.³⁰ However, figure 6 also illustrates the 2004/05 season, which marked the food crisis in the region when prices peaked at much higher levels than during the 2008 crisis. The usefulness of comparing data with the long-term average is quite clear: the monitoring system gives an early warning, revealing large deviations from the long-term average.



The example of Niger in 2005 shows the importance of availability and the drivers of access. Market and price monitoring revealed problems related to availability or access to markets during that period (prices were rising abnormally). At that time, the dynamics of trader behaviour in cross-border trade with Nigeria was not well understood. After stocks arrived at border markets in Niger, they moved to Nigeria. Therefore, prices increased despite a good harvest and seemingly good availability in markets.

^{30.} Source: FEWS NET.

The main data needs and sources for price monitoring are summarized in Table 14.

TABLE 14. I HIGE BAIA NEEDO AND COONCEO

Data needs	Data sources
Monthly time series for prices (per unit) of main food staples, preferably in major urban wholesale and retail markets	WFP or government monitoring (FSMS, ministry of agriculture, national statistical office, private market monitoring organizations, etc.); FAO price database
Monthly time series for prices (per head) of main livestock in major livestock markets	WFP or government monitoring (FSMS, ministry of agriculture, national statistical office, private market monitoring organizations, etc.); FAO price database; ILRI
Consumer price index (CPI) or any measurement of the total basket (and the breakdown food/non-food if possible)	National statistical office
Wage (casual or particular sector)	Ministry of labour, WFP monitoring, International Labour Organization

Caution on prices analysis: (i) interpreting price indicators can be complex. It requires a good understanding of food markets, policies, trader behaviour and other factors that underlie pricing. In addition, one must ensure that the correct prices are being used to reflect availability or access. It is often difficult to conduct real price-trend analysis in rural markets, which lack up-to-date CPI data. (ii) When interpreting retail prices for access, it is important to consider whether households are still consuming that particular product even though the price has increased, or whether they have substituted it for a cheaper alternative. Understanding the context is crucial to interpreting prices.

2.2.5. Market conditions

There is a need to collect contextual information on markets, food availability, access and risk factors. This type of information can provide important insights into the food availability and access of local communities.³¹

A range of qualitative information on markets can be collected through key informants. Informant interviews can provide market food availability and access data that is not only useful for monitoring, it also can facilitate programming decisions (especially regarding cash and vouchers).

^{31.} For further information on the importance of the market environment and primary market data collection from key informants, please see *WFP's Basic Market Analysis for Food Security, How to Conduct a Trader Survey* and FEWS NET's guidance on Structure-Conduct-Performance, which highlights the importance of qualitative data in analysing and interpreting price data.

Indicator	Description
1) Number of traders on the markets	Tracking the increase / decrease of the number of sellers in a market provides an indication of market functioning and recovery after a shock.
2) Commodities most available on local markets	This provides a measure of food availability on the market by understanding the range and diversity of products available.
 Changes in volume / amount on local markets 	This indicates localized food availability on markets.
 Households' and communities' physical access to markets 	This indicates access to local markets; seasonal access to markets (wet and dry seasons).
5) Security / risk factors related to food availability / access	Security issues related to markets can help identify breaks in the supply chain and any resulting difficulties.

TABLE 15. INDICATORS OF MARKET CONDITIONS

• Number of traders on the markets

The first indicator provides a qualitative understanding of whether markets are open and competitive, and whether trading (buying and selling) is sufficient to drive market recovery after a shock. For example, many local markets in Pakistan closed down after damage sustained during the 2005 earthquake, or else traders migrated from rural to urban areas because their customers had lost their livelihoods (and therefore their purchasing power).³² Even though some markets were not damaged, traders did not return because there were not enough customers to support their businesses.

· Commodities most available and change in volume/amount on local markets

The second and third indicators are a measure of localized availability on the market, capturing both the range of products (indicator 2) and changes in the amount available (indicator 3). It is fairly straightforward to establish the range of commodities available; the difficulty lies in determining the actual volume of food being sold and stored in local markets, as traders consider this information an important part of their business strategies and they keep it confidential. It is more feasible to ascertain whether there is an increase, a decrease or an unchanged volume of food moving through a particular market, taking care to adjust for seasonality.

· Households' and communities' physical access to markets

Physical access to markets is a direct indicator of whether or not households in a particular community have enough access to purchase sufficient food. It reflects how far

^{32.} WFP, 2005. Pakistan Market Assessment: Earthquake Affected Areas.

away markets are and whether they are accessible throughout the year. For example, if households do not have access to markets during the wet season, their food security may deteriorate unless they can rely on consumption of their own production or stocks.

Security/risk factors related to food availability/access

This indicator is crucial to understanding whether there are security risks that could break the supply chain to local markets or that could make doing business in a particular region too costly for traders, thereby directly impacting food availability in local markets. If there is outright civil strife, road blockades could stifle commercial trade to those areas; if there is general insecurity, roads may be controlled by bandits or rebel groups who levy taxes at checkpoints, weakening the incentive for traders to continue operating in those areas. This could also affect the availability of food in local markets and cause price increases, which damage food security in areas that depend on market purchases.

More in-depth information can be collected on security risks; these data are best collected from secondary sources, including USAID's *Complex Emergency Situation Reports*.

DATA COLLECTION

Data is best collected at community level through key informant interviews. It should be analysed in the catchment area of the community that has been sampled. In other words, the analysis must be applied directly to the markets that the households use for their market purchases.

TABLE 16. MODULE ON FOOD AVAILABILITY FOR PURCHASE

Α.	A. Food availabiity for purchase (excluding food aid)							
How easily available (irrespective of price) were the following food items over the past month? Please indicate level of availability for each of the commodities using the availability codes below.								
		1	2	3	4	5	6	
Food commodity		Local market	Nearby district markets	Government reserves / stocks	Private grocery	Importer — private wholesaler	Village farmers — retailers	
preferably staples and substitutes								
1	Maize							
2	Sorghum							

A. I	A. Food availability for Purchase (excluding food aid)							
3	Millet							
4	Rice							
5	Wheat							
6	Sweet potato							
7	Irish potato							
8	Cassava							
9	Banana (matoke) / plantains							
10	Groundnuts							
11	Beans							
12	Soya beans							
Ava	ilability Codes:		0 = Not available					
			1 = Available					
			2 = Available but with difficulty					

TABLE 17. MODULE ON CHANGES IN FOOD VOLUMES ON THE MARKET

B. Change in food volumes on the market (excluding food aid)

Have the quantities on the markets increased, decreased or remained unchanged in the past three months? Please indicate changes in availability for each of the commodities using the codes below:

		1	2	3	4	5	6
Food commodity		Local market	Nearby district markets	Government reserves / stocks	Private grocery	Importer — private wholesaler	Village farmers — retailers
pre and	eferably staples d substitutes						
1	Maize						
2	Sorghum						
3	Millet						
4	Rice						

(continue....)

(...continue)

В.	B. Change in food volumes on the market (excluding food aid)						
5	Wheat						
6	Sweet potato						
7	Irish potato						
8	Cassava						
9	Banana (matoke) / plantains						
10	Groundnuts						
11	Beans						
12	Soya beans						
Ava	ailability Codes:		0 = No change				
			1 = Decr	ease			
			2 = Incre	ase			

DATA ANALYSIS AND INTERPRETATION

Since most of this information is qualitative, there are no specific quantitative methods for data collection. In interpreting and reporting on these indicators, bear in mind the seasonal patterns of food availability on markets and community access to markets.

Indicators of the range and quantity of food available should be evaluated in the first rounds of monitoring and compared to previous quarters. Once regular monitoring is established, the following rounds will track changes from one quarter to the next.

Caution on markets condition: note that the information collected at community level applies only to the community being monitored. This data needs to be linked to the geographic coverage of any survey approach adopted.

Questions used in the module to establish a baseline understanding of community access issues should be changed after the first round of monitoring. Subsequent rounds should focus on whether access is normal or not given the time of year. Data on community access, along with information on general market functioning (number of traders and availability of food on the market in sufficient quantity) can be combined with price information (from secondary sources or WFP monitoring) to understand the links between household food security and markets.

2.2.6. Income analysis

DEFINITION OF SOURCES OF INCOME AND REMITTANCES

One of the minimum standards of food security is access to opportunities for income generation, which allows individuals to secure adequate food to sustain their households.³³ Sources of income are an important indicator of food security because suitable employment and income facilitate access to food. Monitoring income sources as a food access indicator entails looking at trends in the reliability and sustainability of income sources.

THE IMPORTANCE OF REMITTANCES IN FOOD SECURITY

Remittances are a source of income based on person-to-person flows from migrants to their families. According to the International Fund for Agricultural Development (IFAD), remittances are the traditional means of providing financial support to family members who remain in less-developed countries,³⁴ while internal remittances are mostly from urban to rural areas. Both internal and international remittances play an instrumental role in reducing poverty and promoting growth and development.³⁵

Because it is difficult to quantify the size of remittances, the location of migrant workers may provide an indication of the significance of this source of income to recipient households. Remittances from areas with sustainable employment often represent a major improvement in household food access, whereas those from areas with workers seeking casual labour usually bring a much smaller improvement. Other data that could be useful in understanding the significance of remittances include: (i) the occupation of the migrant; (ii) the number of migrants that remit to the household; (iii) the frequency and regularity of transfers; (iv) the type of transfers (cash, in kind, mix); and (v) the share of total income from remittances.

^{33.} Tufts University. Food Security Minimum Standards, Key Indicators and Guidance Notes, p. 12. Available at http://www.tufts.edu/nutrition/webcm/docs/pdf/famine/sphere-fsms_draft1.pdf.

^{34.} IFAD. Remittances as a Development Tool, p.2. Available at

www.europarl.europa.eu/document/activities/cont/200911/20091113ATT64459/20091113ATT64459EN.pdf. 35. UNDP, 2005. Background note.

The amount received through remittances has been recorded as more than twice that of official development assistance to developing countries. But the global economic crisis means that developing countries are facing declines in remittances.

UNDERSTANDING LIVELIHOODS

When analysing sources of income, it is important to understand and to distinguish between population groups according to the characteristics that make them vulnerable. One of the main population characteristics is their livelihood group. A livelihood group is defined as a group of people who share similar basic means of livelihood and lifestyles. Livelihoods groups can be identified because they share the same main subsistence and income activities and social and cultural practices, and they face similar risks of food and nutrition insecurity.³⁶ In an FSMS, livelihoods are selected according to primary productive activities; this helps ensure that the groups are relevant to the local context. The following example illustrates how livelihood groups can be impacted by a shock.



If locusts have destroyed crops, livelihoods groups involved with crop production and sales may be severely impacted whereas those who are not would be much less affected. For example, farmers and traders may become food insecure, while fishermen may even report a gain income from their activities.

DATA COLLECTION ON SOURCES OF INCOME AND REMITTANCES

Indicators of income sources and remittances can be collected using both community and household instruments. For microeconomic analysis, it is useful to collect data through household surveys. Macroeconomic analysis can be based on key informant interviews, group discussions and secondary data.

Secondary sources of data include WFP CFSVAs, national living standards measurement surveys, national household income and expenditure surveys, and occasional surveys on remittances undertaken by the International Organization for Migration (IOM). These sources provide low-frequency data, normally every five years, and therefore they can only be used as a baseline.

^{36.} WFP, 2009. EFSA Handbook, second edition, p. 149.

For primary data on sources of income and remittances, community surveys are the preferred method. Since remittances are only a part of households' total income, it is important to separate remittances from other income-generating activities in order to capture the amount received through remittances. The information collected using the sources of income and remittances module includes:

- Main sources of income
- · Most important income sources at present
- · Share of total income contributed by main income sources
- · Occupation of the migrant who remits
- Number of migrants who remit to the household
- Frequency and regularity of remittance transfers
- Type of transfer (cash, in-kind, mix)
- · Share of total income from remittances
- Absolute income/remittance amount (if possible)

Below is an example of a sources of income and remittances module that could be used in a community key informant questionnaire.

A. Co	Community's Main Sources of Income						
A1	Please complete the table, one activity at a time, using the main source codes below. (Using proportional piling or "divide the pie" methods, please estimate the relative contribution to total income of each source [%])	A1a) Currently, what are the three most important income sources in this community? (Use source code, up to three sources, remember to insert %)					
А	Most important	1. Men 3. Women	2%_% 4%_%	1. Men 3. Women	2%_% 4%_%		
В	Second	1. Men 3. Women	2%_% 4%_%	1. Men 3. Women	2%_% 4%_%		
С	Third	1. Men 3. Women	2%_% 4%_%	1. Men 3. Women	2%_% 4%_%		

TABLE 18. INCOME SOURCES MODULE

(continue....)

(...continue)

A. Co	A. Community's Main Sources of Income							
Main	Main source codes:							
1	Remittances				Pensi	on		
2	Food crop production / s	sale	S	11	Forma	al salary / wages		
3	Cash crop production			12	Fishin	g		
4	Casual labour			13	Gifts			
5	Begging			14	Vegetable production / sales			
6	Livestock production / sa	ales	\$	15	Gold	Gold panning / small-scale mining		
7	Skilled trade / artisan			16	Food	assistance		
8	Small business			17	No oth	ner source		
9	Petty trade (firewood sal	es,	etc.)	18	Other			
Remi	ttance							
A2	What proportion of	No rem	nittance	Э	%% (if 1. go to next section)			
	households receive remittances?	2.	Receiv	e remittances		%% (if 2. go to A3)		
	What proportion of households receive remittances from the following sources	What proportion of households receive remittances from the following sources 1 Rural				_%%		
	piling or "divide the	2	Urban	source	9	%%		
	pie" methods, please estimate the relative number of households	3	Abroad (out of	d the co	untry)	%%		
	that receive remittances [%])							
AЗ	Has the frequency and t	he	amount of	f remitt	ances c	hanged in the last XX months?		
	Use the codes on remi	ttar	nce chang	ges be	low			
А	Local source	1	=					
В	Urban source	1	=					
С	Abroad							
	(out of the country)	1	=					
Ren	hittance changes: 1 = Same;	2 =	= Increased	d; 3 = I	Decrease	d		

Source: Sample community instruments under development 2010.

DATA ANALYSIS OF SOURCES OF INCOME AND REMITTANCES

The source-of-income indicator is calculated by average percentages or average absolute income values per each income-generating activity. Similarly, the remittance indicator is calculated by average percentages or average absolute income values per each source of remittance. Sources of income are directly related to economic activities and therefore may vary during the year depending on the seasonality of production, demand for labour, etc.

Quantifying income sources such as self-consumption, in-kind payments for casual labour, gifts and donations can be difficult, so care should be taken to identify all cash and in-kind income sources in order to determine which ones sustain households. Recent CFSVAs give detailed information on population groups according to main economic activities and the contribution of these activities to household incomes. Information collected for food security monitoring may not provide the same level of detail as CFSVAs, which report on groups by income source (as a proxy for livelihood), but CFSVA data represent important baseline information.

INTERPRETING AND REPORTING ON INCOME AND REMITTANCES

Income sources are considered 'poor' when they are unreliable, unsustainable, socially unacceptable (e.g. begging) or known to provide a low gain (for example 'unskilled casual labour' when the daily labour rate is known, or 'pensioner' when the level of the official pension is known). Income sources are deemed 'good' when they are reliable, sustainable, socially acceptable and expected to provide a reasonable gain (for example, 'employment in an international organization' or 'large business'). The types of transfers remitted are also not always equal; international remittances represent a major improvement compared to internal remittances, which in turn offer greater gain than local remittances.



An example of how to report income sources is illustrated in Figure 7.

Figure 8 shows an example of how to report remittances:



Caution of sources of income and remittances: The main concerns here are outliers, missing data, activities repeated in more than one variable and percentages of activity variables that do not add up to 100 percent. Another issue is the accuracy of estimated data, because people are often reluctant to reveal information on their incomes and remittances.

2.2.7. Expenditure analysis

DEFINITION OF EXPENDITURE

This indicator details the level of household expenditures on food and non-food commodities. It is useful for understanding how households allocate scarce resources and prioritize competing needs. Expenditure data are used as a proxy for wider purchasing power, which is an important measure of food access.³⁷

COLLECTION OF EXPENDITURE DATA

The data for this indicator are collected at household level. For all food items, the recall period is set at one month. Non-food items like soap, transport, firewood/charcoal, rent, paraffin and alcohol/tobacco should also have a one-month recall period to enable comparison and analysis. It is important to measure changes over longer periods of time for items such as debts, fines, clothing, construction and other long-term investments.

The information collected in the expenditure module should include:

- monthly amounts spent on food items, whether in cash or in kind;
- monthly amounts spent on non-food items, whether in cash or in kind; and
- biannual (twice year) amounts spent on long-term expenditures in cash.

^{37.} WFP, 2009. CFSVA Guidelines, first edition, p. 102.

Below is an example of an expenditure module that could be used in a sample household questionnaire.

TABLE 19. EXPENDITURES MODULE

A	How much did your household spe "0" if no expenditure (amount in loc	nd on FOOD ITE cal currency)	MS during the PA	AST 30 DAYS?
	FOOD ITEMS	a. Cash / credit	b. Value of consumption from own production	c. Value of consumption from gifts / food aid
A1	Bread / wheat flour			
A2	Maize / sorghum / millet / other cereals			
A3	Fresh vegetables			
A4	Fruits			
A5	Pulses (beans, lentils, cowpeas)			
A6	Milk / dairy products / butter / ghee			
A7	Meat			
A8	Fish			
A9	Poultry			
A10	Other food expenditures			
A11	Soft drinks / beer / drinking water / etc.			
A12	Meals / snacks consumed outside home			
В	How much did your household spend "0" if no expenditure (amount in local	l on NON-FOOD I currency)	TEMS during the	PAST 30 DAYS?
	NON FOOD ITEMS	a. Cash / credit	b. Value of consumption from own production	c. Value of consumption from gifts / food aid
B1	Tobacco / cigarettes			
B2	Soap / cosmetics / personal hygiene			
B3	Transport (including fuel)			
B4	Communication			
B5	Cooking fuel / firewood			
С	How much did your household spend SIX MONTHS? "0" if no expenditure (d on LONG-TERM amount in local cu	EXPENDITURES urrency)	during the PAST
	LONG – TERM EXPENDITURES	a. Cash/credit	b. Value of consumption from own production	c. Value of consumption from gifts / food aid
C1	Clothing			
C2	Education (school uniforms, fees, books)			
C3	Health / medication			
C4	Veterinary expenses for farm animals			
C5	Rent			
C6	House construction / repair			

(continue....)

(...continue)

с	How much did your household spend on LONG-TERM EXPENDITURES during the PAST SIX MONTHS? "0" if no expenditure (amount in local currency)									
	LONG – TERM EXPENDITURES	a. Cash/credit	b. Value of consumption from own production	c. Value of consumption from gifts / food aid						
C7	Hiring labour									
C8	Business inputs / development									
C9	Farming equipment / seeds									
C10	Celebrations / social events									
C11	Utilities (electricity, water, gas)									
C12	Repayments of debts									
C13	Remittances / gifts to help out relatives / friends									
C14	Other long-term expenditures									

In order to obtain values of in-kind expenditures, it is necessary for the interviewer to go through the list of items obtained on a non-cash basis and calculate their approximate values based on known market prices.

DATA ANALYSIS OF EXPENDITURE

To ensure the comparability of all food and non-food items, the absolute values of all the expenditures collected every six months should be divided by six, characterizing them as monthly expenditures. After calculating the sum of all expenditures, three further calculations should be made: total cash expenditure on food items total cash expenditure on non-food items and total cash expenditure.

In analysing expenditure, one could investigate the overall share of expenditure on food or non-food by simply dividing the total expenditure on food items by the total expenditure. To understand which items specifically exhaust expenditure, the share of expenditure on a specific item can be calculated by dividing the expenditure value of this specific food or non-food item by the total expenditure on all food or non-food items.

REPORTING ON EXPENDITURE

The most consistent and unbiased way to interpret expenditure data is to use shares of expenditure on specific items to justify findings from other indicators. For instance, if the proportion of households with poor food consumption has increased significantly, it is likely that their expenditure on meat, fish and eggs has decreased. In addition, it is recommended to report the shares (or percentages) of expenditure items. The best way to display this data is in a pie chart because this illustrates that the total expenditure is equal to 100 percent.

A threshold-based indicator should be established (e.g. the percentage of households spending over 60 percent of total expenditure on food). This requires

baseline data from a CFSVA report or similar. Care should be taken to define the threshold as being on a cash basis or in-kind basis to ensure data is interpreted consistently.



Caveat on expenditure analysis: It is advisable to tailor the expenditure analysis to a reduced list of food and non-food items since the FSMS is intended as a light monitoring system. Therefore only data on key variables (food and in kind) should be collected to obtain an overall estimate of expenditure for each household.

2.3. Food Utilization Indicators

2.3.1. Mid-upper arm circumference (MUAC)

DEFINITION OF MUAC

MUAC is an anthropometric measurement used to gauge acute malnutrition. It is a quick and easy predictor of the immediate risk of death from macronutrient malnutrition. In terms of public health, low MUAC in children denotes an increased risk of mortality, whereas low MUAC in women denotes an increased risk of babies being born with low birth weight.³⁸Although weight for height (w/h) is considered the gold standard for estimating acute malnutrition, MUAC is judged more appropriate for FSMS because of its greater sensitivity to child mortality.

^{38.} WFP,2009. EFSA Handbook, second edition, pg. 59.

DATA COLLECTION OF CHILDREN'S AND WOMEN'S MUAC

A survey of individuals (children and/or women of reproductive age) is used to obtain MUAC data. The information collected in a MUAC module includes the MUAC measurements of children (preferably between 12 and 59 months of age) and the measurements of women of reproductive age. MUAC should not be collected nor analysed for pregnant women because weight gained during pregnancy may give erroneous results.

It is advisable to collect MUAC data within a regular household survey for food security monitoring, but sampling has to be carefully considered. A low number of measurements will not be usable as it is likely to generate a wide range of values. Non-random sampling will also prevent the extrapolation of results to other areas and population groups. However, it is possible to cross-tabulate MUAC with food security information from the same households. Collecting MUAC from either children or mothers is generally sufficient. There is no need to collect anthropometric information from both, although both results can be useful for interventions.

Table 20 is an example of a MUAC module that could be used in a sample household questionnaire.

Ask only ab child	Ask only about children under 5. Complete 1st child (row) then move to the next shild													
	Sex or 1 = m 2 = fe	of child: Date of birth nale (if supported by a document or emale checked – if no document or not known, estimate age in months)			Date of birth (if supported by a document or checked – if no document or not known, estimate age in months)				child: Date of birth le (if supported by a document or checked – if no document or not known, estimate age in months)			is the	What woma MUA (Wom should not be pregn	is the an's C an d ant)
Child No. 1	9.1.1	—	9.1.2	// day/ month/ year	9.1.3	months	9.1.4	 cm	9.1.5	 cm				
Child No. 2	9.2.1	—	9.2.2	// day/ month/ year	9.2.3	months	9.2.4	 cm	9.2.5	 cm				
Child No. 3	9.3.1	—	9.3.2	// day/ month/ year	9.3.3	 months	9.3.4	 cm	9.3.5	 cm				

TABLE 20. MID-UPPER ARM CIRCUMFERENCE MODULE

DATA ANALYSIS OF CHILDREN'S AND WOMEN'S MUAC

MUAC is calculated by measuring the length of the upper arm from the tip of the shoulder to the tip of the elbow, dividing the measurement in half and then measuring the width of the arm at that level.³⁹ The data is analysed using standard thresholds to determine the prevalence of malnourishment in the sample. The table below shows the standard thresholds used and the respective severity statements assigned.

	In children	In women
Severe	MUAC<11.0 cm	MUAC<21 cm
Moderate	MUAC<11-12.5 cm	MUAC<21-22.5 cm
Global	MUAC<12.5 cm	MUAC<22.5 cm

TABLE 21. CATEGORICAL THRESHOLDS IN MUAC

2.3.2. Body mass index (BMI)

DEFINITION OF BMI

BMI is a nutritional status indicator that combines weight and height; it can identify both underweight and overweight individuals. In terms of public health, very low BMI for all adults denotes an increased risk of mortality.⁴⁰ High BMI denotes an increased risk of chronic diseases such as diabetes, cancer and hypertension. Very high BMI signals an increased risk of mortality from these diseases as well as from heart failure. BMI should not be collected nor analysed for pregnant women because weight gained during pregnancy may give erroneous results.

DATA COLLECTION OF REPRODUCTIVE-AGE WOMEN'S BMI

A household survey is used to obtain data to calculate BMI. The main information collected in a BMI module is the weight and height of all adults or of women of reproductive age only.

^{39.} WFP, 2009. CFSVA Guidelines, first edition, pg. 289.

^{40.} WFP,2009. *EFSA Handbook*, second edition, p. 59.

Below is an example of a BMI module for adult women of reproductive age that could be used in a sample household questionnaire.

TABLE 22. BODY MASS INDEX (BMI) MODULE

Caution: Do not measure pregnant women.							
Age in years	10.1.3	years					
What is the woman's height (in cm)	10.1.6	cm					
What is the woman's weight (in kg)	10.1,7	kg					

DATA ANALYSIS OF REPRODUCTIVE-AGE WOMEN'S BMI

BMI is calculated by dividing weight in kg by height in metres squared. The data is analysed using standard thresholds to determine the prevalence of malnourishment in the sample. The table below shows the standard thresholds used.

TABLE 23. CATEGORICAL THRESHOLDS FOR BMI

Type of malnutrition	Threshold	In reproductive-age adult women
	Severe	BMI < 16.0
Under-nutrition	Moderate	BMI 16–16.9
	Mild	BMI 17–18.4
	Normal	BMI 18.5–24.9
	Overweight	BMI 25–29.9
Over-nutrition and obesity	Obese	BMI > or equal to 30

The percentage of women with a BMI above 18.5 represents the proportion of women with overall good nutrition.⁴¹ Findings in the sample can be reported in a bar graph or table showing the percentage of women with a BMI below 18.5.



Caution on reproductive-age women's BMI: the two main concerns when measuring BMI are the accuracy of the measurements and the difficulty of measuring sick or disabled people. There are also considerations related to representativeness of the sample.⁴²

^{41.} WFP, 2009. CFSVA Guidelines, first edition, p. 290.

^{42.} Ibid, p. 290.

2.3.3. Disease prevalence

DEFINITION OF DISEASE PREVALENCE

The prevalence of diseases in a population can be defined as the number of cases divided by the number of individuals. It is a measure of the burden of the disease on the population. In food security analysis, disease prevalence is a food utilization indicator which can illustrate public health problems and help determine the underlying causes of malnutrition.⁴³ When monitoring disease prevalence for FSMS, it is most important to capture the health conditions of children under 5 (usually of children aged between 6 and 59 months).⁴⁴

Since those administering household surveys are not usually health professionals, it is advisable to conduct simple disease prevalence monitoring based mainly on secondary data (collected by health units).

DATA COLLECTION ON DISEASE PREVALENCE

Information can be collected both at household and community levels. A household survey is used for the former, while at community level, information can sometimes be obtained from health centre reporting systems.

The most important information to be collected on disease incidence is the report that a child has been ill with a specific disease in the last two weeks. Below is an example of a disease and MUAC module that could be used in a sample household questionnaire:



TABLE 24. DISEASE AND MUAC MODULE

43. Ibid, p. 291.

44. Ibid, p. 127.

Ask only about children under 5. Complete 1 st child (row) then move to the next child									
Child No. 1	9.1.1	—	9.1.2	_/_/_ day/ month/ year	9.1.3	 months	9.1.4	_	
Child No. 2	9.2.1	—	9.2.2	// day/ month/ year	9.2.3	months	9.2.4	—	
Child No. 3	9.3.1	—	9.3.2	// day/ month/ year	9.3.3	months	9.3.4	—	

DATA ANALYSIS OF DISEASE OCCURRANCE

The occurrence of disease is analysed either by recording the data in binomial yes/no variables or by recording the number of children experiencing a particular illness. Disease prevalence is then determined as the proportion between the number of children reported as have been sick compared to the total number of children in the entire sample. Disease prevalence can be estimated by sex or age group, highlighting gender or age discrepancies.⁴⁵ Data can be reported in a table or cross tabulated by sex.

INTERPRETATION OF DISEASE PREVALENCE

A high prevalence of sick children indicates poor health and probably poor water and sanitation conditions. Some diseases such as diarrhoea are also closely associated with acute malnutrition.⁴⁶ Disease prevalence does not always have a statistically significant association with food security. However, with the use of additional qualitative information, it may be possible to show whether disease is contributing to food insecurity. If a relationship does emerge, it is usually an inverse one whereby higher disease prevalence indicates poorer food security and low disease incidence indicates greater food security.

REPORTING OF DISEASE PREVALENCE

Disease incidence can be reported in a table denoting the proportion of children with diseases.

^{45.} WFP, 2009. *CFSVA Guidelines*, first edition, p. 291. 46. Ibid.

TABLE 25. SOMALIA, LUUQ DISTRICT: DISEASE PREVALENCE

Characteristics	Proportion
Disease prevalence and immunisation	
Children with acute respiratory infection two weeks prior to survey	43.4
Children with diarrhoea two weeks prior to survey	27.5

Source: FSAU Somalia Luuq District Nutrition Survey, pg. 17.

Caution on Disease Prevalence: The main concern when measuring disease incidence is accuracy of reporting from sampled households and possibly a low number of children from whom to calculate results.⁴⁷ It is therefore advisable to simply conduct simple, verifiable symptomatic monitoring.

2.4. Use of Secondary Information

The use of secondary data is key to maintaining a light and efficient system that is also affordable and sustainable. Monitoring systems are encouraged to piggyback on existing systems and conduct desk reviews to avoid duplicating the efforts of partners and other stakeholders. If complications restrict the FSMS from conducting a survey, the system can fall back on secondary information. When obtaining secondary information, it is important to assess the reliability and credibility of the source.

List of sources used in existing WFP FSMS:

- FAO/GIEWS. Country briefs
- FEWS NET. Monthly food security updates, alerts, monthly price bulletins and outlooks
- Ministries of Health
- Ministries of Agriculture
- National Statistics Office
- · Private Marketing Monitoring Organisations
- FAO Price Database

These sources are mainly useful for obtaining information in the domains of agricultural production, prices, food consumption, coping strategies, purchasing power, malnutrition and diseases. Therefore, even in the absence of a survey, an FSMS could report information in many domains and thereby comply with the target of publishing a report every quarter.

^{47.} Ibid.

3. Food Security Trends Analysis



Once results from all the indicators have been calculated and analysed, the analyst needs to tie the analysis together and identify a well-informed trend. Food security information may not always be convergent so different indicators may show improving, stable or deteriorating trends.

Although an FSMS does not have to draw conclusions or recommend action, it is important to consolidate the information in order to provide early warning of potential increases in food insecurity.

Unfortunately, there is no fixed method to correlate all the indicators addressed in this guidance sheet; this is left to the skill of the analyst. Nevertheless, the guidance highlights thresholds in some of the indicators such as the food consumption and MUAC cut-off rates that may be used to identify potentially high risks of food insecurity.

The analyst should also bear in mind the significant changes and shocks that clearly undermine food security.

Annex. Examples of Terms of Trade calculations

Example 1: Afghanistan – Unskilled labour and wheat flour/bread

These examples present two options for calculating ToT: unskilled labour/wheat flour and unskilled labour/bread. The data are derived from WFP's VAM Unit in Afghanistan.

Unskilled labour is the main source of income for poor households in Kabul, while bread is the main staple food. Traditionally, there is a preference for the traditional variety of wheat which is produced as a rain-fed crop. However, because of limited supplies, Kazakh flour now dominates the market thanks to its competitive price and white colour.

Figure 10 shows the daily rate of urban, unskilled labour in Kabul over an 18month period. Although the daily rate may be subject to variation, it is relatively stable when compared with commodity or staple food prices.



Figure 11 shows the price of wheat flour and bread over the same period, which includes several months of rising wheat grain prices on the international market. The international price trend is reflected in an increase in the price of both items until the price stabilized in mid-2008 and thereafter began to decline. While both prices increased, when the price of wheat flour began to fall the price of bread remained high. This tendency was also observed in other markets, including in Europe, after international grain prices reached their peak in 2008.



The calculation of ToT is shown in Figure C. While there was a considerable difference between ToT labour/wheat flour and ToT labour/bread in July 2007, this difference had been reduced to a minimum when food prices peaked in April 2008. For wheat flour, ToT declined by more than 200 percent, while bread saw a 95-percent decline. From May to December 2008, ToT for wheat increased by 40 percent, while that of bread remained constant. Therefore, households who mainly bought bread did not see any improvement in the latter period, while those who bought wheat flour recovered part of their purchasing power.



Example 2: Ethiopia – Livestock and grain

Gode Market in the Somali Region of Ethiopia is an important livestock and graintrading centre for pastoralists, who constitute the dominant livelihood group in this part of the country. Livestock traded in the market mainly consist of sheep and goats; grain is largely imported from other regions of Ethiopia. The calculation of ToT is for shoat/sorghum⁴⁸ and data are derived from the WFP's VAM Unit in Ethiopia. Here, market conditions tend to be marked by considerable seasonal variation as determined by rainfall and pasture conditions. Figure 13 shows the price of a head of shoat over a 27-month period.

^{48.} Shoat = sheep + goat, taking the average price of the two.



While price fluctuations during 2007 were relatively modest, the remaining period until May 2009 was marked by fluctuations of up to 200 percent within 60 days, with a low in September 2008 rising to a high in March 2009.

Figure 14 shows the price of a quintal of sorghum over the same period. From March 2007 to July 2008, the upward trend generally followed the trend in the international market for coarse grains. Prices started to decline between July and September 2008 and then increased to an all-time high in October 2008 (Br800/quintal). This was followed by a drop of more than 300 percent until February 2009. By May 2009, however, prices had increased again to Br400/quintal.



Figure 15 shows ToT for shoat/sorghum, which was marked by considerable variation and a dramatic decline from March 2007 until September 2008. When calculated on the basis of the moving three-month average, the decrease equals about 1,000 percent. This was followed by an improvement in ToT of more than 500 percent until March 2009, and then another decline until May 2009.



Such dramatic variations in ToT seem to be common in pastoralist areas, where the sale of livestock is dependent on access to water and on pasture conditions. However, the persistent upward trend in the price of sorghum was the determining factor in the dramatic decline in ToT during 2007 and the first half of 2008.

INTERPRETATION OF ToT

Both examples of ToT calculations cover a period in which national and international food prices rose continuously. In Afghanistan, this increase was reflected in high wheat flour prices through May 2008, with a modest downward trend until December 2008. In the case of Ethiopia, the price of sorghum peaked twice — in June and October 2008. In both cases, the increasing price of a particular food commodity was the main factor in the deteriorating ToT until the peak of food prices in 2008. However, the severity of the impact on households, as expressed in ToT, was highly variable because of price trends in the commodity being sold.

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Monitoring Food Security

Technical Guidance Sheet 2

Indicators Compendium

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