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Technical Guidance Sheet

Market Analysis

The Basics of Market Analysis
for Food Security
March 2009

Technical Guidance Sheet: The Basics of Market Analysis for Food Security

Prepared by: *Baker Mukeere*

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For any queries on this document, please contact: wfp.vaminfo@wfp.org

United Nations World Food Programme
Headquarters: Via C.G. Viola 68, Parco de' Medici, 00148, Rome, Italy

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1.0 INTRODUCTION

> *"THE Strategic Plan for 2008-2011 is the key to transforming WFP from a food aid agency into a food assistance agency that implements an array of innovative hunger solutions"* ***Josette Sheeran***

WFP's 2008-2011 Strategic Plan has introduced a historical shift in the organization's operational approach. It has committed WFP to change from a food aid agency to a food assistance agency. The Strategic Plan's overarching goal is to reduce dependency and to support governmental and global efforts to ensure long term solutions to the hunger challenge. The shift brings along new challenges in WFP's efforts to address global food insecurity. In order to respond adequately to these challenges, more nuanced and robust analytical tools will be required to provide well researched information for operations planning and informing corporate strategic decisions. Such analytical tools would include (among others) applied economic and market analysis tools.

2.0 THE BACKGROUND

In countries where WFP complements national efforts in combating food insecurity, the organisation's interventions are significant in the domestic food sectors. Being a player in the food sector, it is important for WFP to have a sound grasp of the basics of the food sector, including keeping abreast of the food security situation and relevant market intelligence.

The understanding of market analysis in a food security context is intended to achieve the following objectives;

- To highlight the significance of market analysis for the planning, implementation and evaluation of food security interventions and their impact
- To impart basic knowledge on the key aspects of market analysis in a food security context; and
- To prepare and enable WFP and counterpart staff to conduct basic market analysis in a food security context

3.0 DEFINING THE MARKET

From a general point of view, a market refers to the set of all sale and purchase transactions that affect the price of a commodity. In other words it is an interaction between demand and supply of a good or service and it entails consumers, suppliers, transactions and the factors that affect them.

It is worth noting that the term "market" is not only used to denote an organised exchange of goods and services operating in a well defined physical location. In its more general and abstract use, the term "market" also refers to a set of sellers and buyers whose activities affect the price at which a particular commodity is sold[1]. For example, two separate sales of maize flour in different parts of Zambia may be considered as taking place on the same market, while sales of a shirt and a kilo of beef in adjacent shops of a market square in Lusaka may occur on totally different markets!

In these notes the term "market" will be examined in the context of food security. Therefore, the focus will be on exchange of goods and services that directly or indirectly influence the food security of a society. Examples may include; agricultural inputs, farm produce, transport infrastructure and services, handling and processing, retailing, etc…

4.0 ANALYSING MARKETS

In general, markets are analysed for the purpose of understanding;

- the system within which they operate;
- how they are structured;
- the extent to which their actors are concentrated;
- the extent to which they are accessible to both sellers and buyers;
- whether they are connected and integrated with each other; and
- the policies and rules that regulate their functioning

[1] William J. Baumol and Alan S. Blinder: Economics, Principles and Policy, the Dryden Press Harcourt Brace College Publishers, 1998, New York, Toronto, London, Sydney, Tokyo.

A clear understanding of these aspects of a market provides a basis against which planning can be undertaken to improve a market's efficiency. Markets significantly impact on the lives of people and the general welfare of a society. Functioning markets contribute significantly towards improving living standards in a society.

For the purpose of these notes, markets will be analysed for both their actual and potential capacity to influence the food security status of a society and in the context of the impact of food security interventions.

Before conducting a market analysis, it is imperative to first understand how the market is organised and how it functions. The characteristics of a market system will have a significant effect on how the market itself operates and responds to both endogenous and exogenous effects. The first step of market analysis therefore is to gather information on its basic characteristics in order to build a market profile to understand how it is structured and how it operates and influences the food security status of those who depend on the market.

4.1 Building a Market Profile

In building a market profile, one has to gather information on the following key components namely; the market system, market structure, market concentration, market accessibility and connectivity, market integration and government policies and regulations that impact on the operation of the market.

The following sub-sections provide an explanation of the key constituents of a market profile (in a food security context). Comprehending them as integrated components enables one to understand how a market as a single entity operates and impacts the behaviour of its participants.

4.1.1 The Market System

The relevance of a market system is vital when considering key market aspects such as price fixing mechanisms, production resource allocation, output levels, estimates of sup-

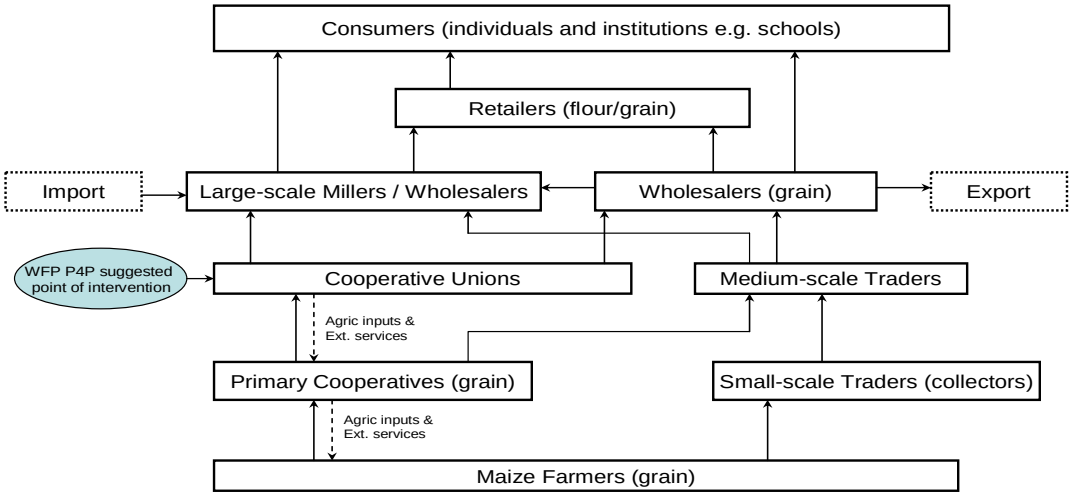
ply changes in response to different consumer demand levels, etc… In order to identify the type of market system that exists, one needs to understand whether the market is;

- Centrally-controlled. A market system is centrally controlled when decisions on production resources allocation are made by Government and not by producers responding to market forces through consumer demand. It is a system where the government's role in controlling the economy is considered "significant" (close to 100%). Examples include the old Soviet system, the North Korean system, etc…
- A free-market system is one where government control is totally absent (an ideal rather than a real situation) and all decisions on production resource allocation are left to the independent decisions of individual producers and consumers acting in their own best interest.
- A mixed-economy market system. In reality this is the type of market economies that prevails world-wide. Here markets are mixed in the sense that they are operated on free-market principles, however with varying degrees of government controls (varying from country to country).

4.1.2 The Market Structure

A reference to market structure describes the market in terms of who is participating in the market, the magnitude of their participation and their level in the market chain. To determine the structure of a prevailing market, one needs to understand whether the market players are predominantly large-scale traders, small-scale individual traders, large companies or farmers' associations/cooperatives etc… By knowing the type of market players at different levels in the market, one is able to determine its structure. The example below illustrates the structure of the maize market in Rwanda. The example was developed in planning for the implementation of a Purchase-for-Progress (P4P) intervention in the country. Through an understanding of the market structure, the assessment team was able to recommend WFP's point of entry in the country's maize market to bring maximum benefit to the maize farmers.

Figure I: Market Structure for Maize in Rwanda



Source: Rwanda Agricultural Development Authority (RADA), Kigali October 2008

4.1.3 Market Concentration

The degree of market concentration reflects the share of a market of a given commodity that is in the hands of an individual participant or a group of participants. The market concentration tells us about the participants' ability to dominate and influence important market processes such as commodity supply, commodity demand, price fixing, etc… The fewer the participants that influence market processes the higher the market concentration and vice versa. In economic terms, the degree of market concentration ranges between ***perfect competition*** (at one extreme) whereby many market participants are selling an identical product, and a ***pure monopoly*** (at the other end) whereby a sole market participant dominates the market single-handedly. In between the two extremes are forms of market concentration (that share both perfect competition and pure monopoly characteristics) like ***oligopoly*** where a few large market participants dominate the market and ***monopolistic competition*** where many small market participants are selling slightly different products. Under circumstances where there is only one buyer on the market, the situation is referred to as a ***monopsony***. Under perfect competition the market has numerous participants whose individual participation is negligible compared to

the total market. Their individual participation is so small that their individual decision bears no effect on a market price[2].

4.1.4 Market Accessibility and Connectivity

Market accessibility and connectivity is defined in terms of the infrastructure that links the market to other markets, the markets to production areas and markets to consumers. In general, the core objective is to examine whether the market points are accessible to all potential participants. The connectivity between producers/production areas and traders/consumers at market points largely determines the functioning of a market i.e. the status of connectivity and accessibility largely influences the prices of goods traded in the market or in extreme cases the market could cease to exist if connectivity is poor or non-existent. In remote areas where this is often the case, poor market accessibility often leads to an increase in food insecurity either through a total lack of supplementary sources of food to complement people's own production or through high food costs that household's are unable to afford. Poor market connectivity also hinders households' ability to earn income from cash crop sales thereby impacting on their food security. In many instances market accessibility and connectivity vary significantly from season to season (e.g. due to events such as impassable roads during the rainy season, etc), thereby triggering seasonal variations in the supply of produce and resultant market price variations.

4.1.5 Market Integration

An integrated market is one whose composite market locations are inter-connected (in terms of physical and communication infrastructure) with fewer barriers to enable efficient flow of goods and services. The interconnectivity among composite market locations lessens transaction costs and enhances efficient price transmissions among various market locations. As a result, an integrated market is characterised by harmonised price patterns of a particular commodity in the various composite market locations.

For the purpose of these notes the term ***market integration*** will be used to refer to what is generally known to be ***spatial market integration***. A spatially integrated market is

[2] William J. Baumol and Alan S. Blinder: Economics, Principles and Policy, the Dryden Press Harcourt Brace College Publishers, 1998, New York, Toronto, London, Sydney, Tokyo.

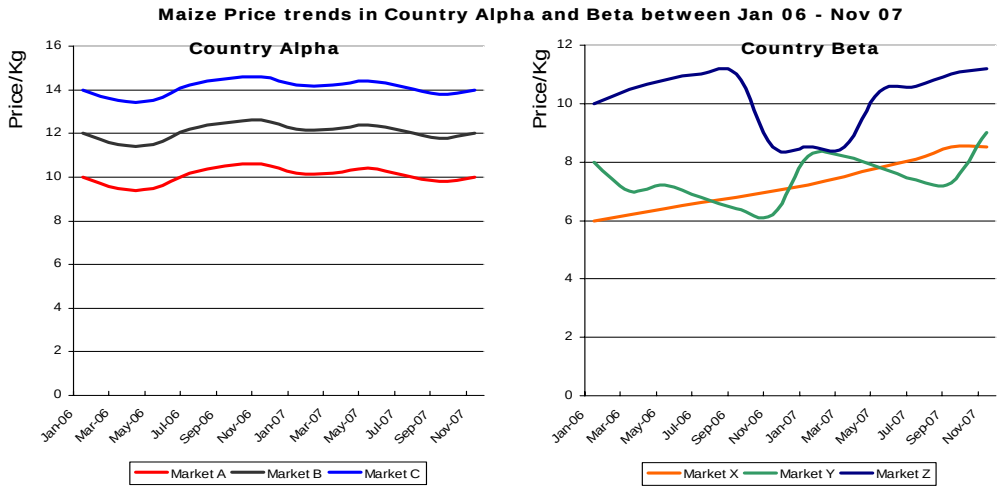
characterised by commodity price trends at different market locations that follow a similar pattern over an extended period of time (i.e. at least 2 agricultural seasons). This pattern is also referred to as a co-movement of prices that is caused by a smooth transmission of price signals across spatially separated market locations. When there is a co-movement of prices among different market locations then the market is said to be integrated.

The degree of market integration can be derived econometrically in order to measure the relationship among spatially separated markets (or market locations)[3]. Some of the advantages of an integrated market include: enhanced security of supply, reduced price risks, reduced market entry barriers leading to increased numbers of suppliers etc… Well-integrated markets support the effectiveness of macro-level economic policies.

The following example in figure 2 illustrates market integration in simpler terms basing on price trends for maize in two hypothetical countries. In country Alpha with a well integrated maize market there is a perfect co-movement of its prices among all the three markets. In country Beta where the maize markets are not integrated the individual price trends do not reflect a significant interdependency among the three markets.

[3] The common tool used to measure spatial market integration is **Co-integration Analysis**. This is so due to the nature price data series (that is used to determine the degree of integration) being non-stationary. The approach of using co-integration analysis avoids spurious regression results that often emerge when non-stationary time series data are used in a regression model giving the indication of a significant relationship when in the real sense there is none.

Figure II: Illustration of Integrated and Not-Integrated Markets



Market Analysis Team, OMXF, WFP Rome, Feb 2009 25

In food security terms, the lack of integrated markets may lead to serious incidences of localised food insecurity in parts of a country when other areas are experiencing food surpluses. If agricultural markets are not integrated, then any local food scarcity will tend to persist, as distant markets (with no scarcity) will not be able to respond to the price signals of isolated markets with food surpluses[4].

4.1.6 Government Policies and Regulations

When building a market profile it is always important to take into consideration prevailing government policies and regulations that either directly or indirectly impinge on the market's processes. Such policies and regulations could either facilitate or hinder a market's performance and functioning.

In general, governments intervene in a market for a number of reasons. These may include; fiscal purposes (e.g. imposition of taxes/duties), political purposes (e.g. consumer subsidies to contain probable riots), development purposes (e.g. producer subsidies or import duties to protect nascent domestic industries) etc…. For a detailed analysis of

[4] Dreze, J. and A. Sen (1995) The Political Economy of Hunger, Oxford: Clarendon

government policies and regulation and their impact on food markets see detailed chapter on “Analyzing Government Policies and Regulations”.

5.0 WHY MARKET ANALYSIS IN A FOOD SECURITY CONTEXT?

The three major components on the supply side of a nation’s food balance sheet (that best estimates a country’s food security status) are:

- domestic food stocks and production capacity;
- capacity to import adequate food to meet food gaps; and if not adequately covered
- food aid as an alternative to help bridge the gap

For the first two components that constitute the core of a nation’s food security, the market is pivotal in ensuring that the two components fulfil their respective roles through the efficient movement of food from where it is produced or imported to where it is consumed.

As economies grow, the proportion of households that are net consumers of food tends to outgrow the number of those that are net producers of food (i.e. with their own food production exceeding household food consumption requirements). In many developing countries, disasters further increase the number of net-consuming households by reducing household food production. From both points of view, the implication is that more and more households worldwide are increasingly relying on markets to meet their food demands. The role of markets has become vital in any nation’s food security. Therefore, the understanding of how markets function has become equally important for those stakeholders involved in dealing with national and global food security.

In the developing world, the food aid component of a country’s food balance sheet may constitute a complimentary but vital part of the national food security. In such instances, careful advance planning becomes paramount since food aid can have serious repercussions on a nation’s food production and food markets if not appropriately implemented. WFP is the largest food assistance organisation in the world and its policy commits the organization to the use of food aid in situations where it has a comparative

advantage and where food aid does not negatively impact local food production and food marketing systems.

In the context of a strategy of a nation's food security, market analysis should serve the purpose of providing tools for:

- estimating national/regional/local food supply capacities/potentials against domestic requirements;
- determining market response capacities to cover national food demand gaps;
- early warning in cases where domestic food production and food markets are unable to adequately cover national food demand gaps; and
- designing policy recommendations to national governments and informing the corporate policies of global food aid actors on global and national food security strategies

In the specific instances of food aid provision at a national level, market analysis in a food security context may provide tools for:

- planning food aid interventions with the assurance that their impact on local food production and food markets is not a negative one;
- making the appropriate decision on whether cash/vouchers or food aid is the best suited option to address prevailing food insecurity; and
- planning local or regional food purchases and ensuring that these are implemented at the optimal time with maximum developmental effect on domestic producers and markets

It is worth noting that in cases of food aid interventions, the basic principles of market analysis for food security are similar for emergency, recovery or development situations. However the depth and expanse of analysis may vary depending on needs, prevailing conditions and the urgency for action.

Applied market analysis in a food security context should always deliver results that are clear, understandable and relevant to efforts being made in addressing food insecurity. Therefore, the results of a market analysis for food security should provide clear answers and evidence-based recommendations on the following questions:

- From the market perspective, what long-term solutions exist to address food insecurity in a sustainable manner?
- What is the capacity of local markets to meet prevailing food demand?
- Is food aid the best option of intervention to address food insecurity among the targeted population; if not, what are the alternatives?
- If food aid is the appropriate response, then what quantity would not distort markets and cause producer disincentives, with what commodities (local tastes), and when would it be best to intervene?
- Is the local/regional procurement of food aid feasible?
- If the local/regional procurement of food aid is feasible; when should it be conducted, what commodities should be procured, how much should be procured, from which markets, from whom, and at what prices, what procurement arrangements would maximise the impact on farm household incomes and on developing local food markets?
- Etc…

6.0 KEY ASPECTS OF MARKET ANALYSIS FOR FOOD SECURITY

In a food security context of a country, market analysis should clearly reflect the interplay among the following key elements that influence national food security:

a) domestic food production
b) food imports (commercial and food aid)
c) the marketing system & infrastructure; and
d) national policies and regulations that interface with food security

The approach for market analysis should involve the use of both; (a) primary qualitative and quantitative data (e.g. from food market surveys and monitoring systems), and (b) secondary data (from sources such as market research reports, regulatory agencies, industry periodicals, statistical departments, commodity trader organizations, companies, etc…). In cases where a databank for time-series data is maintained, market analysis data needs to be updated on a regular basis. Updates could be done on a weekly or

monthly basis depending on feasibility and the routine has to be kept up over a considerable period of time. This is important since markets are always dynamic rather than static. The analysis is expected to provide not just a snapshot of the current situation but a wider picture of events reflecting vital aspects of market seasonality. Some data for market analysis does not necessarily need to be updated on a frequent basis as long as it is not subject to regular changes e.g. national policies/regulations, production seasons, market structure & concentration, national staples, etc…

Another important form of information for market analysis is the data that is derived from other systems e.g. real prices, consumer or other price indices, food deficits/surpluses, degree of market integration/fragmentation, etc…
In a food security context, the key specific data requirements for a market analysis may include the following;

Table 1; Data for Market Analysis in a Food Security Context

Market Aspect	Direct/Indirect Indicator	Data source primary (P)/secondary (S) or derived (D)	Frequently Updated	Not Frequently Updated
Domestic Supply				
	Cropped area	S/P	X	
	Yield averages	S/P		X
	Animal population	S		X
	Domestic food production	S	X	
	Production structure (large/medium/small scale farmers)	P		X
	Production cycles/seasons	P		X
	Average post-harvest losses	S		X
	Average on-farm consumption	S		X
	Marketable surplus	D	X	
	Installed capacity for food processing	S		X
	National stock reserves and or trader stocks	S	X	
	On-farm storage capacities	S/P		X
	Commercial food imports	S	X	
	Government food imports	S	X	
	Informal food imports	P/S	X	
	Food aid stocks/pipeline status	S	X	
Domestic Demand				
	National food consumption estimates	S		X
	Staple foods	P		X
	Per capita consumption	S		X
	Annual food deficit/surplus	D	X	
	Food export estimates	S	X	
	Targeted household food consumption	P	X	

Aspect	Indicator	Data source primary (P)/secondary (S) or derived (D)	Regularly Updated	Not Frequently Updated
Market Prices				
	Price setting mechanism	P/S		X
	Farm-gate prices (nominal)	P/S	X	
	Farm input prices (nominal)	P/S	X	
	Wholesale prices (nominal)	P/S	X	
	Retail prices (nominal)	P/S	X	
	Import parity prices (for internationally tradable)	D	X	
	Export parity prices (for internationally tradable)	D	X	
	Livestock prices (& terms-of-trade with cereals)	P/S	X	
	Labour wages rates	P/S	X	
	Fuel prices	P/S	X	
	Transportation costs	P/S	X	
	Taxes/levies on food commodities	P/S	X	
	Monetary exchange rates	P/S	X	
	Price variations among markets	D	X	
	Consumer price indices	D	X	
Market system & infrastructure				
	Market structure (links among players)	P		X
	Market concentration (scale of dominant players)	P		X
	Credit rates for working capital	S	X	
	Market connectivity and accessibility (road conditions and distance between markets)	P		X
	Market integration/fragmentation	D		X
Policies & Regulations				
	Price controls	S		X
	Taxes/levies on food commodities	S		X
	Food import tariffs or subsidies	S		X
	Food export duties or subsidies	S		X
	Quality control systems	S		X
	Quarantines	S		X
	Quota systems	S		X
	Consumer and or producer subsidies	S		X
	Ban on imports/exports of specific foods	S		X

7.0 HOW TO ANALYSE MARKET PRICES

A price denotes the monetary value of a good or service that the buyer and seller mutually agree to attach to it. For a seller who is seeking a profit, the price is made up of the cost (i.e. the investment made to produce the good or service) and a profit margin. In a perfect market, prices serve to match the quantities supplied to the market to consumers' demand. For example, if a maize price rises due to inadequate supply to meet demand, the farmers will respond by producing more of it to make a profit and in the process raise the quantity supplied to ultimately bring down the price to the equilibrium level[5].

In market analysis, the price aspect often constitutes the prominent part. It is therefore preferable to generate price data from primary sources or reliable secondary sources for better accuracy in the analysis of market dynamics. Price analysis of spot checks rather than of time series data generated over a significant period should always be discouraged because of its limitations in reflecting the vital market aspect of seasonality.

Market prices are primarily analysed (among others) to:

- determine the degree of integration among various market points
- determine profitability of a business venture (in tandem with cost analysis)
- interpret the impact of cost changes and their implications beyond supply and demand;
- anticipate market participant responses towards emerging incentives or disincentives;
- derive price indices that in turn determine the level of inflation;
- Etc…

In a food security context, price analysis would assist in determining:

- accessibility to food by market-dependent consumers (e.g. poor urban net-consumers and other vulnerable groups) by determining a threshold price level beyond which the food security of such groups becomes critical;

[5] The equilibrium level denotes the market price where the quantity supplied on the market matches the quantity demanded.

- likely impact of food aid on domestic food production and food markets;
- whether to adopt a cash/voucher approach as opposed to food in addressing food insecurity;
- whether, when, where and how to implement local food purchases for e.g. humanitarian interventions;
- Etc…

It is worth noting that a more accurate market price analysis is conducted using *real prices* rather than *nominal prices*. (See definition of both terms in the following subsection 7.1)

7.1. Definitions of Key Terms in Market Price Analysis;

Consumer price index: A consumer price index (CPI) expresses the market cost of a basket of goods relative to its cost in some "base period".[6] In most countries the CPI is derived basing on the budget of a typical urban family. The consumer price index is defined by the following rule.

$$\frac{CPI_{2008}}{CPI_{in\ base\ year}} = \frac{Cost\ of\ \ market\ basket_{2008}}{Cost\ of\ \ market\ basket_{in\ base\ year}}$$

When constructing such index numbers, it is conventional practice to set the index at 100 in the base period. Therefore;

$$\frac{CPI_{2008}}{100} = \frac{Cost\ of\ \ market\ basket_{2008}}{Cost\ of\ \ market\ basket_{in\ base\ year}}$$

Resulting in

$$CPI_{2008} = \frac{Cost\ of\ \ market\ basket_{2008}}{Cost\ of\ \ market\ basket_{in\ base\ year}} \times 100$$

As an example, if the CPI in 2008 is equivalent to 143.5, it would simply mean that in 2008 it costs 143.5 currency units to purchase the same market basket of goods and services that cost 100 currency units in the base year. One of the most common uses of the CPI is in the comparison of monetary figures relating to two different points in time.

[6] William J. Baumol and Allan S. Blinder: Economics, Principles and Policy, the Dryden Press Harcourt Brace College Publishers, 1998, New York, Toronto, London, Sydney, Tokyo

The problem is that, if there has been inflation, the currency (Euro, Dollar, Birr, etc…) is not a good measure because it can buy less now than it did in the past or vice versa.

Example I elaborating the use of a Consumer Price Index (CPI) in a food security context

Imagine some typical households living in a chronically food deficit area characterized by recurring droughts, floods or even insecurity in a hypothetical country. How do we devise a cost-of-living index for them? This cost-of-living index (CLI)] could with other instruments be used for example by the Ministry of Disaster Preparedness or the Humanitarian community to plan humanitarian interventions. The CLI could help to gauge how the community's access to food and household food consumption is affected over time by market food prices. Knowing this would help in planning and designing interventions such as safety net programmes that would facilitate the vulnerable households' access to food.

Faced with such a situation, one would first conduct a survey of the households' spending habits in the current period and obtain corresponding survey data or the base year (say 2000 – because according to locals "it was a typically normal agricultural season").

Table a: Results of Vulnerable Household[7] Expenditure Survey, 2000

Item	Price / Shillings	Purchases per Month	Average Expenditure per Month / Shillings
Maize	650	25kg	16,250
Millet	500	16kg	8,000
Meat	1,700	4kg	6,800
Salt	250	1kg	250
Sugar	1,200	3kg	3,600
Cooking oil/fat	1,300	1kg	1,300
Beans	600	10kg	6,000
Condiments	600	0.5kg	300
Clothing	-	1	2,800
School fees	2,500	4 pupils	10,000
Medical expenses	-	1 clinic visit	2,800
Transportation	-	0.5 travel	1,800
Miscellaneous	-	-	2,000
Total			**61,900**

[7] Average household size is 5 individuals

In table a, a typical vulnerable household in our region of interest was spending on average Shillings 61,900/= per month in 2000. In Table b, all the prices of the same household items in 2008 have increased in a different manner: maize by 84.6%, meat by 35.3%, cooking oil by 69.2%, etc… By how much has the cost of living index risen for the community?

Table b: Cost of Vulnerable Household's Budget in 2008

Item	Price / Shillings	Purchases per Month	Average Expenditure per Month / Shillings
Maize	1,200	25kg	30,000
Millet	900	16kg	14,400
Meat	2,300	4kg	9,200
Salt	400	1kg	400
Sugar	1,800	3kg	5,400
Cooking oil/fat	2,200	1kg	2,200
Beans	800	10kg	8,000
Condiments	700	0.5kg	350
Clothing	-	1	4,000
School fees	3,000	4 pupils	12,000
Medical expenses	-	1 clinic visit	3,500
Transportation	-	0.5 travel	3,000
Miscellaneous	-	-	2,000
Total			**94,450**

The totals in both tables show us that what once cost Shillings 61,900 in year 2000 is now costing Shillings 94,450 in year 2008 (an increase of about 52.6%). From our basic rule of calculating price indices

$$\frac{CLI_{2008}}{CLI_{2000}} = \frac{Cost\ of\ \ HH\ budget_{2008}}{Cost\ of\ \ HH\ budget_{2000}}$$

When constructing such index numbers, it is conventional to set the index at 100 in the base period. Therefore;

$$\frac{CLI_{2008}}{100} = \frac{Cost\ of\ \ HH\ budget_{2008}}{Cost\ of\ \ HH\ budget_{2000}}$$

Resulting in

$$CLI_{2008} = \frac{Cost\ of\ \ HH\ budget_{2008}}{Cost\ of\ \ HH\ budget_{2000}} \times 100$$

Therefore:

$$CLI_{2008} = \frac{94{,}450}{61{,}900} \times 100 = 152.6$$

Thus, the Cost of Living Index for the community in our area of interest is 152.6 meaning that the cost-of-living for that community has increased 52.6% over the

eight years. On average, what used to cost Shillings 100 in year 2000, now costs Shillings 152 and 60cents in year 2008.

Nominal prices: Nominal prices denote the current monetary value of a good or service i.e. as seen or actually observed by the monitor in the field, in a shop or at a market stall.

Real prices: are prices adjusted for inflation using a consumer price index of the corresponding year. The process of adjusting for inflation is called deflating by a price index in order to determine the real value of some monetary magnitude in reference to a "base period". The "real" aspect here is defined by the currency value in the base year.
Therefore;

$$P_{real\ in\ 2008} = \frac{P_{nominal\ in\ 2008}}{CPI_{2008}} \times 100$$

This calculation serves to translate non-comparable monetary figures into more directly comparable real figures. The same concept is used to analyse how wages have faired overtime by calculating real wages rather than using nominal wages to determine whether and by how much the purchasing power of workers' wages have been eroded by inflation. It is for such reasons that in economic/market analysis the use of real prices is preferred to nominal prices. (See example below for elaboration purposes)

Example II on using the "Cost of Living Index" (CLI) as a deflator to derive real wages/household incomes

We can use our hypothetical CLI (in Example I) to determine how the purchasing power of the incomes of the heads of households in the study area has faired over the last eight years. As an example, suppose a good number of household heads in that region earn their living as wage labourers. Their monthly wages in year 2000 stood at Shillings 93,000 and in year 2008 they are currently earning Shillings 115,000 monthly. On initial observation the household income appears to have increased by a significant 23.7%

$$\frac{115{,}000 - 93{,}000}{93{,}000} \times 100 = 23.7\%$$

Frome our rule of deriving real figures

$$Wage_{real\ in\ 2008} = \frac{Wage_{nominal\ in\ 2008}}{CLI_{2008}} \times 100$$

Therefore:

$$Wage_{real\ in\ 2008} = \frac{115{,}000}{152.6} \times 100 = 75{,}360$$

In real terms, the wage rate for household heads has actually fallen from Shillings 93,000 to Shillings 75,360 in terms of the 2000 Shilling. With that fall in real household incomes the household heads no longer have the same ability to satisfy their household needs in 2008 as they did in 2000 unless they have a supplementary source of household income. Under such circumstances and without alternative sources of income, one would be justified in assuming a likely negative impact on household food consumption and satisfaction of other household basic needs.

N.B with regular update of monitoring data, a food security analyst in any country is able to predict deteriorating food access situations well ahead of the appearance of signs of malnourishment!!!

The outcome of such analyses would then be used along with other tools to guide the humanitarian community or the Disaster Preparedness Department in designing interventions that target the affected households to improve their access to food. A similar concept is also used by Trade Unions to provide a basis for salary increment negotiations with employers.

Farm-gate price: denotes the monetary value at which a farmer sells his/her produce on or within the vicinity of his/her farm/home premises. The selling could be to a trader, a cooperative or a consumer. Farm-gate prices should not be confused with prices at which a direct-marketing farmer sells his produce to consumers on a weekly produce market for example.

Wholesale price; A wholesale price denotes the monetary value at which a retailer purchases goods in bulk for onward selling with a profit to consumers. The retailer stocks the commodity in bulk and sells on in relatively smaller quantities. In market analysis, wholesale prices are the ones primarily used to calculate Import Parity Prices and Export Parity Prices (see below).

Retail price; A retail price denotes the monetary value at which goods and services are exchanged at the end of a market chain i.e. between the seller and the final consumer. At this stage in the market chain the seller is the retailer and the exchange is generally conducted on a much smaller scale than when goods and services are exchanged from

a wholesaler to a retailer. In market analysis, retail prices are the ones primarily used to derive Consumer Price Indices and GDP deflators

Import parity pricing; Import parity pricing (IPP) is done when a firm sells goods locally at a price customers would pay if they were to import the same goods from another country. Import parity prices are defined by location or points of trade i.e. port of import, major trading city, or central warehousing location. Wholesale prices of commodities are used to calculate their corresponding Import Parity Prices. Import parity pricing involves setting a commodity's price at world prices and adding freight costs, insurance costs, handling, inland transportation (for land-locked countries) up to a defined point of trade/location. See formula below elaborating the calculation of an IPP for a commodity imported into a landlocked country at the central warehouse.

$$IPP_{Central\ warehouse} = P_{cif} + C_{port\ charges} + C_{handling} + C_{inland\ transportation}$$

Where $P_{cif} = \left\{P_{FOB\ port\ of\ export} + C_{freight} + C_{insurance} + C_{unloading\ at\ port\ of\ import}\right\}$

$IPP_{Central\ Warehoouse} = import\ \ parity\ \ price\ at\ central\ \ warehouse$

$P_{cif} = import\ \ price\ entailing\ \cos t, insurance\ and\ \ freight\ charges$

$C = \cos t$

$P_{FOB} = price\ of\ \ commodity\ of\ \ import,\ \ free\ on\ board\ \ at\ \ port\ of\ \ export$

For calculating **Export Parity Prices (EPP),** the equation for IPP is more or less reversed. The formula below elaborates the case for a land-locked country. What is considered the port of import while calculating the IPP is referred to as the port of export in calculating the EPP. The EPP at the port of export is synonymous with the price of commodity free on board (fob) at the port of export.

$$EPP_{port\ of\ export} = \left\{P_{wholesale} \times Exchange\ rate\right\} + \left\{C_{inland\ transport} + C_{handling} + C_{port\ charges}\right\}$$

$EPP_{port\ of\ export} = Export\ \ parity\ \ price\ at\ \ port\ of\ \ export$

$P = price$

$C = \cos t$

Export parity prices are commonly used to determine the competitiveness of a country's produce at the international level (i.e. in the world market).

Commodity terms-of-trade: this term originates from international trade where it denotes the relative price value of a country's exports to its imports. A negative change in a country's terms-of-trade simply means a fall in value of its exports relative to its imports and vice versa. The term can also be used in comparing relative prices of two different commodities

In the context of market analysis for food security, the terms-of-trade jargon is used at a more local level to reflect a "barter-trade" approach. In this sense terms-of-trade often refer to the relative value (not necessarily in price terms) of one commodity (for instance a sack of millet) to another commodity (for example a goat). Based on this particular example, the commodity terms-of-trade helps gauge a situation's impact on one group of a society (e.g. herders) in comparison to another one (e.g. crop farmers). In many developing countries, drought conditions often lead to a hike in cereal prices while at the same time prices for animals are falling. This comes about as a result of reduced cereal supplies on the market and a concurrent lack of adequate pasture for herders to graze their animals. Under these conditions animal herders will rush to sell-off their animals to avoid losing them through death thereby creating a glut on the animal market thereby leading to a slump in prices. As elaborated in the table below, in such situations the terms of trade shift in favour of crop farmers with cereals and worsen for animal herders as the exchange value of a goat in terms of cereals has fallen. Between the months of September and January, in price terms one goat fetches less amount of maize flour than between February and August. For a food security analyst, this type of information is vital in identifying the food insecure among various social groups of a community in subject.

Table 2: Terms of Trade Ratios between Goat and Maize Flour Prices

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Goat price / animal	800	900	1000	1055.4	1127.3	1014	1211	900	800	765	750	750
Maize flour price / kg	22	19	19	20	19	19	20	20	21	21	21	22
Terms-of-trade Ratio (goat : flour)	36.4	47.4	52.6	52.8	59.3	53.4	60.6	45.0	38.1	36.4	35.7	34.1

Source: Author's hypothetical experimentation, November 2008

8.0 ANALYSING DOMESTIC FOOD SUPPLY AND DEMAND

The analysis of domestic food supply and demand at the national level is best done using a food balance sheet. The food balance sheets are primarily developed to give an overview of a country's food security situation over a specified reference period. The net food balance (reflected by the difference between domestic food supply and food utilisation) is derived by aggregating total domestic production with imports (adjusted for changes in stock prior to the start of the reference period) less domestic utilisation and exports. Domestic utilisation is constituted by; seed use, feed use, waste due to storage/transportation losses and industrial uses (food and non-food uses). The table below elaborates the content of a food balance sheet of a country for a given commodity. In instances where the net cereal balance is negative, the magnitude would determine the need of external assistance to bridge the food gap.

Table 3; Structure of a National Food Balance Sheet (cereals)

Annual Average Estimates		Quantity (MT)
Domestic Supply		**A = {b + c + d}**
	-stock balances from before reference period (including food aid stocks)	b
	-domestic cereal production	c
	-total cereal imports (formal + informal + food aid imports in transit)	d
Domestic Utilization		**E = {f + g + h + i + j + k}**
	-food for human consumption needs / requirements	f
	-feed use	g
	-seed use	h
	-waste (post harvest losses)	i
	-industrial use (food and non-food use)	j
	-cereal exports	k
Net food balance		**K = {E – A}**

The prime data required for analysing domestic food supply and demand can be obtained from secondary sources like Ministry of Agriculture, National Statistics Department, industrial journals, FAO database, etc… Whenever possible secondary data should be validated through targeted spot-checks of primary data collections (also referred to as "ground truthing").

With regard to domestic food supply, its two prime constituents (domestic food production and food imports) have to be well analysed and their roles weighted in terms of their contribution to a country's total food supply. Together with a demand analysis, information on food production and imports is vital to determining whether a country is a net food importer or food exporter. Knowing the net importer/exporter status guides the understanding of the degree of the country's food security exposure to global food price fluctuations. A slump in world food prices would mean improved food access in a net food importing country and a fall in revenue for a net food exporting country. In a situation of rising global food prices, the net food exporting countries would benefit from increased export revenues whereas next importing countries would be faced with increased import bills and possible food insecurity in cases of balance-of-payments difficulties. Through household surveys that highlight such aspects like net-consumers and net-producers, a clearer picture can be obtained on how the aggregate national aspects impact on food security at the micro-level (household level).

Knowing the potential or actual availability of marketable food surpluses at household level guides effective planning for activities such as local food procurement (for e.g. humanitarian programmes) and other developmental interventions such as food processing projects that may boost farmers' incomes and increase commodity storage life. The absence of marketable food surpluses in a food growing area could also provide an indication of inherent production problems that may need to be investigated further. The magnitude of commercial food imports and public food stocks could help in gauging a country's capacity to bridge gaps in domestic food demand. When the two are found insufficient, the need for external assistance to bridge the gap may be raised.

9.0 ANALYSING GOVERNMENT POLICIES AND REGULATIONS

A totally free market economy does not exist anywhere in the world. Governments always tend to interfere with trade for one reason or the other. The interference in trade may have significant implications on the flow of goods and services, which in turn may impact on food markets and the food security situation at large.

Government policy interventions and regulations towards trade may include the following among others:

- Tariffs on imports/exports
- Quotas limiting volumes of imports/exports
- Export/import bans
- State subsidies encouraging exports
- Prohibition of money capital exports (which could indirectly restrict investment in areas like agro processing, etc…)
- Quarantines that limit domestic movements of food and animals from surplus to deficit areas
- Etc…

In a food security context, it is always important to analyse Government policies and regulations and consider the possible implications they could have on the efficient flow of food commodities to address food demand and guarantee stable national food security. Recent experience with rising global food prices have provided examples where Governments adopt protective policies that are detrimental to the food security of others and in some instances even lead to speculation and a further rise in food prices. Other countries have adopted opposing policies such as reducing food import barriers and tariffs. In the case of food exporting countries, protective policies such as export bans appear to be precipitous measures, with Governments trying to protect domestic consumers against price rises and possible domestic food shortages. In the medium to long- term, such measures not only affect food importing countries but also create a disincentive to domestic producers who are deprived of the benefits of high commodity prices on the world market.

In terms of food availability and access, trade barriers or tariffs on food imports intended to protect a particular food industry result in higher food prices, which in turn create an accessibility problem to a particular food commodity by poorer sections of the society. Therefore, policies that hamper food availability and access may directly impact the nutritional status of vulnerable groups with serious negative repercussions. Trade barriers and tariffs on food trade tend to hinder healthy competition in the supply of food, per-

petuate inefficient production systems and ultimately punish consumers with increased prices that are passed on to them by traders/importers.

In other instances, impromptu taxes also affect the smooth transfer of food commodities from surplus to deficit areas. Plant and animal quarantines may completely cut-off areas from a market for a specific agricultural commodity with implications on food availability in other areas.

The most common justifications given for such government interventions include:

- Generation of revenue through tariffs/duties/taxes;
- Protection of domestic industry (usually at the early stages of development) against foreign competition;
- As a measure against unemployment (protecting domestic employment through tariffs and quotas);
- Economic development purposes (as the protection of nascent domestic industries is expected to bring about economic development in the longer-term);
- The urge for autarky or national economic self-sufficiency;
- For national defence purposes (particularly on commodities that bear national defence interests and surprisingly these may also include food!);
- Balance-of-payments difficulties (after a shortage of foreign exchange);
- Plant or animal disease control (in cases of quarantines);
- Etc…

10.0 ANALYZING DATA AND REPORTING

Analysing quantitative market data is commonly done using statistical and or econometrical techniques. Use of time series data generated over a significant period is always preferable to be able to capture seasonality aspects. In emergency situations, the analysis can also be done based on spot check data from a rapid market survey. However this type of data should always be interpreted with caution due to its limitations in reflecting the wider market aspect of seasonality.

Reporting can be done in the form of statistical tables, graphs, charts and or free text, with relevant conclusions and evidence-based recommendations. In an operational context such conclusions and recommendations should be geared to corporate objectives in food market assessments, market data analysis and provide clear answers to the following classic questions on humanitarian intervention:

- What is the capacity of domestic markets to meet food demand?
- Is there a food gap that needs to be addressed with external assistance?
- What form of food assistance should food insecurity be addressed with? (food aid commodities, cash or vouchers)
- For interventions with cash or vouchers, does the necessary infrastructure exist to support this form of intervention?
- For interventions with food aid commodities, when is it best to intervene without distorting food markets?
- What amount of food aid should be used to intervene in order not to cause producer disincentives?
- What type of commodities suit local tastes?
- Is there an option to procure food aid commodities locally exist?
- If yes, when is it optimal to conduct local or regional food purchases?
- What are the appropriate quantities of commodities to be purchased locally or regionally without crowding-out regular traders and raising market prices beyond what the poor can afford?
- Which markets should purchases be made from?
- What procurement arrangements should be deployed in order to maximise the impact on farm household incomes, etc…

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