

The Food Price Crisis Monitor¹

Executive Summary

1. A multisectoral effort led and coordinated by the World Bank's Poverty Global Practice (GPVDR) has developed a proposal for a food price monitoring system. This framework defines, identifies, and monitors food security crises at the national level caused by shocks and factors that are not circumscribed to a given country. The framework will provide critical information for timely responses in the face of food crises.
2. The proposed monitoring system should contribute to the early detection of unfolding food security crises in most vulnerable countries. By doing so, the framework will provide relevant inputs to the Crisis Response Window team and to Bank colleagues participating in fora such as the UN High Level Task on Global Food Security and the Agricultural Market Information System, AMIS. It is also expected to assist Bank country teams engaged in food security work by providing country specific data and regional/global benchmarking.
3. The key concept underlying this monitoring framework is a country's vulnerability to food insecurity. Vulnerability is defined in terms of the degree of exposure to domestic food price spikes and limited macroeconomic capacity to mitigate their effects. The framework consists of two components, the global and domestic stages.
4. This proposal discusses, compares, and calibrates several indicators and triggers in the global and domestic stages. The calibration exercise determines the best performing triggers in terms of identifying past crises peaks; minimizing false positives; early detection of the crisis (that is, the number of months before the price peak is reached); and length of the crisis.
5. Using food, fertilizer, and fuel global price trends from 1960 to 2012 from the World Bank, 46 country specific staple prices data from FAO and macroeconomic indicators for such countries reported by the IMF, the calibration exercise that predicts the 2008 and 2011 price spikes show that the best performing triggers are:
 - (i) Global food price index exceeds 3 standard deviations (SD) from the detrended historical mean of 1960–2006 (2005=100).
 - (ii) Domestic food staple prices increase at least 15 percent during a period of five months for two or more countries from a same (sub)region.
 - (iii) All those countries in the region or subregion that exceed the staple price trigger have at least one macroeconomic vulnerability (as defined by debt, current account, fiscal, and foreign reserves triggers).

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6. The framework will provide red flags or warnings in two ways. In the top-down approach, a warning is issued after global food prices exceed their specific trigger. Then, domestic staple prices and macroeconomic vulnerability variables are analyzed for countries by region to determine the most severe cases. In the bottom-up approach, in the absence of global prices' warnings, a warning or alert may become active when domestic variables in two or more countries within a region exceed their triggers.
7. By no means the tool will or should be used unilaterally by the Bank or any of its departments to declare global or national food crises. There are existing international venues and engagements – in which the Bank is a partner— for such declarations to be collectively made. To be sure, the tool will provide the Bank with analytical inputs for such decisions, but should never be used for unilateral declarations.
8. Several next steps are identified, including the piloting of the system with current data, the need to define the governance of the framework, and data requirements to sharpen the system.

1. Context

This note introduces a **framework to monitor food crises** and includes its basic characteristics; objectives; basic underpinnings; indicators and triggers; its calibration and use; and next steps. This framework responds to the need to design an information tool that effectively identifies and monitors unfolding, multicountry food crises. Ultimately, this framework will contribute to the Bank's ongoing mitigation and prevention efforts in preparation for future crises.

This monitoring framework adds to other World Bank's ongoing operational and financial efforts to improve policies, transparency and monitoring of food related crises. These efforts include partnership with the G20's Agricultural Market Information System and UN High Level Task Force on Global Food Security; the quarterly monitoring report, Food Price Watch, and the knowledge platform, Secure Nutrition; crisis alleviation financing mechanisms such as the Rapid Response Mechanism, the Global Food Price Response Window, and the Crisis Response Window. Medium and long term interventions and advocacy on agriculture, nutrition and food security include the Global Agricultural Food Security Program; participation in the CGIAR; the Critical Commodities Finance Program and novel risk management products against food price volatility.

The monitoring framework is not the only tool currently dealing with food security issues. Other instruments like the FAO-GIEWS (Food and Agriculture Organization—Global Information and Early

prices of futures, food stocks and selective subnational information. This is believed to maximize the contribution of this framework to existing monitoring tools.

There are three main challenges that the framework must still address. First, there is no consensus on a definition of what a food crisis is (box 1), and, consequently, there is not a generally accepted mechanism to identify the onset of a food crisis until well after it has started. Second, there is typically a lag—to various degrees—in the availability of relevant data. Third, while there is a consensus on the multiple factors driving global and domestic food crises, there is much less consensus on the relative importance of each and their interdependence.

The current framework acknowledges these three challenges. It proposes an empirical definition of food crises that is easy to operationalize and monitor, but is also appropriately flexible for revision as circumstances require or when additional information becomes available. The framework maximizes frequently available relevant data and, when not available, uses annual data. Finally, the framework does not attempt to solve analytical or operational issues (such as, for instance, whether responses should be different in transitory and chronic situations), but focuses instead on single channels clearly conceptualized.

Box 1. Defining a Food Crisis

Although the concept of food security is widely acknowledged, “all people, at all times, have physical and economic access to sufficient, safe and nutritious food for a healthy and active life,”^a there is not a clear operational definition of what constitutes a food crisis. For example, the World Bank’s Global Food Crisis Response Program does not contain an explicit definition of “food crisis.”^b The Bank’s Operation Policy 8.00, which lays out the Bank’s policy on rapid response to crises and emergencies, does not differentiate between “crises” or “emergencies,” and includes the term “disaster” in stating when the Bank can respond to a borrower’s request for assistance—which would be when “an event that has caused, or is likely to imminently cause, a major adverse economic and/or social impact associated with natural or man-made crises or disasters.”^c

Both the Food and Agriculture Organization (FAO) and World Food Program (WFP) differentiate transitory from chronic food insecurity and talk specifically of “crisis-induced food insecurity.” This includes sudden “shocks” (for example, due to a flood or conflict) and “crises” that develop progressively (for example, due to drought or economic collapse).^d The 2008–13 Strategic Plan of the WFP does not once mention “food crisis.” It speaks of “emergency,” defined as urgent situations in which there is clear evidence that an event or series of events have occurred that cause human suffering or imminently threaten human lives or livelihoods and for which the government has not the means to remedy. “Emergency” is also described as a demonstrably abnormal event or series of events that produces dislocation in the life of a community on an exceptional scale.^e In monitoring such emergencies, the WFP uses indicators of mortality rates, nutrition, and food security to establish the magnitude of the problem. FAO-GIEWS (Global Information and Early Warning System) does not have a definition for “food crisis” either, but does identify three factors by which to determine whether a region is in a food crisis: (i) lack of food availability; (ii) limited access to food; and (iii) severe and localized problems.^f

The Integrated Food Security Phase Classification (IPC), originally developed in Somalia under the FAO Food Security Analysis Unit (FSAU) and by a multiagency partnership of eight major United Nations agencies and international nongovernmental organizations (NGOs), defines an “Acute Food and Livelihood Crisis” as “highly stressed and critical lack of food access with high and above usual malnutrition and accelerated depletion of livelihood assets that, if continued, will slide the population into Phase 4 [(i.e. Humanitarian Emergency)] or 5 [(i.e. Famine/ Humanitarian Catastrophe)] and/or likely result in chronic poverty.”^g To determine the level of food insecurity in a given country, the IPC uses indicators such as crude mortality rate, acute malnutrition, stunting, food access/availability, dietary diversity, water access/availability, hazards, civil security, livelihood assets, and structural factors.

In a study prepared for the Strengthening Emergency Needs Assessment Capacity Project, Devereux^h distinguishes the temporal from the severity aspects of food insecure situations and discusses chronic and transitory food insecurity; predictable versus unpredictable food insecurity; and cyclical and seasonal insecurity. By combining the temporal and severity dimensions,

The presence of two stages does not imply necessarily that both are closely linked. The pass-through of international prices to domestic prices is not automatic, either because national markets are not internationally integrated or, when they are, price transmission lags several months on average. Rather, the two stages of the framework ensure that specific countries' vulnerabilities to global shocks are carefully analyzed but also that domestically generated alerts are not overlooked when global prices are calm.

Operationally, the monitoring framework will generate two types of alerts: "top-down" and "bottom-up." In the top-down approach, the global stage sets off an alert after either or both global food and fuel prices exceed some predefined threshold. Then, domestic indicators are analyzed to determine the severity of each IDA country's vulnerability to the global alarm. At that point, the framework might include in its domestic analysis if there are ex ante warnings on unfolding disaster and humanitarian crises. The bottom-up approach focuses on domestic vulnerability and sets an alarm—even in the absence of global crisis—when two or more countries in a region or subregion exceed their domestic price and macroeconomic triggers.

Global food and crude oil prices: In principle, the framework should monitor all shocks that may affect food security. In practice, the framework focuses on two direct global shocks, those regarding global food prices and global crude prices. These two factors are expected to affect the food security situation in a country in two ways: directly, by contributing to increases in domestic food prices, the overall cost of living and fertilizer and transport costs, or indirectly, by contributing to policy responses such as export bans that affect access or prices of food.

Global macroeconomic shocks (fiscal, financial, and trade) may also affect food security. To the extent that global macro shocks affect global prices of food and/or fuel, they will be captured in those components of the monitoring system. For example, a huge increase in public debt that will affect the capacity of a country to import food will be considered in the second stage of the framework. The hypothetical resulting reduction in food imports, for example, is not considered a shock, but the effect of the debt shock. As a result, global food and oil prices are considered both shocks and transmission mechanisms from other global shocks into national food insecurity. To the extent that they are country specific, they are covered in the second/domestic stage of the framework. In this sense, the proposed framework seeks to strike a balance between a meaningful account of crthe2.31 Tmc6 50 0 1 72.02n-2(hETBTc8JETBT1 :

Note: SSA = sub-Saharan Africa; EAP = East Asia and Pacific; ECA = Europe and Central Asia; LAC = Latin America and Caribbean; MENA = Middle East and North Africa; SA = South Asia. Currently, there are 81 IDA countries after the recent inclusion of Micronesia and Marshall Islands. Other countries may add to the list in the future.

Using FAO domestic prices, the analysis is circumscribed to individual staple food prices (rather than domestic food inflation). In principle, the more staple prices considered, the closer the exercise will be to an ideal scenario. It is well known, however, that the consumption of staples is subject to substitution, typically for cheaper staples or for nonstaples, as their prices go up.⁸ But setting a specific number of staple prices per country to monitor, or a predetermined mix of particular staples (say wheat, rice and maize), would further restrict the sample size being analyzed. As a result, the key domestic staple for each country for which its prices are reported is considered in the domestic stage of the analysis.

Early warning ex ante variables: The Integrated Fo

The calibration exercise, presented in section 5, explains how to identify the set of thresholds (of selected indicators) that would have identified the 2008 and 2011 food price crises. The exercise also shows how these thresholds would have fared in previous and in-between periods, where for this analysis it is considered that there were no food price crises. If an alert is activated in those periods, that instance is

Table 3. Illustration of Categorization of IDA Countries

	Food price inflation	Macro vulnerability			Categorization
		Fiscal	Public debt	FX CA	
IDA country 1					Very highly vulnerable
IDA country 2					Highly vulnerable
IDA country N					Moderate/low vulnerability

Source: Authors' illustration.

Note: CA = current account; FX = foreign exchange.

5. Calibration

Table 5: Incidence of Global Food iden

The length of alerts shortens after introducing the criterion of consecutive months. In effect, five consecutive months of food price increases reduce

Table 6. Incidence of Domestic Alerts

Region	Countries	Date	Staple	Average staple price increase (%)	Number of countries with macro vulnerabilities	Number of macro vulnerabilities
SSA- Eastern	SDN, ETH, KEN, UGA	July, 2008	S, M, M, M	90	4	12
SSA-Southern	MOZ, MWI, ZMB	March, 2008	M, M, M	83	3	9
SSA- Eastern	TZA, ETH, SOM, UGA, KEN, RWA	July, 2011	M, M, M, M, M, M	81	6	15
LAC	CRI, NIC	March, 2009	R, M	80	2	5
SSA- Eastern	UGA, SDN, KEN, ETH	June, 2008	M, S, M, M	77	4	12
LAC	NIC, HND, CRI	May, 2009	M, M, R	76	3	8
LAC	HND, CRI, NIC	April, 2009	M, RCRI, NIC			

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Source: Authors' compilation.
 Note: C = cassava; M = maize; R = rice; S = sorghum; W = wheat; Mil = millet; B = barley. Macro vulnerabilities: D = public debt; C = current account; F = fiscal deficit; R = reserves. Djibouti is part of the Middle East and North Africa region according to World Bank classification, not part of eastern Africa.

6. The framework at work in 2011 and 2012

We also analyze how this framework would have responded during the period January 2011 until August 2012, latest available data at present. At the global level, using 3 standard deviations of the detrended series spanning 1960–2006 as the threshold, the trigger for global food prices would have been activated in January 2011 until August 2011 and back in July 2012 and August 2012. See Figure 2 below. Alerts based on the global crude oil prices trigger would have been activated on February 2011 and it would have lasted 17 months remaining active until June 2012.

At the domestic level,

Table 7. Domestic Alerts for the Food Price Crisis in 2011 and 2012

Source: Authors' compilation.

7. Next Steps

Expand the list of countries for which domestic food prices are available: The analysis was conducted on 63 countries for which FAO data on staples are available.

Appendix 1. Snapshot of the Master Database for Two Selected Indicators

Raw Data from DECPG					TRIGGER ACTIVATION				5 Consecutive Months			
	Food	Grain	Fert	Fuel	50% of 2008 peak	75% of 2008 peak	US \$100 a barrel for oil	Food	Grain	Fert	Fuel	
2000M01	78	84.47										

2003M08	86	90.32	73.26	55.95	0	0	0	0	0	0	0
2003M09	89	91.60	74.24	51.42	0	0	0	0	0	1	0
2003M10	96	92.45	75.69	54.82	0	0	0	0	0	1	0
2003M11	100	95.88									

Appendix 2. Database for Domestic Triggers

Region	Countries	Date	Staple	Average staple price increase (%)	Number of countries with macro vulnerabilities	Number of macro vulnerabilities
SSA- Eastern	ETH, SDN	June, 2005	M, S	34	2	6
SSA- Western	TCD, BEN, TGO, MLI	June, 2005	M, M, M, Mi	64	4	11
SSA- Eastern	ETH, SDN	July, 2005	M, S	35	2	6
SSA- Western	BEN, MLI, TCD, NGA, TGO	July, 2005	M, Mi, M, S, M	42	5	13
SSA- Eastern	ETH, SDN	August, 2005	M, S	46	2	6
SSA- Western	MLI, TCD, TGO, NGA	August, 2005	Mi, M, M, S	33	4	10
SSA-Southern	MOZ, ZAF	August, 2005	M, M	23	2	6
SSA- Western	NGA, MLI	September, 2005	S, Mi	67	2	5
SSA-Southern	ZAF, ZMB, MOZ	September, 2005	M, M, M	31	3	9
SSA- Western	MLI, NGA	October, 2005	Mi, S	30	2	5
SSA-Southern	ZMB, MOZ, ZAF	October, 2005	M, M, M	39	3	9
SSA-Southern	MOZ, ZAF, ZMB	November, 2005	M, M, M	48	3	9
SSA						

SSA- Eastern	TZA, ETH	September, 2007	M, M	51	2	6
SSA- Western	CPV, NGA	September, 2007	W, S	25	2	5
EAR	MNG, KHM	October, 2007	W, R	33	2	3
ECA	KGZ, RUS, AZE, UKR, TJK, ARM, GEO	October, 2007	W, W, W, W, W, W, W	43	7	18
LAC	PAN, DOM, PER	October, 2007	R, R, R	19	3	8
SAR	PAK, AFG, NPL	October, 2007	W, W, R	20	3	6
SSA- Eastern	ETH, BDI, SDN, RWA, TZA	October, 2007	M, B, S, M, M	37	5	14
SSA- Western						

SAR	PAK, IND, LKA, AFG	March, 2008	W, R, R, W	37	4	8
SSA- Eastern	TZA, KEN, SDN, UGA, ETH	March, 2008	M, M, S, M, M	41	5	15
SSA- Western	BEN, TCD, GHA, NER, TGO, NGA	March, 2008	M, M, M, Mi, M, S	52		

SSA-

SSA- Western	CHA, MAL, NIG	June, 2012	Mil, Mil, Mil	26	3	4
SSA- Eastern	RWA, SUD	July, 2012	M, S	26	2	4
SSA- Western	BUR, MAL, NIG	July, 2012	S, Mil, Mil	20	3	5

Source: Authors' compilation.