

Global Food Security

Understanding it

Measuring it

Assessing price impacts



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Rabat

Leo Abruzzese

Global Forecasting Director



Background

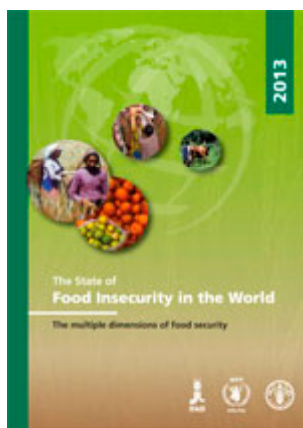
- About 842m people in 2013, or one in eight globally, suffered from chronic hunger, according to the FAO.
- The world's population will grow from 7bn now to 9.3bn in 2050, an increase of one-third.
- Recent spikes in food prices have highlighted food-security vulnerabilities, as have natural disasters and weather shocks.
- Many factors are behind the food security crisis:
 - Rising energy prices
 - Declining agricultural sector investment
 - Stagnating/declining agricultural productivity
 - Rising demand for food due to economic growth, higher incomes and population pressures
 - Trade-distorting subsidies
 - Ecological degradation
 - Substituting subsidised bio-fuels for food production



Measurement tools

FAO: Suite of food security indicators

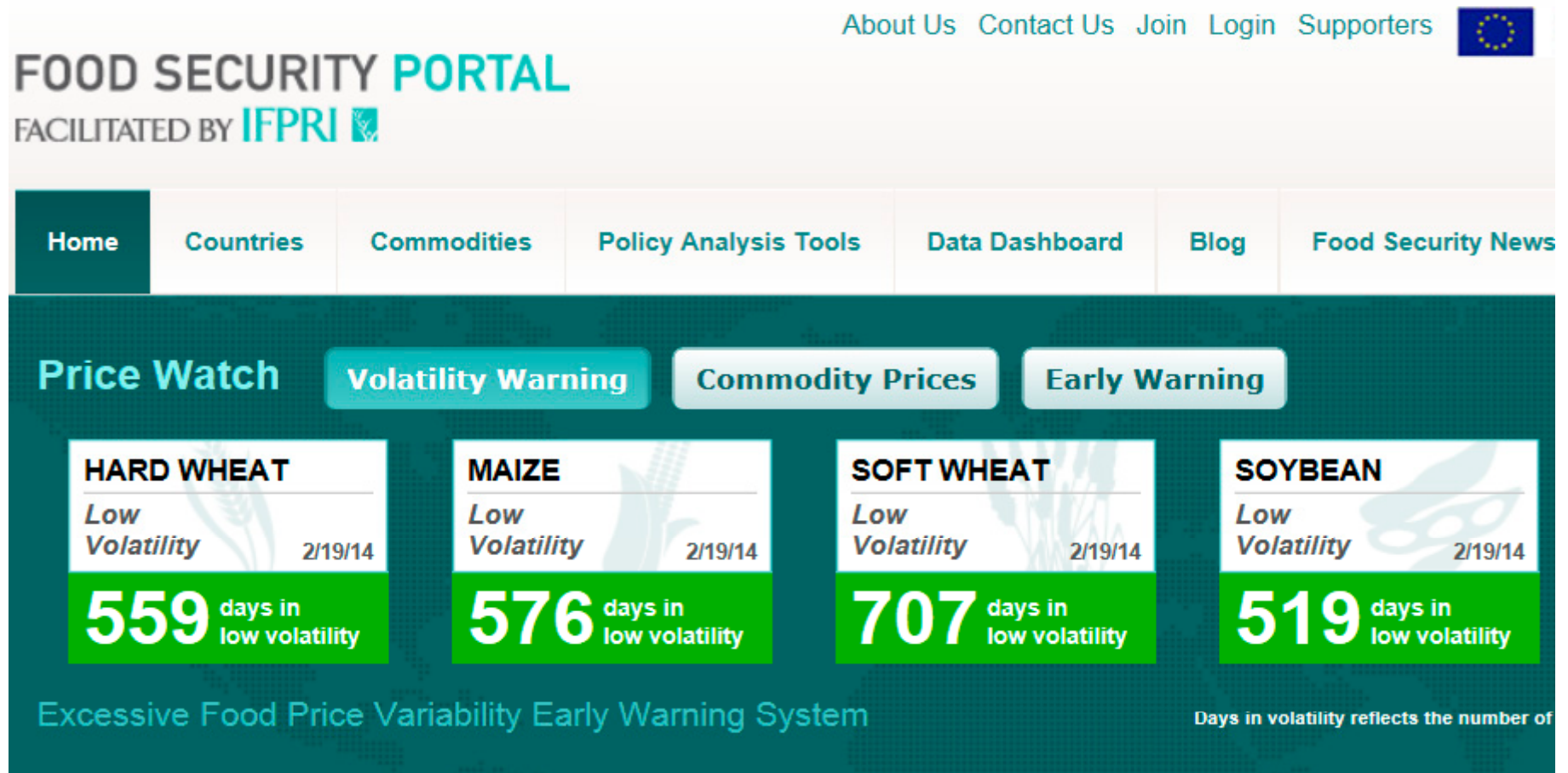
- Four food security dimensions can be identified: food availability, economic and physical access to food, food utilization and stability (vulnerability and shocks) over time.



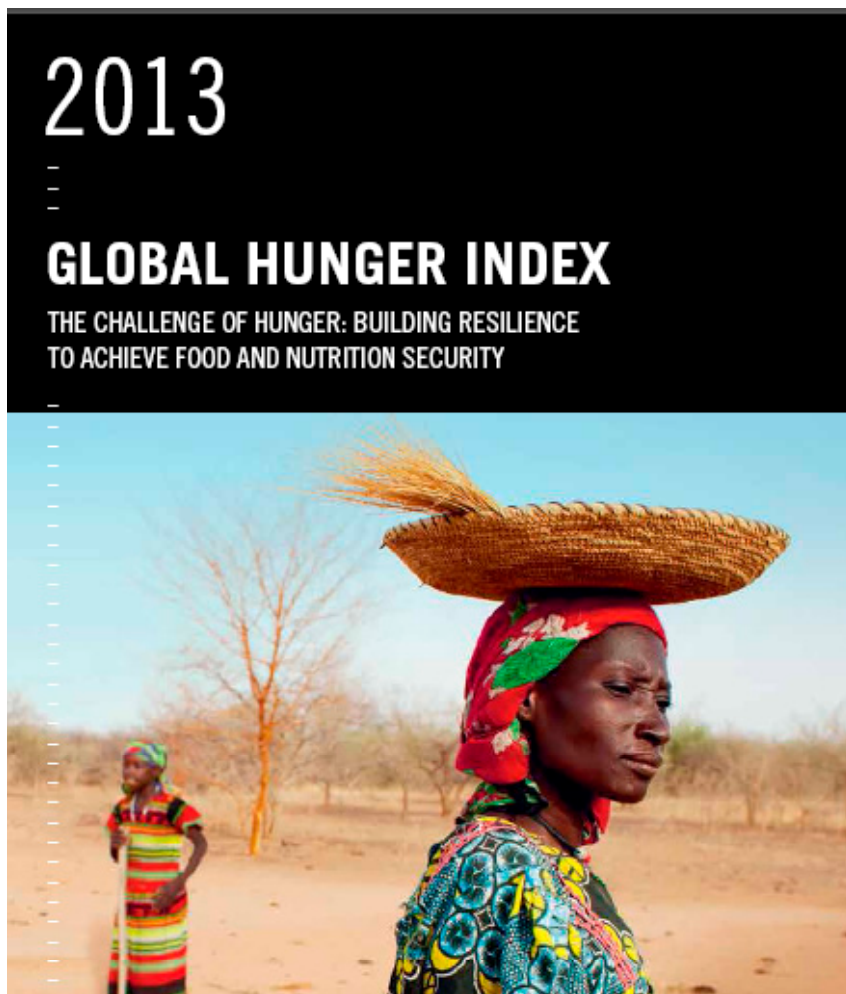
FOOD SECURITY INDICATORS	DIMENSION
Average dietary energy supply adequacy Average value of food production Share of dietary energy supply derived from cereals, roots and tubers Average protein supply Average supply of protein of animal origin	AVAILABILITY
Percentage of paved roads over total roads Road density Rail lines density	PHYSICAL ACCESS
Domestic food price index	ECONOMIC ACCESS
Access to improved water sources Access to improved sanitation facilities	UTILIZATION
Cereal import dependency ratio Percentage of arable land equipped for irrigation Value of food imports over total merchandise exports	VULNERABILITY

IFPRI: Excessive Food Price Variability Early Warning System

- Identifies periods of extreme food commodity price variation (volatility) that exceed the 95th percentile.



IFPRI: Global Hunger Index



- A tool designed to comprehensively measure and track hunger globally and by region and country
- Highlights successes and failures in hunger reduction

THE GLOBAL HUNGER INDEX IS CALCULATED AS FOLLOWS:

$$\text{GHI} = (\text{PUN} + \text{CUW} + \text{CM})/3$$

with **GHI:** Global Hunger Index

PUN: proportion of the population that is undernourished (in %)

CUW: prevalence of underweight in children younger than five (in %)

CM: proportion of children dying before the age of five (in %)

Food Secure: EU Research project

- Objective: to develop advanced tools that may help to improve the ability of decision makers to foresee and respond to future food and nutrition security crises
 - an indicator-based trigger for policy response to upcoming price-related food crises
 - toolbox of long term global economic and biophysical models to explore possible future developments in food and nutrition security



Global Food Security Index

Overview: The Global Food Security Index

The Economist Intelligence Unit was commissioned by DuPont to research and produce a comprehensive Global Food Security Index.

Defining food security

- Food security exists when people at all times have physical, social and economic access to sufficient and nutritious food that meets their dietary needs for a healthy and active life.*

The Global Food Security Index:

- ranks 107 countries
- according to their relative levels of food security
- using 27 indicators divided into three categories: Affordability; Availability; Quality and Safety.



* Adapted from the 2009 Declaration of the World Summit on Food Security

The
Economist

Intelligence
Unit

Index framework

- Food consumption as a share of household expenditure
- Percent of population under global poverty line
- GDP per capita, \$US, PPP
- Agricultural import tariffs
- Presence of food safety nets
- Access to finance for farmers

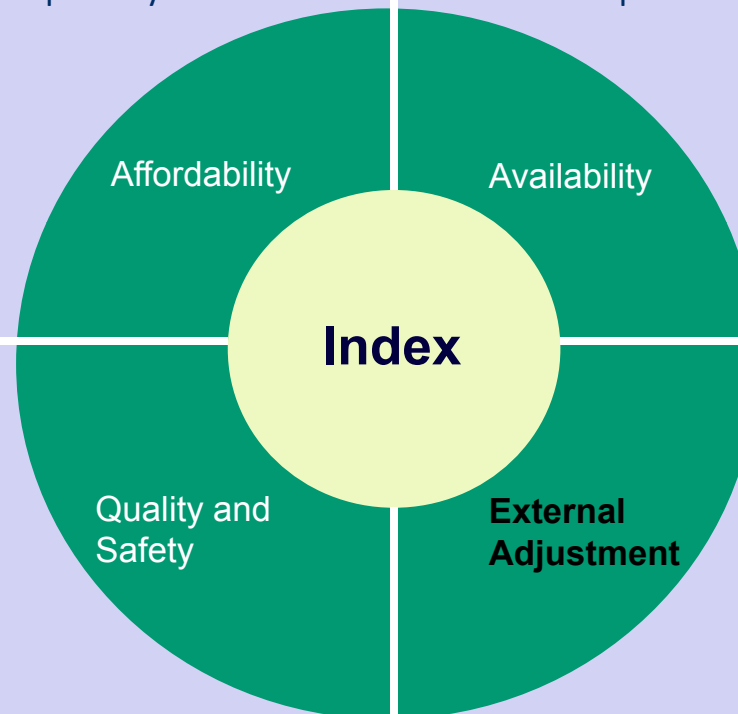
- Sufficiency of supply: food supply in kcal/person/day and chronic food aid dependency
- Public expenditure on agricultural R&D

- Agricultural infrastructure
- Volatility of ag production
- Political stability risk
- Corruption
- Urban absorption capacity

- Diet diversification
- Government commitment to increasing nutritional standards
- Micronutrient availability
- Protein quality
- Food safety

Food Price Adjustment Factor

- FAO global food price index adjusted for income growth, pass-through coefficient of global to national food prices, exchange rates and import dependency
- Applied to Affordability score



Capturing the full timeline of food insecurity

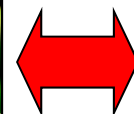
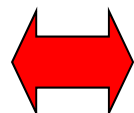
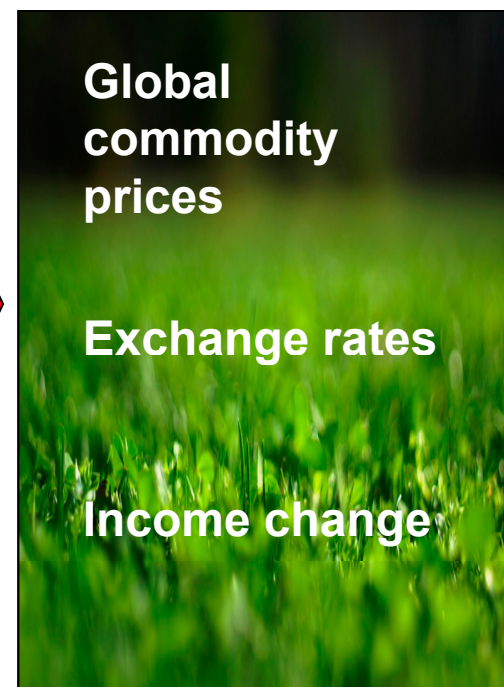
**Structural /
long-term**



**Policy driven /
medium term**

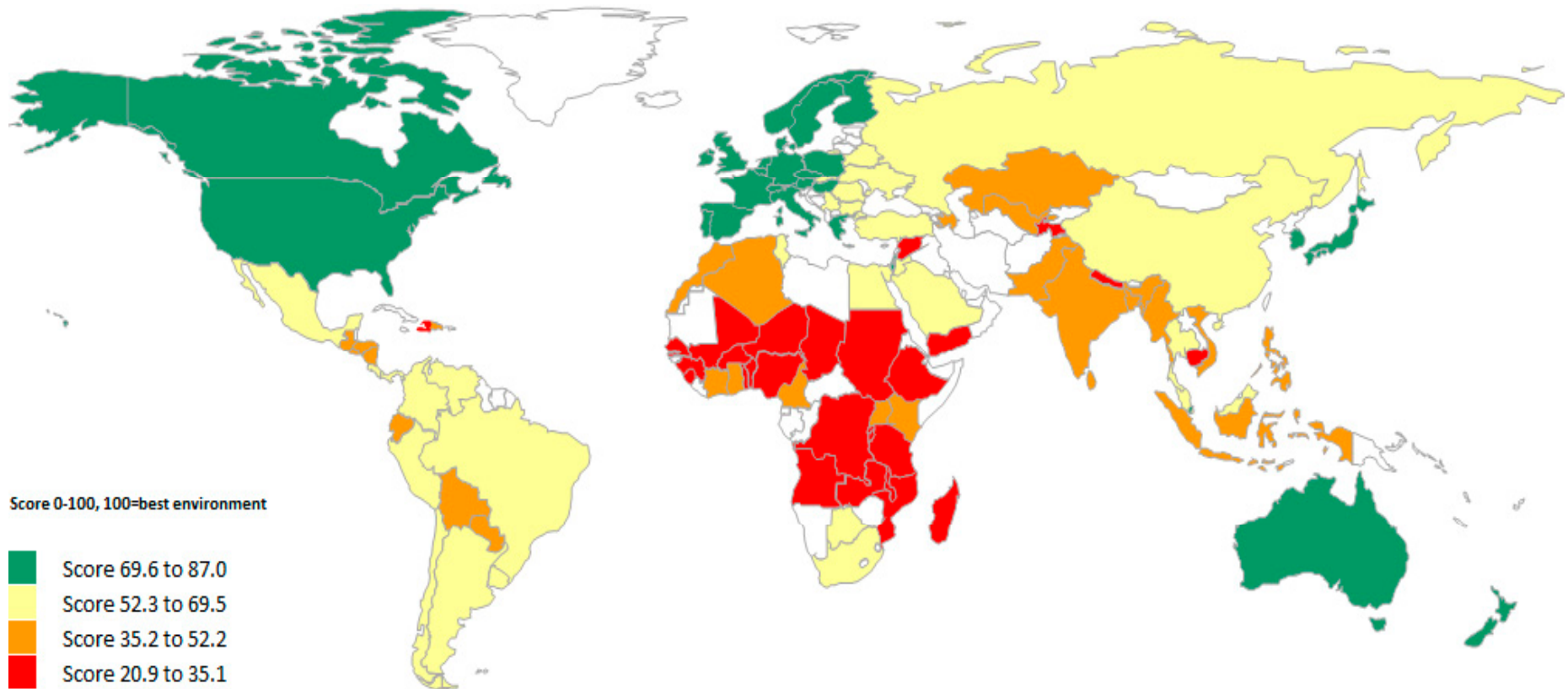


**High frequency /
short term**



Results for the 2013 Global Food Security Index

OVERALL SCORE

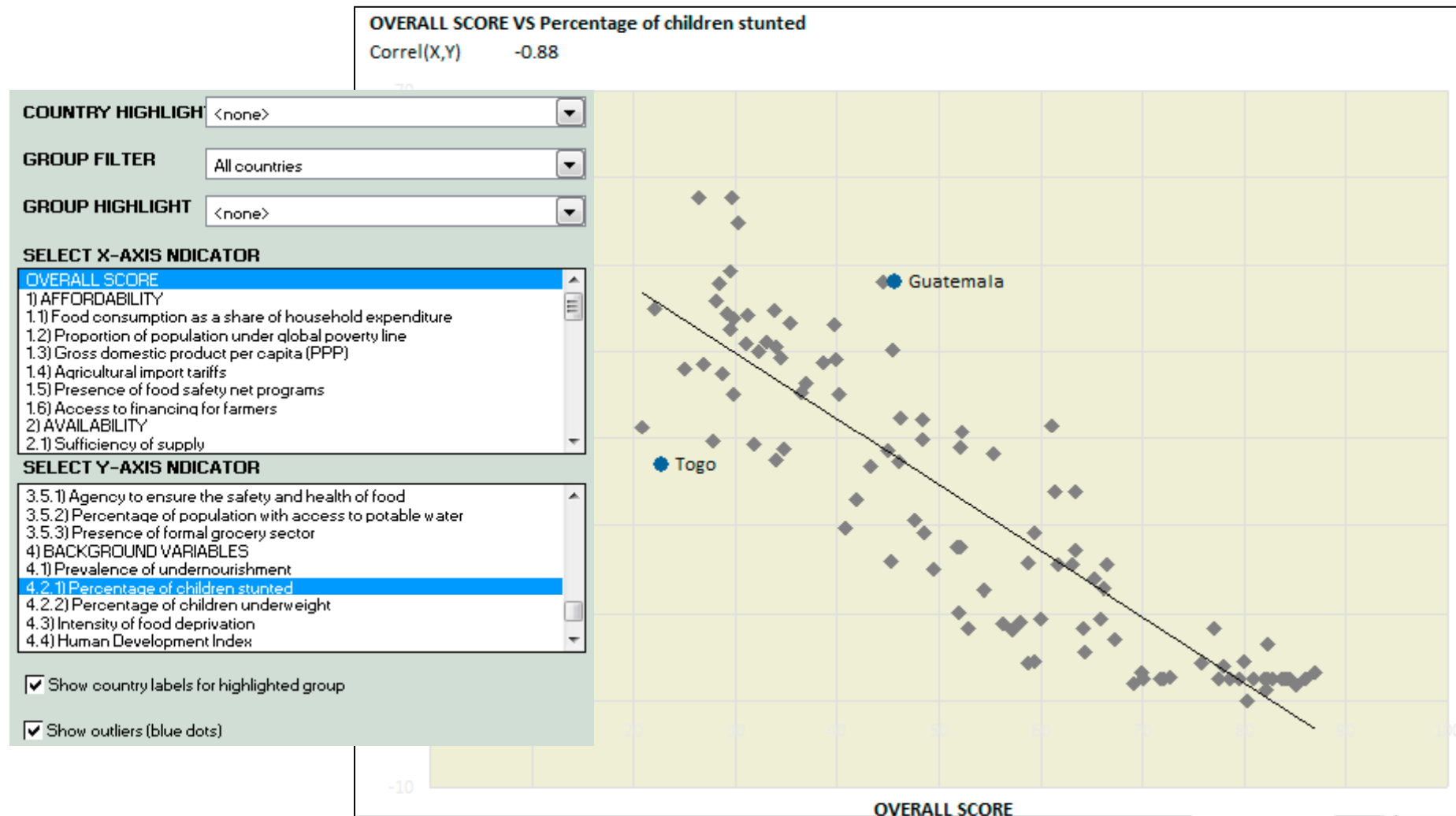


Top and bottom countries in the Index

BEST ENVIRONMENT		
Rank		Score / 100
1	United States	87.0
2	Norway	86.0
3	Netherlands	85.1
4	Belgium	84.5
5	Austria	84.2
6	France	84.1
7	Switzerland	83.8
8	Ireland	82.8
9	Denmark	82.4
10	Canada	82.3

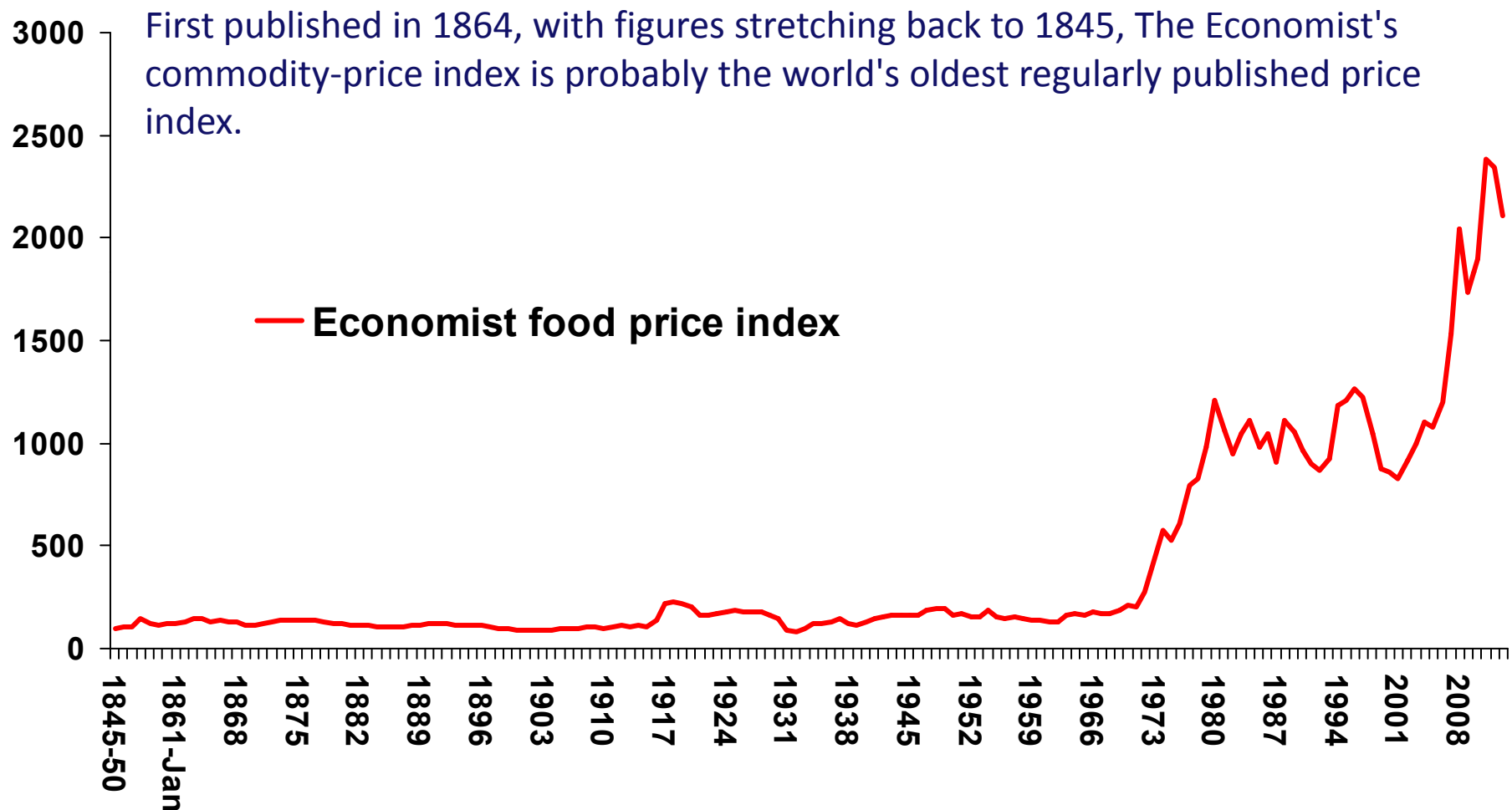
NEEDS IMPROVEMENT		
98	Sierra Leone	28.8
99	Malawi	28.5
100	Zambia	28.2
101	Haiti	27.9
102	Mali	26.9
103	Burundi	26.4
104	Sudan	25.1
105	Togo	22.8
106	Chad	22.2
107	Congo (Dem. Rep.)	20.9

Tool has analytical functions: correlations, weights, etc



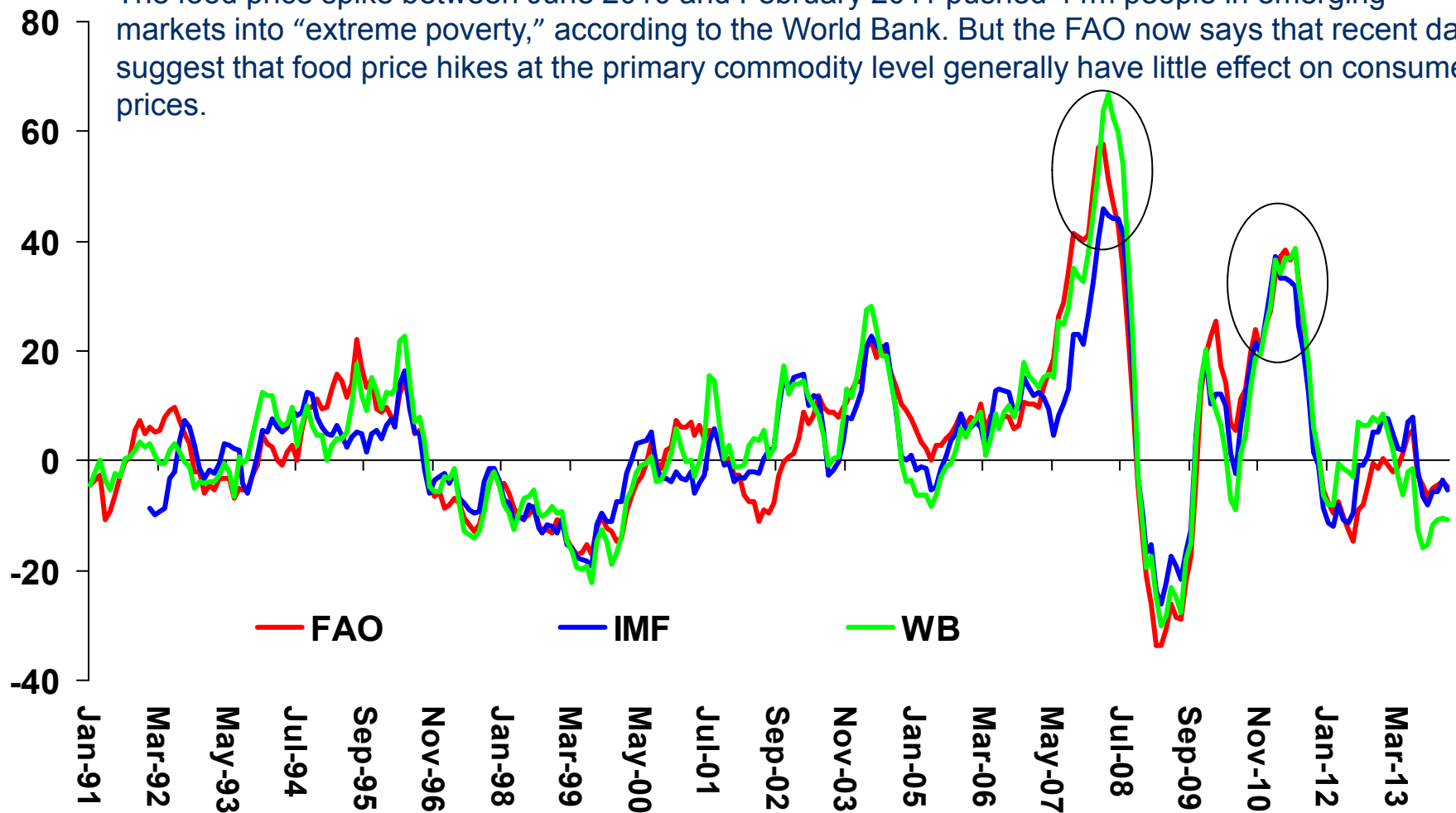
Price trends

Food commodity prices since 1845



Food commodity prices: High volatility, but how harmful?

The food price spike between June 2010 and February 2011 pushed 44m people in emerging markets into “extreme poverty,” according to the World Bank. But the FAO now says that recent data suggest that food price hikes at the primary commodity level generally have little effect on consumer prices.



Price adjustment factor: Rough & ready guide to vulnerability

- We took the quarterly change in global food prices (FAO index) for the last 10 years and compared it with food price inflation (CPI) for all countries in the index to determine a long-run relationship.
- Each quarter, we adjust this “pass-through” price factor for exchange rates, import dependency and estimated per capita income growth.
- We apply the adjustment to the Availability score.
- The PAF does not consider unique, short-term developments in each country, such as recent political turmoil, transportation or distribution issues, local food shortages or policy responses to food price shocks, such as price controls or export restrictions.



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