

# Food Price Watch



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POVERTY REDUCTION AND EQUITY GROUP  
POVERTY REDUCTION AND ECONOMIC MANAGEMENT (PREM) NETWORK  
THE WORLD BANK

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Global food prices declined 8% between September and December 2011. Wheat, maize, and rice prices declined due to improved supply conditions, and among concerns regarding the global economy. However, global prices still remain high, with the 2011 annual food price index exceeding the 2010 annual index by 24 percent.

Prospects for a decline in 2012 prices are favorable on account of increasing supplies. Yet, global prices remain high and volatile, markets tight, and oil prices uncertain. There has been strong demand from deficit areas and production losses from La Niña have already occurred. Domestic food prices also remain high and volatile, and continue to show large differences from country to country.

Declining global prices should not diminish vigilant monitoring of food price movements. Because domestic food prices have remained high, households have adopted coping strategies. These strategies follow common patterns but are not universal. Coping strategies may partially offset some of the effects of crises, yet the nutritional consequences of food crises can quickly become devastating, especially in low-income countries with weak safety nets.

## Global Price Trends

Global food prices declined 8% during September–December, ending the year with prices 7% below December 2010 levels. While the first quarter of 2011 witnessed sharp rises in international food prices, five consecutive months of decreases at the end of the year drove the World Bank Food Price Index to 14% below its February 2011 peak (table 1).

**All key staples saw their prices decline.** Reductions in the index for grains reached 10%; 8% for fats and oils; and also 8% for “others,” which includes sugars and meats. Declines have been significant for wheat (15%) and maize (12%) and more moderate for rice, which declined only 2% in the fourth quarter of 2011. This

Table 1. Price Change of Key Food Commodities

Indices	Sept – Dec 2011 (%)	Dec 2010– Dec 2011 (%)	Feb–Dec 2011 (%)
Food	-8	-7	-14
Fats and oil	-8	-15	-19
Grains	-10	2	-8
Other	-8	-4	-10
Fertilizer	-10	19	14
<b>Prices</b>			
Maize	-12	3	-12
Rice (Thai, 5%)	-2	10	12
Wheat (US HRW)	-15	-12	-23
Sugar (world)	-14	-18	-22
Soybean oil	-8	-9	-12
Crude oil, avg.	3	16	6

Source: World Bank, DECPG.

modest variation in the price of rice is explained by different export prices behavior by origin, with a vigorous export response from India and Pakistan offsetting increases in the price of Thai rice exports, which were caused by floods and the adoption of a mortgage price scheme in that country.

**Yet global prices remain high and volatile.** The global Food Price Index averaged 210 points in 2011, up 24 percent from its average in 2010 (169 points, figure 1). Average annual prices in 2011 for wheat, maize, and rice also well exceeded averages for 2010.<sup>1</sup>

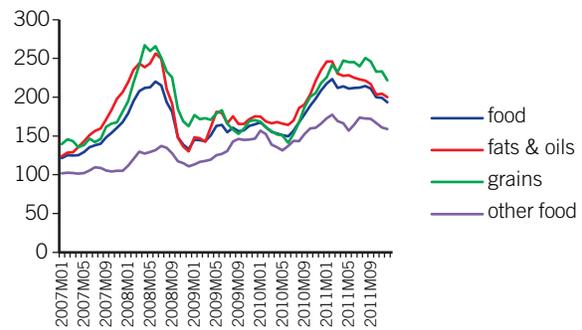
Volatility continued to be high during the fourth quarter, as shown by the periods of price declines followed by periods of marked increases. Maize prices saw two periods of increases, one through October and the other in the second half of December. Wheat prices saw four periods in which prices rose: October, late November, half of December, and mid-January.<sup>2</sup>

**Food price declines in the fourth quarter occurred despite moderate oil price increases of 3%.** A factor contributing to the nontransmission of increasing oil prices to food prices was the strong decline in the price of fertilizers. The 10% reduction in the price of fertilizer—a critical input for agricultural production—during the fourth quarter put a halt to sustained increases in fertilizer prices throughout the year.

**Increasing supplies and an uncertain global economy contributed to decreasing food prices.** Concerns about a prolonged deterioration in global demand combined with uncertain economic prospects and U.S. dollar appreciation exerted downward pressures on global prices. A better-than-anticipated production of wheat from the Black Sea and winter harvests in Argentina and Australia, a good maize harvest in Ukraine, and bumper rice harvests in China and India have all more than compensated for bad harvests in the United States and rice production losses in Thailand and other countries in that region. The vigorous response from rice exporters such as India and Pakistan and maize exporters such as Ukraine also helped fill the gap in world exports that followed the floods and the mortgage price scheme in Thailand (the world largest rice exporter) and reductions in maize exports from the United States (the world largest maize exporter) due to unfavorable weather. Demand for rice imports from large Asian importers has been subdued following expectations of good harvests, keeping price pressures down.<sup>3</sup>

**Prospects for global food prices remain favorable.** With better-than-anticipated production in 2011 and strong

**Figure 1. World Bank Food Price Index**



Source: World Bank, DECPG.

Note: The Global Food Price Index weighs the export prices of a variety of food commodities around the world in nominal U.S. dollar prices, 2005 = 100.

forecasts for 2012 supplies, global carry-over stocks are also expected to build up. The U.S. Department of Agriculture has recently revised upward its estimated beginning stocks for 2011/12 for wheat (by 0.7%), maize, (0.8%) and rice (0.6%) from its previous estimates in December.<sup>4</sup> Food and Agriculture Organization (FAO) projections indicate increases in the stock-to-use ratio for wheat, which reaches a level of 28%, and in the stock-to-use ratio for rice up to the level of 32% in 2012.<sup>5</sup> The smaller increase in the stock of maize (in a context of a weaker growth in the demand for animal feed and biofuels) is not expected to increase the stock-to-use ratio of rice, which is stable at a low level of 14%.<sup>6</sup>

Expectations remain relatively favorable for declines in the price of energy, including crude oil, and minerals in an uncertain global economy dominated by a persistent debt crisis and a slowdown in the demand growth in China.<sup>7</sup> The recent elimination of biofuel subsidies in the United States might also contribute to a reduction in the diversion of agricultural production for nonfood purposes, although the effect on food prices is not yet clear.

**Several upward price pressures still need close monitoring.** The expiry of the U.S. tax break for ethanol may have a limited impact in the short run because legal requirements for the blending of renewable fuels like ethanol into gasoline remain in place. The elimination of U.S. duties for ethanol imports may also make biofuel imports from other countries more competitive in the United States, allowing globally efficient sourcing of ethanol for biofuel use.<sup>8</sup> Furthermore, demand for biofuels might increase if oil prices pick up again in 2012.

Despite good prospects, stock-to-use levels for maize remain at their lowest level since 1974, causing markets that are already tight to remain highly sensitive to price

variations. Unrest in the Middle East and North Africa may also affect the level and volatility of oil prices, which a recent study confirms to be a key contributor to food price increases.<sup>9</sup> Weather vagaries may also affect production; La Niña has already made its presence felt in the Pacific Ocean and is expected to affect the growing season for maize and soybeans in Argentina and Brazil. Delayed harvests in the Sahel and in Kenya due to climatic conditions have also contributed to flat or even increasing prices.<sup>10</sup>

At the local level, restrictive domestic policies following upward price pressures in exporting countries may lead to greater volatility in markets. Stronger demand from deficit areas has maintained higher domestic maize prices in Uganda<sup>11</sup> and Malawi. In Malawi, the government recently imposed an export ban. As increasing demand puts upward pressures on prices, the prices of Indian rice exports have also started to pick up, and in Vietnam, export prices for rice have seen only moderate declines.

**Domestic food price movements continue to show large differences from country to country, with significant increases still being observed.** As table 2 shows, price decreases in **maize** from September to December in East Africa reached 40% in Somalia (linked with increases in food relief) and 30% in Ethiopia (associated with increases in production). The price of maize in Kenya increased 40% because heavy rainfalls delayed harvests. In Central America, maize prices declined in Honduras (44%), Nicaragua (34%), and Guatemala (31%) partially due to good *primera* harvests and favorable expectations of secondary season harvests.<sup>12</sup> **Wheat** prices increased by 36% in Belarus, among the collapse of the ruble and triple-digit year-to-year inflation rates seen in the fourth quarter.<sup>13</sup> Prices decreased by 15% in South Africa and Ethiopia. **Sorghum** prices are up by 24% in Burkina Faso (partially due to reduced production) and down by 50% in Somalia (from continued food relief and off-season harvests).<sup>14</sup> Because of poor rains, rice prices increased in Rwanda (25%), Tanzania (24%), and Uganda (19%) in the fourth quarter, while inundations in Cambodia contributed to increases in domestic rice prices (18%). Prices declined in Somalia (19%) and in Bangladesh (12%) where crops were better than expected.<sup>15</sup>

**For some countries, domestic prices of staples remain at levels higher than those of a year ago** (that is, December 2010–December 2011, table 2). **Wheat** prices are up in Belarus (88%), Ethiopia (23%), and Bolivia (13%); **rice** prices are up in Uganda (81%), Malawi (56%), and Rwanda (39%); **maize** prices are up in Kenya (117%), Mexico

(106%), and South Africa (84%); and **sorghum** prices are up in Burkina Faso (57%), Ethiopia (28%) and Niger (19%), attributable in part to reduced production, increasing demand, and high oil prices.

These sharp, unseasonal increases in cereal prices have contributed to renewed calls for urgent action to prevent the deterioration of food security conditions in Burkina Faso, Chad, Mali, Mauritania, and Niger. Food security conditions are also expected to deteriorate in conflict-affected areas of Sudan and northern areas of South Sudan during the first three months of 2012, and remain at emergency and famine levels across southern Somalia.<sup>16</sup>

## Coping Strategies of the Poor Against High Prices and Food Insecurity

**High domestic food prices demand coping strategies from households,<sup>17</sup> but not all households under food stress are able to implement strategies** to mitigate the deterioration of their food security, food spending, and nutrition. A study in Indonesia found that 60% of food insecure rural households did not employ any coping strategy, while some 45% of food secure urban households did so.<sup>18</sup> Coping mechanisms are not universal, but they typically involve responses that are common across households and countries.<sup>19</sup> Strategies initially include some form of adjustment in food consumption (eating cheaper food and reducing the size and frequency of meals) and consumption-smoothing behavior (borrowing money, purchasing food on credit, selling assets, and looking for additional work). Children's food is frequently protected, sometimes at the cost of women's. Strategies like cutting spending on education and health care and selling productive assets tend to be adopted when the severity of the crisis increases.<sup>20</sup>

**The adoption of specific coping strategies is context dependent**, which is to say, it depends on the availability and cultural acceptability of alternative strategies and the nature of the crisis. **Evidence for South Africa shows that strategies differ by season.** Poor rural farm workers rely on less preferred food and wild food through all seasons, but consume seed stocks during winter when food is less available and buy food on credit in spring when crops cannot be harvested.<sup>21</sup> In **Indonesia, strategies differ by the household's level of food insecurity.** Among urban households characterized as "not hungry,"<sup>22</sup> borrowing money from family to buy food, eating less, and having an additional job were the most common strategies. In rural households with severe hunger, borrowing money from

**Table 2. Largest Domestic Price Movements (through December 2011)**

Quarterly Price Movements: September–December 2011			
Wheat	% change	Maize	% change
Belarus, natl. avg., wheat (flour), retail (Belarussian ruble/kg)	36	Malawi, Mzuzu, maize, retail (kwacha/kg)	63
Pakistan, Karachi, wheat (flour), retail (Pakistan rupee/kg)	6	Kenya, Kisumu, maize, wholesale (US\$/ton)	23
Georgia, natl. avg., wheat (flour), retail (lari/kg)	-4	South Africa, Randfontein, maize (yellow), wholesale (rand/ton)	16
Tajikistan, natl. avg., wheat flour (1st grade), retail (somon/kg)	-8	Ethiopia, Addis Ababa, maize, wholesale (Ethiopian birr/local)	-30
Ethiopia, Addis Ababa, wheat (white), wholesale (Ethiopian birr/local)	-15	Guatemala, Guatemala City, maize (yellow), wholesale (quetzal/local)	-31
South Africa, Randfontein, wheat, wholesale (rand/ton)	-15	Nicaragua, natl. avg., maize (white), wholesale (córdoba oro/kg)	-34
		Somalia, Mogadishu, maize (white), retail (Somali shilling/kg)	-40
Rice	% change		
Rwanda, Kigali, rice, wholesale (US\$/ton)	25	Honduras, San Pedro Sula, maize (white), wholesale (US\$/kg)	-44
United Rep. of Tanzania, Dar es Salaam, rice, wholesale (US\$/ton)	24		
Uganda, Kampala, rice, wholesale (US\$/ton)	19	Sorghum	% change
Cambodia, Phnom Penh, rice (mix), wholesale (riel/kg)	18	Burkina Faso, Ouagadougou, sorghum (local), wholesale (CFA franc/local)	24
Madagascar, natl. avg., rice (local), retail (Malagasy ariary/kg)	15	Niger, Niamey, sorghum (local), wholesale (CFA franc/local)	9
Nicaragua, Managua, rice (3rd quality), retail (córdoba oro/kg)	-5	Somalia, Mogadishu, sorghum (red), retail (Somali shilling/kg)	-50
Bangladesh, Dhaka, rice (coarse), retail (taka/kg)	-12	Somalia, Baidoa, sorghum (red), retail (Somali shilling/kg)	-57
Somalia, Mogadishu, rice (imported), retail (Somali shilling/kg)	-19		
Annual Price Movements: December 2010–December 2011			
Wheat	% change	Maize	% change
Belarus, natl. avg., wheat (flour), (Belarussian ruble/kg)	88	Kenya, Nakuru, maize, wholesale (US\$/ton)	117
Ethiopia, Addis Ababa, wheat (white), wholesale (Ethiopian birr/local)	23	Mexico, Culiacán, maize (white), wholesale (peso/kg)	106
Bolivia, La Paz, wheat (flour), wholesale (boliviano/kg)	13	South Africa, Randfontein, maize (white), wholesale (rand/ton)	84
China, average of 50 main cities, wheat (flour), retail (yuan renminbi/kg)	10	Ethiopia, Addis Ababa, maize, wholesale (Ethiopian birr/local)	76
Afghanistan, Kabul, wheat, retail (afghani/kg)	-7	Rwanda, Kigali, maize, wholesale (US\$/ton)	58
Bangladesh, Dhaka, wheat (flour), retail (taka/kg)	-10	Panama, Panama City, maize, retail (balboa/kg)	54
		Malawi, Mzimba, maize, retail (kwacha/kg)	-21
		Bolivia, La Paz, maize (hard yellow; boliviano/kg)	-32
Rice	% change	Sorghum	% change
Uganda, Kampala, rice, wholesale (US\$/ton)	81	Burkina Faso, Ouagadougou, sorghum (local), wholesale (CFA franc/local)	57
Malawi, Lilongwe, rice, retail (kwacha/kg)	56	Ethiopia, Addis Ababa, sorghum (white), wholesale (Ethiopian birr/local)	28
Rwanda, Kigali, rice, wholesale (US\$/ton)	39	Niger, Niamey, sorghum (local), wholesale (CFA franc/local)	19
Pakistan, Karachi, rice (irri), retail (Pakistan rupee/kg)	33	Somalia, Mogadishu, sorghum (red), retail (Somali shilling/kg)	-11
Cambodia, Phnom Penh, rice (mix), wholesale (riel/kg)	24	Somalia, Baidoa, sorghum (red), retail (Somali shilling/kg)	-46
Lao People's Dem. Rep., Vientiane Capital, rice (ordinary)	-11		
Bolivia, Cochabamba, rice (grando de oro cubano), wholesale (boliviano/kg)	-11		
Bangladesh, Dhaka, rice (coarse), retail (taka/kg)	-16		
Mozambique, Maputo, rice, retail (metical/kg)	-16		

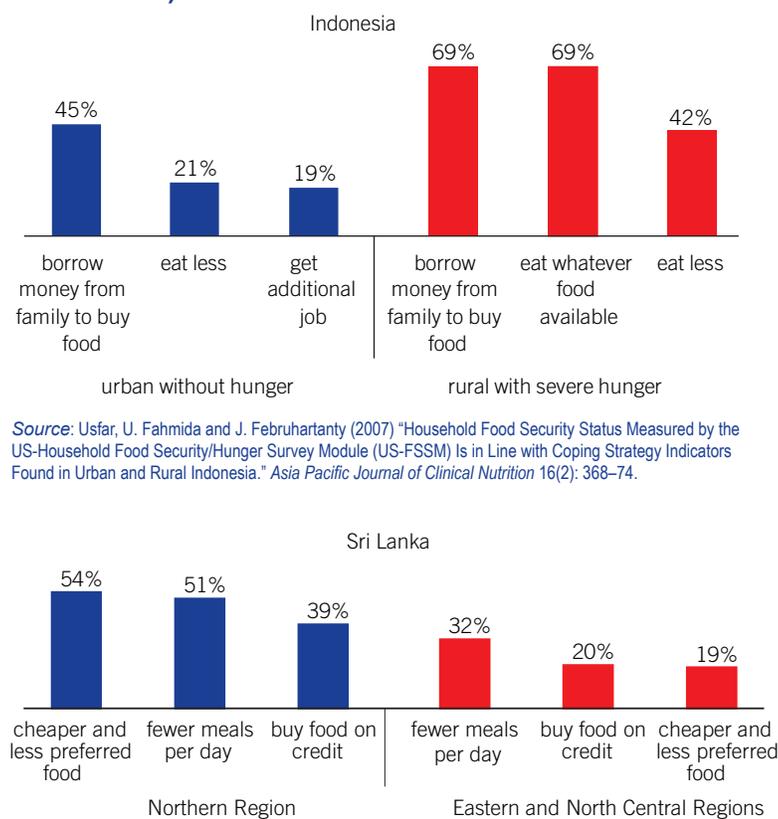
Source: FAO, GIEWS.

family to buy food, eating whatever food is available, and eating less were found to be the top three strategies (figure 2). Eating less and buying cheaper brands were the top coping strategies during the late 1990s financial crisis.<sup>23</sup>

**In Sri Lanka, coping strategies vary by location and type of shock**, and these are closely related.<sup>24</sup> Food insecure households rely on less preferred and cheaper food; fewer meals; and buying food on credit in the Northern Region, where civil war has been the main source of food insecurity. In the eastern and north central provinces, following the monsoon floods in November 2010, households' most frequent strategies were fewer meals per day, buying food on credit, and consumption of less preferred foods (figure 2). Evidence in Sri Lanka also shows that strategies varied within each region: eating less preferred food was practiced by between 20% and 90% of food insecure households across analyzed districts in the Northern Region.

**A better understanding of coping strategies is important for informing nutritional and social protection policies.**<sup>25</sup> First, the nutritional consequences of food price increases can quickly become devastating.<sup>26</sup> Save the Children recently estimated that an additional 400,000 children's lives may be at risk following the food price increases in 2011.<sup>27</sup> Coping strategies may mitigate some of these risks, with the strategies having significant positive welfare impacts (box 1), but also contribute to others. Reduced consumption of basic foods and being unable to afford a diversified diet both lead to a lower intake of micronutrients.<sup>28</sup> Reducing meal sizes and skipping meals may also have effects on macronutrients and calories. These deficiencies are connected to increased risk of malnutrition, increased susceptibility to infections, slow cognitive development, poorer school performance, and reduced work productivity. Young children, pregnant and lactating women, and the chronically ill require more diverse diets and have fewer coping mechanisms.<sup>29</sup>

**Figure 2. Top Coping Strategies Employed by Households in Indonesia and Sri Lanka (% of households)**



Source: Usfar, U. Fahmida and J. Febrihartanty (2007) "Household Food Security Status Measured by the US-Household Food Security/Hunger Survey Module (US-FSSM) Is in Line with Coping Strategy Indicators Found in Urban and Rural Indonesia." *Asia Pacific Journal of Clinical Nutrition* 16(2): 368–74.

Source: A. Petersson, L. Nanayakkara, R. H. W. A. Kumarasiri, and R. Liyanapathirana, *Food Security in the Northern, Eastern and North Central Provinces: A Food Security Assessment Report*, Hector Kobbekaduwa Agrarian Research and Training Institute, Ministry of Economic Development and United Nations World Food Programme (2011), <http://documents.wfp.org/stellent/groups/public/documents/ena/wfp243519.pdf>.

Second, public interventions need to consider coping behaviors, complement their positive effects, and mitigate their deficiencies. For example, school food programs may reduce the incentive for parents to take children out of school to work, as can conditional cash transfers. Cash transfers may reduce the need to skip meals, and well-targeted nutritional programs may reduce micronutrient deficiencies from skipped meals. Food-for-work programs may be a better alternative than a precarious additional job in the informal sector. A safety net may prevent reductions in households' health or educational spending. However, these public interventions are far from being universally available in many countries.

**Countries commonly use food assistance to mitigate the impact of price shocks, but safety net systems remain weak.** In a review of policies adopted in response to rising prices during 2007 and 2009, UNICEF found that 75 countries used some measure to enhance consumption: food assistance—school feeding, food transfers, and voucher/stamps—was the most popular, food for work was the least used.<sup>30</sup> Yet a recent World Bank update on social safety nets shows that between 2008 and 2011, some 80 countries out of 137 reviewed had weak or no safety net capacity (two-thirds of these were low-income countries). Only 9 of those 80 countries undertook strong

## Box 1. Substituting Behavior during the Food Crisis in Uganda

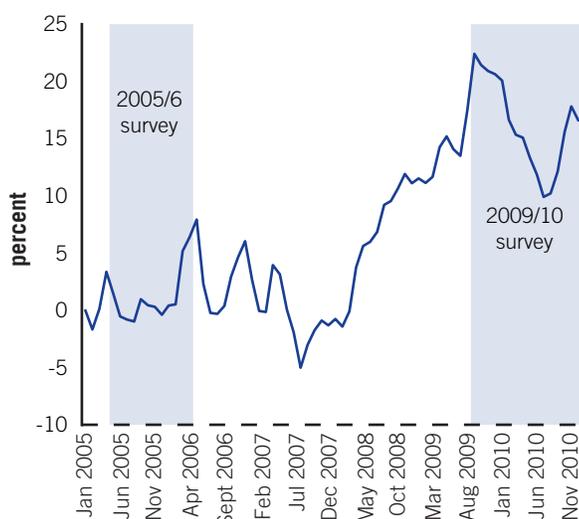
Following a period of relatively stable prices from 2005 to early 2008, Uganda experienced a noticeable increase in food prices (relative to the overall consumer price level) that peaked in September 2009 and November 2010. A recent analysis tracked the adjustments made by individual households in consumption and farm production to assess the impacts of these adjustments on Uganda's poverty rate. In this analysis, a sample of 2,428 households was interviewed before the food crisis (May 2005–April 2006) and then again after prices had peaked (September 2009–December 2010).

Consumers' adjustments to food price increases were faster and more effective in terms of mitigating poverty than producers' responses. This may reflect farmers' difficulties in forecasting and responding to 2009/10 prices, particularly given the increase in their volatility. Also it may reflect constraints in a declining sector of the economy: the share of agriculture in the economy went from 26.7% to 24.2% during the period of analysis. Consumers responded by moving away from commodities whose prices had risen the most, as seen elsewhere. The consumption of *matooke* (plantains), the most commonly consumed food in Uganda, fell by 1.7% following its price rising 1% over the food price index for the period analyzed (figure 3). Similarly, the consumed quantity of sweet potatoes fell by 5.6%, with its price rising 6.2% more than that of all foods. On the other hand, the consumption of fresh cassava rose 3.1%, while its relative price declined 13.3%, and the consumption of milk rose 3.6%, while its relative price dropped 16.2%.

These adjustments are estimated to have lowered the adverse poverty impact of increasing food prices by 2.8 percentage points (figure 4). Observed adjustments in farmers' output mixes made a much smaller difference in terms of poverty reduction.

Source: M. Ivanic and W. Martin, "Examination of Short and Long-Run Impacts of Food Price Changes in Poverty," Working Paper, World Bank (forthcoming).

**Figure 3. Changes in Food Prices in Uganda, 2005–10, Monthly Variation of Food Price Index over CPI**



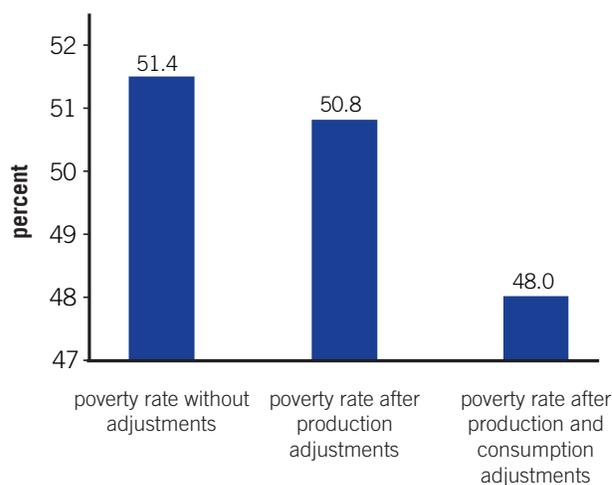
Source: FAOSTAT.

measures to improve their safety nets during the crisis period.<sup>31</sup>

### Notes

1. From 2010 to 2011, annual price averages rose from US\$185.91 to US\$291.68 per metric ton; from US\$488.91 up to US\$543.03

**Figure 4. Changes in Poverty Rates Due to Household Adjustments**



Source: Ivanic and Martin, "Examination of Short and Long-Run Impacts of Food Price Changes in Poverty," Working Paper, World Bank (forthcoming).

per metric ton of rice, Thai 5%; and from US\$223.58 up to US\$316.26 in the case of wheat, U.S. HRW (World Bank, *Commodity Price Data* [Pink Sheet], updated January 5, 2012). Substantive increases are also observed in real terms.

2. CME Group, Agricultural Commodity Prices.
3. USAID, *WASDE Report*, January 12, 2012.

4. USAID, *WASDE Report*, December 9, 2011.
5. The stock-to-use ratio for wheat in 2010/2011 was 26.7%, well above the 2007/8 ratio of 21.6%. For rice, the stock-to-use ratio was 30% in 2010/2011 (FAO, *Food Outlook*, Global Market Analysis, November 2011).
6. FAO, *Food Outlook*, November 2011.
7. World Bank, "Global Economic Prospects," *Commodity Market Outlook*, January 18, 2012, Washington, DC, [www.worldbank.org/prospects/commodities](http://www.worldbank.org/prospects/commodities).
8. In any case, the diversion of maize production into biofuels in the United States has grown from 11% in 2004 to 40% in 2010/2011, although at declining rates of growth since 2007/8. The annual growth for ethanol use in 2011/12 is forecasted at 1%, down from 9% last year (FAO, *Food Outlook*, Global Market Analysis, April 2011).
9. World Bank, *Global Economic Prospects*, 2012. The study concludes that oil price variations contributed to about two-thirds of the price increases of key food commodities between 2000 and 2005 and between 2006 and 2010.
10. USAID, *Price Watch*, December 21, 2011.
11. USAID, *Price Watch*, p. 3
12. USAID, *Price Watch*.
13. UNDP (United Nations Development Programme), Office of the Chief Economist, "Has Belarus's Currency Crisis Bottomed Out?" January 3, 2012, <http://europeandcis.undp.org/senioreconomist/show/E4AFB654-F203-1EE9-B19A83640A301CD2>.
14. FAO, *Global Food Price Monitor*, December 9, 2011.
15. FAO, *Food Outlook*, Global Market Analysis, November 2011.
16. USAID, GIEWS Country Briefs, 2012.
17. It is important to note, however, that households do not become food insecure simply because food prices soar or remain volatile after floods or droughts or harvest failures; they become insecure when they are unable to cope with such changes.
18. In effect, households do not engage in coping strategies only when there are food crises or when they are food insecure; they also use coping strategies in more favorable conditions to improve their diets. Results for Indonesia come from a study covering household behavior from February 2004 to August 2005 (A. Usfar, U. Fahmida, and J. Februhartanty, "Household Food Security Status Measured by the US-Household Food Security/Hunger Survey Module [US-FSSM] Is in Line with Coping Strategy Indicators Found in Urban and Rural Indonesia," *Asia Pacific Journal of Clinical Nutrition* 16[2]: 368–74 [2008]).
19. D. Maxwell and R. Caldwell, "The Coping Strategy Index," *Field Methods Manual*, Second Edition, 2008.
20. J. Compton, S. Wiggins, and S. Keats, "Impact of Global Food Crisis on the Poor: What Is the Evidence?," ODI, London, 2010.
- Evidence on coping strategies refers to 14 countries: Bangladesh, Burkina Faso, Burundi, Cambodia, China, Côte d'Ivoire, Haiti, Nepal, Nigeria, Pakistan, the Philippines, Sierra Leone, Swaziland, and the Republic of Yemen.
21. The study was conducted in a community located on Oranje Farm in the Fouriesburg District, Free State Province. The sample consisted of 21 adult women (from 17 households) 18 to 57 years of age responsible for provision, preparation, and distribution of food in the households of Oranje Farm (R. Kruger, H. Schöenfeldt, and J. Owen, "Food-Coping Strategy Index Applied to a Community of Farm-Worker Households in South Africa," *Food Nutrition Bulletin* 29[1]: 3–14 [2008]).
22. Sample consisted of 3,704 households (45%) in urban and rural (55%) areas between February 2004 and August 2005, with children under the age of five in six provinces: two rural provinces in the eastern part of the country, two urban provinces in the West, and Jakarta and Surabaya as urban cities (Usfar, Fahmida, and Februhartanty, "Household Food Security Status").
23. M. Mardiharini, "Family-Coping Strategies in Maintaining Welfare during the Economic Crisis in Indonesia: A Case Study in Urban and Rural Areas in Bogor, West Java, Indonesia," *Journal Agro Ekonomi* 23(1): 54–70 (2005). In 2011, seeking alternative jobs and limiting meal sizes are reported as the top two strategies used in rural areas (Indonesia Food and Nutrition Security Monitoring System [FNSMS], Food and Nutrition Security Bulletin in Four Selected Provinces [East Java, NTT, West Kalimantan, and Central Sulawesi]).
24. A. Petersson, L. Nanayakkara, R. H. W. A. Kumarasiri, and R. Liyanapathirana, *Food Security in the Northern, Eastern and North Central Provinces: A Food Security Assessment Report*, Hector Kobbekaduwa Agrarian Research and Training Institute, Ministry of Economic Development and United Nations World Food Programme (2011), <http://documents.wfp.org/stellent/groups/public/documents/ena/wfp243519.pdf>.
25. Additional understanding of these strategies is needed in the context of food crises. Some knowledge gaps remain regarding how coping strategies differ between soaring prices perceived to be permanent versus those perceived to be transitory, and between food price increases and volatile prices. Also, it is not clear when households start implementing these strategies to cope with food price crises, that is, what information (levels of prices or shortages) triggers the adoption of a coping mechanism.
26. See evidence in S. Horton and J. Ross ("The Economics of Iron Deficiency," *Food Policy* 28[1]: 51–75 [2003]); C. Victoria, L. Adair, C. Fall, P. Hallal, R. Martorell, L. Ritcher, and H. Sachdev ("Maternal and Child Undernutrition: Consequences for Adult Health and Human Capital," *Lancet* 371 [9609]: 340–57 [2003]); and M. Ruel, J. Garnett, C. Hawkes, and M. Cohen ("The Food, Fuel and Financial Crises Affect the Urban and Rural Poor Disproportionately: A Review of Evidence," *Journal of Nutrition* 140 [1]: 170S–76S [2010]).
27. Save the Children, "Costing Lives: The Devastating Impact

- of Rising and Volatile Food Prices,” Media Brief, October 2011.
- Studies on the impact of food price increases on nutrition after 2006 estimate annual increases in hunger for 63–91 million people, depending on the period analyzed (S. Tiwari and H. Zaman, “The Impacts of Economic Shocks on Global Undernourishment,” Policy Research Working Paper 5215, World Bank; H. Brinkman, S. de Pee, I. Sanogo, L. Subran, and M. Bloem, “High Food Prices and the Global Financial Crisis Have Reduced Access to Nutritious Food and Worsened Nutritional Status and Health,” *Journal of Nutrition* 140: 153S–61S [2010]).
28. There are documented cases, however, such as in parts of China, where a rise in the prices of rice and wheat led to lower consumption of these cereals and increased consumption of nutritious pulses (R. Jensen and N. Miller, “The Impact of the World Food Price Crisis in Nutrition in China,” Faculty Research Working Papers RWP08-039, Harvard Kennedy School of Government, Harvard University [2008]).
29. Save the Children, “Costing Lives.”
30. I. Ortiz, J. Chai, and M. Cummins, “Escalating Food Prices: The Threat to Poor Households and Policies to Safeguard Recovery for All,” Policy and Practice, UNICEF Working Paper. The study samples 98 countries.
31. Arup Banerji, “Update on World Bank Work on Social Safety Nets, and Country Assessment of the Readiness of Safety Net Systems,” World Bank brief, December 6, 2011.