Urgent Actions Needed to Prevent Recurring Food Crises

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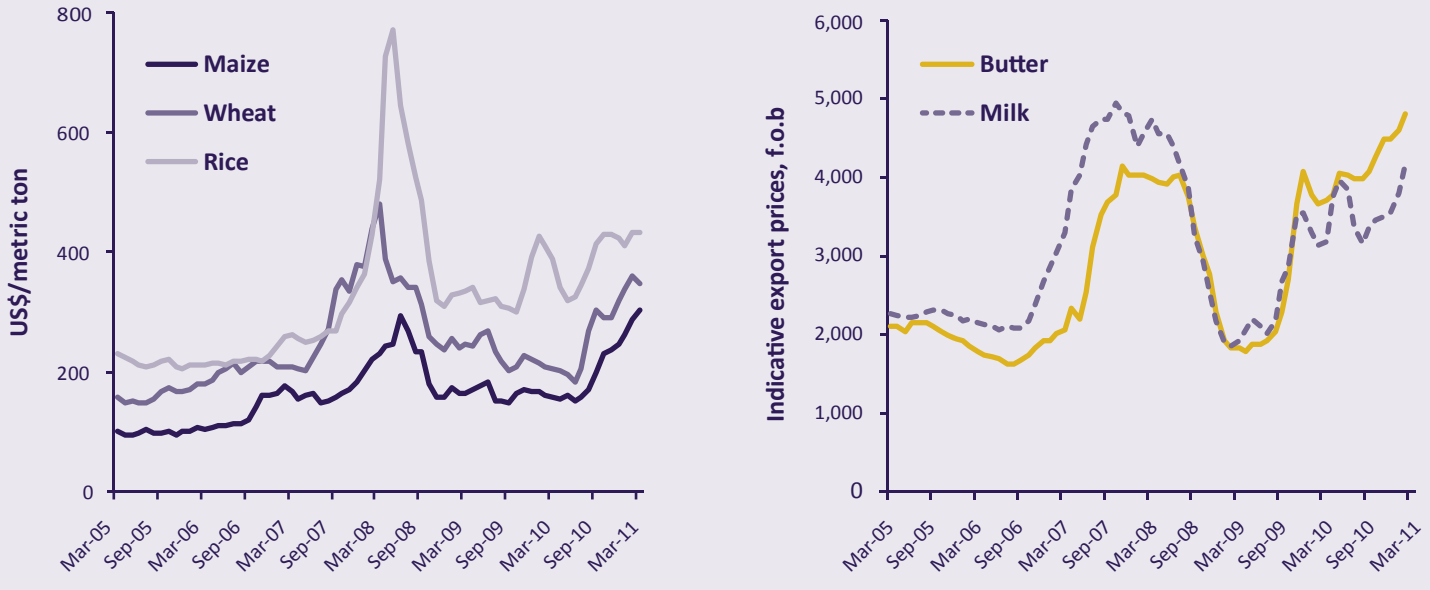
Three years after the 2007–08 food crisis, the prices of basic food items are again rising rapidly, fueling new concerns about the food security of poor people.[1] The international prices of maize and wheat have almost doubled between June 2010 and mid-March 2011, and the global prices of dairy products have also risen (Figure 1). High food inflation is affecting many developing countries, including those home to large numbers of poor people. For example, food inflation rose to 10 percent in China and 18 percent in India between December 2009 and December 2010, mostly driven by higher prices of meat, fish, eggs, dairy, vegetables, and fruits.[2]

A New Food Crisis on the Horizon?

Elements of the 2007–08 global food crisis can be seen in the current global food price situation.[3] In particular, expanding biofuel production, rising oil prices, US dollar depreciation, export restrictions, and panic purchases are again pushing food prices higher, although not yet to the same extent as three years ago.[4] Assigning each cause a specific magnitude is difficult, partly because the effects differ by food products and markets; yet, studies suggest that the diversion of crops from food or feed to biofuel production applies a significant amount of demand-induced pressure.[5] In the case of maize, for example, many experts claim ethanol demand in the United States is a major factor in driving down maize stocks and driving up maize prices. Higher maize prices also have domino effects on livestock prices—even though maize ethanol produces byproducts that can be used as feed—as well as oilseed prices, given the competition for land between maize and oilseed production in the United States.[6] Research suggests biofuel mandates and support policies, particularly in the United States and European Union, contribute to increased demand and prices.[7] If the current biofuel policies remain in place and oil prices stay high, prices of agricultural commodities used for biofuels could remain substantially higher in the coming decades.[8] The recent weakening of the US dollar has also put pressure on a range of commodity prices, since crude oil and most of the major grains are traded in US dollars.[9] Weather

Figure 1—Global food prices, March 2005–11



Source: FAO (Food and Agriculture Organization of the United Nations), International Commodity Prices Database, accessed March 24, 2011, www.fao.org/es/esc/prices/PricesServlet.jsp?lang=en.

Notes: Maize = US No. 2, Yellow, US Gulf; Wheat = US No. 2, Hard Red Winter ord. prot, US f.o.b. Gulf; Rice = White Broken, Thai A1 Super, f.o.b. Bangkok; Butter = Oceania, indicative export prices, f.o.b.; and Milk = Whole Milk Powder, Oceania, indicative export prices, f.o.b.

events—including the 2010 Russian wildfires and the Australian drought prior to the 2007–08 crisis—have also driven the recent food price spikes, both in 2007–08 and now. These events resulted in production shortfalls in major producing countries, while also inducing trade diversion and panic purchases in other markets.[10] Climate change will likely increase the frequency of extreme weather events and put upward pressure on food prices.

Although many parallels exist, certain aspects of today's world food situation differ from the situation in 2007–08. Overall grain production and stock levels, particularly in developing countries, are higher compared with the levels of three years ago.[11] The international price of rice, the main staple in Asia, has not increased as much as it did three years ago—although considerable price increases have affected some domestic markets, including South Asia. In contrast to these more positive signs, the economies of China and India are now overheated and experiencing high overall inflation caused by factors such as excess liquidity, whereas three years ago domestic food markets in these countries were much calmer. Rising oil prices in recent months, the expansion of biofuel production, particularly maize ethanol, and other factors mentioned above suggest the significant risk of even higher global food prices.

Global food prices can have substantial impacts on domestic prices in many parts of the world. In Sub-Saharan Africa, for example, groundwork research suggests that average increases in staple food prices between June 2007 and June 2008 exceeded 60 percent—amounting to about three-quarters of the proportional increase in corresponding food commodities' global prices.[12] Parts of Asia and Latin America have experienced similar effects. For example, a study showed positive transmission effects from global prices to domestic prices for rice in Vietnam, wheat in Bangladesh, and bread in Ecuador, Nicaragua, and the Dominican Republic.[13] The degree of transmission, however, varies by country and commodity, depending on the traded volumes of food commodities; trade policies, such as import tariffs, export restrictions, and price subsidies imposed by national governments; and partial protection of domestic markets from international price increases due to currency appreciation.

The Hardest Hit

Sharp increases in the prices of staple foods such as cereals, as well as excessive price volatility, are particularly harmful for the world's poorest consumers, who spend a large proportion—about 50 to 70 percent—of their income on food and have limited capacity to adjust quickly to rapid price increases.[14] Poor agricultural producers can benefit from higher food prices through higher incomes only if they are net sellers of food and if input costs do not rise in parallel. In recent years, however, input costs, such as fertilizer and transport costs, have also been high and volatile. Increasing costs, as well as the uncertainty that comes with excessive price volatility in both input and output markets, can reduce farmers' profit margins, distort long-term planning, and dampen the incentives to invest more in productivity enhancement.

Evidence based on household simulation analyses shows that when food prices change quickly, poverty increases in the vast majority of cases.[15] Self-reported food insecurity data show that most countries in Africa felt sharp increases in food insecurity in 2007–08 and 2008–09, compared with the pre-crisis period of 2006–07 (Figure 2).[16] In Asia, self-reported food insecurity declined sharply in 2007–08, especially in China and India and more modestly in Indonesia, before rising again in 2009.[17] This

Figure 2—Trends in self-reported food insecurity in Sub-Saharan Africa

Source: Based on data from D. Headey, *Was the Global Food Crisis Really a Crisis?*, IFPRI Discussion Paper (Washington, DC: IFPRI, forthcoming).
Notes: Results for 2007–2008 and 2008–2009 both pertain to the food crisis, although 2008–2009 also covers the onset of the financial crisis, which especially affected countries that export minerals and oil.

is consistent with modest food inflation in all three countries during rapid economic growth. Trends in other regions are more mixed, with Latin American and Central Asian countries generally reporting only modest increases in food insecurity, if anything.[18]

The variations in self-reported food insecurity could also be due to the degree of transmission from international prices to domestic prices. The food security of many poor people and vulnerable groups, particularly women and children, is again at risk due to the steep international food price increases in recent months. Although the impacts of the current food price spikes are not yet known, the impacts in 2010–11 will likely differ from those observed in 2007–08. Some of the price increases observed in developing countries this time around are for high-value food products, such as vegetables, fruits, and meat, of which the poor generally consume little. Moreover, although international maize prices have increased rapidly in recent months to levels equivalent to those observed in the 2008 crisis, evidence from 2008 suggests that the transmission of international maize prices to domestic maize prices in Africa was relatively low in 2007–08.[19] So far, at least, the same appears true in 2010–11 as there are few signs of increasing maize price increases in Africa. However, 2010–11 differs significantly from the earlier crisis because food prices are rising rapidly in countries with large numbers of poor people—such as India, China, and Indonesia—which was not the case in 2007–08.

Urgent Actions Needed

The recent trends in food prices—higher levels and higher volatility—confirm trends predicted by a number of experts.[20] Given the complex web of factors influencing global food security, governments of developed and developing countries, as well as international organizations, must use a comprehensive approach to prevent a food crisis reoccurrence. This comprehensive approach should comprise a number of initiatives and reforms; while some of these have been proposed before, their merits are even more relevant today and justify reprioritization of and reallocation within national and international budgets. There are seven main initiatives that governments and institutions should promptly implement.

1 **EFFECTIVE POLICIES AND TECHNOLOGY INVESTMENTS TO MINIMIZE FOOD–FUEL COMPETITION.** Public policies, particularly in the United States and the European Union, should aim to curtail and reform existing biofuel policies and subsidies to maximize environmental benefits while minimizing biofuel demand's possible contribution to the volatility of international and domestic food markets.[21] One measure would be to include provisions to reward lower carbon intensities in biofuel production, such as using inputs more energy-efficient than grain feedstock.[22] Reduction of the nonfood demand for grains can also relieve some of the pressure on food markets.[23] Additionally, recent preliminary research suggests that trade liberalization under the current US and EU biofuel mandates can offer important benefits such as greater reduction in global greenhouse gas emissions, lower global fuel prices, and smaller global price increases for agricultural products.[24] In the long run, the benefits and threats of crop-based biofuel production for food security and environmental sustainability need to be carefully evaluated in terms of their real contribution to lowering greenhouse gas emissions and transport fuels' carbon intensity.

2 **SOCIAL PROTECTION, ESPECIALLY SOCIAL SAFETY NETS,** for the most vulnerable groups, including women and young children, in developing countries. Despite strong advocacy for creating social safety nets to protect the most vulnerable—who tend to be most affected by sharp food price increases—many countries failed to put them in place during the 2007–08 food crisis and its aftermath. A recent study indicates that the importance of using cash transfer programs to protect the diet diversity and micronutrient nutrition of poor households increases during food price crises.[25] The prospect of continued food price volatility suggests that the establishment of safety nets should be accelerated. Social protection programs are also desirable because they protect the poor from the impacts of other types of negative shocks. National governments should immediately expand safety net programs already in place. The effectiveness of these programs will depend on the availability of fiscal resources and administrative capacities, as well as proper targeting, design, and implementation.[26] Although safety net programs compete for limited government resources, when properly targeted, they typically account for less than 1 percent of gross national product.[27] In countries lacking established safety net programs, governments should begin program development immediately, focusing on the geographic areas with extreme hunger, and should draw on best practices from other countries.[28] Safety nets should be effectively combined with gender-sensitive interventions that increase the productive capacity and improve the health and nutrition of vulnerable households and individuals. Indeed, combined social protection and agricultural support interventions can lead to greater impacts on food security than either intervention alone.[29]

3 **TRANSPARENT, FAIR, AND OPEN GLOBAL TRADE** to enhance the efficiency of global agricultural markets. National governments should eliminate existing export restrictions, such as export bans, and refrain from imposing new ones. Although export bans may help to secure domestic food supply, they lead to tighter markets for other exporting countries and induce panic purchases by food-importing countries, both of which lead to further price increases and volatility.[30] In addition, eliminating export bans could benefit domestic food markets, since export bans tend to inhibit domestic production response, which could potentially exacerbate domestic supply problems. Governments should also eliminate harmful import tariffs and nontariff trade barriers. Recent studies argue that a quick and favorable completion of the World Trade Organization (WTO) Doha Round would reduce maximum tariff levels and thereby

also reduce the risk of governments implementing policies that would further destabilize world food markets.[31]

4 A GLOBAL EMERGENCY PHYSICAL GRAIN RESERVE to address the effects of the food price crises for the most vulnerable. Such a reserve should be owned and managed by an institution such as the World Food Programme, which already has a global food management system in place, including strong logistical capabilities. The reserve should be created through donations of grain stocks from large food exporters, such as the United States, Canada, and France, and large food producers such as China and India. For easy and fast access, the managing institution should strategically position the emergency reserve in both large, food-producing countries and, more importantly, in food-importing poor countries, such as Bangladesh and the countries in the Horn of Africa. Although a properly managed system of grain reserves can play an important role in calming food markets,implementing such a system presents many challenges.[32] The operating costs need to be low, and moral hazard problems that may prevent effective functioning of the system need to be overcome. These challenges suggest that such a grain reserve system should be started on an experimental scale with relatively small reserves. To some extent this process is already underway—the Association of Southeast Asian Nations plus China, Japan, and South Korea (ASEAN+3) emergency rice reserve, currently under discussion, is an example. However, efforts in this regard are uneven across regions, and a coherent roadmap for a more comprehensive global grain reserve system does not exist.[33]

5 POLICIES AND INVESTMENTS TO PROMOTE AGRICULTURAL GROWTH, IN PARTICULAR SMALLHOLDER PRODUCTIVITY, IN THE FACE OF CLIMATE CHANGE. The occurrence of the global food crisis has renewed attention to agriculture and spurred increased investment in the sector. Public policy should ensure that small farmers have opportunities to increase their productivity and income.[34] Investments by national governments, as well as global and regional institutions, should focus on improved smallholder access to inputs such as seeds and fertilizer—through lower transport and marketing costs, improved market infrastructure, and greater competition, as well as financial and extension services and weather-based crop insurance. Governments and institutions should strongly promote new agricultural technologies suitable for smallholders through increased investment in crop breeding and livestock research. Rural infrastructure should also be strengthened to increase access to markets. Past successes show that such investments can achieve rapid increases in smallholder productivity. During the Green Revolution in Asia, small farms benefited from the provision of farm-size-neutral technologies, equitable land distribution and secure property rights, modern and affordable inputs and credit for small farms, and policies that guaranteed stable and fair prices for small farmers.[35] More recent successes in Sub-Saharan Africa also demonstrate the potential to increase the productivity of small farmers.[36]

6 INVESTMENTS BY NATIONAL GOVERNMENTS IN CLIMATE CHANGE ADAPTATION AND MITIGATION USING THE FULL POTENTIAL THAT AGRICULTURE OFFERS, since climate change has significant implications for agricultural productivity and human welfare. Adaptation includes investments in improved land management, adjustment of planting dates, and introduction of new crop varieties; mitigation includes improving energy efficiency and crop yields and increasing carbon storage through new land management techniques. Recent research shows that additional agricultural productivity investments of at least US$7 billion per year would be needed to raise calorie consumption enough to offset the adverse affects of climate change on the health and well-being of children.[37] Most of these investments also make good economic sense even in the absence of climate change. However, agricultural adaptation investments remain limited, likely because climate change issues are perceived as long term, while political horizons are short term. This area requires a great deal of political will and commitment, particularly from national governments. Climate change adaptation through agriculture must be brought to the forefront of the international climate negotiation process in order to catalyze action.

7 AN INTERNATIONAL WORKING GROUP TO REGULARLY MONITOR THE WORLD FOOD SITUATION and trigger action to prevent excessive price volatility. While several working groups already exist—along with a remarkable consensus on the need to respond to global food crises and how to do it—a lack of cohesion in efforts to understand and properly respond to food price volatility persists. This proposed working group should be made up of key institutions, such as the Food and Agriculture Organization of the United Nations, the International Food Policy Research Institute, the International Fund for Agricultural Development, the Organisation for Economic Co-operation and Development, the United Nations Conference on Trade and Development, the World Bank, the World Food Programme, and the World Trade Organization. The working group, in close collaboration with other major stakeholders, should pay close attention to food production, consumption (including for biofuels), trade, stocks, prices, and policies, as well as energy prices, input prices, and financial market speculation. The group could also provide guidance on the optimal level of grain reserves to be held for food security emergencies, when and how to release them, and at what prices. These responsibilities should be carried out by the working group in a coordinated, transparent, and timely fashion.

To prevent a repeat of the 2007–08 food price crisis, proactive steps must be taken by governments of developed and developing countries, as well as interested institutions and organizations. Timely research has presented important lessons gleaned from the last crisis—lessons that should be used to inform current actions. The research-based initiatives described in this brief should be a guide for a coordinated effort to stabilize food markets and thereby continue the reduction of hunger and malnutrition worldwide.

1 Food security refers to food availability, access, utilization, and stability.

2 National Bureau of Statistics of China, "Consumer Price Index (CPI) by Category (2010.11)," accessed March 24, 2011, http://www.stats.gov.cn/english/statisticaldata/monthlydata/t20101227_402693597.htm; Office of the Economic Adviser to the Government of India, Ministry of Commerce and Industry, "Wholesale Price Index (WPI) Data," accessed March 24, 2011, http://eaindustry.nic.in/.

3 See D. Headey and S. Fan, *Reflections on the Global Food Crisis: How Did It Happen? How Has It Hurt? And How Can We Prevent the Next One?,* Research Monograph 165 (Washington, DC: IFPRI, 2010).

4 According to OECD (Organisation for Economic Co-operation and Development), biofuel production is projected to more than double between 2006–08 and 2018. For details, see OECD-FAO, *OECD-FAO Agricultural Outlook 2009–2018* (Paris and Rome: 2010).

5 See, for example, P.C. Abbott, C. Hurt, and W. E. Tyner, *What's Driving Food Prices?,* Issue Report (Oak Brook, IL, US: Farm Foundation, 2008); W. W. Wilson, W. Koo, B. Dahl, and R. Taylor, "Impacts of Ethanol Expansion on Cropping Patterns and Grain Flows," *Applied Economic Perspectives and Policy* 30, no. 4 (2008): 642–663.

6 The stocks-to-use ratio of maize in the United States is projected to be at 5.5 percent in 2010–11, the lowest since 1995–96 when it dropped to 5.0 percent, according to the United States Department of Agriculture; see D. Headey, "Rethinking the Global Food Crisis: The Role of Trade Shocks," *Food Policy* 36, no. 2 (2011): 136–146.

7 See OECD, *Biofuel Support Policies: An Economic Assessment* (Paris: 2008); OECD-FAO, *Agricultural Outlook.*

8 According to the United States Energy Independence and Security Act of December 2007, the mandate for biofuels use was increased to 36 billion gallons by 2022, of which 15 billion gallons will be mainly from maize-based ethanol; see OECD-FAO *Agricultural Outlook.*

9 For more details, see D. Headey and S. Fan, *Reflections on the Global Food Crisis.*

10 See D. Headey, "Rethinking the Global Food Crisis." A recent analysis of United States wheat exports shows that demand for United States wheat surged a few weeks after Russia's export ban on wheat, by almost 100 percent. However, the surge was more short-lived than comparable surges in 2007 and 2008, probably because global wheat stocks for 2010–11 are more plentiful than those for 2007–08.

11 The 2010–11 forecast for world cereal production and stocks is 4 and 22 percent higher compared to their levels in 2007–08, according to FAO. Stocks in developed countries have decreased by about 25 percent compared to 2009–10, while stocks in developing countries grew by about 3 percent. Although stocks-to-use ratio for cereals, particularly for wheat and coarse grains, may suggest tighter market supply, the ratio in 2010–11 is predicted to be higher than in 2007–08. For more details, see FAO, *Crop Prospects and Food Situation*, no. 4 (December 2010).

12 N. Minot, *Transmission of World Food Price Changes to Markets in Sub-Saharan Africa*, Discussion Paper 1059 (Washington, DC: IFPRI, 2011).

13 M. Robles and M. Torero, "Understanding the Impact of High Food Prices in Latin America," *Economia* 10, no. 2 (2010): 117–164; M. Robles, *Price Transmission from International Agricultural Commodity Markets to Domestic Food Prices: Case Studies in Asia and Latin America* (2010), accessed March 24, 2011, http://www.foodsecurityportal.org/sites/default/files/Price_Transmission-in_LAC_Asia.pdf.

14 Excessive price volatility is determined in a period of time in which a large number of large daily returns are observed that exceed a certain established threshold that characterizes what is "large." For further details on excessive price volatility see C. Martins-Filho, M. Torero, and F. Yao, *Two-Step Conditional A-Quantile Estimation via Additive Models of Location And Scale*, IFPRI Mimeo (Washington, DC: IFPRI, 2010), accessed March 24, 2011, http://www.foodsecurityportal.org/policy-analysis-tools/wheat-prices-and-returns.

15 M. Ivanic and W. Martin, "Implications of Higher Global Food Prices for Poverty in Low-Income Countries," *Agricultural Economics* 39, no. S1 (2008): S405–S416; C. Arndt, R. Benfica, N. Maximiano, A. M. D. Nucifora, and J. T. Thurlow, "Higher Fuel and Food Prices: Impacts and Responses for Mozambique," *Agricultural Economics* 39, no. S1 (2008): S497–S511.

16 Self-reported food insecurity is estimated from the World Gallup Poll on whether a household has experienced difficulties affording food over the previous 12 months. The Gallup Poll was conducted over the period 2005–2010 and it covered almost 90 percent of the developing world population. While such data may not be ideal, they offer a useful barometer for gauging the welfare impacts of the global food crisis. For more details, see D. Headey, *Was the Global Food Crisis Really a Crisis? Simulations versus Self-Reporting*, IFPRI Discussion Paper (Washington, DC: IFPRI, forthcoming).

17 Headey, *Was the Global Food Crisis Really a Crisis?.*

18 Ibid.

19 Minot, *Transmission of World Food Price Changes.*

20 See D. Headey, S. Malaiyandi, and S. Fan, "Navigating the Perfect Storm: Reflections on the Food, Energy, and Financial Crises," *Agricultural Economics* 41, no. S1 (2010): 217–228, for a review of OECD-FAO and USDA (United States Department of Agriculture) models of global food prices from 2008 to 2018.

21 H. de Gorter and D. R. Just, "The Social Costs and Benefits of Biofuels: The Intersection of Environmental, Energy, and Agricultural Policy," *Applied Economic Perspectives and Policy* 32, no. 1 (2010): 4–32.

22 Ibid.

23 M. W. Rosegrant, T. Zhu, S. Msangi, and T. Sulser, "Global Scenarios for Biofuels: Impacts and Implications," *Applied Economic Perspectives and Policy* 30, no. 3 (2008): 495–505.

24 P. Al-Riffai, B. Dimaranan, and D. Laborde, *European Union and United States Biofuel Mandates: Impacts on World Markets*, Technical Notes IDB-TN-191 (Washington, DC: Inter-American Development Bank, 2010).

25 E. Skoufias, S. Tiwari, and H. Zaman, *Can We Rely on Cash Transfers to Protect Dietary Diversity During Food Crises? Estimates from Indonesia*, Policy Research Working Paper 5548 (Washington, DC: World Bank, 2010).

26 See H. Alderman and J. Hoddinott, *Growth-Promoting Social Safety Nets,* 2020 Focus Brief on the World's Poor and Hungry People (Washington, DC: IFPRI, 2007).

27 Ibid.

28 Impact evaluations provide useful information on best practices; see E. Skoufias, *Progress and Its Impacts on the Welfare of Rural Households in Mexico*, Research Report 139 (Washington, DC: IFPRI, 2005); A. Fiszbein and N. Schady, with F. H.G. Ferreira, M. Grosh, N. Kelleher, P. Olinto, and E. Skoufias, *Conditional Cash Transfers: Reducing Present and Future Poverty*, Policy Research Report (Washington, DC: World Bank, 2009).

29 D. O. Gilligan, J. Hoddinott, and A. S. Taffesse, "The Impact of Ethiopia's Productive Safety Net Programme and Its Linkages," *Journal of Development Studies* 45, no. 10 (2008): 1684–1706.

30 D. Headey, "Rethinking the Global Food Crisis."

31 See, for example, H. Boumellassa, D. Laborde, and C. Mitaritonna, *A Picture of Tariff Protection across the World in 2004: MAcMap-HS6, Version 2*, IFPRI Discussion Paper 903 (Washington, DC: IFPRI, 2009); A. Bouet and D. Laborde, *Economics of Export Taxation in a Context of Food Crisis*, IFPRI Discussion Paper 994 (Washington, DC: IFPRI, 2010).

32 S. Rashid and S. Lemma, *Strategic Grain Reserves in Ethiopia: Institutional Design and Operational Performance*, IFPRI Discussion Paper 1054 (Washington, DC: IFPRI, 2011).

33 For more details on the ASEAN+3 emergency rice reserve, see http://www.apterr.org/.

34 See, for example, P. Hazell, C. Poulton, S. Wiggins, and A. Dorward, "The Future of Small Farms: Trajectories and Policy Priorities," *World Development* 38, no. 10 (2007): 1349–1361.

35 P. Hazell, "Transforming Agriculture: The Green Revolution in Asia," in *Millions Fed: Proven Successes in Agricultural Development*, eds. D. Spielman and R. Pandya-Lorch (Washington, DC: IFPRI, 2009).

36 J. Ariga and T.S. Jayne, "Unlocking the Market: Fertilizer and Maize in Kenya," in *Millions Fed: Proven Successes in Agricultural Development*, eds. D. Spielman and R. Pandya-Lorch (Washington, DC: IFPRI, 2009).

37 G. C. Nelson, M. W. Rosegrant, J. Koo, R. Robertson, T. Sulser, T. Zhu, C. Ringler, S. Msangi, A. Palazzo, M. Batka, M. Magalhaes, R. Valmonte-Santos, M. Ewing, and D. Lee, *Climate Change: Impact on Agriculture and Costs of Adaptation*, Food Policy Report (Washington, DC: IFPRI, 2009).

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