Supply and Demand of Agricultural Products and Inflation
- How to Address the Acute and Long-Run Problem -

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Summary of issues and actions
The surge in food prices has become a major political concern because of its role for inflation, its impacts on the whole economy, and because of adverse effects on the wage earning poor and middle class. The price developments can help reduce urban – rural income gaps in the aggregate, but some groups in rural areas lose and others gain. The issue is not only one of too fast increases in prices, but one of risky volatility and of inappropriate policy responses around the world posing threats for free trade and possibly for political stability in some countries. A dual strategy is needed: (1) a science and technology initiative at a national and global scale to address the long-run problem, and (2) a comprehensive social protection and food and nutrition initiative to address the short and medium-run problems. China, which has expanded its investment in agriculture by 23 percent in 2007[2], can play an important role in this needed strategy, both domestically, and at a global scale.

The new causes of food price inflation

Strong and new forces of change in the world food equation are transforming food consumption, production, and markets.[3] On the demand side it is high income growth, change of peoples' consumption preferences with urbanization, and subsidized biofuel production; on the supply side it is too slow-growing productivity, low stocks, weather induced supply shocks, and climate change; these forces add up to global agriculture imbalances and have led to **drastic agricultural price increases**. The rise in cereal prices has indeed been dramatic. Since the beginning of 2000, the price of wheat increased more than three-fold, while the prices of corn and rice more than doubled. When adjusted for US$ depreciation, the price increases are lower, but still drastic. The global surge in food prices has been translated at the national level. In China, year-on-year inflation in January 2008 rose by 7.1 percent, reaching a record high in 11 years. Food price inflation now contributes to about 85 percent of overall inflation, compared to less than 50 percent in 2005-2006. The high global agricultural **prices do not appear likely to fall soon**. IFPRI's global scenario analysis[4] suggests that real world prices for cereals and meat will continue to be high. While current peaks may not remain for the long run, rice, wheat, and maize prices will increase by about 20 percent by 2015 beyond 2006 price levels, and beef, pork, and poultry prices are projected to grow by up to 10 percent in the next decade.

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[1] The contributions to this paper by Mark Rosegrant, Shenggen Fan, and Bella Nestorova (all at IFPRI) are gratefully acknowledged
[2] National Development and Reform Commission, 5th session of 11th National People's Congress, March 5, 2008 Beijing
[3] For details see: von Braun, J. 2007. The World Food Situation – New Driving Forces and Required Actions. IFPRI Food Policy Report. Washington, D.C.
[4] Scenario analysis is based in the International Model for Policy Analysis of Agricultural Commodities and Trade (IMPACT), managed by IFPRI's Environment and Production Technology Division under the leadership of Mark Rosegrant.

Demand

The global system of agriculture today is very much **driven by the demand side**. With income growth, globalization, and urbanization, demand for agricultural products will continue to grow and shift towards high-value commodities. IFPRI's projections until 2015 show that global cereal demand will increase across all regions up to 20 percent. By 2050, demand will increase by more than one-third in East Asia and the Pacific and three-fold in Sub-Saharan Africa. In China, most of the demand for cereals will be driven by animal feed demand, which will double by 2050. On a per capita basis, cereal consumption for rice and maize in China will decline by 18 and 35 percent by 2050. These trends will be accompanied by very strong growth in meat consumption, especially in poultry and beef. Poultry consumption per capita will increase almost three-fold by 2050, and beef consumption – more than two-fold, and milk consumption also increases fast.

Energy and Biofuels

Biofuel production has contributed to the changing world food equation and currently adversely affects the poor through price-level and price-volatility effects. Ethanol and biodiesel production, which largely draws on maize and oilseeds, has a strong effect on agricultural prices. IFPRI's global scenario analysis until 2020 projects that biofuel expansion may result in price increases of 26 percent for maize and 18 percent for oilseeds compared to 2005. As new linkages and trade-offs are created between the agricultural and energy sectors, agricultural commodity prices are becoming increasingly correlated to energy prices. The worrisome implication is that volatile energy prices will translate into larger food price fluctuations. Second-generation biofuel technologies, which may lessen the food-fuel competition and the negative effects on the poor, are still a long way away. Waiting for the emergence of second-generation technologies, and planning for "leapfrogging" to these technologies later, makes sense for many countries. In view of concerns about food security, China has adopted modest biofuel expansion plans, compared to others. Basing future fuel ethanol production on non-food feedstocks and waste and relying on non-arable lands could be a suitable strategy for other countries as well.

Growing Water Scarcity

Demand for the world's increasingly scarce water supply is rising rapidly, challenging its availability for food production. Agriculture is competing with industrial, household, and environmental uses, and water will be increasingly transferred from irrigation to other uses in relatively dry regions. Even as demand for water by all users grows, groundwater is being depleted, other water ecosystems are becoming polluted and degraded, and developing new sources of water is getting more costly. Three broad strategies that can address the challenge posed by water scarcity for food production include: i) investments in infrastructure to increase the supply of water for irrigation, domestic, and industrial purposes; ii) water conservation and improvements in the efficiency of water use in existing systems through water management and policy reform; and iii) improvements in crop productivity per unit of water and land through integrated water management and agricultural research and policy efforts, including crop breeding and water management for rainfed agriculture. Improvements in the irrigation sector must be made at the technical, managerial, and institutional levels.

Climate Change

Although there are considerable uncertainties regarding the impact of climate change on agriculture, there is a growing consensus that agricultural production globally is likely to be reduced by climate change, with developing countries experiencing the greatest production losses and increased food insecurity. Aggressive policies for climate change mitigation and adaptation can reduce the negative impacts. While there are viable mitigation strategies for the agricultural sector in the developing world, key constraints need to be overcome: first, a new and more comprehensive post-Kyoto international climate change regime must be negotiated; second, the rules of access to carbon trading —which still do not credit developing countries for reducing emissions by avoiding deforestation or improving soil carbon sequestration—must change, and, third, the operational rules, with their high transaction costs for developing countries and small farmers and foresters in particular, must be streamlined. Some of the carbon sequestration may further compete with food production and may increase the shortage of supply and add to the high prices.

Nevertheless, the most aggressive mitigation efforts that can be reasonably anticipated cannot be expected to make a significant difference in the short to medium term. This prospect means that climate change adaptation has become an imperative. Many adaptation strategies are extensions of good development policy, including a) promoting growth and diversification; b) investing in research and development, education and health; c) creating markets in water and environmental services; d) improving the international trade system; e) enhancing resilience to disasters and improving disaster management; and f) promoting risk-sharing, including social safety nets and weather insurance. But effective adaptation strategies must also go beyond good development policy to explicitly target the impacts of climate change, particularly on the poor.

Supply constraints

In view of the high agricultural demand, rising prices, and emerging challenges, the global production response has been slow. The overall productivity growth in agriculture is simply too low to cope with the fast demand. Total factor productivity -that is, the aggregate productivity, not just yields per unit of land or animals- grows by about 1.3 percent per annum in most regions and by about 2 percent in China. Its growth is dependent on technological progress. Between 2000 and 2006, cereal supply increased by mere 8 percent. **The production response to high prices is impaired** because of land and water constraints and because of neglect in agriculture innovation investments in many countries in past years. Yields grow very slowly in most regions today that have already reached high levels of production in the past. Africa shows actually the highest agricultural growth compared to other world regions, but starting from low levels. Increased production driven by higher yields (and not by area expansion) and increased productivity in the livestock sector require substantial investments in research and development (R&D), services, and input supply systems. The need for more agricultural science and technology investment is further increasing due to climate change, continuing population growth, and must embrace the entire value chain with enhanced food quality and safety. Yet, growth in global public agricultural R&D expenditures, especially in developed countries, has slowed down. Developing countries as a whole are currently undertaking more of the world’s public agricultural R&D, largely due to China, Brazil, and India. Many developing countries, however, are still underinvesting in agricultural R&D and are dependent on science and technology spillovers, while the international network of agricultural research centers, the CGIAR, remains underfunded.

Impacts on the poor

The increase in agricultural **prices will have an uneven impact across countries and population groups**. Countries that are net exporters –but they are few- benefit from improved terms of trade, while net importers will struggle with meeting domestic food demand or pay high subsidies to shield their consumers from the price increases, like India and Egypt. Even though China is the largest producer of cereals in the world, it is a net importer and these net imports are projected to rise. Surging agricultural commodity prices and food availability pressures affect the most those who can afford it the least – the poor and food insecure. The few poor households that are net sellers of food benefit from higher prices. Households that are net buyers of food, which represent the large majority of the world's poor, would be negatively impacted. Adjustments in the rural economy, which can create new income opportunities, will take time to reach the poor. **Nutrition among the poor is at risk** as higher food prices will induce them to shift to even less-balanced diets, with adverse impacts on health in the short and long run. Poor people spend about 50 to 60 percent of their overall expenditures on food. For a five-person household living on one dollar-a-day, a 50 percent increase in food prices cuts at least $1.50 from their $5-budget and raising energy costs add to their adjustment burden.

Structural problems

Small farmers dominate world agriculture and these farmers would like to take advantage of the new income-generating opportunities presented by high-value products, but for many, barriers to market entry remains high. These barriers arise from geographic distance to national market centers, lack of market organizations and information as well as the increased safety and quality standards of food processors and retailers. The regional and intercontinental integration of the agrifood system has been accompanied by a rise in the power and leverage of international corporations. Between 2004 and 2006, the sales of the top 10 food retailers soared by more than 40 percent, while the sales of the top food processors and agricultural input companies grew by 13 and 10 percent, respectively. The disparity of scale between small farmers and the rest of the agrifood business chain is also increasing due to still further fragmentation of agricultural holdings in many countries.[5] Institutional innovation with new forms of contracts and cooperation to overcome the problem of fragmentation and scale in the small farm sector is needed.

Needed Policy Actions

World agriculture is facing new and historically different challenges, and is not well prepared for that. The persistence of poverty in the rural areas of low- and middle-income countries, of high food prices undermining livelihoods, and of deficiencies in the sustainability of agriculture requires large-scale global action. A coordinated global response is needed with new partnerships among old and new players such as the United States, Europe, China, India,

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[5] Gulati A. and S. Fan. 2007, eds. The Dragon and the Elephant: Agricultural Reforms in China and India. Baltimore: The Johns Hopkins University Press for the International Food Policy Research Institute.

Brazil, United Nation agencies, foundations, the private sector and the global research system, that is, the Consultative Group on International Agricultural Research (CGIAR).
Four actions are recommended, and China can play important roles in all four of these:

1. **Developed countries should facilitate flexible responses** to drastic price changes by eliminating trade barriers. A world confronted with more scarcity of food needs to open up trade more—not less—to spread opportunities and risks fairly. Subsidies for biofuel production and excessive quotas for blending petrol with biofuels should be stopped. Programs that set aside agriculture resources, except in well-defined conservation areas should be terminated.

2. **Developing countries should rapidly increase investment in rural infrastructure and market institutions** in order to reduce agricultural-input constraints, since these are hindering a stronger production response. Also, these countries need to remain open to trade. The recently by many countries introduced export bans and import subsidies should be ended. Government interventions and scaled up investments should be supported by good governance practices.[6]

3. **Investment in agricultural science and technology would play a key role** in facilitating a stronger global production response to the rise in prices. A global R&D initiative for accelerated agriculture productivity makes economic sense, is pro-poor and sustainable, and serves security.

4. The **acute risks** facing the poor due to reduced food availability, high prices and limited access to income-generating opportunities **require expanded social-protection measures now**. Depending on circumstance, such social protection could include food aid in kind and cash transfer programs, employment programs, and social security and health systems strengthening, targeting the poorest with a focus on enhancing early childhood nutrition programs.

[6] Fan, S, L. Zhang, and X. Zhang. 2002. Growth, Inequality, and Poverty in Rural China: The Role of Public Investment. IFPRI Research Report 125. Washington, D.C.: International Food Policy Research Institute.