Food Prices, Agricultural Development and Poverty

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FEATURE-As biofuels boom, will more go hungry?

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(As part of a series on renewable energy)

By Ruth Eldley

Several years ago, the US and other wealthy nations made alternative fuels a priority, especially biofuels made from agricultural crops. But the push to produce more biofuels has come to cloud the issue of hunger. As prices rise for basic foodstuffs like corn and sugar beets, some experts worry that growth in biofuels production could further strain the availability of food in several poor countries, but some experts say the need for biofuels is too great to ignore.

washingtonpost.com
Wider food price paradox

- World Bank and others
  - Successful conclusion to the agricultural negotiations in the Doha Round has potential to lift tens of millions out of poverty by raising world market prices

- Historical evidence
  - The huge drop in poverty in China initiated by reforms which led to higher food prices

- Senauer and Sur (2001)
  - A 20% increase in food prices in 2025 relative to a baseline will lead to an increase of 440 million in the number of undernourished

  "Declining food prices have a powerful income effect for the poor, for whom food spending usually accounts for at least 50% and as much as 80% of total expenditures."

- Are low food prices pro-poor?
Outline

• National food security impacts of higher food prices
• Household impacts of higher food prices
• Global response to higher food prices
• Biofuels: an opportunity for developing countries?
• Conclusions and main messages
Section 1. National food security impacts of higher global food prices
National-level food security impacts

- Countries that are net food exporters will experience improved terms of trade, while net food importers will face increased costs
- Food import bills have reached record highs
  - 29% higher in 2007 compared to 2006 (FAO, 2008)
  - 40% higher for LIFDCs (UN CFA, 2008)
  - Bulk of increase accounted for by higher cereals and vegetable oils prices
  - More expensive feed led to higher prices for meat and dairy product imports
  - Rise in international freight rates
- Higher food prices accompanied by rising fuel prices
  - Offsets for some but exacerbates for most (IMF 2008)
- May be offset for others by higher export earnings
- Balance?
### Table 1. BOP Impacts of Fuel and Food Shocks on PRGF-eligible Countries

<table>
<thead>
<tr>
<th></th>
<th>Increase in Jan 07-Apr 08</th>
<th>Increase in Jan 07-Jul 08</th>
<th>Increase in May-July 08</th>
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<tbody>
<tr>
<td><strong>Food shock</strong></td>
<td></td>
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<td></td>
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<tr>
<td>In percent of GDP</td>
<td>0.5</td>
<td>0.9</td>
<td>0.4</td>
</tr>
<tr>
<td>In months of imports</td>
<td>0.2</td>
<td>0.3</td>
<td>0.1</td>
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<tr>
<td><strong>Fuel shock</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>In percent of GDP</td>
<td>2.2</td>
<td>3.4</td>
<td>1.2</td>
</tr>
<tr>
<td>In months of imports</td>
<td>0.7</td>
<td>1.2</td>
<td>0.5</td>
</tr>
</tbody>
</table>

1 The shocks are measured as the size of the BOP impact for the indicated period expressed relative to 2007 GDP and relative to 2008 months of imports.
"Fuel shock" applies to 58 net fuel importers, "food shock" to 33 net food importers.

Source: IMF September 2008
Countries in red expected to suffer biggest trade balance losses from higher food prices; countries in blue expected to show biggest gains.
Most countries seem to be able to maintain a non-declining per capita cereal consumption, although this does not rule out reduction among poorer households, or reductions in expenditure on other foods or health and education.

Source: FAO (2008)
Impact on food aid flows
tonnes cereals in grain equivalent

Source: WFP Interfais
Section 2. Household impacts of higher global food prices
Where the poor live

Figure 2  Where the US$1-a-Day Poor Live, 1990 and 2004

1.248 billion in 1990

- Latin America & the Caribbean: 44.6 million (4%)
- Middle East & North Africa: 5.3 million
- Sub-Saharan Africa: 240.8 million (19%)
- East Asia & Pacific: 476.2 million (38%)
- South Asia: 479.2 million (39%)

969 million in 2004

- Latin America & the Caribbean: 47.0 million (5%)
- Middle East & North Africa: 4.4 million
- Europe & Central Asia: 4.5 million
- East Asia & Pacific: 169.1 million (17%)
- Sub-Saharan Africa: 298.2 million (31%)
- South Asia: 446.2 million (47%)
Impact of high prices: Bangladesh

- Five-person household living in Bangladesh on one-dollar-a-day per person spends its $5
  - $3 on food
  - $0.50 on household energy
  - $1.50 on non-foods
- A 50% increase in food and energy prices cuts $1.75 from their expenditures
- Food expenditures will be cut most, and will be accompanied by:
  - Reduced diet quality
  - Increased micronutrient malnutrition, increasing probability of developmental damage

Source: Based on von Braun (2008)
Household food security impacts depend on price transmission

- Impact depends on the extent to which international prices pass through to domestic markets
  - Exchange rate appreciation against the US$
  - Policy instruments to insulate domestic prices from international markets
    - Government procurement, trade measures
    - Different countries adopted different policies
- Impact (on producers) also depends on competitiveness and length of the domestic marketing chain
- Ivanic and Martin (2008): pass through rate of 0.66 leads to increase of 105 million in poverty, pass-through rate of 0.33 to an increase of 45 million.
Household food security impacts – short run

- Impacts operate through food prices and household incomes
- Higher prices will benefit net food sellers, but hurt net food buyers
- Which are the poor – net buyers or sellers?
### Share of net staple food-seller households among urban, rural and total households

<table>
<thead>
<tr>
<th>COUNTRY/YEAR</th>
<th>SHARE OF HOUSEHOLDS</th>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Urban (Percentage)</td>
<td>Rural (Percentage)</td>
<td>All (Percentage)</td>
</tr>
<tr>
<td>Bangladesh, 2000</td>
<td>3.3</td>
<td>18.9</td>
<td>15.7</td>
</tr>
<tr>
<td>Bolivia, 2002</td>
<td>1.2</td>
<td>24.6</td>
<td>10.0</td>
</tr>
<tr>
<td>Cambodia, 1999</td>
<td>15.1</td>
<td>43.8</td>
<td>39.6</td>
</tr>
<tr>
<td>Ethiopia, 2000</td>
<td>6.3</td>
<td>27.3</td>
<td>23.1</td>
</tr>
<tr>
<td>Ghana, 1998</td>
<td>13.8</td>
<td>43.5</td>
<td>32.6</td>
</tr>
<tr>
<td>Guatemala, 2000</td>
<td>3.5</td>
<td>15.2</td>
<td>10.1</td>
</tr>
<tr>
<td>Madagascar, 2001</td>
<td>14.4</td>
<td>59.2</td>
<td>50.8</td>
</tr>
<tr>
<td>Malawi, 2004</td>
<td>7.8</td>
<td>12.4</td>
<td>11.8</td>
</tr>
<tr>
<td>Pakistan, 2001</td>
<td>2.8</td>
<td>27.5</td>
<td>20.3</td>
</tr>
<tr>
<td>Peru, 2003</td>
<td>2.9</td>
<td>15.5</td>
<td>6.7</td>
</tr>
<tr>
<td>Viet Nam, 1998</td>
<td>7.1</td>
<td>50.6</td>
<td>40.1</td>
</tr>
<tr>
<td>Zambia, 1998</td>
<td>2.8</td>
<td>29.6</td>
<td>19.1</td>
</tr>
<tr>
<td><strong>Maximum</strong></td>
<td>15.1</td>
<td>59.2</td>
<td>50.8</td>
</tr>
<tr>
<td><strong>Minimum</strong></td>
<td>1.2</td>
<td>12.4</td>
<td>6.7</td>
</tr>
<tr>
<td><strong>Unweighted average</strong></td>
<td>6.8</td>
<td>30.7</td>
<td>23.3</td>
</tr>
</tbody>
</table>

*Source: FAO, 2008a.*
FIGURE 28
Distribution of poor net buyers and sellers of food staples

Percentage

Bolivia   Ethiopia   Bangladesh   Zambia   Madagascar   Viet Nam   Cambodia

Urban (net buyers) | Rural landless (net buyers) | Smallholders (net buyers) | Smallholders (self-sufficient) | Smallholders (net sellers)

1 Percentage of poor population buying or selling internationally traded staples (rice, wheat, maize, beans).

Observations on previous tables

• While almost all urban dwellers are net food consumers, not all rural dwellers are net food producers
• In only two countries does the share of net selling households exceed 50 per cent
• Net food sellers will typically be those farmers with more land
• Even in rural areas, the greater share of the poor are net food buyers
A large share of smallholders – commonly the majority – are net buyers of the food crops they produce. Households are not autarchic, but sellers and buyers at different times of the year or of a proportion of their supplies/needs are hurt, not helped, by policies that increase local prices for staple foodgrains. "..policymakers and many development researchers continue to discuss development policy for rural Africa as if all farmers were net sellers of the crops they produce and thus stood to benefit from increased prices. The evidence against that popular belief is by now overwhelming."
More on the characteristics of net food buyers and sellers

- Aksoy and Isik-Dikmelik (2008)
  - Based on household surveys for nine countries, agrees there are more poor net food buyers than sellers
  - But suggests that half these households are marginal net food sellers, thus price increases will have small impacts on their welfare
  - Notes that the average incomes are net food buyers are higher than the average incomes of net food sellers, so higher food prices transfer income from rich buyers to poorer sellers and thus are ‘pro-poor’.
  - Note that policies of low food prices in developing countries (e.g. through rural taxation) penalised agriculture to the detriment of overall economic growth
Poverty impacts of higher food prices - methodological caveats

- Household survey estimate of income generally lower than expenditure
- Use of headcount indicator means $1 change in real purchasing power can move household in or out of poverty
  - Dessus et al. (2008) show that 88% of the increase in urban poverty depth due to the global increase in food prices is from poor households becoming poorer and only 12% from households falling into poverty.
- Nature of clustering around the poverty line can lead to non-linear relationship between the rate of price increase and the change in poverty
  - Ivanic and Martin (2008) show that, in rural Peru, the impact of a 20% price rise on the poverty headcount is five times greater than that of a 10% rise.
Poverty impacts of higher food prices – short run

Single staple food, 10 percent price increase assumed

No behavioural responses

Poorest quintiles the worst affected in both urban and rural areas

Even in some countries where rural households gain on average, poorest quintiles lose
Lower bound estimates take both producer and consumer impacts into account.

Upper bound estimates only take into account consumer impacts, justified by imperfect price transmission and higher price of fertiliser.

Source: Wodon et al. (2008a). Impacts are estimated for a 50% increase in food prices.
Strong gender dimension to poverty impacts

- Female-headed households typically fare worse than male-headed households
  - Even though female-headed households are not disproportionately represented among the poor
  - Female-headed households tend to spend a greater proportion of their income on food
  - In rural areas, they generally have less access to land and don’t depend as much on staple sales

Source: FAO 2008
Household poverty impacts – longer run

- What happens when substitution and behavioural responses are taken into account?
- Could positive labour market effects (increased demand for labour) overcome the negative impact of higher food prices on the purchasing power of the rural poor?
  - YES (Ravillion 1990 study for rice in Bangladesh)
- Can farm productivity increase in response to increase in price of food staples?
- How important are the multiplier effects of increased farm incomes for rural businesses?
- Methodology of choice is Computable General Equilibrium analysis but constrained by severe methodological and data issues in linking macro-micro models
Four African countries net staple buyers and sellers

Using a partial equilibrium approach, their main conclusion is that policies leading to higher food prices are likely to increase poverty, even after factoring in countervailing wage and productivity effects.

Source: Christiaensen and Demery (2007) Down to Earth, World Bank
Other studies

• Ivanic and Martin (2008)
  – Study first-order welfare impacts (including wage effects) in ten countries for range of commodities
  – Overall impact of higher food prices on poverty is generally adverse
  – Extrapolating (heroically!) from the average percentage point increase in poverty rates in the sample, they conclude that the actual increase in food prices 2005-early 2008 may have led to increase in global poverty of 105 million
Using CGE approach, higher rice prices benefit most poor households, with labour markets playing a largely positive role in transmitting price effects. Similar if more muted effects for wheat. Source: Polaski (2008)
Section 3. Global response to higher food prices
Proposed policy actions


• The emergency package
  – Expand humanitarian assistance to food insecure people
  – Eliminate agricultural export bans and export restrictions
  – Undertake fast-impact food production programmes in key areas
  – Manage macroeconomic impacts

• The resilience package
  – Invest in social protection
  – Scale up investments for sustained agricultural growth
  – Improve international trade markets
  – Change biofuel policies
Section 5. Biofuels: an opportunity for developing countries?

We have so far considered the consequences of biofuel production in the developed world. What about the potential for biofuel production in developing countries?
The market opportunity for biofuels

Developing countries can:
- Produce their own domestic transportation fuels, improving energy security
- Take advantage of export markets with unlimited demand
- Lower GHG emissions and assist move to low-carbon economy
- Create new jobs in rural economies

• Emergence of biofuels could help to revitalise agriculture in developing countries
Tanzanian example – farming for energy

Potential of biofuels in Tanzania

Current fuel imports 20,000 barrels per day
(source: international Energy Agency)
(1 barrel =160 liters, 1 year = 365 days)

✧ 1,2 billion liters per year
(1 liter of petroleum = 30 dollarcents)

✧ 0.4 billion USD per year
(= 20% imports in 2003)

Land needed to substitute this by biofuels
(productivity per hectare = 4000 liter per year)

✧ 300 thousand hectares

Source: De Keyser and Hongo, 2005
Tanzania – farming for energy

Tanzania has 4.6 million hectares under crops (5.3% of its land mass).

=> Tanzania can easily produce its own fuel and it even has export potential.

In the fuel self-sufficiency scenario, Tanzania will benefit from biofuels as follows:

- Job creation: 300 thousand (one per ha)
- FOREX savings: 0.4 billion USD per year
- Growth in GDP: 4% (GDP = USD 10 bn)

Source: De Keyser and Hongo, 2005
Objections to developing biofuels

• The effect on food security of production of energy crops
  – Some energy crops (jatropha) don’t compete with agricultural land
  – Energy crops can provide synergies, not conflict, with food production
  – Efforts to increase land and labour productivity are crucial to minimise competition

• Adverse environmental consequences
  – Intensifying agricultural production on existing land and increasing use of irrigation and fertiliser risks depleting water supplies and adding to nitrogen overload
  – Extending production to new lands can threaten marginal lands and forests

• Some developing countries have significant bioenergy potential due to low population densities, large areas of suitable land, and low productivity of existing agricultural systems
Palm oil in Malaysia

Acknowledgement: http://www.cwbiodiesel.com/
Getting poor families involved

• Role for public policy
  – Encouraging contract farming and outgrower schemes
  – Protecting the resource and land rights of vulnerable groups and protected forests
  – Improving infrastructure, transportation, market coordination, credit and fertiliser distribution, land markets
Section 5. Conclusions and main messages
Conclusions and main messages

• Whether higher food prices worsen poverty or not will depend on the products involved, the patterns of household incomes and expenditure, and the policy responses of governments.

• The price impacts of biofuel policies in developed countries are felt primarily in cereals and oilseeds markets, and the evidence suggests that these price increases are damaging to the poor in developing countries.

• The urgency of a coordinated response to higher food prices (contrast with response to financial crisis!) including re-think of biofuel policies in developed countries.
Conclusions and main messages

• The distinction between the short and long run impact of price rises is crucial
• Historical evidence that prospect of sustained higher food prices (not necessarily an adverse terms of trade shock) have stimulated agricultural growth and thus overall economic growth
• In that context, biofuel production in developing countries has the potential to energise agricultural production, if carefully managed