Changing roles of agriculture and food sector in Asia

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Key messages

- Food security in Asia is under stress
- Agriculture needs to be adapted to dynamic changes and emerging trends
- Policies and investments must be redesigned to promote agricultural growth for broader development outcome
13 countries in Asia have **serious/alarming** levels of hunger (2010 GHI)

GHI components:
- Proportion of undernourished
- Prevalence of underweight in children
- Under-five mortality rate

Source: von Grebmer et al. 2010

Significant variability in hunger within countries

**India State Hunger Index, 2008**

State-level hunger in India
- 4 states: “serious”
- 12 states: “alarming”
- 1 state: “extremely alarming”

Source: IFPRI 2009
Food security is under stress from a complex web of factors

- Population growth and urbanization
- Land and water constraints
- Climate change
- High and volatile food prices
- Rising energy prices/biofuel expansion
Population and demographic trends

Developing South and East Asia’s rural and urban population

Number of people (billion)

Rural

Urban

- Urban population projected to exceed rural in 2028

Larger and more urban population = increased demand for more and better food

Source: World Bank 2011

Global and domestic food price hikes and volatility

GLOBAL

DOMESTIC

Retail prices in Indonesia, national average

- Maize: 105%
- Wheat: 88%

Retail prices in Dong Thap, Vietnam

Source: Data from FAO 2011
Land and water constraints are high

Land degradation, 1981-2003

Areas of physical and economic water scarcity, 2007

Climate change will affect agriculture and food security

- **Lower agricultural yields, production, and land availability** due to
  - Higher temps. and changes in precipitation patterns
  - Sea-level rise
  - Extreme events: soil erosion, droughts, floods, landslides, etc.
    - Forest fires in Indonesia
    - Salt water intrusion in Vietnam
    - Floods in Pakistan
- **Higher food prices**
**Climate change impact: Crop yields, 2050**

<table>
<thead>
<tr>
<th>ASIA</th>
<th>Crop</th>
<th>Change in Production (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rice</td>
<td>Irrigated</td>
<td>-10.47</td>
</tr>
<tr>
<td></td>
<td>Rainfed</td>
<td>0.66</td>
</tr>
<tr>
<td>Maize</td>
<td>Irrigated</td>
<td>-5.54</td>
</tr>
<tr>
<td></td>
<td>Rainfed</td>
<td>1.71</td>
</tr>
<tr>
<td>Wheat</td>
<td>Irrigated</td>
<td>-13.50</td>
</tr>
<tr>
<td></td>
<td>Rainfed</td>
<td>-1.91</td>
</tr>
<tr>
<td>Soybeans</td>
<td>Irrigated</td>
<td>-6.73</td>
</tr>
<tr>
<td></td>
<td>Rainfed</td>
<td>8.58</td>
</tr>
</tbody>
</table>

Source: IFPRI 2011

Variation in impact across crops, countries, and regions

Source: IFPRI 2011
Climate change impact: Agric. land

<table>
<thead>
<tr>
<th></th>
<th>With 1 meter rise ('000 ha)</th>
<th>With 3 meter rise ('000 ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Myanmar</td>
<td>295</td>
<td>1,214</td>
</tr>
<tr>
<td>Thailand</td>
<td>199</td>
<td>796</td>
</tr>
<tr>
<td>Cambodia</td>
<td>35</td>
<td>118</td>
</tr>
<tr>
<td>Vietnam</td>
<td>2,513</td>
<td>4,281</td>
</tr>
</tbody>
</table>

30 percent of Vietnam’s rice growing area

Source: Nelson 2010

Strong link between oil and food prices influences food security

- Rising oil prices cause food prices to increase, rather than the reverse (Heady and Fan 2010)
- Rising oil prices make biofuels more profitable, rather than agricultural production more expensive (Abbott, Hurt, and Tyner 2008)

Rise in oil prices particularly severe for Asian countries as many are net oil importers

Source: IMF 2011

Note: Oil = Average crude oil price of U.K. Brent, Dubai, and West Texas Intermediate
Biofuel expansion

- Increased biofuel production due to rising oil costs, etc.
- Increased demand for biofuel feedstock crops
- Increased competition for resources
- Increased global food prices
  - Biofuels account for 30% of increase in weighted average grain prices, 2000-2007 (Rosegrant 2008)

Changing Role of Agriculture
Agricultural GDP declining but employment remains important

About 70% of poor in Asia live in rural areas and depend on agriculture for their livelihood (FAO 2010)

Smallholder agriculture will continue

- Estimated 87% of world’s 500 million small farms (<2 ha) are in Asia (Thapa and Gaiha 2011)
  - China and India home to 193 mil. and 93 mil. small farms, respectively

- Declining trends in farm size:

<table>
<thead>
<tr>
<th>Country</th>
<th>Census year</th>
<th>Avg. Farm Size (Ha)</th>
<th>Number of Small Farms (million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>India</td>
<td>1971</td>
<td>2.3</td>
<td>49</td>
</tr>
<tr>
<td></td>
<td>2005/2006</td>
<td>1.2</td>
<td>108</td>
</tr>
<tr>
<td>Nepal</td>
<td>1992</td>
<td>1</td>
<td>2.4</td>
</tr>
<tr>
<td></td>
<td>2002</td>
<td>0.8</td>
<td>3.1</td>
</tr>
<tr>
<td>Pakistan</td>
<td>1971/73</td>
<td>5.3</td>
<td>1.1</td>
</tr>
<tr>
<td></td>
<td>2000</td>
<td>3.1</td>
<td>3.8</td>
</tr>
</tbody>
</table>

Source: Hazell 2011; Headey, Bezemer and Hazell 2010
Recent yield growth of staple crops in Asia has either modestly increased or been on the decline.

Consumption and production is more diversified.

**Production**

<table>
<thead>
<tr>
<th>Staple Crops</th>
<th>Annual Growth, 1990-2009 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eggs</td>
<td>1</td>
</tr>
<tr>
<td>Milk</td>
<td>2</td>
</tr>
<tr>
<td>Meat</td>
<td>3</td>
</tr>
<tr>
<td>Fruit</td>
<td>4</td>
</tr>
<tr>
<td>Vegetables</td>
<td>5</td>
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**Consumption**

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Large Gender Equality in Agriculture

- Women make up large share of ag. workforce but have less access to resources and services

- Closing gender gap in agriculture (FAO 2011):
  - Increases ag. production by 2.5–4%
  - Reduces number of undernourished people by 12–17%

Conflict and Agriculture

- Conflicts are directly/indirectly related to agriculture:
  - Poverty and underemployment of young men
  - Inequalities in land, water, and other natural resources

- Recent uprisings in Arab region driven partially by food insecurity and high unemployment (Breisinger et al. 2011)
Actions needed to enhance Asia’s food security

**Short term**
1. Invest in productive social safety nets
2. Support transparent, fair, and open trade
3. Set up regional strategic grain reserves
4. Prevent biofuel expansion

**Long term**
5. Promote smallholder productivity

1. Invest in productive social safety nets

- Better-targeted and more productive social protection policies need to:
  - Secure basic livelihoods
  - Protect poor people from risk and vulnerability

*Bangladesh Vulnerable Group Development Program*
- Combines income-generating and food security interventions
- Increased per capita food consumption by 45-66 kcal per *taka* transfer (Ahmed et al. 2009)

Programs depend on needs, capacities, and resources
2. Support transparent, fair, and open trade

- Eliminate harmful trade restrictions and prevent new ones to:
  - increase market efficiency
  - reduce price fluctuations

- Potential costs of failed Doha Round could be high (Bouet and Laborde 2009):
  - 11.5% loss of developing country exports
  - US$353 billion loss in world welfare

Quick completion of the Doha Round is crucial

3. Establish regional strategic grain reserves

- Create regional emergency reserve with grain donations from large food exporters
  - Located in these countries, and also in poor food importing countries, e.g. Bangladesh

- Some regional initiatives are emerging e.g.
  - Asean+3 Emergency Rice Reserve
  - SADC Regional Food Reserve Facility

- Can address food crises, but need to
  - lower operating costs
  - overcome moral hazard and other challenges
4. Prevent biofuel expansion

- Halt expansion of biofuels from food crops to end competition between biofuel and food crop production
  - Develop biofuel technologies that
    - Convert crop residue into biofuels
    - Enable use of land not suitable for food crops
  - Curtail biofuel subsidies

- Flexible mandates and biofuel call options
  - Divert agricultural products from biofuels to human consumption during food crises

5. Improve smallholder productivity

- Invest in smallholder-friendly ag. R&D and infrastructure
  - Access to technology, high-quality seeds, and fertilizer
  - Rural infrastructure

- Link smallholders to markets, esp. high-value
  - Increase vertical and horizontal coordination
  - Strengthen private sector participation
    - Reform laws and reduce corruption
    - Promote public-private partnerships
      - Indian Rural Business Hubs → public-private-panchayat (village council) partnership
5. Improve smallholder productivity

- Link smallholder production with health and nutrition outcomes
  - Develop more nutritious varieties of staple food crops
  - Improve safety regulations and postharvest handling

- Use agriculture to resolve conflicts: e.g. Pakistan, Afghanistan and Addressing Gender Gaps

- Invest in climate change mitigation & adaptation
  - Win-win-win: agricultural investments should provide mitigation, adaptation, and productivity benefits for smallholders

The most effective and sustainable actions must be country-led and country-owned