Status and Prospects of the Green Revolution
IAMA 20th Annual World Forum: Navigating the Global Food System in a New Era

Session -- Sustainability and Productivity: Are they Compatible?

Status and Prospects of the Green Revolution

Edwin Price and Shahriar Kibriya
Acknowledgements

- CAST Issue paper, No. 45, 1/2010
  Norman Borlaug, Gale Buchanan, Robert Herdt and Luther Tweeten
- Father of the Green Revolution
  Norman Borlaug
- Task Force for Business and Stability Operations
Norman E. Borlaug
Nobel Peace Prize 1970

“THE FIRST ESSENTIAL COMPONENT OF SOCIAL JUSTICE IS ADEQUATE FOOD FOR ALL MANKIND.”

- NORMAN E. BORLAUG
Today the Borlaug Institute seeks to follow in Dr. Borlaug’s footsteps with:

• Bold ideas
• Quick action
• Persistent effort
• Science-based solutions
World Food Insecurity

Underlying conditions causing the world food crisis:

- Technology fell behind
- Land taken out of production
- Incomes rising
- Population rising
- Energy costs trending upward
World Food Insecurity

Sparks that ignited the world food crisis:

- Accelerated biofuel production
- Bad weather
- Conflict in food growing regions
- Food stocks falling
- Speculative demand
World Food Insecurity

Events reduced the pressure on food prices:

- Good weather
- Expanded production area
- Increased fertilizer and other inputs
- Reduced incomes

Underlying conditions remain:

- Population
- Land/water going to other uses
- Long-term rising incomes
- Technology slow to respond
At a cost:

World Hunger however has increased from 854 million persons in 2006 to 1.02 in 2009 (FAO Database)
Figure 1. Real U.S. prices of maize, soybeans, and wheat, 1924–2008 (Alston, Beddow, and Pardey 2008).
### Table 2. Growth in agricultural land and labor productivity worldwide, 1961–2005
(Alston, Beddow, and Pardey 2008)

<table>
<thead>
<tr>
<th>Group</th>
<th>Land Productivity</th>
<th>Labor Productivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developing countries</td>
<td>2.60</td>
<td>3.00</td>
</tr>
<tr>
<td>Excluding China</td>
<td>2.47</td>
<td>2.29</td>
</tr>
<tr>
<td>Developed countries</td>
<td>1.71</td>
<td>0.27</td>
</tr>
<tr>
<td>World</td>
<td>2.04</td>
<td>1.84</td>
</tr>
<tr>
<td>Excluding China</td>
<td>1.93</td>
<td>1.20</td>
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<tr>
<td>Excluding China and USSR</td>
<td>1.93</td>
<td>1.58</td>
</tr>
<tr>
<td>Top 20 producers</td>
<td>2.08</td>
<td>2.18</td>
</tr>
<tr>
<td>Excluding China</td>
<td>1.98</td>
<td>1.38</td>
</tr>
<tr>
<td>Other producers</td>
<td>1.83</td>
<td>0.88</td>
</tr>
</tbody>
</table>
CAST/Borlaug Recommends for US:

- Take greater advantage of global markets
- Achieve efficiency through research on sustainable agricultural productivity for food, energy, feed, fiber environmental quality
- Seek public support for political action on climate, animal welfare, natural resources, and long term investments in research and education
In view of interrelations of the US economy to global agriculture, especially China, India, Brazil and Sub-Saharan Africa --

Commit to scientific approaches to improve agricultural productivity
CAST: Next Green Revolution

- C₃ plants to C₄ photosynthetic pathway
- N fixation for nonlegumes
- Apomixis for plants
- Better water and nutrient efficiency in crops
- More efficient process for fuel from cellulose
- Improved pest resistance in plants
- Increased energy efficiency in plants
- Commodities with greater health benefits
Developing country perspective on donor country initiatives

- Sustainability – community rights to resources: Land, water, genetics
- Chemical fertilizer – remains a potent short & long-term way to improve productivity
- Public-Private partnerships – market ready products vs market access; cultural practices vs genetics, disease response, advanced fertilization.
- Bioengineered crops – political litmus test in LDCs, BT Brinjals
Highest aid goes to Gov. Adm. & Development Policy & Planning and lowest goes to Agriculture (Kibriya, Price et al 2010).

(Kibriya, Price et al 2010).
DAG Results

Diagram showing relationships between aid, terror, and in with numeric values.
Dag results
Priorities in Fragile States

- Crop seed quality and varieties
- Animal breeds: Bovine and fish
- Diagnostic laboratory capability
  - Plant Disease
  - Animal Disease
- Soil quality
- Seed quality
Fragile States, Priorities Cont’d

- Farmer knowledge
- Tillage
- Varieties/management
- Efficient water use
- Youth programs
- Land rights
Priorities in Fragile States

- Livestock forage and feed
- Oilseed production and processing
- Agricultural credit
Community development by local universities

- Agricultural technology
- Agribusiness
- Youth leadership and entrepreneurship
- Health and Hygiene
- Education
- Natural resource rights
- Governance
- Infrastructure
...peace can not be built on empty stomachs...

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