Session 1.7
USAID Agriculture Core Course

Agriculture: A Holistic Approach

Steven Haggblade
Michigan State University
December 12, 2011
Outline

1. What is agriculture?
2. Structural transformation
3. Agricultural productivity drivers
4. Pathways out of poverty
5. How can poor households navigate these transitions?
1. What is agriculture?

Consumption

Distribution
Packaging
Processing
Marketing

Farming

Inputs
1. How does USAID define agriculture?

- **Commodities:**
  - food (crops, livestock, fish, forest)
  - feed
  - fiber (crops, forest products)
1. How does USAID define agriculture?

- Disciplines:
  - family and consumer sciences
  - nutrition
  - food science
  - crop sciences
  - veterinary medicine
  - agricultural economics and social sciences
  - forestry
  - wildlife
  - fisheries & aquaculture
  - floriculture
  - environmental and natural resource sciences
Agriculture is big and complex.

Cassava Value Chain in Northern Mozambique

**Consumption**
- Fresh Roots
  - Volume: 5,000 T
- Casava Flour and Dried Chips
  - Volume: 140,000 T dry

**Retailing**
- Retailers

**Processing**
- Mills
  - n = 30
- LT Depots
  - n = 70
- ST Depots
  - n = 150
- Assembly Traders
  - n = 1,000

**Wholesaling/storage**
- Service Mills
  - n = 150

**Assembly**
- LT Plants
  - n = 70

**On-farm processing**

**Cultivation**

Non-Commercial Cassava-Growing Farm Households
- n = 1.3 million
- Volume = 3 million tons (fresh weight)

Commercial Cassava Farmers
- n = 300,000
- Volume = 405,000 tons (fresh)

**Channels**

1. **Channel 1**
   - Subsistence Farming
   - Spot market sales
   - Contract services
   - Short-term trade financing
   - Long-term financing and seasonal storage

2. **Channel 2**
   - Fresh Sales
   - Retailers
   - LT Plant
   - Assembly Traders
   - Mills
   - n = 30
   - LT Depots
   - n = 70
   - ST Depots
   - n = 150
   - 70 spot market sales
   - 1,000 Assembly Traders
   - 30 LT plants
   - 150 ST plants

3. **Channel 3**
   - Dried Sales
   - Retailers
   - LT Plant
   - Assembly Traders
   - Mills
   - n = 30
   - LT Depots
   - n = 70
   - ST Depots
   - n = 150
   - 70 spot market sales
   - 1,000 Assembly Traders
   - 30 LT plants
   - 150 ST plants

4. **Channel 4a, b, c**
   - Experimental Industrial Processing
   - Long-term financing
   - Seasonal storage

**Products**

- Fresh Roots
  - Volume: 5,000 T
- Cassava Flour and Dried Chips
  - Volume: 140,000 T dry
- Bread
- Ethanol
- Beer
- Cassava Paste
  - Concentrate
  - n = 1
- Cassava Paste
  - Concentrate
  - n = 1

**Retailers**

- Fresh Roots
  - Vol = 5000 T
- Cassava Flour and Dried Chips
  - Vol = 140,000 T dry
- Bread
- Ethanol
- Beer
Outline

1. What is agriculture?

2. Structural transformation

3. Agricultural productivity drivers

4. Pathways out of poverty

5. How can poor households navigate these transitions?
Outline

1. What is agriculture?
2. Structural transformation: how does agriculture contribute to economic growth?
3. Agricultural productivity drivers
4. Pathways out of poverty
5. How can poor households navigate these transitions?
2. Structural transformation

<table>
<thead>
<tr>
<th>Country</th>
<th>Income ($/person)</th>
<th>Agriculture (% of GDP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>46,000</td>
<td>1</td>
</tr>
<tr>
<td>Korea</td>
<td>25,000</td>
<td>3</td>
</tr>
<tr>
<td>Brazil</td>
<td>9,400</td>
<td>5</td>
</tr>
<tr>
<td>China</td>
<td>5,400</td>
<td>12</td>
</tr>
<tr>
<td>Nicaragua</td>
<td>2,500</td>
<td>20</td>
</tr>
<tr>
<td>Cambodia</td>
<td>1,700</td>
<td>30</td>
</tr>
<tr>
<td>Ghana</td>
<td>1,300</td>
<td>36</td>
</tr>
<tr>
<td>Ethiopia</td>
<td>800</td>
<td>46</td>
</tr>
</tbody>
</table>
Structural transformation
Structural transformation

![Graph showing the relationship between GNP per capita and agricultural share in GDP.](image)
Structural transformation

Engel’s Law

1

Graph on the left: Agricultural share in GDP vs. GNP per capita (US$)
Graph on the right: Food share of consumption vs. Expenditure per capita ($).
Structural transformation

Engel’s Law

Graph 1: Agricultural share in GDP vs. GNP per capita (US$)

Graph 2: Food share of consumption vs. Expenditure per capita ($)

1

2
Structural transformation

Engel’s Law

1

2

3
2. Structural transformation

- *Productivity gains* drive structural transformation.

- *Productivity gains* drive economic growth.

- *Agricultural productivity gains* offer the most powerful lever for raising productivity of the poor.
Outline

1. What is agriculture?
2. Structural transformation
3. **Agricultural productivity drivers**
4. Pathways out of poverty
5. How can poor households navigate these transitions?
Farm productivity: technology
Marketing efficiency
3. Agricultural productivity drivers

• Farm technology
• Marketing efficiency
3. Agricultural productivity drivers

- Farm technology
- Marketing efficiency
- Labor productivity
Labor productivity
Labor productivity: nutrition
Labor productivity: health
Labor productivity: education
Management practices affecting farm productivity

a) Time of planting
b) Weed control
c) Soil fertility and soil organic matter (SOM)
d) Optimal input doses
e) Water management
f) Pest management
## Farm management

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<th>Sources of difference</th>
<th>Cotton</th>
<th>Maize</th>
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<td>Conventional plowing</td>
<td>820</td>
<td>1,350</td>
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<td>Conservation farming basins</td>
<td>1,280</td>
<td>3,000</td>
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<tr>
<td>Higher input use</td>
<td>90</td>
<td>500</td>
</tr>
<tr>
<td>Early planting*</td>
<td>40</td>
<td>400</td>
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<tr>
<td>Water harvesting in basins*</td>
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<td>750</td>
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## Nonfarm earnings

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<th>Region</th>
<th>Nonfarm share of rural income (%)</th>
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<tr>
<td>Africa</td>
<td>37</td>
</tr>
<tr>
<td>Asia</td>
<td>51</td>
</tr>
<tr>
<td>Latin America</td>
<td>47</td>
</tr>
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Source: Haggblade, Hazell and Reardon (2007), Table 1.1
3. Agricultural productivity drivers

• Farm technology
• Marketing efficiency
• Labor productivity (nutrition, health, education)
• Farm management
• Nonfarm employment
## Labor market linkages

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<th>Bangladesh</th>
<th>Sluggish Ag.</th>
<th>Growing Agricultural Regions (% increase)</th>
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<tr>
<td>services</td>
<td>11</td>
<td>4%</td>
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<td>cottage industry</td>
<td>4</td>
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<td>trade</td>
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<td>total nonag</td>
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<td>59%</td>
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4. Pathways out of poverty

Subsistence agriculture:

a) → commercial agricultural staples
b) → high value agriculture
c) → nonfarm occupations
4. Pathways out of poverty

Subsistence agriculture:

a) → commercial agricultural staples
b) → high value agriculture
c) → nonfarm occupations
Commercializing staples
### How many make the transition?

**Malawi 2009**

<table>
<thead>
<tr>
<th>% of Farms</th>
<th>Farm size (ha)</th>
<th>Asset wealth ('000 kw)</th>
<th>Maize sales (kgs)</th>
<th>Total crop sales ('000 kw)</th>
<th>Non-farm income ('000 kw)</th>
<th>Female headed (%)</th>
<th>Subsidized fertilizer received (kgs/hh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top 50% of maize sales</td>
<td>2</td>
<td>2.0</td>
<td>208</td>
<td>2,510</td>
<td>283</td>
<td>101</td>
<td>13</td>
</tr>
<tr>
<td>Rest of maize sellers</td>
<td>19</td>
<td>1.3</td>
<td>94</td>
<td>204</td>
<td>84</td>
<td>31</td>
<td>25</td>
</tr>
<tr>
<td>Farm hhs not selling maize</td>
<td>79</td>
<td>1.2</td>
<td>14</td>
<td>0</td>
<td>51</td>
<td>12</td>
<td>28</td>
</tr>
</tbody>
</table>

Source: Jayne (2011)
4. Pathways out of poverty

Subsistence agriculture:

a) $\rightarrow$ commercial agricultural staples

b) $\rightarrow$ high value agriculture

c) $\rightarrow$ nonfarm occupations
High-value agriculture
4. Pathways out of poverty

Subsistence agriculture:

a) → commercial agricultural staples
b) → high value agriculture
c) → nonfarm occupations
Nonfarm occupations
Nonfarm occupations
How long does the transition take?

<table>
<thead>
<tr>
<th>Japan</th>
<th>Nonfarm share of farm household income (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1950</td>
<td>22</td>
</tr>
<tr>
<td>1960</td>
<td>42</td>
</tr>
<tr>
<td>1970</td>
<td>63</td>
</tr>
<tr>
<td>1980</td>
<td>80</td>
</tr>
<tr>
<td>1987</td>
<td>87</td>
</tr>
</tbody>
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Source: Haggblade, Hazell and Reardon (2007)
4. Pathways out of poverty

Subsistence agriculture:

a) → commercial agricultural staples

b) → high value agriculture

c) → nonfarm occupations
4. Pathways out of poverty

Subsistence agriculture:

a) → commercial agricultural staples
b) → high value agriculture
c) → nonfarm occupations
d) → poverty trap
Poverty trap
Outline

1. What is agriculture?
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4. Pathways out of poverty
5. How can poor households navigate these transitions?
What strategy would you follow?

• You are the head of this household.
• Family size: husband, wife, 3 children
• Asset holdings:
  – 2 hectares of land
  – 3 hand hoes
  – Family labor