Rice Production Self Sufficiency in Bangladesh: Role of Technology, Plot, and Farmer

Mohammad Rajib Hasan, Krishna P. Paudel, Maria Bampasidou, and Humnath Bhandari

(Contact: mhasa16@lsu.edu)

SAEA Meetings 2018
Jacksonville, FL
Area of Study: Bangladesh

- Country Profile
  - Area: 56,977 square miles
  - Population: 160 million
  - Staple food item: Rice
  - Arable land: Decreasing

- Achievement: Rice Production Self-Sufficiency
  - Contributing Factors:
    - Adoption of HYV of Rice
    - Trade Liberalization on Production Inputs
    - Subsidy on Diesel and Fertilizer
Motivation

Previous Studies

• Factors affecting technology adoptions.
  • Farm Size: Feder et al., (1985)
  • Education: Huffman (2001)
  • Tenure Arrangements: Newbery, (1975)
  • Credit Constraints: Krishnan (1996)
  • Information Constraints: Schutjer & Van der Veen (1997)
  • Social Networks & Learning: Conley & Udry (2010)
  • Risk: Ward and Singh (2013)

This study

• We estimate the role of HYV rice technology, farm, and farmer characteristics on achieving rice production self-sufficiency in Bangladesh.

• Research Goal:

To estimate the percent contribution of

• HYV rice technology
• Farm (soil) characteristics
• Farmer characteristics
Data

• Source: IRRI survey in Bangladesh (2014)

• Technologies:
  • High Yield Varieties (HYV)
  • Traditional Varieties (TV)

• Seasons:
  • Boro (HYV)
  • Aman (TV)
Empirical model

• We use a differential yield and gross return function
• Variables included: Yield, area, experience, labor application, fertilizer application, and soil quality
• Each variable is differenced by technology (HYV & TV)

• We control for:
  • Farmer Characteristics
  • Farm Characteristics
  • Plot Characteristics
## Results and Discussion

• Decomposition of Expected Output by Source

<table>
<thead>
<tr>
<th>Percent of Mean HYV Output Gains Due to</th>
<th>(Percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HYV method, of which</td>
<td>61.57</td>
</tr>
<tr>
<td>Unconditional productivity gains from</td>
<td></td>
</tr>
<tr>
<td>Base productivity effect</td>
<td>100.61</td>
</tr>
<tr>
<td>Experience with HYV</td>
<td>-30.47</td>
</tr>
<tr>
<td>Marginal yield gains from</td>
<td></td>
</tr>
<tr>
<td>Land</td>
<td>0.008</td>
</tr>
<tr>
<td>Labor</td>
<td>13.91</td>
</tr>
<tr>
<td>Fertilizer</td>
<td>0.03</td>
</tr>
<tr>
<td>Plot specific characteristic (soil)</td>
<td>3.08</td>
</tr>
<tr>
<td>Farmer-specific effects</td>
<td>35.35</td>
</tr>
</tbody>
</table>
Results

- Results highlight the importance of controlling for farmer characteristics in technology adoption studies

- Farmer characteristics shape adoption decisions

- Individual traits impact adoption decisions

- Plot specific characteristics are the least contributors to technology adoption
Questions/Comments

Thank you
Mohammad Rajib Hasan
mhasa16@lsu.edu