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

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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
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