Input Profitability Analysis

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Input profitability analysis

. . . A necessary early step in developing and sustaining successful input promotion and market development programs
What is input profitability analysis?

• Financial incentives/net returns to farmers
• Economic benefits/comparative advantage
• Examples of input profitability analyses
  – Calculating a value/cost ratio for fertilizer use
  – Enterprise/whole farm budget analysis of improved technologies
  – Comparing returns to investing in improved agricultural technology versus investing in non-farm activities
  – Assessing the economic (“social”) costs and benefits of increased input use

Why is profitability analysis important?

• Profitability analysis should be the first step in designing:
  – Input promotion programs
  – Input market development programs
• Reforms have created a need for frequent updating of profitability assessments
  – Farmers now bear risks formerly covered by government
  – Input/output prices are more variable now
  – Traders need help in locating and estimating demand
  – Greater emphasis on financial sustainability and economic soundness means revisiting price and cost assumptions
Perspectives on profitability

• Input adoption is a function of:
  – Financial incentives to farmers (demand), i.e., returns to input use relative to returns from alternative investments
  – Farmers’ capacity to purchase/use inputs, based on human and financial resources and ability to bear risk (demand)
  – Local availability of inputs (supply)
• Greater post-reform emphasis on availability than on incentives or capacity
  – Lack of availability sometimes interpreted as sign of market failure or “weak” private sector
  – Lack of farmer demand often seen as sign of inability to pay but may also reflect low relative returns due to:
    • inappropriate recommendations
    • inadequate farmer skills for adapting recommendations to their own circumstances

Recent uses of input profitability analysis in policy formulation

• Rwanda: Use of fertilizer response and market price data to update fertilizer profitability analyses and stimulate input market development
• Zambia: Similar approach, plus use of farm survey data to evaluate observed response rates and profitability
• Ethiopia and Mozambique:
  – Data collected on farm-level impact of SG2000 technologies (improved maize seed plus high levels of fertilizer)
  – Financial and economic analyses conducted
  – Determinants of yield response examined
Rwanda

- Background and prevailing policy situation
- Characteristics of analysis
- Integration into the policy process
- Outcomes

Sorghum: Recommendation for fertilizer promotion program in Rwanda
Summary of sorghum recommendations--Rwanda

<table>
<thead>
<tr>
<th>Zone</th>
<th>Treatment</th>
<th>Fertilizer Response (kg/ha)</th>
<th>Markets</th>
<th>Sorghum Price (RwF/kg)</th>
<th>Value-Cost Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plateau du Sud</td>
<td>76 kg DAP</td>
<td>576</td>
<td>Butare</td>
<td>143/110</td>
<td>2.1</td>
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<tr>
<td></td>
<td>78 kg Urea</td>
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<tr>
<td>Plateau du Sud</td>
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<td>Kigali-Ville</td>
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<td>70 kg Urea</td>
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<td>Kibungo</td>
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<tr>
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<td>78 kg Urea</td>
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<tr>
<td>Bugesera</td>
<td>110 kg DAP</td>
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<tr>
<td></td>
<td>80 kg Urea</td>
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Zambia

- Fertilizer profitability assessed using research data on crop response, and alternative assumptions about input levels and input/output prices
- Results:
  - Cotton: zero of 15 cases had a value/cost ratio > 2
  - Maize: 3 of 16 cases had value/cost ratios > 2; all 3 used less than the recommended doses
- Limitations:
  - Range of application rates was relatively high (100-750 kg/ha)
  - Soil quality on research stations may not be typical of farm-level conditions
Zambia, cont.

- Low fertilizer profitability confirmed by production function analysis using recent farm survey data
- Current fertilizer policy in Zambia fails to address market development issues that keep fertilizer costs high
- Current fertilizer recommendations in Zambia fail to take into account
  - site-specific nature of input profitability
  - need to improve fertilizer efficiency (e.g., lower doses, conservation farming, organic/inorganic fertilizer combinations)

Experience with improving input profitability for smallholders

- Organic/inorganic fertilizer combinations
  - Technical evidence on input efficiency is good
  - Evidence on adoption is limited but increasing
  - Capacity of these fertilizer combinations to stimulate input market development is poorly understood
- Malawi’s “best bet” technologies
  - Good idea but gives complex menu of options
  - More difficult for extension to implement; recent programs have returned to standard recommendations
- Participatory research may improve farmers’ skills to adapt inputs to their own conditions
Analysis of SG2000 technologies

• Ethiopia:
  – Technology introduced into high potential zones
  – Maize package highly profitable financially under a range of yields and output prices
  – Maize economically profitable as import substitute; not clearly profitable if exported (to Kenya)
  – Recent events show major (80%) price declines due to surplus production and high marketing costs
  – So returns to farmers still risky despite high yields
  – Medium fertilizer levels often most profitable

Analysis of SG2000 tech., cont.

• Mozambique:
  – Yield impact and financial profitability more modest than in Ethiopia
  – High input levels not significantly more profitable than low input levels, and more risky
  – Profitability (financial and economic) more dependent on how maize was marketed:
    • If stored for later sale → higher net returns
    • If sold in capital as import substitute → often not profitable
    • If exported to nearby Malawi or Tanzania → often profitable
SG2000 lessons/conclusions

- Profitability of SG technology varied depending on:
  - how long after harvest maize was sold
  - fertilizer and transport costs
  - whether maize is valued as import substitute or as export
  - location of production zone relative to sale point
  - regional production conditions and trade prospects
- High-input technology can be successfully introduced; challenges are scaling-up and sustaining such programs
- Investments in institutions and infrastructure are needed to bring down marketing costs and risks

Conclusions/Recommendations

- Profitability analysis (PA) is an under-utilized ingredient in input policy analysis;
- Most PA is still done by donor-funded projects
- Need to develop local capacity for PA analysis and make results available to policy makers, farmers, and input suppliers
- PA should be situation-specific, incorporating local variability in yields, input/output price ratios, and risk
- Input recommendations and promotion programs should be profitability-based, and research on increasing input use efficiency supported when profitability is weak