Why Investing in Irrigation Wells?
Analysis for 6 Indian Villages

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Presentation outline

Context
Objective
Methodology
Results
Conclusions
Context

• Since 1970 boom in borewells in India
  > From 20% irrigated by wells to 60%
  > Private initiatives
  > Policy support (credit, subsidies...)

• By end of the 1990s problem of water scarcity
  > Falling water tables
  > Borewell failures
  > Increasing investment costs
Context

- Return on investments has decreased and becomes much more uncertain
- Nevertheless farmers keep investing
- Possible reasons
  - Insufficient knowledge of groundwater system
    - Invisible nature of the resource
    - Difficulty to perceive impact of own use
Context

- Possible reasons
  - Sunk cost fallacy / escalation of commitment
    - Costs from the past determine current decisions
    - Vicious circle of indebtedness
- Behaviour aggravates water scarcity
Objective

- Understand investment decisions of farmers
- Support policy formulation for sustainable groundwater extraction
Methodology

- ICRISAT Village level Studies dataset is used
- Representative panel dataset (2001-2009) of 447 farmers in 6 villages in 3 districts from two states (Andhra Pradesh and Maharashtra)
- Yearly interview on a variety of topics (socio-economic; farming; resource use...)

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Methodology

• Questionnaire contains module on well investments
  • Size of investment, depth of the well, number of attempts
• Analysis of investment decision using a Double Hurdle model:
  • Whether to invest (logit)
  • How much to invest (truncated)
Results: Descriptives

• On average 2.2 ha cultivated, irrigated area 1 ha
• Irrigation of paddy, cotton, sugar cane, vegetables
• 70 % indebted (average 400 euro)
• Signs of increasing water scarcity ?
  • Over years slight decrease in irrigated area
  • Deeper wells
  • Increasing investments
Results: Investment model

• Two decision have different determinants
  • Double hurdle outperforms tobit

• Decision whether to invest depends on
  • Past investments (+)
  • Land ownership (+)
  • Rainfall (-)
  • District
Results: Investment model

- Decision how much to invest depends on
  - Irrigated area (+)
  - Non-agricultural income (+)
  - District
Conclusions

• Confirmation of problem of escalation of commitment

• Adequate legal and institutional arrangements are necessary to regulate users
  • Credit and subsidy system
  • Licensing of wells, a reform of the property rights
  • Making people aware of the non-viability of their investments
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