Benefits from rural ICT applications in India: Reducing transaction costs and enhancing transparency?

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Presentation Structure

• Nature of benefits
• Examples of ICT initiatives in agriculture
  – Computerization of Mandis (agri-markets)
  – eChaupal-an initiative of a large private firm
  – eSAGU: extension services and knowledge
  – Agri watch Portal-private sector
  – On-line Land records by Karnataka Govt
  – Computerized co-op milk collection centers
• Key lessons from the Indian experience
Benefits: Lower Costs, Added Value and Transparency

- ICTs can help by providing
  - access to credible and timely information
  - access to knowledge on farm practices
  - more convenient and cheaper services by private sector and government
- Farmers can be helped in the entire cycle of production - from decision on crops to be grown to production and sales
- In measuring cost of access to information, trust (credibility of source and accuracy) is important
- Opportunity of missed profits/ economic value because of lack of information is also important
- Observable transaction costs: include marketing costs such as transport, handling, packaging, storage, spoilage etc.
- Unobservable transaction costs: include cost of information search, bargaining, screening, monitoring, co-ordination, enforcement
- No systematic attempt to measure costs in India
Farmers
Where can
ICT help?

Supply of
consumer
produce &
services

Supply of
inputs

Issue of
Certificates
and Licenses

Procurement
of Produce

Development info
projects, programs,
schemes & feedback

Access to Markets

Education, training to
enhance employment &
economic opportunity

Delivery of
health &
educational
services

Entertainment &
info for social needs

FARMER’S INFORMATION NEEDS
Prices and availability in markets of
inputs/ commodities
Weather forecasting
Information on crop insurance
Early warning/management diseases/pests
Soil testing/ soil sampling information
Question-and-answer service
Low Bargaining Power of Indian Farmer

- Fragmentation: Average holding less than 1.5 hectare, poor bargaining power
- Geographic dispersion 120 million farmers in 600,000 villages
- Heterogeneity: Knowledge, risk taking ability, soil, precipitation, irrigation
- Lack of Institutional Infrastructure: Credit approval, banking, insurance
- Dependence on middle man for credit, leading to a vicious circle
Madhya Pradesh State Agricultural Market Board Computerization

- There are 7 Regional Offices, 231 Mandis and associated Sub Mandis
- The organization serves around six million farmers of the state (trading in 1700 commodities); and 70,000 licensed traders
- Trade volume handled: 12.5 million tonnes annually worth Rs. 140 billion. Collect a fee of Rs. 2 billion
- The web site is visited by 8-10,000 visitors resulting in 50,000 page views
- 85% of visitors are from out of state
Weighing of Farm Produce:
Preparation of Standard Bags (90 to 100 Kg)

Grain Loss: 2-3 Kg
per Quintal (100 Kg)
ITC’s eChoupal

- Internet kiosk in the house of a trained farmer within walking distance of target farmers
- Warehousing hub managed by the erstwhile middleman, within tractorable distance of target farmers

- Procure 2 million Tonnes valued at US$ 400 million
- 6400 eChoupals in 5 states of India covering 38,000 villages, servicing 4.0 million farmers, sourcing 13 agri commodities (oilseeds, grains, coffee, aquaculture)
Services and Benefits to the Farmers

- Relevant & Real-time Information despite distances
  - Commodity prices, Local Weather, News
- Customised Knowledge despite Heterogeneity
  - Farm Management, Risk Management
- Supply Chain for Farm Inputs
  - Screened for quality, demand aggregation for competitive prices & efficient logistics
- Higher Incomes for Farmers through
  - Increased Yields; Improved Quality; Reduced Transaction Costs
  - Power of Scale to the Small Farmer
- Lower Transaction Costs, Better Value through Traceability
- Marketing a variety of goods and services (agri-inputs, consumer goods, insurance, market research)
Reduction in Transaction Costs

**Farmer Incurs**
- Trolley Freight to ITC Hub = 120
- Labour = 50
- Kacchha Adat = 150
- Handling Loss = 50

**Rs per MT**
- 370
- 120

**Processor Incurs**
- Commission to Sanchalak = 100
- Cost of Gunny Bags (net) = 75
- Freight to Factory = 120
- Storage & Handling at Hub = 40
- Cash Disbursement Costs = 50

**Total Chain**
- 705
- 335
e Sagu System: A Collaboration Amongst Research Institutions

Parts of eSagu system. C indicates coordinator. A double arrow indicates the information flow.
eSAGU Impact on Costs

- Implemented in 5000 farms spread in 40 villages over six districts in Andhra Pradesh for 6 major crops
- Benefit to farmer is about Rs 3,820/- per acre.
  - fertilizers (0.76 bags) per acre = Rs 229.70/- per acre
  - pesticide sprays (2.3) = Rs 1,105/- per acre
  - extra yield (1.56 quintal) = Rs 2,485/- per acre.
- Expenditure is Rs 1200/- per acre.
- Farmers in a few Mandals have formed small cooperatives, pooling funds, for purchase of fertilizers and pesticides.
- Farmers need not be literate
AGRI-WATCH PORTAL
http://www.agriwatch.com/

ON rice, wheat, maize, oil, pulses, spices, coffee, sugar, livestock, herbs, aromatic plants, seeds, agrochemicals, and fertilizers

FOR farmers, traders, processors of agricultural outputs, suppliers of inputs.

OFFERS news analysis, expert opinions, advice, agri statistics, Government schemes, tenders, analysis of commodity prices collected through a network of 60 markets (national and international), price trends, international trade flows, crop forecasting, freight market information, weather analysis
Making Dairying Economically Profitable at the Farmer’s Level

- Increasing transparency in collection through e-weight, fat testing and immediate payment
- E-commerce: cattle feed, artificial insemination
- Knowledge on disease
- Veterinary services
- Increasing the yield of milk per animal
- Reducing dry days and increasing yield per day
## Transaction Costs Saved Through Different Projects

<table>
<thead>
<tr>
<th>Stages</th>
<th>Invisible and Visible Costs</th>
<th>eChaupal</th>
<th>Mandi</th>
<th>eSAGU</th>
<th>Agri-watch</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Decision</strong></td>
<td>Visits to meet farmer association officials to decide on a crop</td>
<td></td>
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<tr>
<td><strong>Seed</strong></td>
<td>- Cost of finding info on a particular seed</td>
<td>*</td>
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<tr>
<td></td>
<td>- Cost of traveling to purchase seeds if the seeds not available</td>
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<td>*</td>
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<tr>
<td><strong>Land and planting</strong></td>
<td>- Costs of finding labor</td>
<td></td>
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<td></td>
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<tr>
<td></td>
<td>- Costs finding machines to prepare the land</td>
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<td></td>
<td></td>
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</tr>
<tr>
<td><strong>Growing</strong></td>
<td>- Costs of finding fertilizer, pesticides, weedicides etc</td>
<td>*</td>
<td></td>
<td></td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>- Costs of traveling to purchase fertilizer, pesticides, weedicides etc if those were not available</td>
<td>*</td>
<td></td>
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<td>*</td>
</tr>
<tr>
<td><strong>Harvesting, Packing, and Storing</strong></td>
<td>- Costs of finding market prices</td>
<td>*</td>
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<tr>
<td></td>
<td>- Costs of finding labor</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>- Costs of finding storage, packing materials etc</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Selling</strong></td>
<td>- Costs of comparing prices of different traders</td>
<td>*</td>
<td></td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>- Costs of finding transport Freight and handling losses</td>
<td>*</td>
<td></td>
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</tr>
</tbody>
</table>
Land Record Computerization (Karnataka)

- 20 million records, 6.7 mln farmers, 9000 villages.
- Manual RTC issue took 3-30 days and a bribe of Rs 100-2000. Mutation can take up to 2 years (30 days).
- 180 centers operational for one year where RTCs are issued on-line for a fee of Rs 15. Mutation request filed on line.
- 5.2 million users, Rs. 80 millionn collection goes to dept.

Issue of land records from 800 Tele Centres thru a private agency with bar code embedded digital signature.

Crop updation using Tele Centres: Pilot at 50 centres. Web enabled to verify records on Internet.
IMPACT OF LAND RECORDS COMPUTERIZATION

- MANUAL
- COMPUTERIZED
IMPACT OF LAND RECORD COMPUTERIZATION

**SERVICE QUALITY**

**GOVERNANCE**

**IMPROVEMENT OVER MANUAL ON A FIVE POINT SCALE**

**PERCENT PREFERING COMPUTERIZATION**
<table>
<thead>
<tr>
<th>State</th>
<th>Travel cost incurred in each trip to a taluk center (Rs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gujarat</td>
<td>20.00</td>
</tr>
<tr>
<td>Haryana</td>
<td>38.92</td>
</tr>
<tr>
<td>Himachal Pradesh</td>
<td>12.11</td>
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<tr>
<td>Rajasthan</td>
<td>26.99</td>
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<tr>
<td>Tamil Nadu</td>
<td>17.11</td>
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<tr>
<td>Uttarakhand</td>
<td>25.75</td>
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<tr>
<td>West Bengal</td>
<td>19.60</td>
</tr>
<tr>
<td>Madhya Pradesh</td>
<td>54.60</td>
</tr>
</tbody>
</table>

Average Cost per Trip is Rs. 18.7
Learning from Indian Experience

- Changing age old systems is a complex task requiring many partners - need to utilize the drive and entrepreneurship of private enterprise
- Organizational design - coming together of partners with specific value proposition, incentives and rules to cooperate.
- Creative use of technology in places or for a purpose not originally intended. Combining emerging and traditional technologies to overcome constraints
- Focus on concrete value delivered by use of ICTs and improvement in logistics
- Adapting business models to local contexts to make them sustainable
- A phased implementation that is demand driven, with systematic assessment at the end of a phase
- Technology adoption is a slow process - may take 5 years