Benefits of ICT applications to farmers with emphasis on transaction costs: experiences from India

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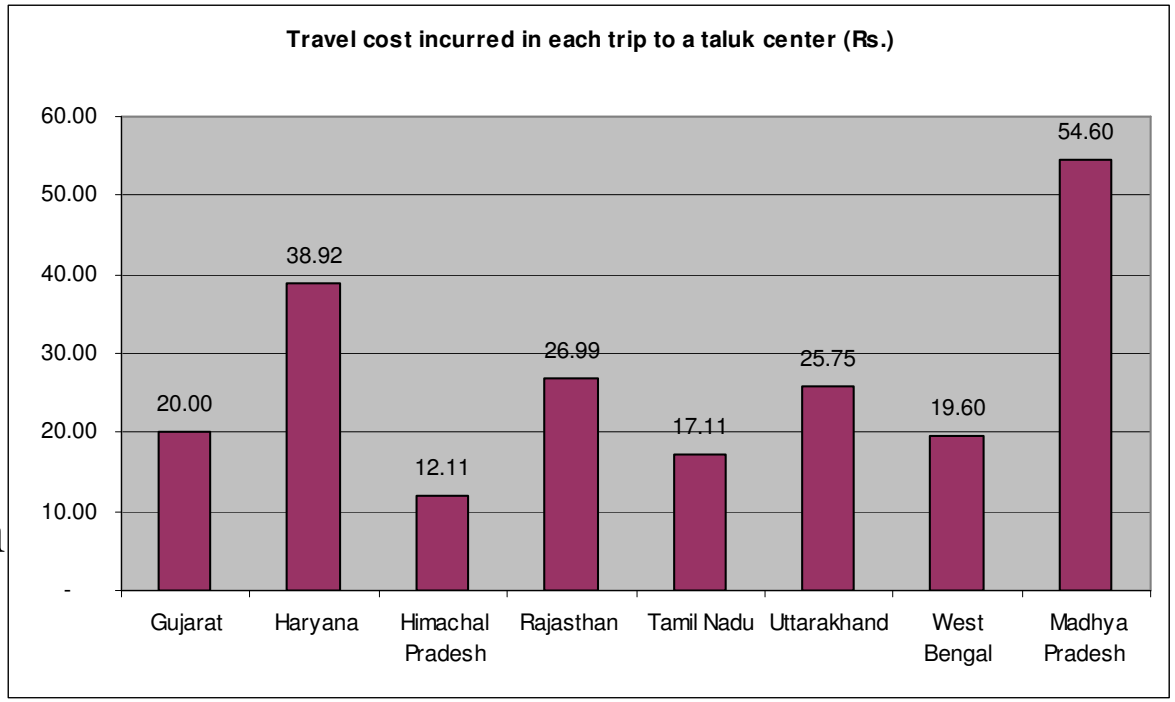
Presentation Structure

- Nature of benefits and transaction costs
- Examples of ICT initiatives in agriculture
  - eChaupal
  - Computerization of Mandis (agri-markets)
  - eSAGU: extension services and knowledge
  - Agri watch Portal
  - Land record computerization
  - Computerization of milk collection
- Critical Success Factors for ICT use

Transaction Costs for Farmers

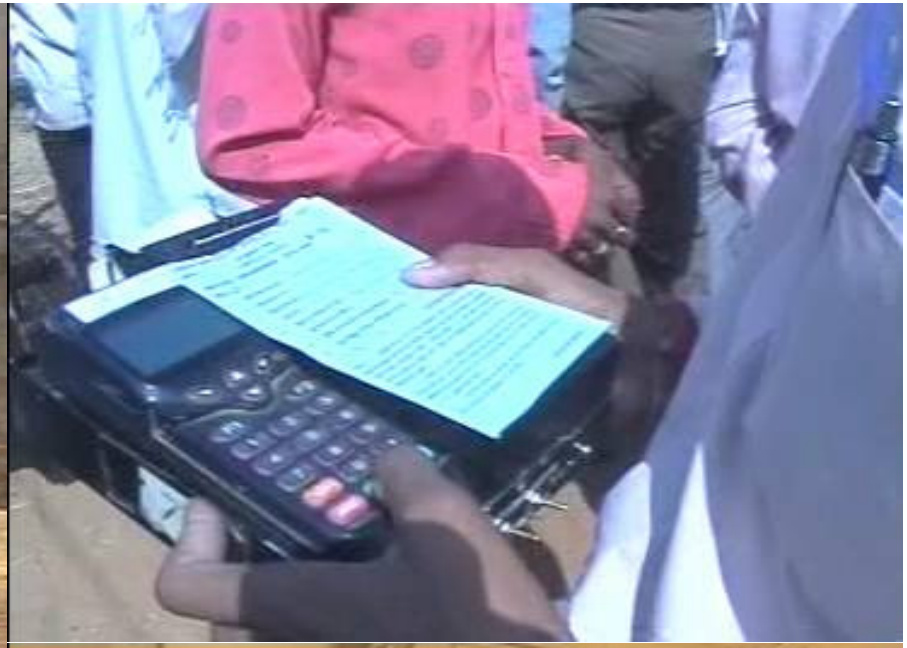
- Observable transaction costs: include marketing costs such as transport, handling, packaging, storage, spoilage etc.
- Unobservable transaction costs: include cost of information search, bargaining, screening, monitoring, co-ordination, enforcement
- No systematic attempt to measure costs in India

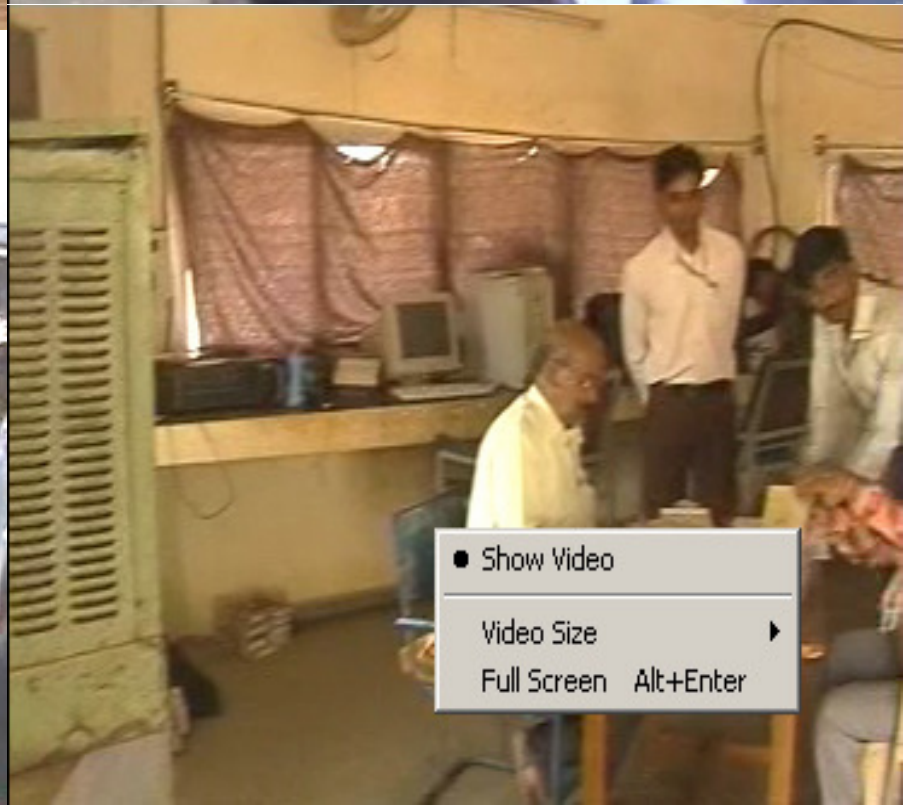
Travel Costs per trip to Taluk Town in India



Average Cost per Trip is Rs. 18.7

Mandi Computerization



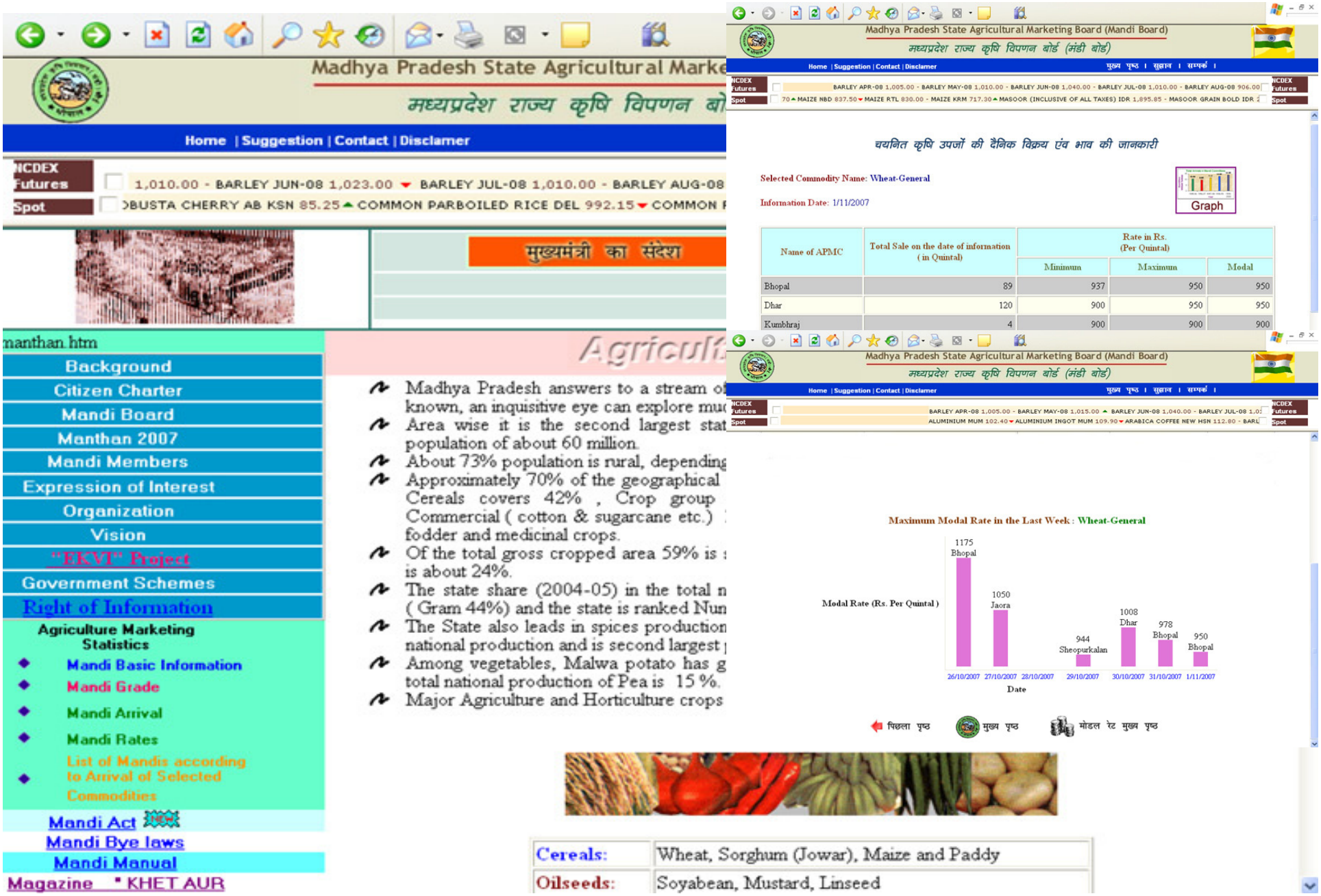


Weighing of Farm Produce:
Preparation of Standard Bags (90 to 100 Kg)

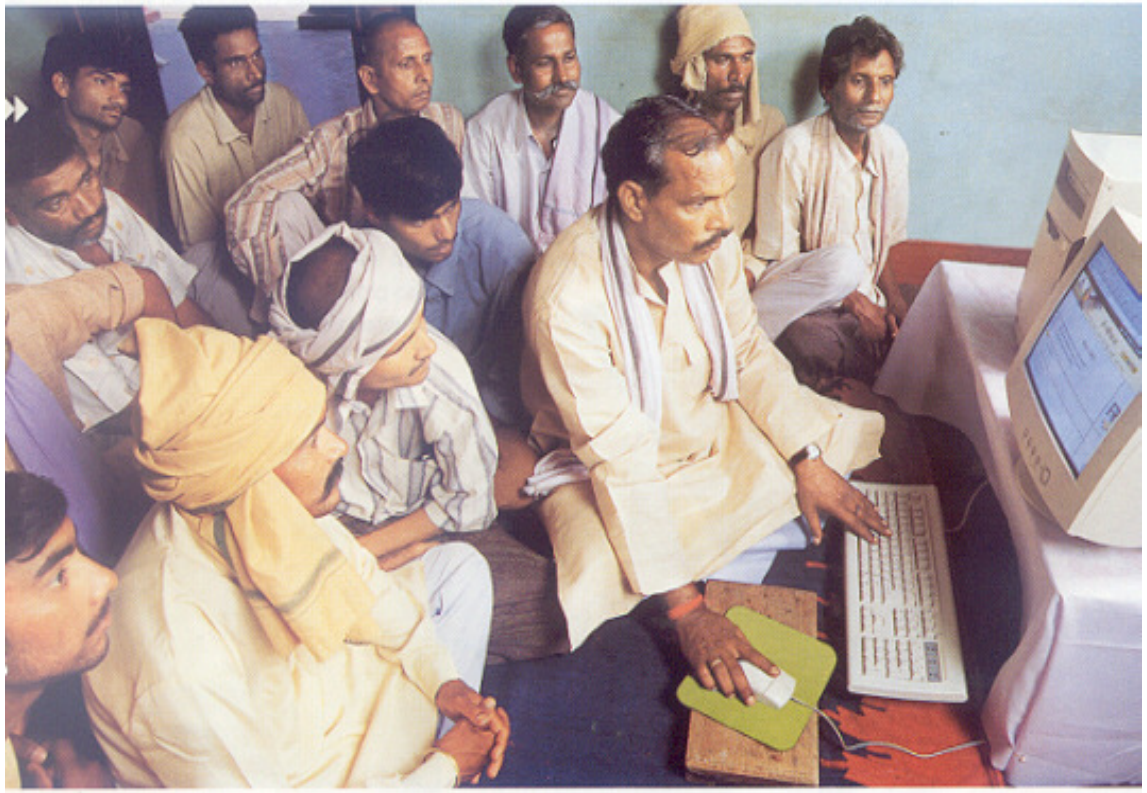
Madhya Pradesh State Agricultural Market Board (Mandi Board)

- Mandi Board's Head Office is in State Capital in Bhopal. There are 7 Regional Offices, 231 Mandis and associated Sub Mandis and 50 Check posts (Nakas).
- 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. 1 40 billion. Collect a fee of Rs. 2 billions
- The web site is visited by 8-10,000 visitors resulting in 50,000 page views
- 85 % of visitors are from out of state

Mandi Board Website – Main Menu



ITC's eChoupal



- Marketing a variety of goods and services (agri-inputs, consumer goods, insurance, market research)
- 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)

Low Bargaining Power of the 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,
- Dependence on middle man for credit, leading to a vicious circle

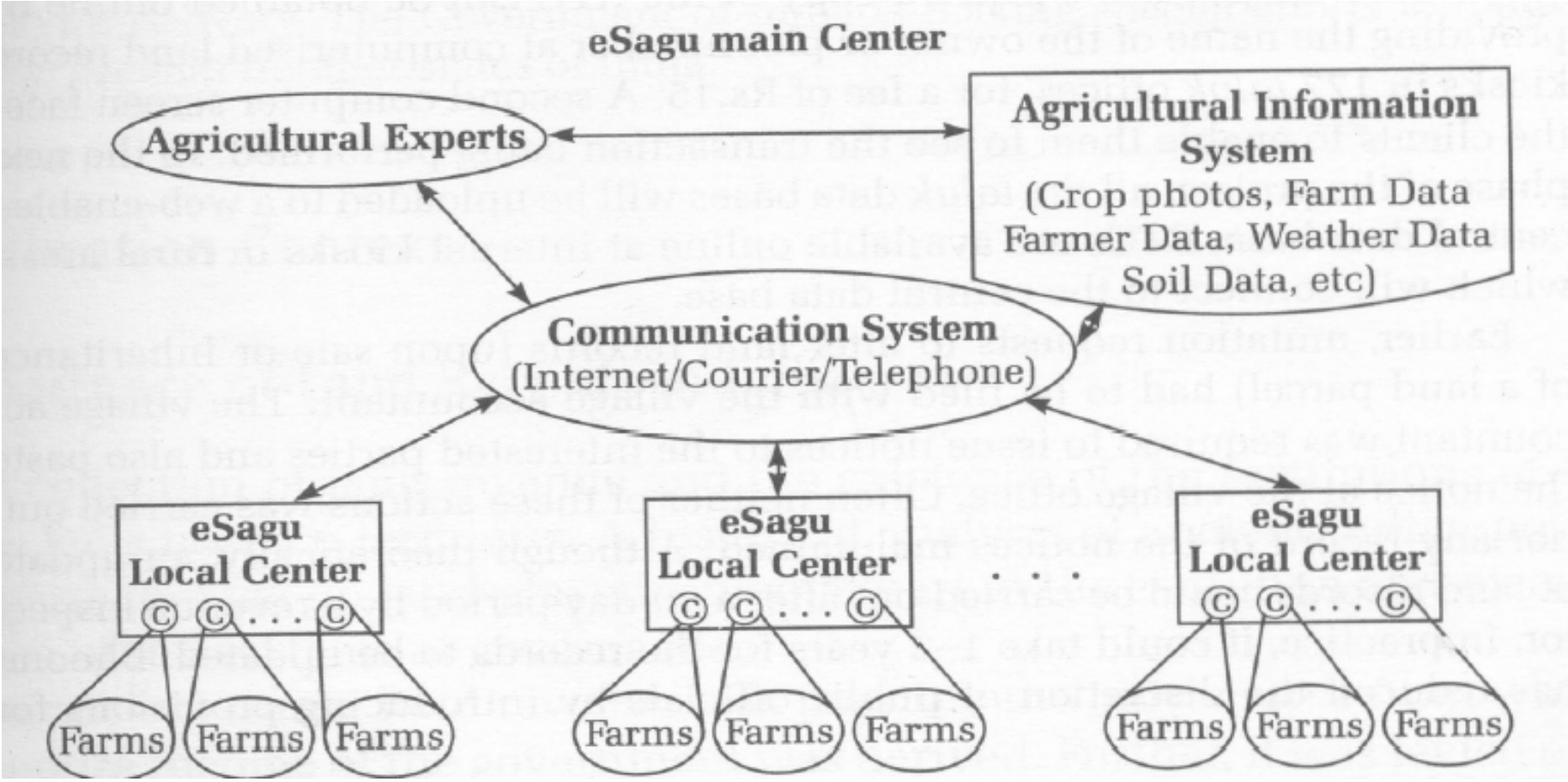
Services and Benefits to the Farmers

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

Reduction in Transaction Costs

		Rs per MT	
Farmer Incurs	Trolley Freight to ITC Hub	= 120	~~370~~ 120
	~~Labour~~	~~= 50~~	
	~~Kacchha Adat~~	~~= 150~~	
	~~Handling Loss~~	~~= 50~~	
Processor Incurs	Commission to Sanchalak	= ~~100~~ 50	~~335~~ 215
	Cost of Gunny Bags (net)	= 75	
	~~Freight to Factory~~	~~= 120~~	
	Storage & Handling at Hub	= 40	
	Cash Disbursement Costs	= 50	
Total Chain			~~705~~ 335

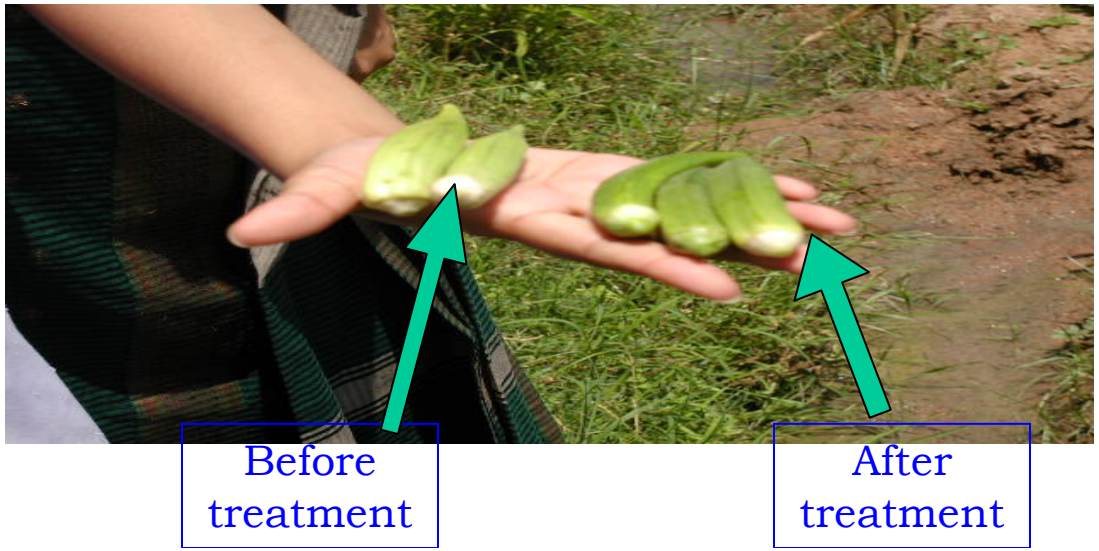
e Sagu System :A Collaboration Amongst Research Institutions



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



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

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

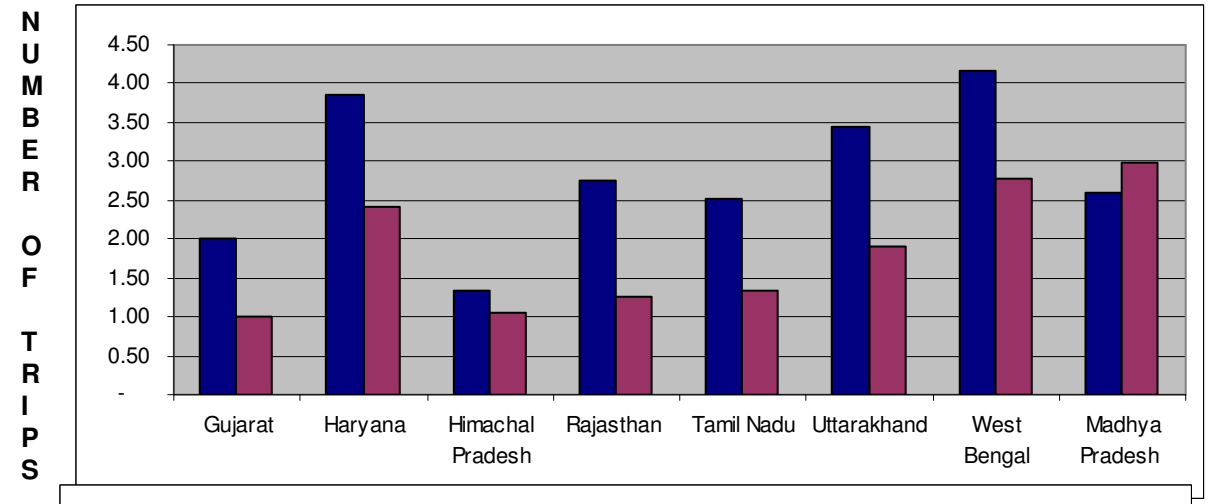
Land Record Computerization(Karnataka)

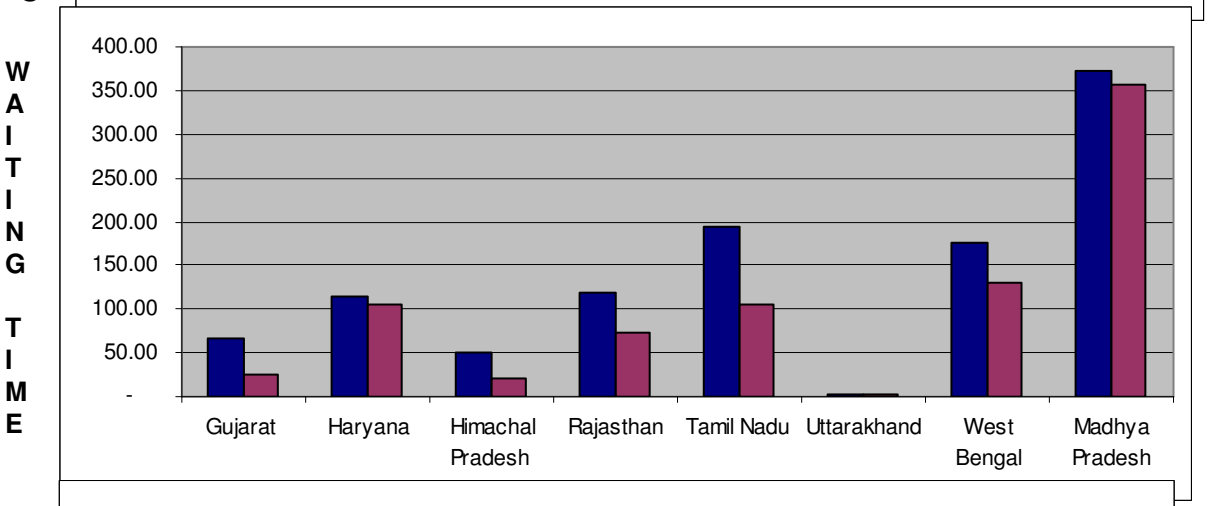
- 20 million records, 6.7 mln farmers, 9000 villages.
- Manual RTC issue took 3-30 days and a bribe of Rs 100-2000. Mutation can take up to 2 years (30 days)
- 180 centers operational for one year where RTCs are issued on-line for a fee of Rs 15. Mutation request filed on line
- 5.2 million users, Rs. 80 millionn collection goes to dept.
- Investment of Rs 180 million. Operational expenses: Rs 40 million at 5 million users
- **Issue of land records from 800 Tele Centres** thru a private agency with bar code embedding digital signature
- **Crop updation using Tele Centres:** Pilot at 50 centres. Web enabled for citizens to verify records on Internet.

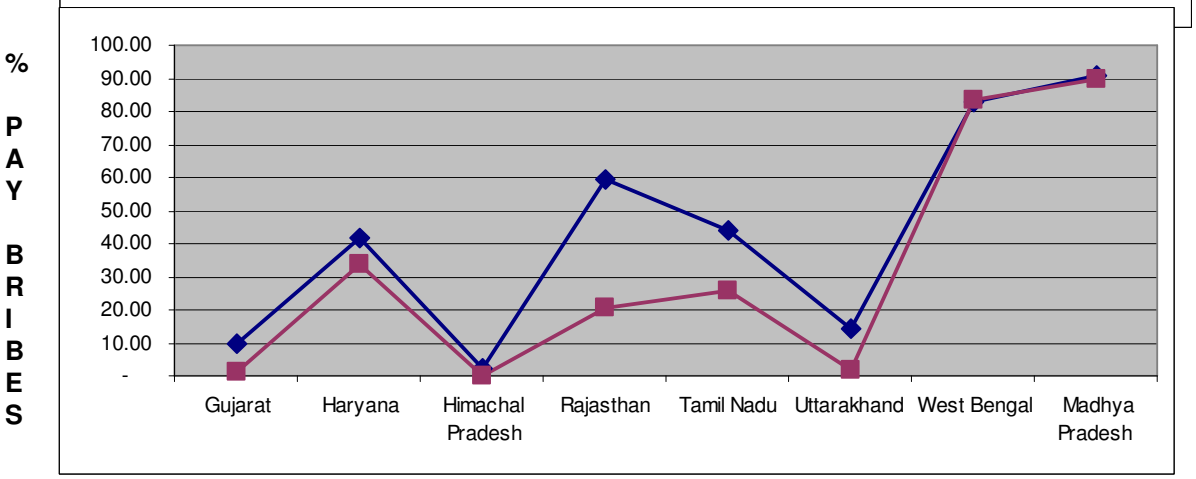
IMPACT OF LAND RECORDS COMPUTERIZATION

MANUAL

COMPUTERISED





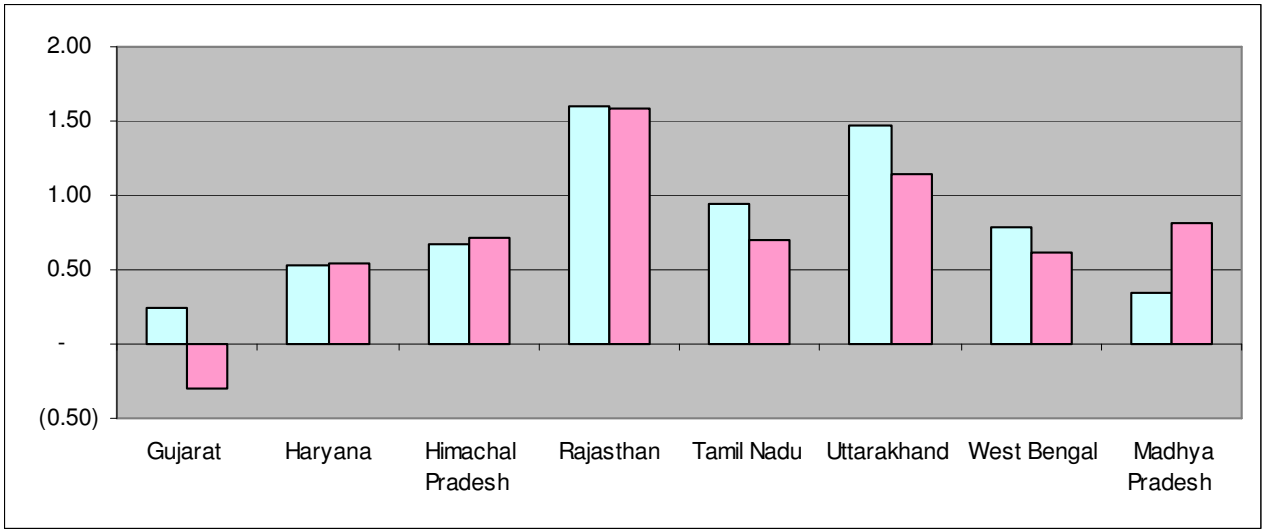


IMPACT OF LAND RECORD COMPUTERIZATION

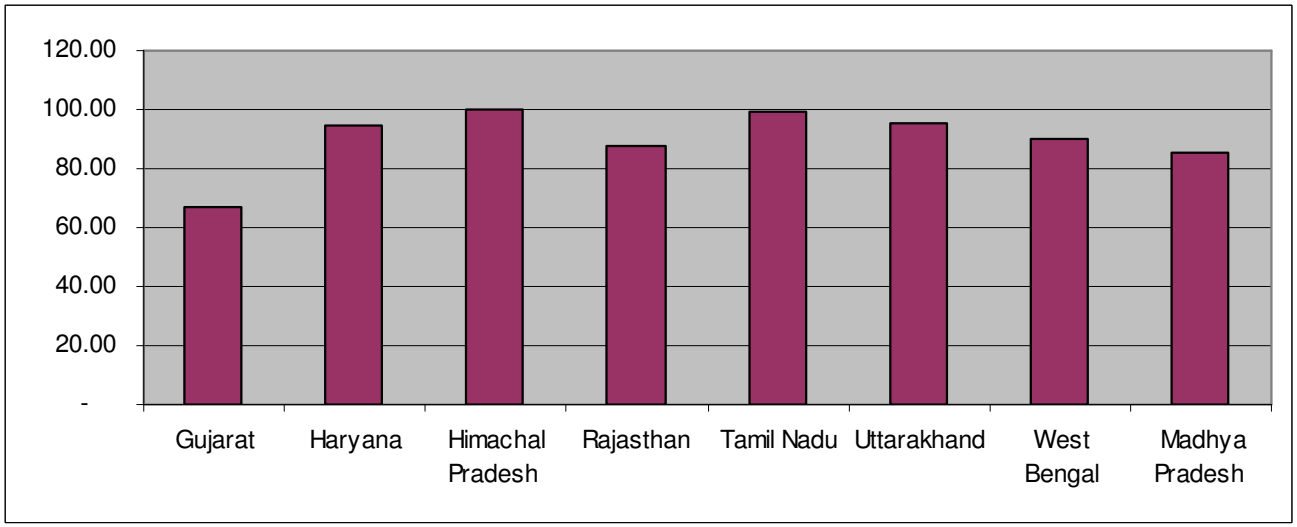
SERVICE QUALITY

GOVERNANCE

IMPROVEMENT OVER MANUAL ON A FIVE POINT SCALE



PERCENT PREFERRING COMPUTERIZATION

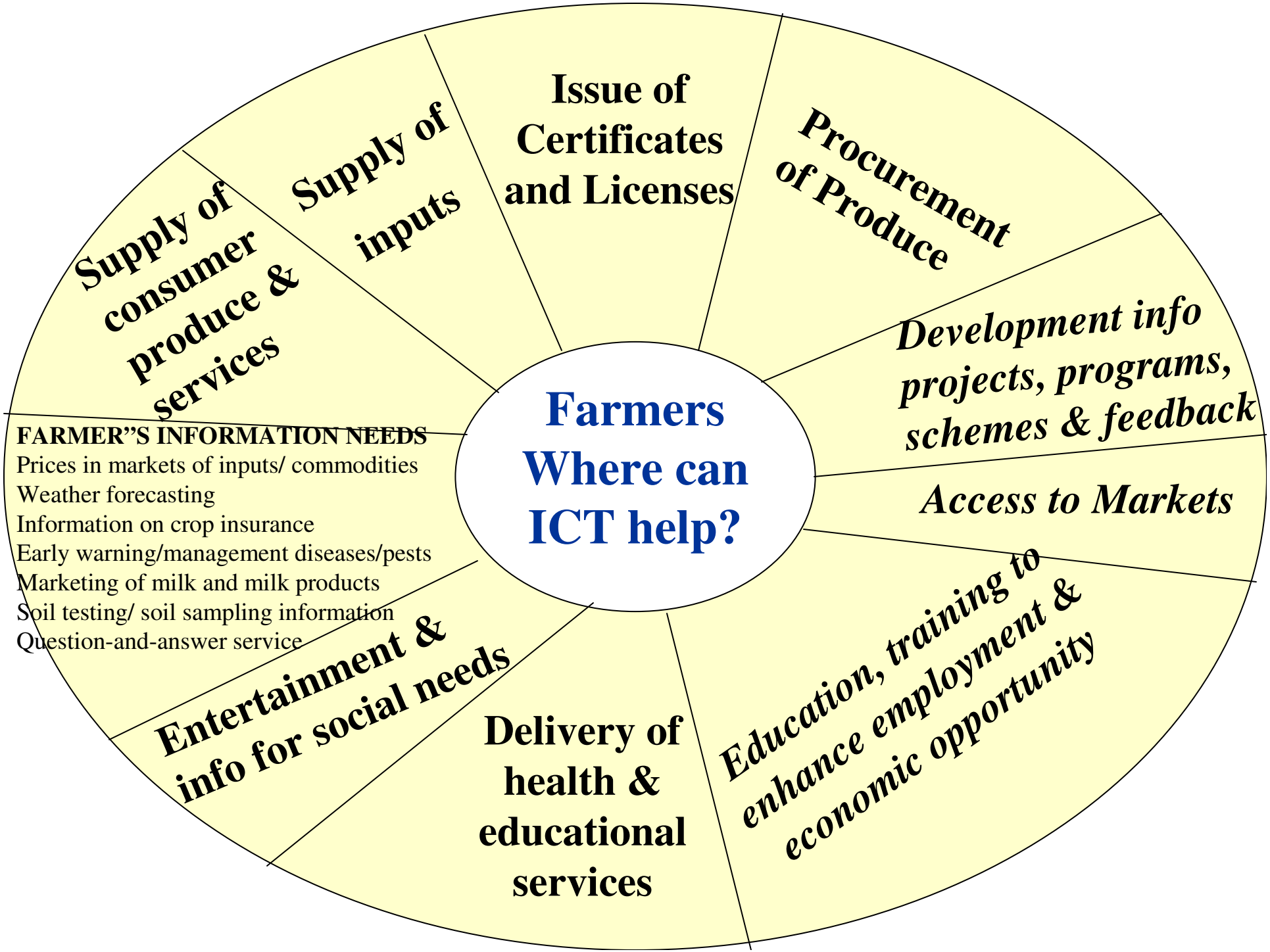


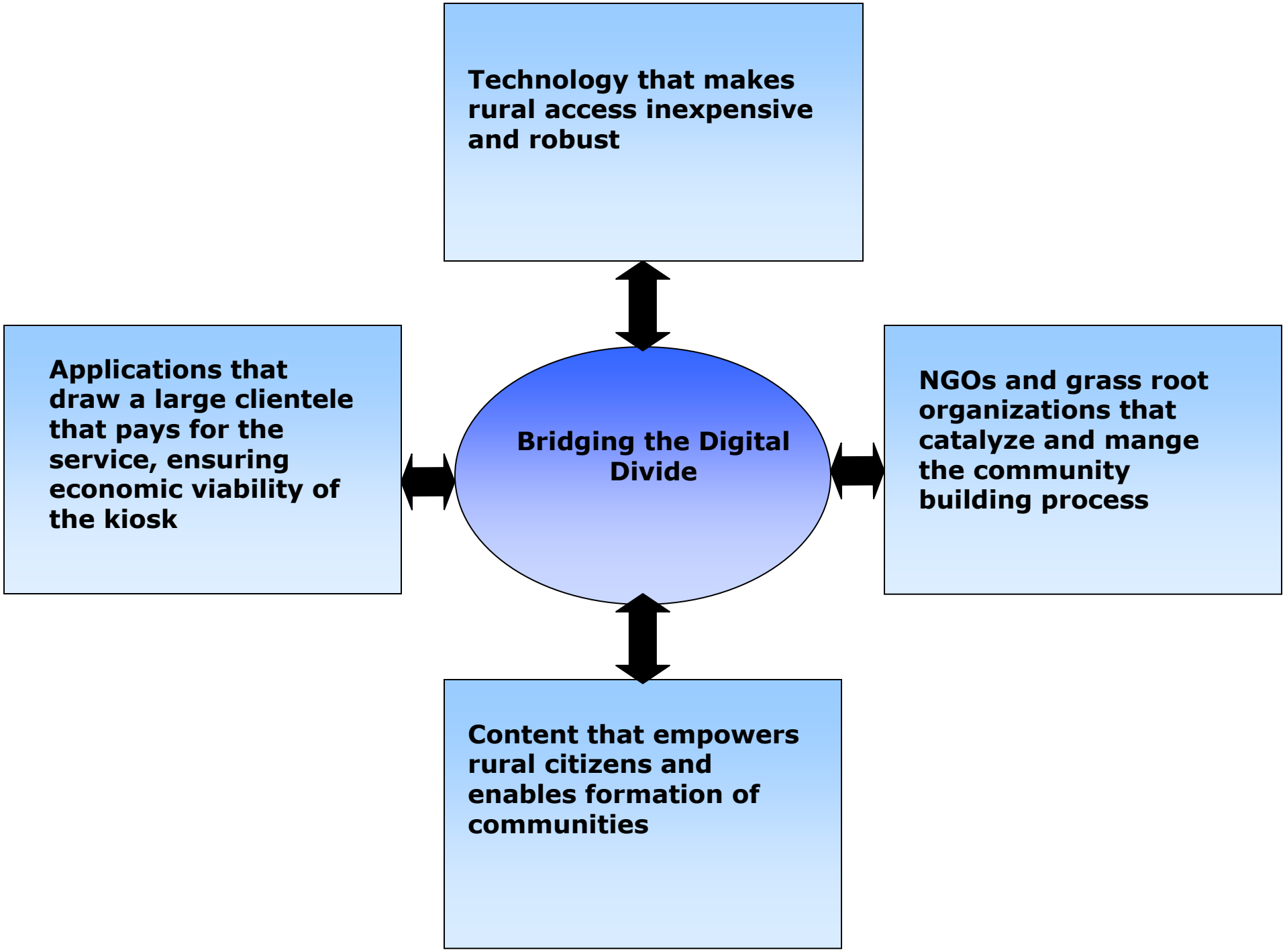
AGRI-WATCH PORTAL
http://www.agriwatch.com/

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


Farmers Where can ICT help?
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
Supply of consumer produce & services
FARMER"S INFORMATION NEEDS
Prices in markets of inputs/ commodities
Weather forecasting
Information on crop insurance
Early warning/management diseases/pests
Marketing of milk and milk products
Soil testing/ soil sampling information
Question-and-answer service


Technology that makes rural access inexpensive and robust
Applications that draw a large clientele that pays for the service, ensuring economic viability of the kiosk
Bridging the Digital Divide
NGOs and grass root organizations that catalyze and mange the community building process
Content that empowers rural citizens and enables formation of communities

Innovations and Creativity: Key to Success

- Making a market despite many missing links
- Creative use of technology in places or for a purpose not originally intended.
- Organizational design- coming together of partners with specific value proposition, incentives and rules to cooperate.
- Combining emerging and traditional technologies to overcome constraints
- Adapting business models to local contexts
- Role of network orhestrators

Challenges in Replication and Scale Up

- Poor telecom access and infrastructure in rural areas--high installation and maintenance costs
- Entrepreneurial capacity of the rural community-great acumen, but needs plenty of training
- Management capability to execute complex business models and to manage scale
- Understanding the agricultural value chain and rural society to figure out the value addition of Information Technology
- A large number of pilots, most are economically unviable. Limited revenue generating potential
- Reluctant donors-lack of evidence of macro impact and experience of failed projects

Successful Scaling Up Requires:

- Success is likely in organisations with financial resources, leadership, strong project management and ability to discover services that are valued. Three models have emerged:

- Large private/public/cooperative sector companies operating in rural markets may be able to derive sufficient value by improving business processes. to make such centers viable and scalable.
- Government services that are valuable can charge a user fee for electronic delivery through privately owned telecenters.
- Intermediary organizations partner with providers of valued service as well as rural entrepreneurs who create access points to orchestrate the operations of a large network of kiosks.

- Cost of access to information, its economic value , trust and accuracy are important
- Do farmers