A New Personalized Agriculture Advisory System
Reality, Potential and Technology Challenges

Ashok Jhunjhunwala, Jayalakshmi Umadikar, Suma Prashant & Nishan Canagarajah

European Wireless Conference
April 2013

IU-ATC project funded by Department of Science and Technology (DST), Government of India and UK EPSRC Digital Economy Program
India’s fragmented farmers

88 million farmers with 98.5 million holding

• Employing 52% of India’s workforce
  • average holding of 1.1 hectare
    • in 630000 villages
    • speaking 20 different languages and more dialects
  • Contribution to GDP falling to 13.9% from 30% in 1990-91
    • Average household income barely 1000 Euro per year

But thanks to wireless most today have a mobile phone

• Basic phone with voice + SMS plus a camera
  • Some have GPRS

April 2013
European Wireless Conference
Reality

**Challenges:** Limited land and water availability, fragmentation of land, changes in demand and consumption patterns, new pest and disease outbreaks, liberalization of trade as well as a move towards high-value agriculture

- **Farmer:** How and where to receive the right information at the right time?
- **Extension workers:** How to provide specific solutions for specific problems?
How accessible is ICT to farmers?

- 2G GSM and GPRS networks
- Robust voice connectivity in most villages
- Limited data-connectivity
- But phones have a camera and MMS to send a picture

Dispersed farmers: How do modern industries deal with large number of dispersed customers?

Sophisticated call-centers have service history for each customer enabling highly customized service

Presents an Agricultural Advisory System leveraging mobile phones to provide highly customized service to farmers

April 2013
European Wireless Conference
A New Agricultural Advisory System

Crop Protection
Cultivation Practices
Input Prices
Livestock
Market Info
Value Addition

Relay of Agricultural Advisory Voice Messages

Since August 2012, Agricultural Advisory Voice Messages with customized information relayed to around 0.2 million farmers across 5 Districts in Tamil Nadu
- 3.2 million messages relayed so far
- Content include information on new crop production technique, pest and disease management, information on new crop

- Weather
- Links to Market Prices
- History of Farm, Farmer profile, past advisories given
- Photos of Infestation in crops

Potentially any other required info
Escalation when needed

If Advisor finds it difficult to handle certain issue, Escalation to an expert takes place

• Crop-expert (agri-scientist)
• Market-expert
• Finance-expert

• Expert has same view of farmer’s page as that of Advisor

• Three-party calls set up getting farmer to discuss with an Advisor and an expert

Who will Pay? Farmer? Government Subsidy? Advisors supported by Government?

April 17, 2012
World Information technology Forum (2012), New Delhi
Early Implementation Feedback

Agricultural Advisory System using Call Centre Approach

• Extension staff at call-center often not able to provide immediate advisory; had to contact the expert in an off-line communication
  • Conferencing of an expert important
  • Qualifications and training of operator needs to be strengthened
• Image-uploading application a little complex
  • still farmers were very happy to receive personalized advisory based on the images they could send.
    • Some went on to purchase better camera and subscribed to GPRS

Relay of agricultural advisory voice messages.

• quick-survey by asking a question at the end of a message
  • 91% respondents found messages to be relevant and useful
  • Need categorisation of farmers for better customisation of messages
Technological and Implementation Challenges

Uniform availability of reliable GPRS would help
• Improvement in QoS (Quality of Service) over network needed for picture transmission

What level of training is adequate for extension workers at call-center?

Human Computer Interface Challenge at call-center
• dashboard design to place information at right place

Automatic Voice Response System Challenge
• can a AVRS handle most calls?
  • switch to an operator at first signs of farmer’s discomfort

Designing appropriate PUSH voice-messages
• Challenging to have feedback integrated with every voice-message push and using IVRS/ASR to analyze the feedback
Conclusion

Mobile telephony in remote areas can be effectively leveraged
• to provide extension service in fragmented landscape
  • highly personalized and customized agricultural extension possible
    • Increase of data rate and QoS in wireless networks would help
  • Have potential of transforming agriculture in countries like India
  • May be equally useful in developed nations of Europe
    • Relative importance of voice Vs data for the service may vary between India and European countries

April 2013
European Wireless Conference