

# Mapping & Preliminary Evaluation of ICT Applications Supporting Agricultural Development

An IFC sponsored study in Uganda, India & Indonesia

Prepared by

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Background, Introduction to ICT Solutions & IFC's clients

## SCOPE OF STUDY

# Background

- Study undertaken to evaluate and map current “ICT for agriculture” models and aggregate lessons
- Enable IFC to effectively integrate ICT solutions into its agribusiness advisory services projects
- Participating ICT solutions in Uganda, Indonesia and India, where some of IFC’s agribusiness clients are operating

# Study to find answers

- Which is the most effective way to reach farmers with timely agricultural information and knowledge? Is it telephone, radio, FM radio stations, print, SMS, or Internet, among others?
- How can the potential of radio and digital telephony be harnessed to communicate agricultural information to farmers?
- How should agricultural information and knowledge be synthesized or repackaged for small-scale farmers?
- What is the minimum literacy level required by small-scale farmers to use ICTs?

# Study to find answers (contd.)

- What ICT solutions could be used to share and exchange agricultural information, knowledge and innovation among illiterate small-scale farmers?
- How can existing ICT solutions be improved and leveraged?
- What lessons have been learnt and based on the lessons learnt, what should be done to increase adoption?
- In terms of use of ICTs within communities, what technologies are available, how does the community share resources, and how is agricultural information and knowledge created, captured, preserved and shared?

# ICT Solutions Surveyed

- MTN Uganda – Google SMS & Search
- Grameen Foundation’s Community Knowledge Worker (CKW) Program
- Question Box
- Esoko
- Institut Technology Bandung, Indonesia - SAPA Mobile
- Nokia Life Tools
- Reuters Market Light (RML)
- IFFCO Kisan Sanchar Limited (IKSL)
- AgriFone
- BubbleMotion’s Bubbly
- TCS’ mKrishi
- eChoupal 3.0
- IFC Small and Medium Enterprise (SME) Toolkit

# IFC Clients' Surveyed

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Uganda      Kawacom (U) Ltd

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Indonesia      PT. Indo Cafco (U) Ltd (ECOM)

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Armajaro

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India      FieldFresh Foods Pvt. Ltd.

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Jain Irrigation Systems Ltd.

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DCM Shriram Consolidated Ltd. (DSCL) Sugar



Usage of ICT to address Information needs

## FARMER TRENDS

# Uses of Mobile Phones

Activity	% of users who use mobile phones for this purpose in a week		
	Uganda	Indonesia	India
Make phone calls to other mobile phones or fixed lines	72%	82%	90%
Send/Receive SMS from another user	68%	85%	15%
Conduct financial transactions	23%	12%	0%
Listen to music/radio	37%	48%	12%
Click pictures and send to another user	12%	34%	10%
Receive SMS information from operator/third party sources	18%	28%	12%
Access mobile internet (GPRS/CDMA) and 3G	4%	18%	2%

Data collected from a sample of 50 farmers each in Uganda, Indonesia & India

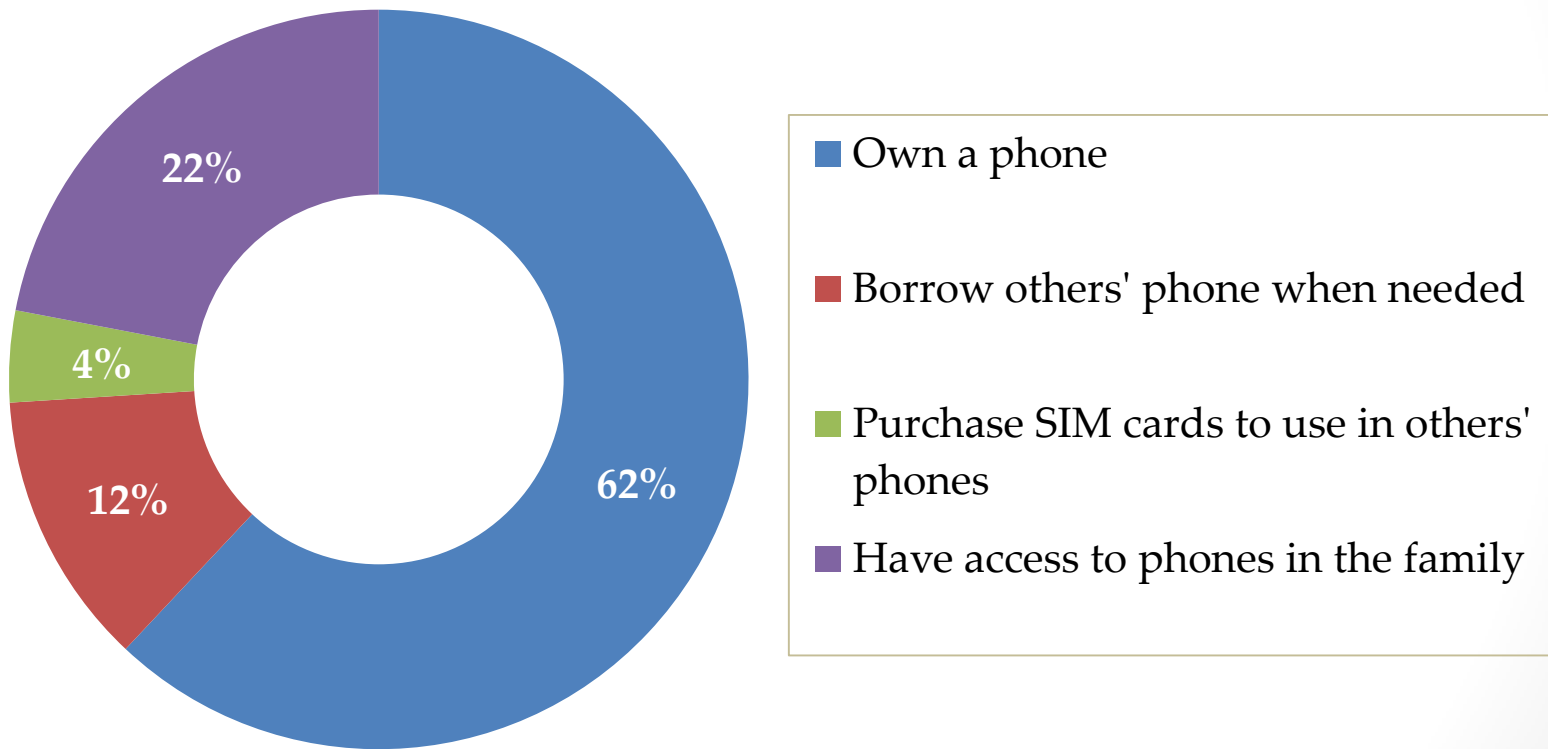
# English Language Capacity

Self-Reported Ability to Read English Text	% of users who use mobile phones for sending/receiving SMS		
	Uganda	Indonesia	India
Not at All	6%	14%	8%
Not Easily	14%	20%	12%
Easily	76%	24%	12%
Prefer Local Language	4%	42%	68%

Data collected from a sample of 50 farmers each in Uganda, Indonesia & India

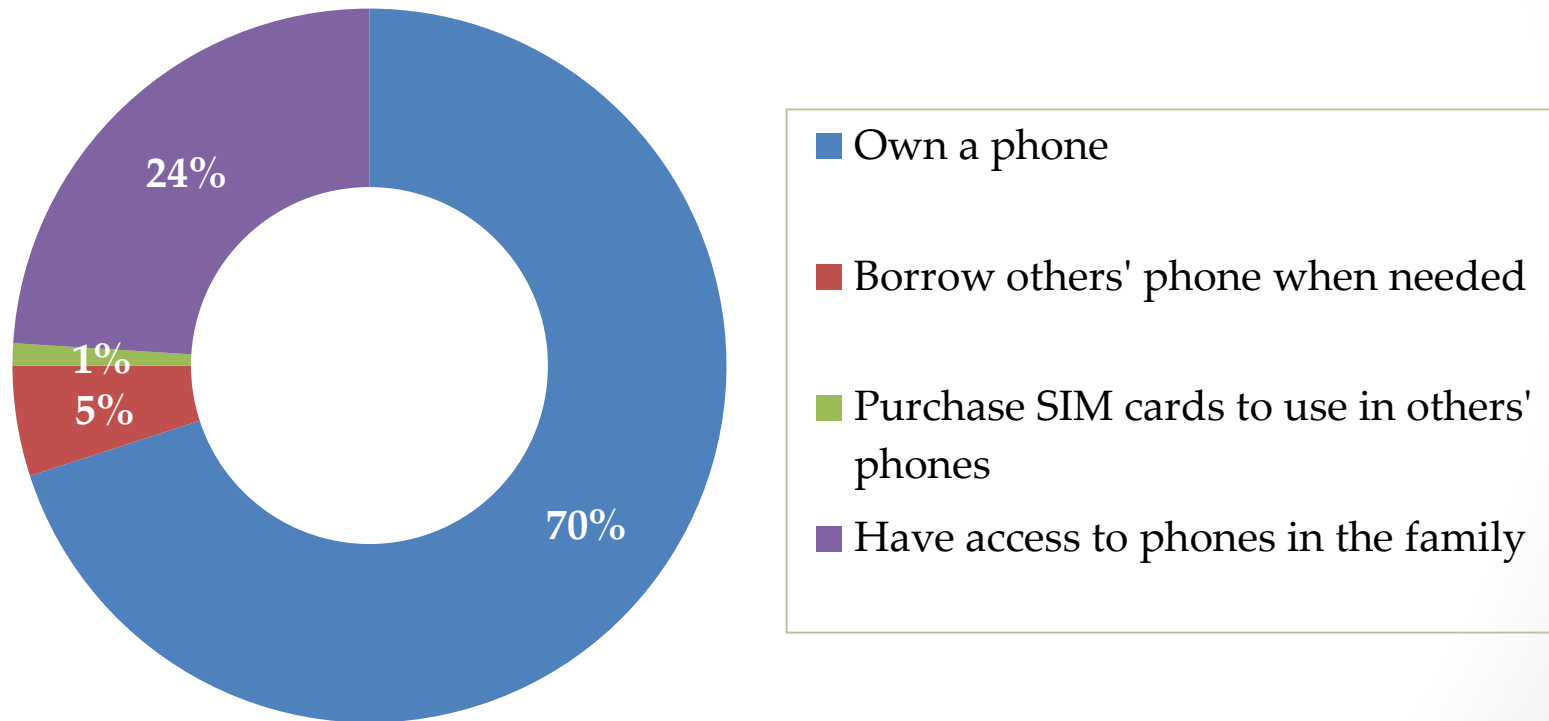
# Mobile Phone Ownership

## *Types of Mobile Phone Ownership - Uganda*



# Mobile Phone Ownership

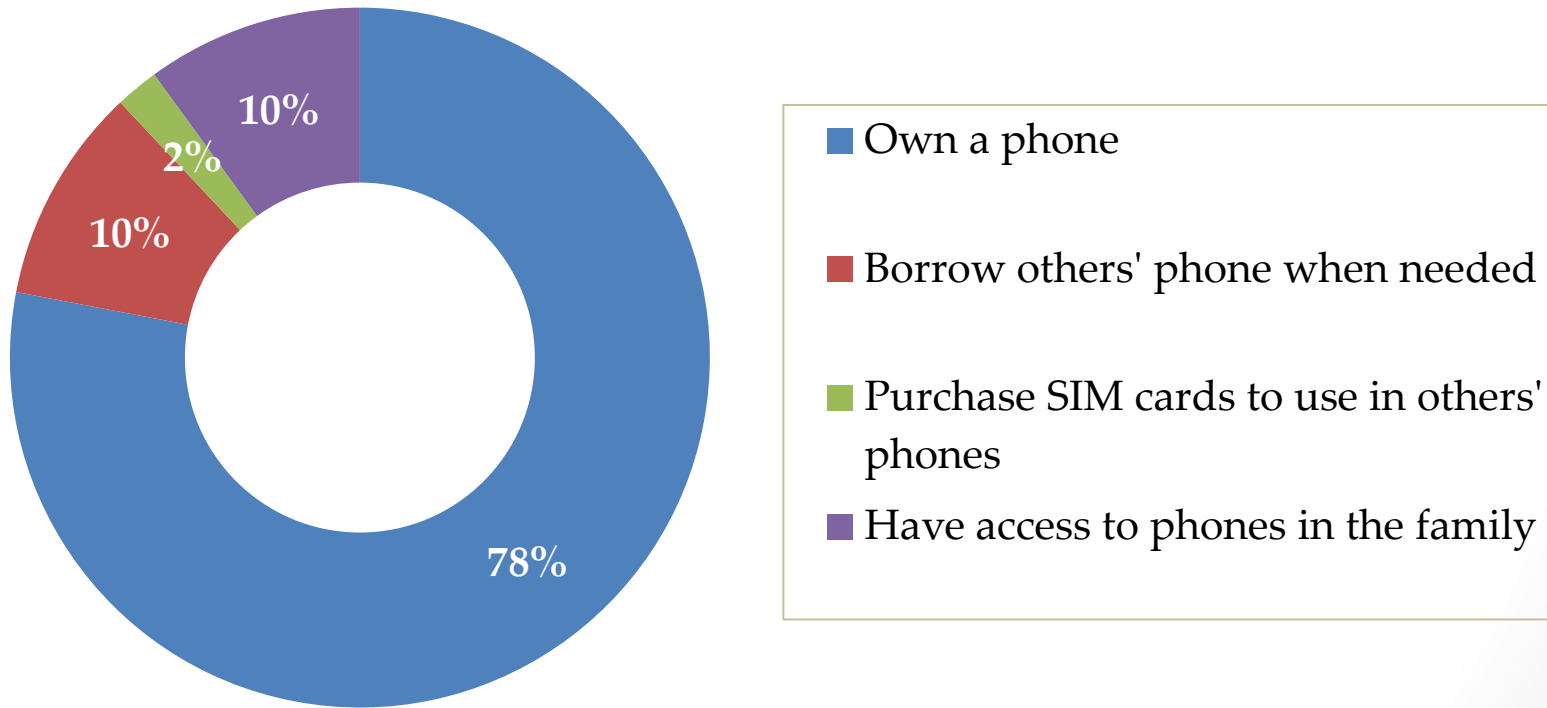
## *Types of Mobile Phone Ownership - Indonesia*



Data collected from a sample of 50 coffee growers in Medan, Indonesia

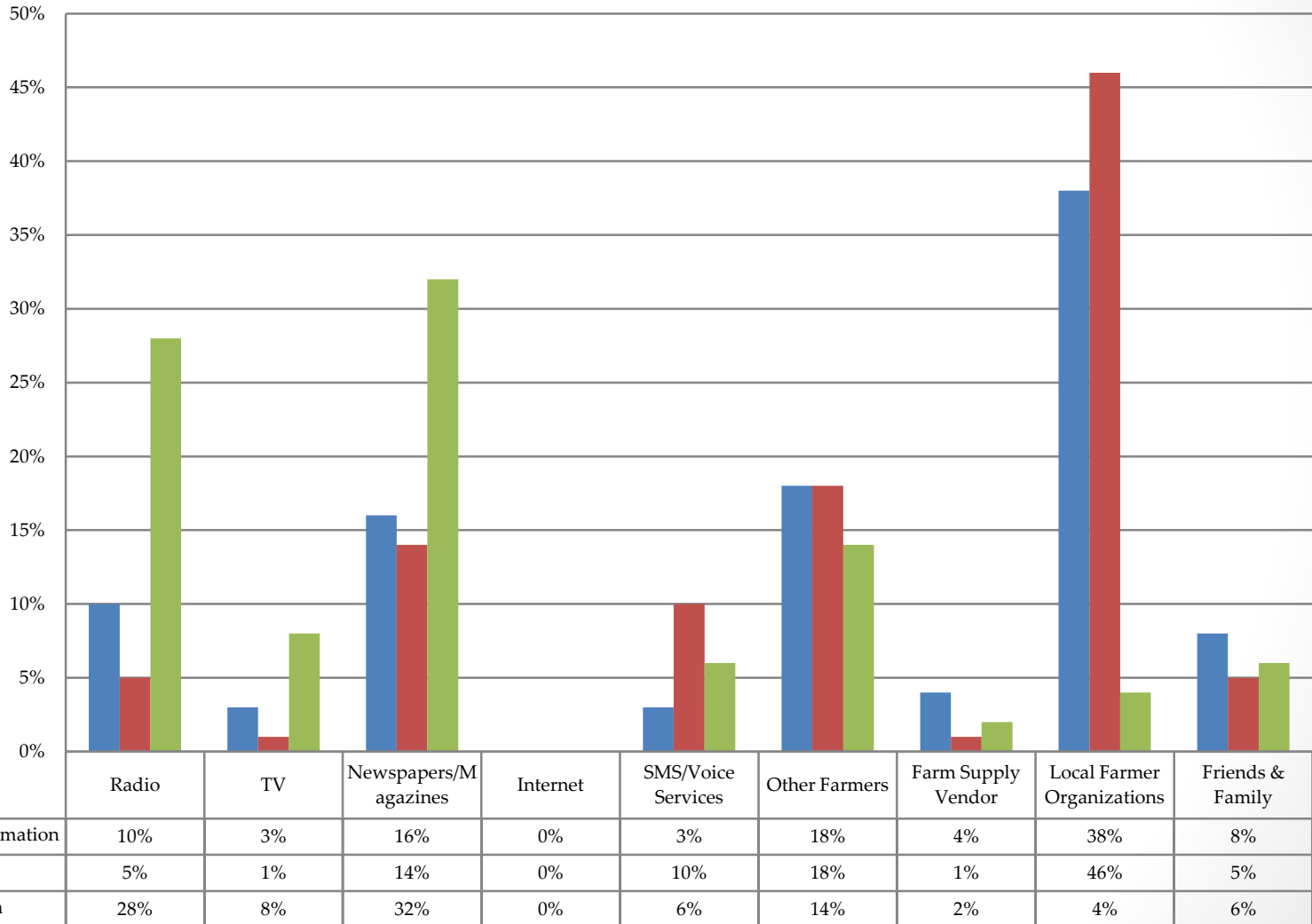
# Mobile Phone Ownership

*Types of Mobile Phone Ownership - India*



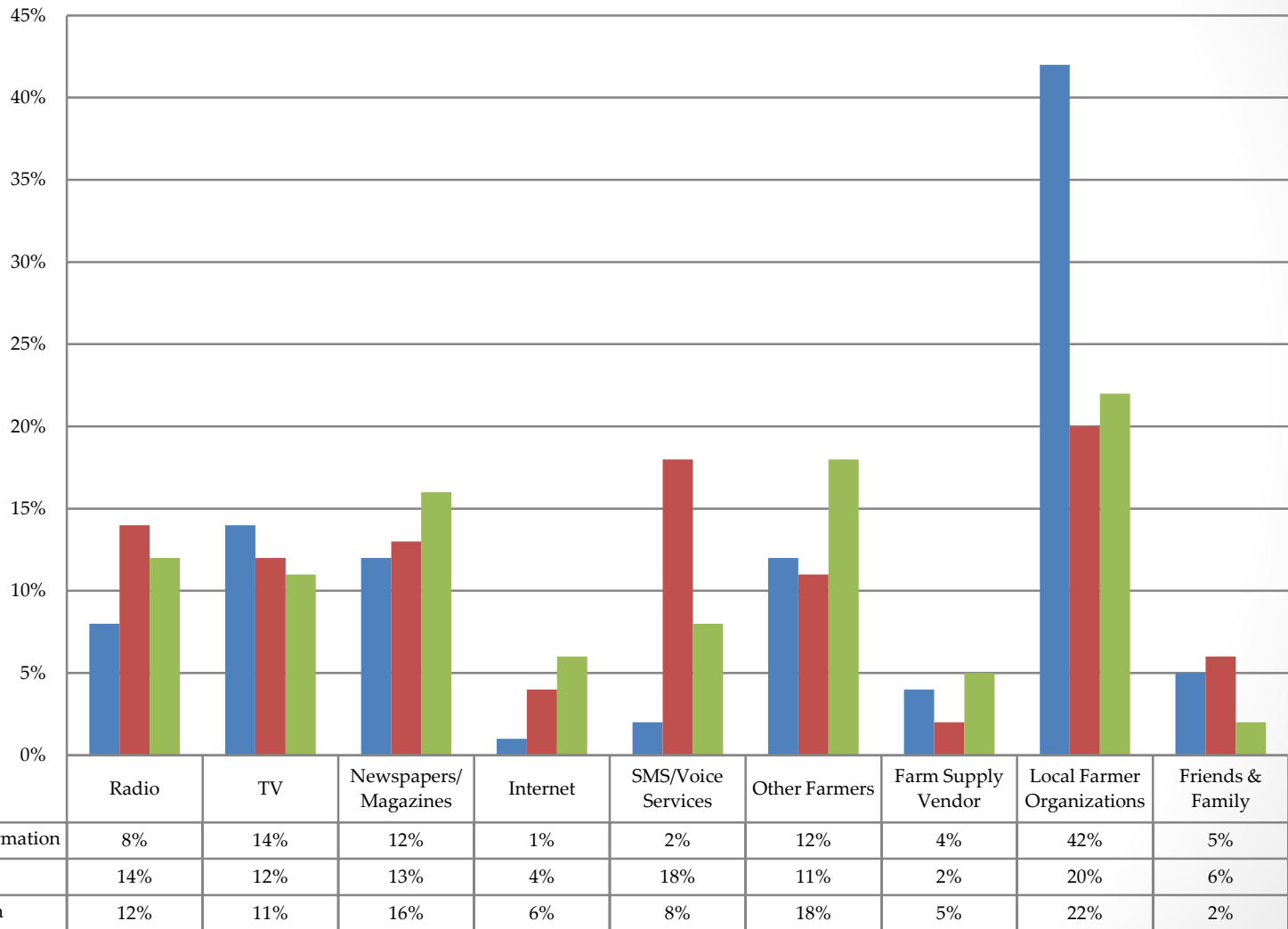
Data collected from a sample of 50 apple growers in Kashmir, India

# Sources of Farm Information



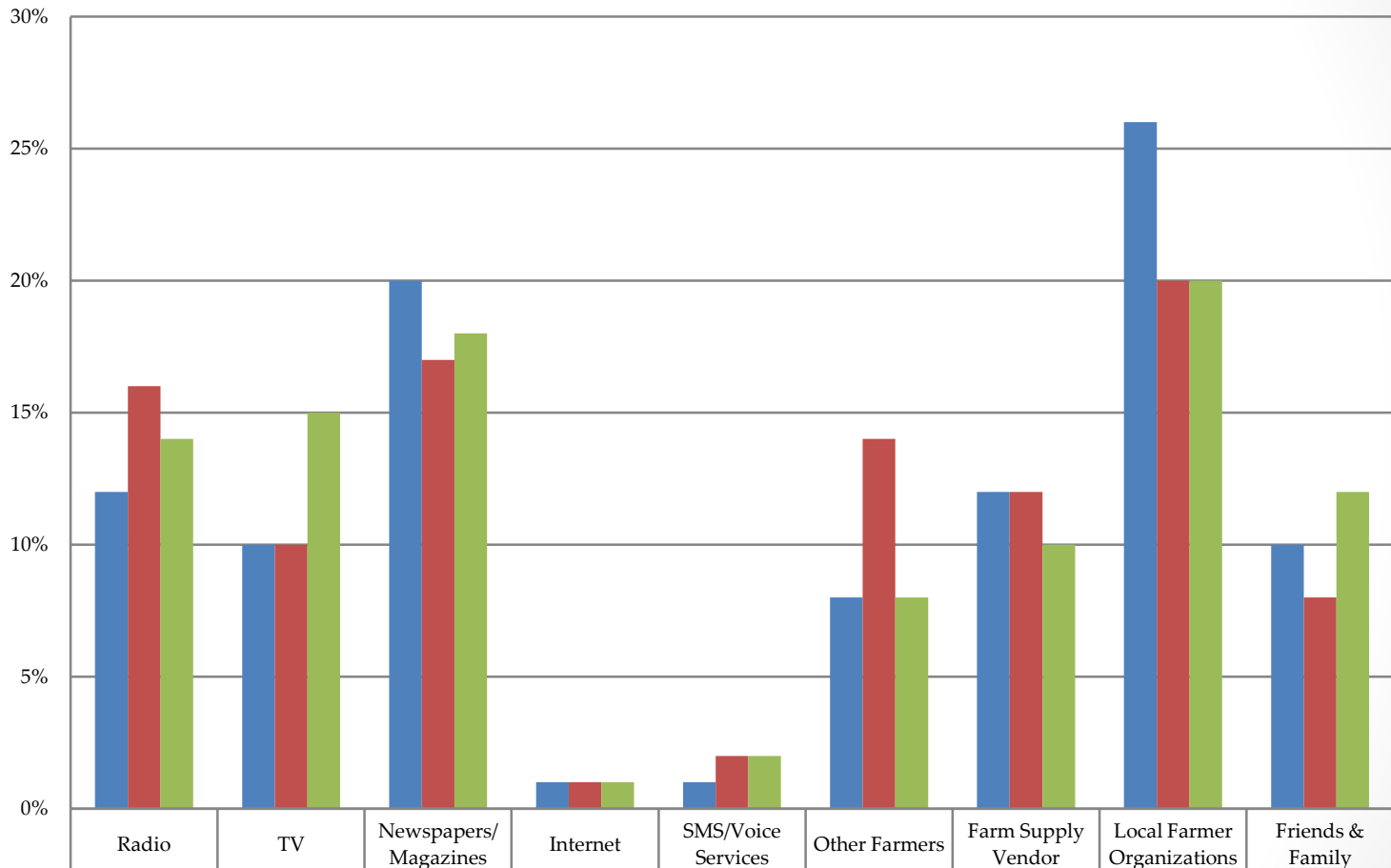
Data collected from a sample of 50 coffee growers in Nebbi, Uganda

# Sources of Farm Information



Data collected from a sample of 50 coffee growers in Medan, Indonesia

# Sources of Farm Information



■ Farm Advisory Information	12%	10%	20%	1%	1%	8%	12%	26%	10%
■ Market Information	16%	10%	17%	1%	2%	14%	12%	20%	8%
■ Weather Information	14%	15%	18%	1%	2%	8%	10%	20%	12%

Data collected from a sample of 50 apple growers in Kashmir, India

# Priority of Farm Information

Type of Farm Information	Willing to pay?	Priority & Rank	Willing to pay?	Priority & Rank	Willing to pay?	Priority & Rank
	Uganda		Indonesia		India	
Package of Practices	No	5	Yes	2	Yes	1
Package of Practices (if leading to certification)	Yes	3	Yes	3	NA	NA
Pest Information, Alerts & Remedy	Yes	3	Yes	1	Yes	3
Weather Forecasts & Alerts	No	6	Yes	6	Yes	4
Market/Price Information for Commodities	Yes	1	No	7	Yes	5
Access to experts in real time (farm advisory)	Yes	4	Yes	4	Yes	2
Information on Farm credit & subsidies	No	2	Yes	5	No	6

Data collected from a sample of 50 farmers each in Uganda, Indonesia & India

# Summarizing ICT needs

- Few respondents said they trust mobile phones to get formal news updates by SMS from third-party sources.
- SMS remains as popular as making a phone call while sending pictures through mobile phone as MMS is not popular.
- Mobile internet access through GPRS or CDMA or 3G services remain least popular due to additional and unpredictable costs involved in accessing these services.
- One obvious obstacle to using SMS is illiteracy; although the majority of mobile phone users said that they can read English easily, those who cannot do so are left with no information.
- Evidently there is a need for farm advisory and market information systems. If information is made available on mobile phones as SMS or voice messages, farmers are even willing to pay for accessing the information on a timely basis.



Diverse set of technological tools and resources to create, disseminate, store, bring value-addition and manage information

## ICT SOLUTIONS FOR AGRIBUSINESS

# Role of ICT Solutions

- ICTs play a key role in improving the availability of agricultural production and market information in developing countries.
- ICT-based market information and farm advisory systems have a proven track record for improving rural livelihoods in developing countries where they have been introduced.
- Furthermore, while Internet-based market information and farm advisory systems work well in more developed, literate markets, other media such as mobile phones or community radio, could be appropriate alternatives in developing and least developed countries.

# Gamut of options!



Touch Screen Kiosks



Computer-based  
Information  
Systems



Smartphone-based  
Applications  
(GPRS & CDMA)



Radio-based  
Broadcasts



Voice-based Mobile  
Solution & Interactive  
Voice Response  
Systems



SMS-based Mobile  
Messaging Systems



Tablets-based  
Information Systems



Community Video  
Programs

# Touch Screen Kiosks

- Pros
  - Large screens, easy to read
  - No learning curve required to use the touch screen applications
  - Graphics display and photographs are rendered easily
  - Menu or picture-driven interactions make it intuitive for users to access information
  - Can reach literate and illiterate audience with combined text and graphics
- Cons
  - Cannot reach targeted audience in their homes
  - Cannot give feedback to specific questions in real-time
  - Susceptible to vandalism
  - Expensive
  - Facilitates one-way communication

# Computer-based Information Systems

- Pros
  - Provides for powerful and versatile applications to be designed and developed
  - Portable when using notebooks/laptops
  - Facilitates access to unlimited content on demand
  - Offers two-way communication when connected to Internet
- Cons
  - Not practical in rural areas due to lack of infrastructure
  - Awkward for field use as the computers/notebooks are bulky
  - Cannot reach targeted audience in their homes
  - Usually requires training for using the information system
  - Could become expensive if not designed well

# SMS-based Mobile Messaging Systems

- Pros
  - Provides easy access of information to target audience
  - Is accessible on low-end mobile phones; works with all types of mobile handsets
  - Works across multiple mobile network operators
  - Offers flexible delivery options (Push, Pull, Shared, Interactive)
- Cons
  - Limited number of characters per message (160)
  - Relatively expensive when compared to GPRS/CDMA data services
  - Dependent on mobile network coverage in target areas
  - Language localization might increase dependence on select mobile handsets and network operators that support appropriate encoding
  - Unpredictable delivery mechanism often leads to messages not reaching at scheduled times causing delays and sometimes even leading to lost/undelivered messages

# Voice-based Mobile Solutions

- Pros

- Delivers pre-recorded audio or text-to-speech converted audio information; works just like a voice call
- No additional infrastructure required as it is hosted by mobile network operator
- Offers predictable cost models as it is similar to making voice calls
- Widespread penetration of mobile phones in rural areas makes it easy to access voice applications
- Can offer local language content thereby working above literacy requirements
- Works on all types of mobile handsets and even on fixed line telephones

- Cons

- Requires significant mobile phone usage by target audience
- Usually more expensive than SMS costs
- Restricted to mobile network operators which offer such voice services

# Smartphone-based Applications

- Pros
  - High-end content can be handled
  - Offers high portability across multiple mobile handsets
  - Highly interactive when combined with local field implementers and customized applications
  - Usually 500 times cheaper than SMS costs.
- Cons
  - Expensive for widespread rural use
  - Offers limited support to local languages
  - Requires training
  - Dependent on mobile network coverage in target areas
  - Usually requires training for using the applications
  - Tiny keyboard for data entry makes it cumbersome to use

# Summarizing ICT Solution Types

- Choosing an ICT solution should reflect the focus on rural connectivity, content applicability and capacity to scale.
- Of all the technology solutions available, mobile wireless connectivity has registered the highest growth in most developing countries in the world.
- Mobile-based ICT solutions have an edge over other solutions as they provide for easy access and affordability.
- Within the realm of mobile-based ICT solutions, it is important to analyze the technology capabilities (voice, text & data) vis-à-vis user-related challenges.

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Overview of participating ICT solutions

## ICT SOLUTIONS SURVEYED

# MTN Uganda – Google SMS

- MTN Uganda, leading mobile network operator, has partnered with Google to launch a suite of mobile phone applications
- The suite of five mobile applications includes
  - *Farmer's Friend* - a searchable database with both agricultural advice and targeted weather forecasts
  - *Health Tips* - provides timely, relevant information on sexual and reproductive health
  - *Clinic Directory* - enables people to locate nearby clinics
  - *Google Trader* - matches buyers and sellers of agricultural produce and commodities as well as other products
  - *Search* - provides access to Google Search on mobile phones

# Community Knowledge Worker (CKW) Program, Uganda

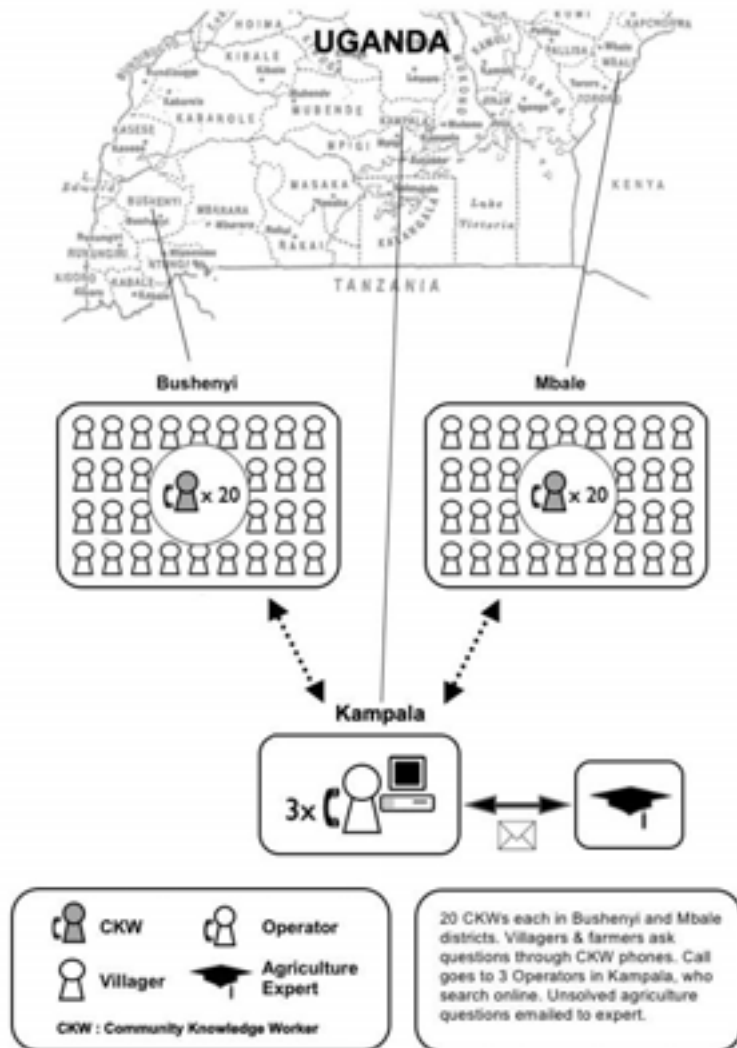
- Grameen Foundation through its Community Knowledge Worker (CKW) Initiative, seeks to improve information flows by creating a sustainable business model based on the dissemination and collection of relevant information to smallholder farmers
- In the CKW model, a distributed network of village-level intermediaries are equipped with mobile phones and a suite of relevant applications to provide on-demand information to smallholder farmers and data to a range of agricultural actors, including government agencies, commercial buyers, and research organizations.
  - CKWs are trusted local intermediaries serving farmers who lack basic access to up-to-date information on best farming practices, market conditions, pest and disease control, weather forecasts, and a range of other issues.

# Question Box

- Question Box is an initiative developed by Open Mind (a California-based non-profit organization) that helps people find answers to everyday questions in the fields of health, agriculture, business, education and entertainment.
- Question Box is a simple telephone intercom.
  - It's a durable metal box, hung on the wall in streets that makes it easily accessible. With the push of one green button, a person can connect to a live question and answer hotline service.



# Question Box Hotline Schematic



- Partnered with Grameen Foundation for the initial pilot of Community Knowledge Worker (CKW) initiative in Uganda.
- Villagers could ask their Community Knowledge Worker a question on a range of topics, who then calls a Question Box telephone operator to find the relevant answer.

# Esoko

- Software platform that facilitates the flow of market information between farmers, buyers, experts and other stakeholders involved in agriculture and rural development.
- Managed over the Web, and delivered via mobile phones.
- Four key services
  - *Live market feeds*: Real-time SMS alerts on market prices and offers
  - *Direct SMS marketing*: Target specific groups of users to send procurement or extension messages and reduce travel and communication costs.
  - *Scout polling*: Set up automatic SMS polling for field activities to track inventories, crop activities etc. to monitor and report on crop cycles and yields.
  - *Online profiling and marketing*: Customizable Web space that can advertise goods and services.

# Esoko Web & Mobile Screens

**esoko** Home Contacts & Networks Settings Krish Logout search esoko

Welcome Krish

Summary Buzz Approve Upload

To personalize this page, select your preferred commodities and markets under [settings](#)

**Prices**

**Rice (local) Prices (INR)**

	INR	AGBO	ANOS	BAWK	BOLG	TAMA	TECH
Groundnut...	62.14	-	55.28	47.75	21.26	47.43	
Maize (Wh...	16.35	-	15.37	14.72	13.08	11.84	
Maize (Ve...	16.35	11.45	-	14.72	13.08	-	
Millet (Sa...	29.44	-	17.66	21.59	20.44	20.61	
Rice (Imp...	45.79	23.74	18.97	39.25	50.70	49.06	
Rice (Local)	32.71	18.59	24.86	26.17	21.26	27.64	
Sorghum (W...	-	-	16.68	17.99	20.44	-	
Cassava (G...	26.17	-	32.05	28.78	30.44	19.30	
Cowpea (Wh...	40.34	-	25.51	33.36	20.44	30.42	
Onion (Vic...	62.14	-	25.84	32.60	16.35	-	

Wholesale prices

**Offers**

Groundnut (Edible)	13 offers to sell
Millet (Semi, Grain)	4 offers to buy 13 offers to sell
Beans White	2 offers to buy 13 offers to sell
Beans Red	1 offer to sell
Rice (Local)	12 offers to sell
Barbara Beans	6 offers to sell
Cowpea (White)	1 offer to buy 2 offers to sell
Goat (Live 13-30kgs)	4 offers to sell

**News**

**Cotton farmers receive support**  
 Vice President John Dramani Mahama on Saturday launched a GH¢5 million Cotton Support Programme to improve cotton farming in the three northern regions here. [28 Jun 2010]

**Survival of Northern Star Tomato Factory depends on resource support- Report**  
 A report on the Tomato Value Chain in the Upper East Region has suggested the need for collaboration between stakeholders to provide the initial support needed for effective operation. [28 Jun 2010]

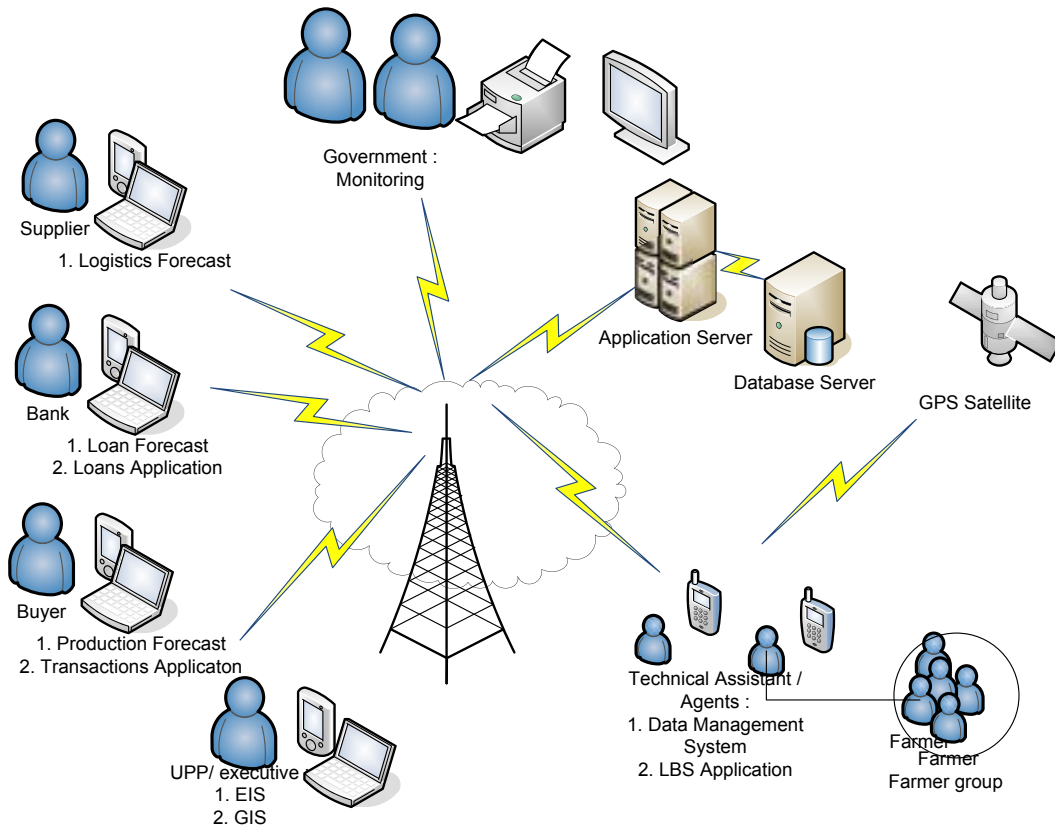
**Agric Is The Answer To Unemployment**  
 Governments Youth-In-Agriculture Programme which is reported to have created 47,000 jobs; by Agriculture Minister Kwesi Ahojwe has been hailed by the National President of Ghana National Associat



# Institut Teknologi Bandung/SAPA Mobile

- SAPA Mobile is a comprehensive, mobile-based supply chain and information management system.
- Incubated at Institut Teknologi Bandung and now a private sector venture.
- A full supply chain management system that
  - Integrates large numbers of smallholder farmers into commercial supply chains and facilitate mutually beneficial partnerships between smallholder farmers and exporters/buyers
  - Provides technical information, and recommend best practices to smallholder farmers at real time
  - Links smallholder farmer production to specific market needs

# SAPA Mobile Ecosystem



- Data collection using GPRS/CDMA and Bluetooth enabled mobile phone devices
- In-built camera on mobile phones capture pictures from the field and transmit wirelessly
- GPS receivers used to map production areas and geo-tag farm locations
- Comprehensive dashboard available as a Web application

# SAPA Mobile - Current Footprint

2:02 pm

Tambah data petani (15) 123 Kembali

Nama:  
**Pak Tani**

Kelompok Tani:  
Panen Sukses

Alamat:  
Cibeureum

No Telepon:  
0813999999

Simpan

Farmer Data Collection Screen

2:48 pm

Data Pasca Panen Petani (23) abc Kembali

Nama Petani:  
Pak Tani

Tanggal Panen:  
19/03/2010

Luas Panen (Ha) :  
24

Produksi Gabah (Ton) :  
50

Simpan

Farmer Post Harvest Data

- SAPA Mobile currently operational among 5000 organic rice farmers in Sukabumi, West Java, and Serdang Bedagai, and North Sumatera regions.
- Other regions, such as Bekasi, Bogor, Sumedang, and Langkat are planned shortly.
- Supported by the Ministry of Social Welfare, Ministry of Cooperative and SME, Ministry of ICT, Ministry of Maritime and Fishery, Nokia Indonesia, Nokia APAC, Grameen Foundation USA, Korean International Agency, and Markany Corporation.

# Nokia Life Tools

- Nokia Life Tools is a platform that delivers up-to-date and relevant information from a wide range of agriculture, education and entertainment services directly to a consumer's Nokia phone.
- The service was rolled out commercially in India on June 12, 2009, after a pilot trial in the state of Maharashtra.
  - The project, with IDEA Cellular as the operator billing partner, started in December 2008 with promotional activities in five focus districts and eight non-focus districts without marketing.
- Nokia Life Tools was launched in Indonesia from early December 2009, with the Agriculture service available for Java and Sumatra at the first stage, and Education and Entertainment services available nation-wide.

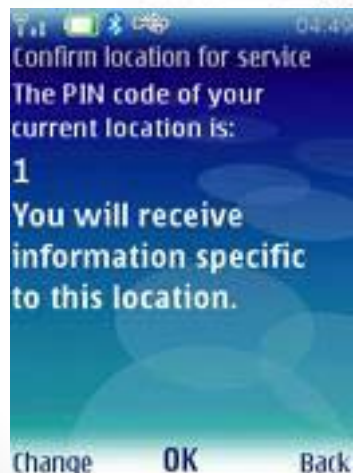
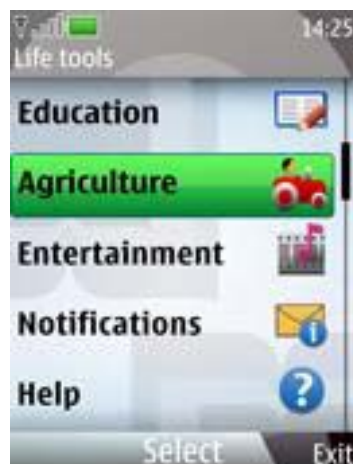
# Nokia Life Tools (Contd.)

- The services are subscription oriented, where one pays a monthly fee, and some are chargeable on a per download/request basis.
- The SMS-based service sends basic text messages on an icon-driven interface; the delivery system ensures that the service works wherever mobile phones work.
  - The information sent out to the consumer's mobile phone is targeted to the person based on his or her location.



# Life Tools - Customized Service

Displays information in 2 languages – English and in the local language (Bahasa - Indonesia & Hindi - India)



# Nokia Life Tools (Contd).

- Life tools popularity due to relevant information received almost daily in local language and services integrated/pre-installed on Nokia devices
- Content delivered through cellular network as SMS messages and works wherever there is GSM network coverage
  - No additional settings
  - No need for GPRS/CDMA subscription
- While Agriculture is the main focus service, Education and Entertainment services are supplementary
- Works across mobile network operators (MNOs)
  - Telkomsel, Indosat, XL and Hutch users can subscribe in Indonesia
  - Airtel, Vodafone, IDEA, Aircel and BSNL in India

# Reuters Market Light

- Reuters Market Light (RML) offers Indian farmers up-to-date, customized commodity pricing information, local news and weather updates.
- RML provides information relevant to 54 commodities in 270 mandis (crop wholesale markets).
  - The service offers farmers weather information specific to their taluka (district) early in the morning (around 7:30 AM), market prices from three selected mandis, tips related to specific crops (chosen by the farmer) in the afternoon, and relevant national and international news in the evening.
- Subscription entitles to
  - Market prices and arrivals in three markets for each of the two crops chosen by the farmer
  - 24-hour local weather forecast relevant to the farmer's taluka
  - Information on best practices of production for two crops
  - News impacting agricultural marketing and production.

# Reuters Market Light (Contd.)

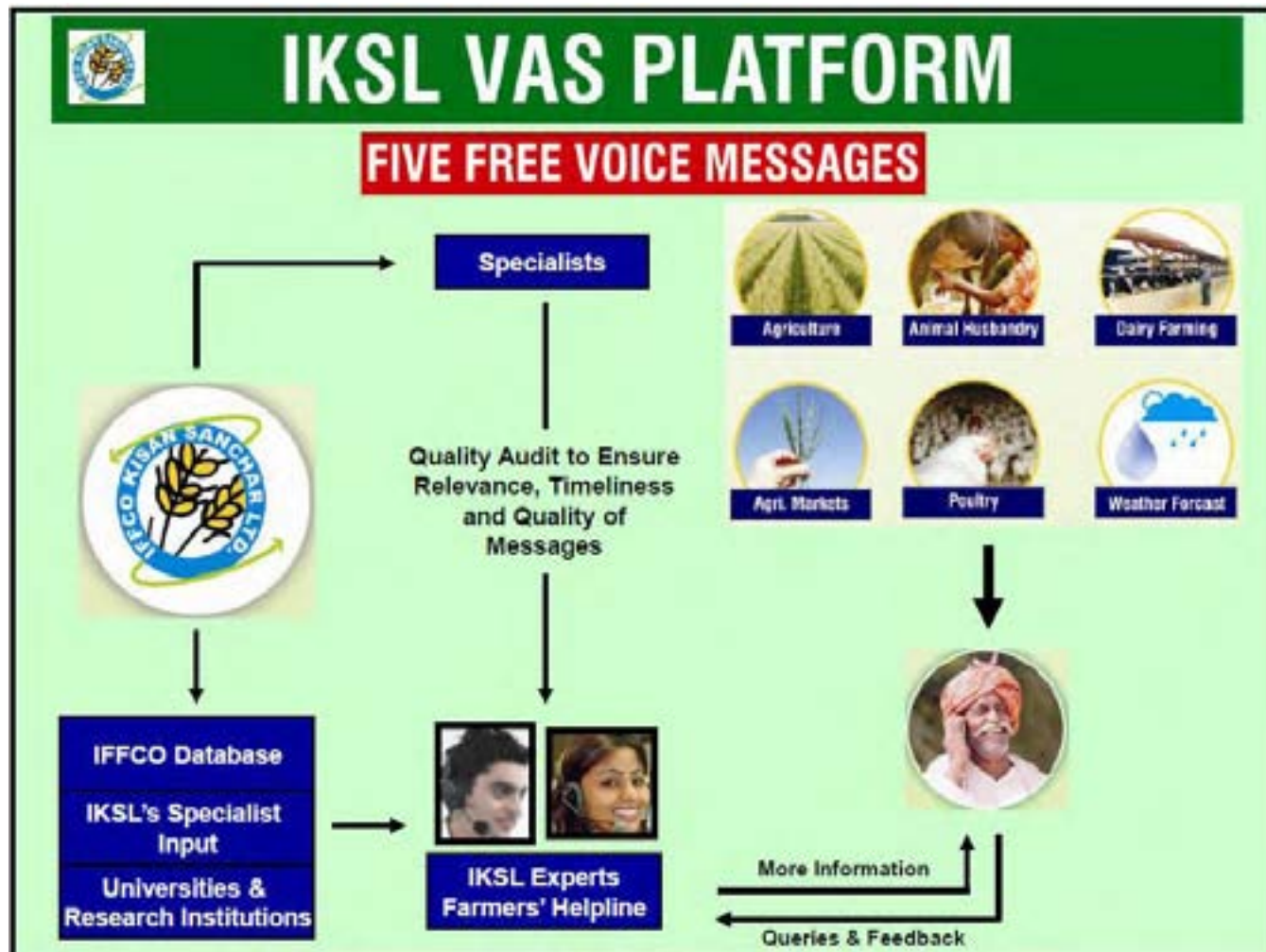
- Content delivered through cellular network as SMS messages and works wherever there is GSM network coverage
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- Works across mobile network operators (MNOs)



# IFFCO Kisan Sanchar Limited

- IFFCO Kisan Sanchar Limited (IKSL), a subsidiary of Indian Farmers Fertilizer Cooperative Limited (IFFCO), entered into an agreement with Bharti Airtel, India's leading mobile network operator to provide mobile tele-services to the rural farmers.
- IKSL distributes Airtel SIM cards under the name "Green SIM" to the farmers and all subscribers are provided five 1-minute voice-based messages free of cost every day.
  - Experts in the fields of agronomy, pathology, animal husbandry and entomology help generate and validate content related to agriculture.
- Consumers can also access a toll-free helpline service (534351) at the cost of Rs. 1 per minute where they receive farm advisory messages and practical inputs from experts.

# Voice-driven Service



# IKSL (Contd.)

- Content delivered through cellular network as Voice messages and works wherever there is GSM network coverage
  - No additional settings
  - No need for GPRS/CDMA subscription
- Works only on Bharti Airtel, India's leading mobile network operator (MNO)
- IKSL schedules its voice messages based on the local agricultural situation and queries on their helpline
- Messages of one-minute duration in local language are usually vetted by experts before they are broadcasted.

# AgriFone Services

- VaudioPhone's AgriFone service addresses the needs of farmers, agricultural workers, agribusinesses and input supply organizations.
- AgriFone service provides convenient and easy-to-use tools for farmers that are accessed through existing low-end mobile phones.
- AgriFone supports two-way, one-to-many peer to peer mobile-based interactions through a combination of voice & text messages and images transmitted wirelessly.
- Service allows farmers to record a voice message, attach a picture of the crops/produce to support the message and broadcast the message to subscribers grouped by regional/crop association.

# AgriFone: Easy as 1 – 2 – 3



Step 3: Click the "Send" button to broadcast/unicast the message



Step 2: Take a photo on the camera phone and associate with the voice message



Step 1: Record an audio message on the mobile phone

# AgriFone

- Application is device and network agnostic—works with any GPRS-enabled mobile phone without any preference to a mobile network.
- Zero upfront costs to deploy—promotes OTA (Over The Air installation of the application once GPRS is enabled on the phone).
- Within a region, it builds community interactions between farmers.
- While promoting peer-to-peer interactions, system allows participation of agribusiness clients (buyers), input providers, technical extension agents, and experts in interactions with farmers.
- As the messages are voice-based broadcasts, language is no longer a barrier.
- One-to-One and One-to-Many broadcasts are allowed by the AgriFone service.

# BubbleMotion's Bubbly™

- Bubbly™ is a voice-blogging service for mobile phones where individuals record voice updates which can be played back on mobile phones
  - It's Twitter with a voice; works with a similar "Follow" and "Unfollow" concept
- In India, Bharti Airtel, India's leading telecom company, and BubbleMotion have partnered to introduce Bubbly
- Any Airtel subscriber can sign up for their own blog by dialing \*7\*, and asking "followers" to call up \*<own mobile number>\* to subscribe.
- Blog subscribers will receive an SMS every time there's an update, and will have to dial \*2\* to listen to the updates.

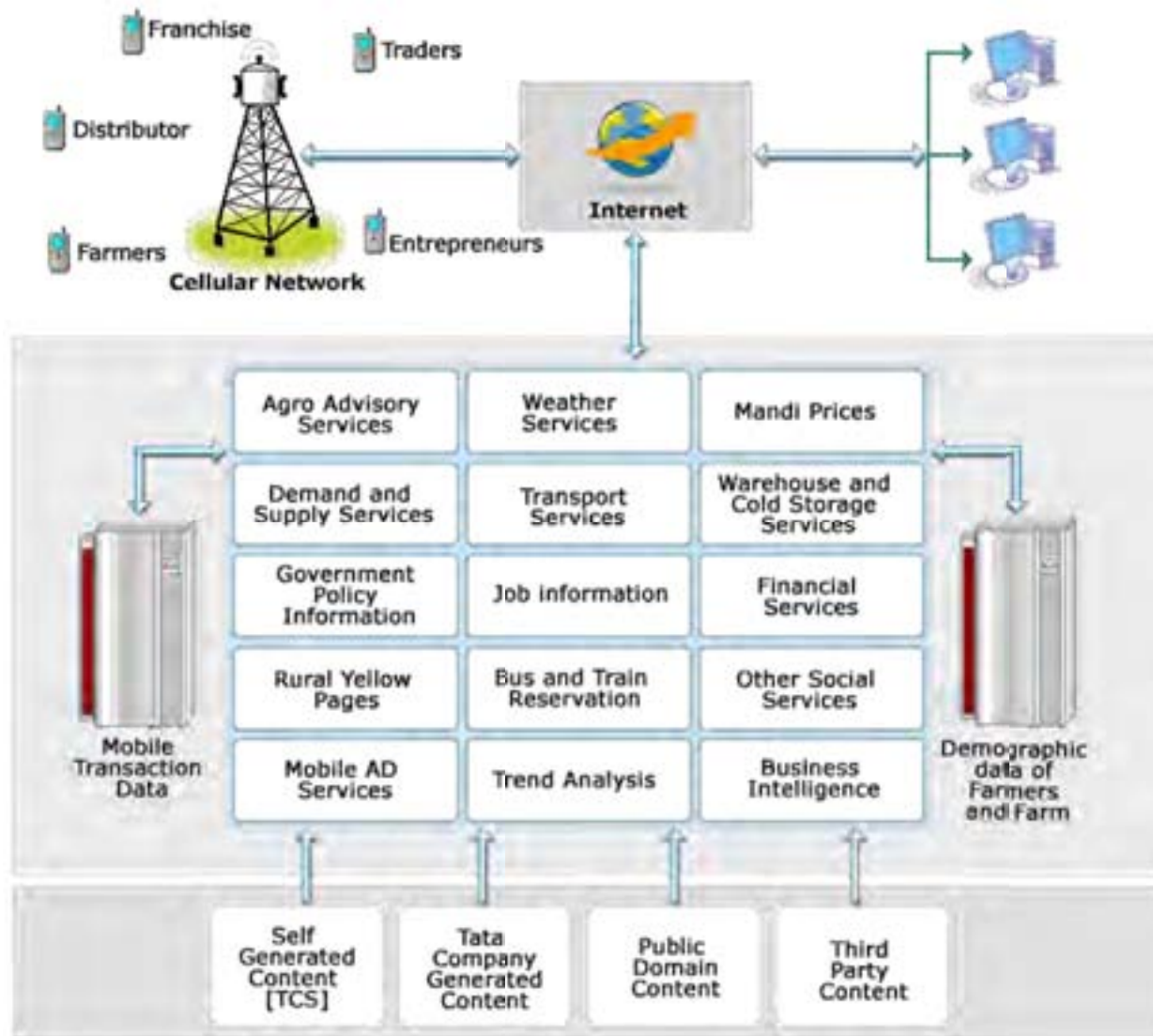
# BubbleMotion's Bubbly™

- Content delivered through cellular network as Voice messages and works wherever there is GSM network coverage
  - No additional settings
  - No need for GPRS/CDMA subscription to access voice blogs
- BubbleMotion service is limited to a single mobile network operator.
  - In India only Airtel subscribers can voice blog, and only Airtel subscribers can listen to their voice blogs.
- While loosely called Twitter for Voice, Bubbly lacks mechanism by which one can search for a particular user thereby making discovery of similar interest topics and groups difficult!

# TCS' mKrishi

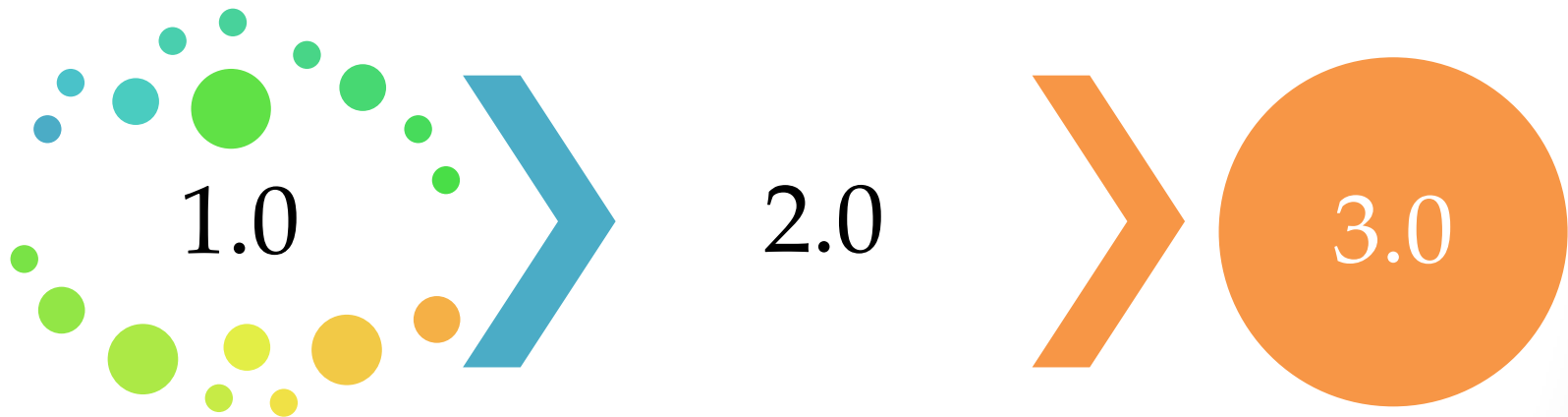
- Tata Consultancy Services (TCS)'s mKrishi is a proprietary mobile agro-advisory system that allows farmers to send queries to agricultural experts in their local languages through a mobile phone and receive personalized advice or relevant information in the local language.
- The end-to-end mKrishi solution has been developed through the integration of technologies such as sensors, solar power, CDMA modem, CDMA network, GPS, handset with camera, binary runtime environment for wireless to develop multiple applications on the handset, client software (on mobile phone), expert console software, and an engine to assist in displaying mobile screens in Indian languages.

# mKrishi Agro Services Platform



# eChoupal 3.0

- ITC's eChoupal initiative enables rural Indian farmers to enhance their efficiency through price transparency over the Internet.

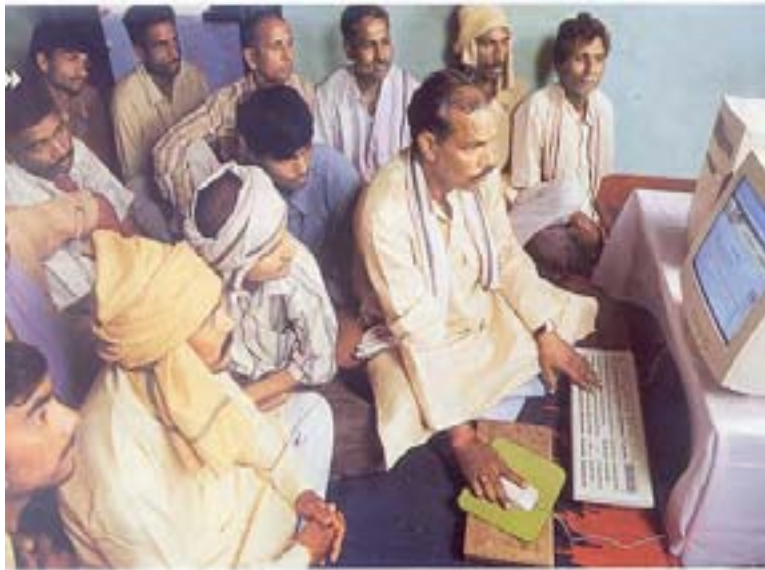


VSAT technology providing connectivity to computer-based information systems. experiment to help the farmer get a better price for his produce.

Solution scaled up to reach 40,000 villages, covering 4 million farmers in 10 states. It has 6,500 kiosks, with each kiosk serving five or six villages.

New version to ride the mobile revolution among farmers in India. It will deepen the company's relationship with individual farmers & create more value. Full version to be launched by 2012.

# eChoupal 3.0



## eChoupal provides

- Relevant and real-time information such as commodity prices & local weather forecast information
- Customized knowledge such as farm management and package of practices
- Supply chain integration for farm inputs whereby harvested produce is screened for quality and demand aggregation to ensure competitive prices and efficient logistics
- Direct marketing channel for farm produce through lower transaction costs

# eChoupal 3.0

- Under the new version, ITC plans to offer personalized crop management advisory services to individual farmers by integrating mobile phones into the digital and physical network of eChoupal.
  - It will enable a farmer to provide information on the type of soil, crop variety, the date of sowing, and details about crop condition on an ongoing basis to the company.
  - Subsequently, this data will be processed to give farmers specific advice.
- Integration of mobile phones with sophisticated analytics will not only enable personalized solutions but also reduce costs.
- The necessary hardware-cum-software prototypes are being developed by Nokia (Life Tools) and ITC Infotech.
  - Though Nokia Life Tools for agriculture is in the marketplace, the two-way mobile application and its full operations will be introduced only in 2012.

# IFC Small & Medium Enterprise Toolkit

- A project of the International Finance Corporation, the SME Toolkit offers free business management information and training for small businesses/small and medium enterprises (SMEs) on accounting and finance, business planning, human resources (HR), marketing and sales, operations, and information technology (IT).
- The SME Toolkit offers a wide range of how-to articles, business forms, free business software, online training, self-assessment exercises, quizzes, and resources to help entrepreneurs, business owners, and managers in emerging markets and developing countries start, finance, formalize, and grow their businesses.

# SME Toolkit

- The SME Toolkit consists of four major components:
  - *Web/CD-ROM Interface*: An easy-to-use Web and CD-ROM interface that allows users to search or browse to locate the content they need
  - *Global Content*: A large set of best-of-breed small business content: the number of tools, business forms, news items, and how-to articles on sites exceeds 40,000 cumulatively.
  - *Content Management System*: Content management tool that allows partners to manage the website locally and offers robust back office management tools.
  - *Training Curriculum*: A business training curriculum for business development service providers and SMEs.

# SME Toolkit in action



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- Tax Pre-Occupier Checklist
- Marketing Plan Samples
- Educational Records Check
- Effective Committee Analysis

**Success Story**

**Streamlining Business Processes**

Ms. Aranya Tamrakar is the Executive Director of Creative Women's Craft (CWC) and a consultant and freelance trainer in the fields of Micro, Small and Medium Enterprise, and Microcredit and Enterprise Development. Familiar with the plight of low-income women in Nepal, Ms. Tamrakar decided to set up a business to assist them. As she had expertise in Nepali paper manufacturing, she founded CWC in 1997. CWC produces, with low-income women's help, a wide range of paper products for sale in Nepal and abroad. CWC exports its products to a number of countries, including the USA, Canada,



Field videos of select ICT Solutions

# ICT SOLUTIONS' DEMONSTRATIONS

# Solutions in Action



- Nokia Life Tools
- Grameen Foundation's Community Knowledge Worker Program
- Grameen Foundation's Village Phone/AppLab Program
- TradeNet (Esoko)



Technology, Services, Cost & Engagement Models

# COMPARATIVE ANALYSIS OF ICT SOLUTIONS

# Technology Models

## *Computer-based Information Systems requiring Internet Access*

ICT Solution	Limitations
eChoupal 1.0 & 2.0	PC with internet connectivity needed
IFC Small and Medium Enterprise (SME) Toolkit	PC with internet connectivity needed

## *SMS-based Mobile Messaging Systems*

ICT Solution	Limitations
MTN Uganda Google SMS & Search	Pull service only
Esoko	Not operating in Uganda
Nokia Life Tools	Limited to Nokia handsets only
Reuters Market Light (RML)	Nil
eChoupal 3.0	Expected to launch commercially in 2012

# Technology Models

## *Voice-based Messaging System*

ICT Solution	Limitations
Community Knowledge Worker (CKW)	Available only in Uganda
Question Box	Requires a call center backend
IFFCO Kisan Sanchar Limited (IKSL)	Limited to Airtel users only
BubbleMotion's Bubbly™	Limited to Airtel users only
TCS' mKrishi	Proprietary solution

## *Data (GPRS/CDMA)-based Mobile/Smartphone-based application*

ICT Solution	Limitations
ITB/SAPA Mobile	Not a commercial solution yet
TCS' mKrishi	Proprietary solution
AgriFone	Not a commercial solution yet

# Services Offered

## Market Information



- AppLab/CKW Program
- Esoko
- Nokia Life Tools
- Reuters Market Light
- IFFCO Kisan Sanchar Limited
- eChoupal
- IFC SME Toolkit

## Farm Advisory



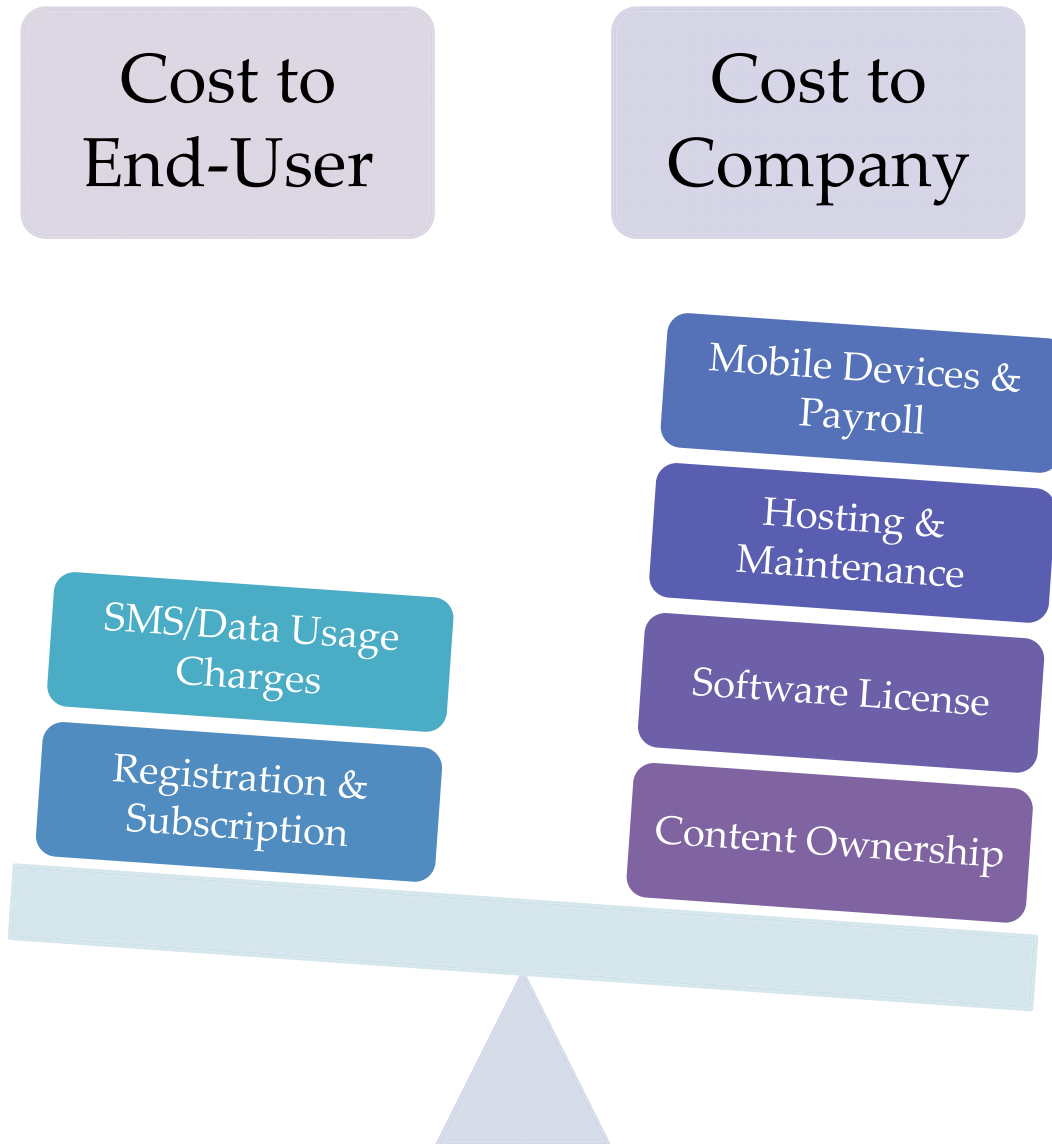
- MTN Google SMS
- AppLab/CKW Program
- Question Box
- Esoko
- Nokia Life Tools
- Reuters Market Light
- IFFCO Sanchar Limited
- ITB/SAPA Mobile
- AgriFone
- mKrishi
- eChoupal
- IFC SME Toolkit

## Weather Forecasts



- MTN Google SMS
- AppLab/CKW Program
- Esoko
- Nokia Life Tools
- Reuters Market Light
- IFFCO Kisan Sanchar Limited
- eChoupal
- IFC SME Toolkit

# Costing Models



# Engagement Models

## End-user

Nokia Life Tools

## Subscription Model

Reuters Market Light

ICT services provider has an established cost recovery model from the end-users directly.

IFFCO Kisan Sanchar Limited (IKSL)

AgriFone

BubbleMotion's Bubbly

## Turn-key solution

Grameen Foundation's CKW Program

Maximum or full investment expected from the engaging private sector company; minimum cost commitment from the ICT services provider.

Question Box

Esoko

ITB/SAPA Mobile

mKrishi

eChoupal

# Conclusions

- Computer-based information systems require Internet connectivity and hence heavy infrastructure.
  - Such a system can enhance communications between organizations but remains inaccessible on the field.
- SMS-based information systems are easy to implement and works on all mobile phone models.
  - More expensive than data (GPRS/CDMA) solutions but considering the ease of access and affordability, they remain popular above others.
  - Most effective when Push and Pull message delivery models are enabled. Illiteracy and local language support often limits the benefits of SMS solutions.

# Conclusions (Contd.)

- Voice-based information systems are easily accessed by mobile phones and it works above the constraints of illiteracy and local language support as faced by SMS solutions.
  - Better operated by mobile-network operators (MNO) & so the solution can be accessed only by subscribers of that particular mobile network.
- Data (GPRS/CDMA)-based Smartphone applications are a growing trend offering advanced communication features.
  - Limited by the type of mobile handsets that are capable of data transport (GPRS/CDMA)
  - Typically low-end GSM phones lack these capabilities and a high-end device is preferred for access.
  - Even if a high-end device is available at an affordable cost, the subscriber needs to have data subscription enabled at the MNO
  - Over and above these challenges, cost of data transport is unpredictable and so can lead to high monthly bills on data usage.

# Conclusions (Contd.)

- In conclusion, it is best to choose ICT solutions that are device and operator independent.
  - Subscription and usage costs needs to stay affordable to the farmers.
  - It may be necessary to combine SMS and Voice features to create maximum impact.
- Of all ICT solutions analyzed, MTN Google SMS, Grameen Foundation's AppLab/CKW program, Question Box, Esoko, and Reuters Market Light have least technology-related challenges and remain easily accessible and affordable.
- Nokia Life Tools are accessible only on Nokia handsets and on select models as well. This is a device constraint which cannot be addressed.
- IKSL, BubbleMotion and MTN Google SMS are mobile operator dependent and this is yet another barrier which cannot be addressed at bigger scale of farmer engagement.

# Conclusions (Contd.)

- While almost all of the solutions are capable of providing market information, farm advisory & weather forecast information, some solutions rise above the simple needs of dissemination and information alerts.
  - Esoko, AgriFone. mKrishi and SAPA Mobile offer additional services such as GPS/GIS tagging, maps feature, data collection surveys for M & E purposes, and soil sampling and analysis services.
  - It is important to choose the range of services that an agribusiness company wishes to offer to its farmers and present it without any technology barriers.

# Conclusions (Contd.)

- Typically ICT solution providers operate independently as a Value Added Service (VAS) provider and directly market their solution.
  - Partnering with VAS providers will present best results with few or no challenges.
  - ICT solution providers that are proprietary or having a joint-venture relationship with a mobile network operator (MNO) carry forward several barriers that cannot be resolved for a mass rollout.
    - A MNO-led solution can be accessed only by subscribers of that mobile operator thereby excluding others or forcing others to change their SIM cards/mobile network subscriptions.
    - IKSL, BubbleMotion and MTN Google SMS are best examples of such collaboration.

# Conclusions (Contd.)

- Proprietary ICT solutions are ICT solutions that are developed by Agribusiness Companies (Buyers) and hence are available to farmers associated with the buyer organization.
  - TCS' mKrishi and ITC's eChoupal were developed so as to develop buying relationships with farmers in rural areas.
  - Collaboration between IFC's agribusiness clients and competing agribusiness companies may not be possible given the overlap of business interests.

# Conclusions (Contd.)

- Government-funded and NGO-operated ICT solutions have an expiry date and when intervention ends, the solution needs a full sponsorship to revive its operations.
  - Question Box, Grameen Foundation's AppLab and CKW programs are best examples where the program ends in a certain region when funds are fully utilized.
  - Special mention to Grameen Foundation that has created a commercially sustainable model with its CKW program in Uganda and so it is a welcome move.
- But for such commercially sustainable examples, it usually takes a lot of effort and investment to revive ICT solutions developed and operated by Government and NGO agencies.

# Conclusions (Contd.)

- It is important for an ICT solution provider to establish a revenue model and make the offering commercially sustainable in the region of operation.
- If an ICT solution does not have a commercial model, then it becomes a turnkey solution implementation that expects donor funds, public-private partnerships or a full private sector sponsorship for operating the solution in a certain region.
- Best-case scenario is when an ICT solution provider internalizes all expenses and establishes a revenue model based on subscription or usage-based to monetize the costs and emerge profitable over a period of time.

# Conclusions (Contd.)

- At the time of this study, Question Box, AgriFone and SAPA Mobile do not have a commercial revenue model of operation.
- Grameen Foundation's AppLab and CKW programs are starting to establish a commercial model for its services.
- TCS' mKrishi and ITC's eChoupal is heavily funded and proprietary & so do not expect end-users to pay for the service.
- Other than the above-mentioned solutions, all others involved in this study have a well-defined subscription model to engage end-users and a partnership structure for engaging private sector.

# Thank You!

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