Application of innovative ICT tools for linking Agricultural research knowledge and extension services to farmers in Kenya

Boniface Akuku* (MSc, MCSE, FCK, PhD Research interest-Knowledge Management), Makini F (PhD), Wasilwa L (PhD), Makelo M (PhD), Kamau G (PhD)

Assistant Director, Information Management & Communication Technology, KARI

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Presentation Outline

- Introduction
- The Virtual Agricultural Community (VAC) Framework
- Objectives
- Methodology
- Results and Discussion
- Conclusion

Introduction

- Despite the application and use of mobile and web-based technologies in improving access to information;
  - » Agricultural extension services still plays a key role in disseminating knowledge, technologies and agricultural information, and linking farmers with other stakeholders
  - » Small holder farmers are faced with a myriad of challenges;
- A common denominator to these challenges is lack of access to relevant and actionable information

Motivation

- Knowledge management has become the successor of various business trends in the world today.

Therefore;

- The application of ICT innovative tools such as Virtual Agricultural Community (VAC) for agricultural transformation is key in Knowledge transfer.

Motivation

- Agricultural extension in Kenya dates back to early 1900s, but its only notable success was in the dissemination of hybrid maize technology in the late 1960s and early 1970s (Madhur Gautam, 2000).
- Consequently the effectiveness of the agricultural extension services has been severally questioned and debated (Gautam and Anderson, 1999).

Motivation

- Agricultural based institutions obtain funds to develop technologies to improve farm productivity and livelihoods.
- However, challenges to on-farm productivity exists to date & despite investments in technology development

Motivation

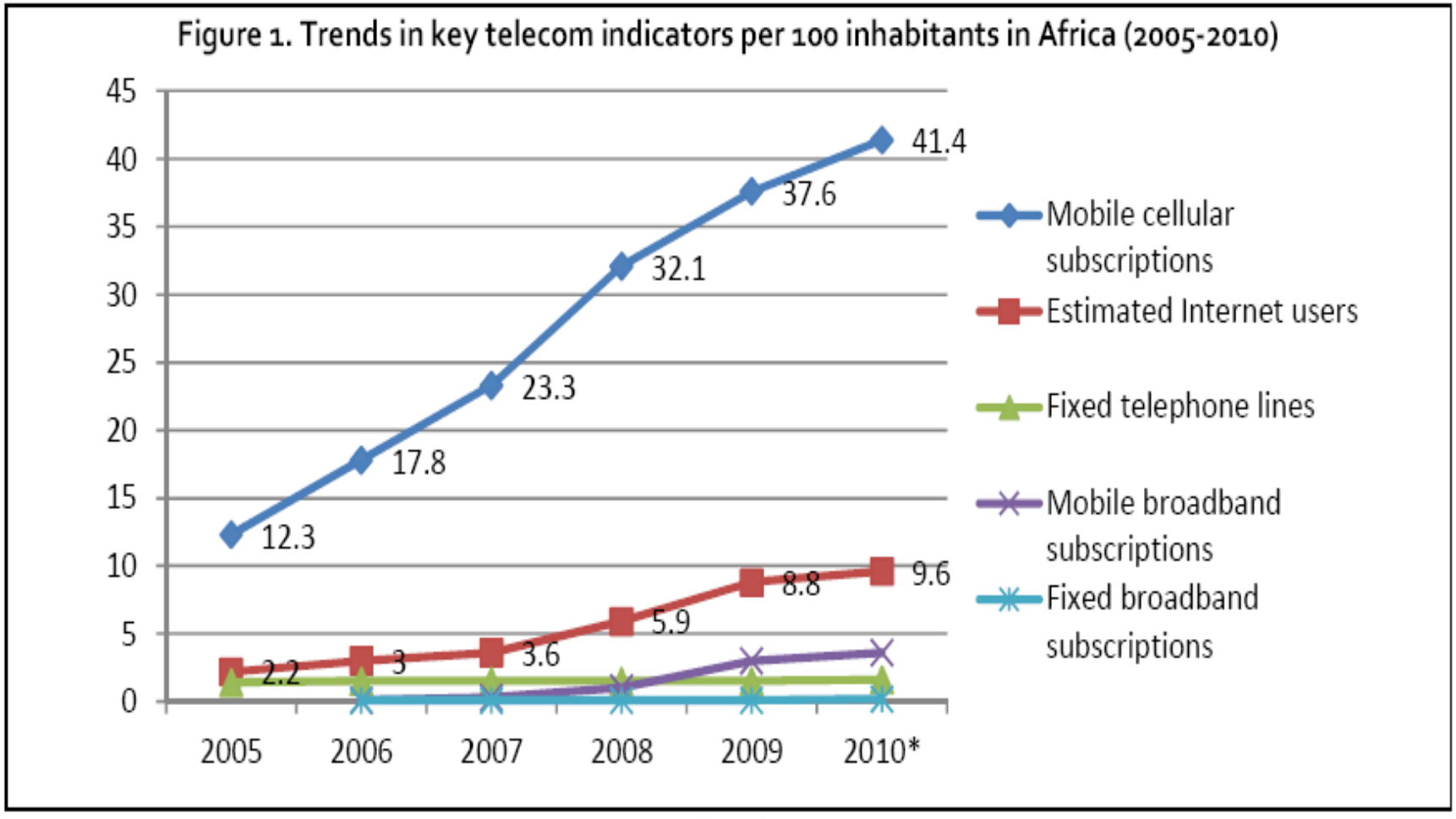
- In Kenya the extension staff: farmer ratio is 1:1,500 and
- Yet it is a critical change agent required in transforming farming, promote household food security, improve income and reduce poverty.

- There are 500 million small farms in developing countries that support two billion people, a third of humanity (IFAD, 2011)

Justification

- Agricultural extension is changing worldwide, with emphasis on innovation (Saravanan, 2008).
- Hence ; the VAC

ICT development trend 2005-10



Source: data from ITU (2010c).

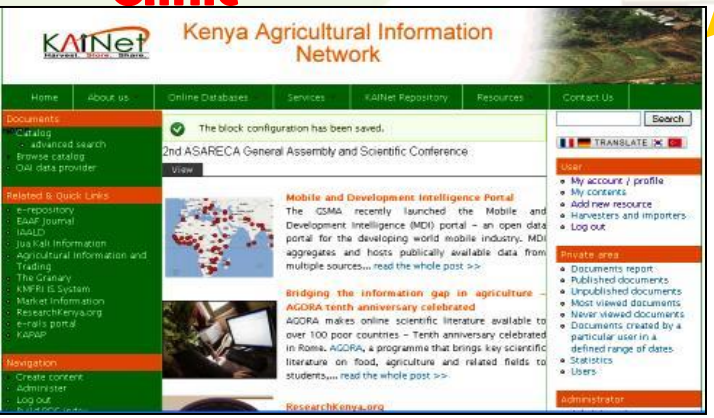
Note: *The 2010 data are estimates by ITU (2010c)

Kenya Agricultural Research Institute

KARI service delivery innovation PLATFORM *are not adequate*

KARI eMimea Clinic

Kenya Rice Knowledge Bank



Kenya Agricultural Information Network

Kenya Pollination Information Network

The Virtual Agricultural Community platform: Framework

The main function of VAC platform is to modernize and to make the national extension system demand-driven, participatory, bottom-up, and real time.

SOLUTION ARCHITECTURE

Farmers/Extension officers: Mobile Voice/SMS

- Queries
- Responses
- Enquiries
- Case Follow Up

Farmers: Computers

- Enquiries
- Access To Information & Knowledge
- Case Follow Up

Farmers/Extensions officers

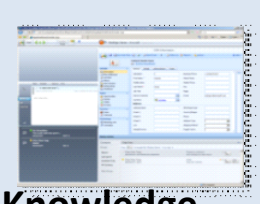
- Case Resolution
- Knowledge Dissemination
- Complaints / Enquiries
- Case Escalation

Researchers/ Experts/stakeholders

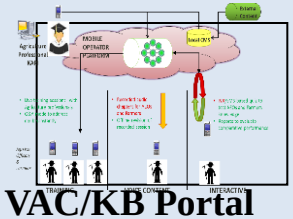
- Farmer Knowledge Feed Back Review
- Knowledge Review & Update
- New Knowledge Input
- Case Resolution
- Fact Sheets

VAC/Knowledge Bank Portal CMS

- Fact Sheets
- Knowledge collaboration & work flow
- Step by Step Guides
- Step by Step Guide
- Resources / Technical Material
- Access Control & Audit Trail
- News / Event



Knowledge Managers



VAC/KB Portal Interface

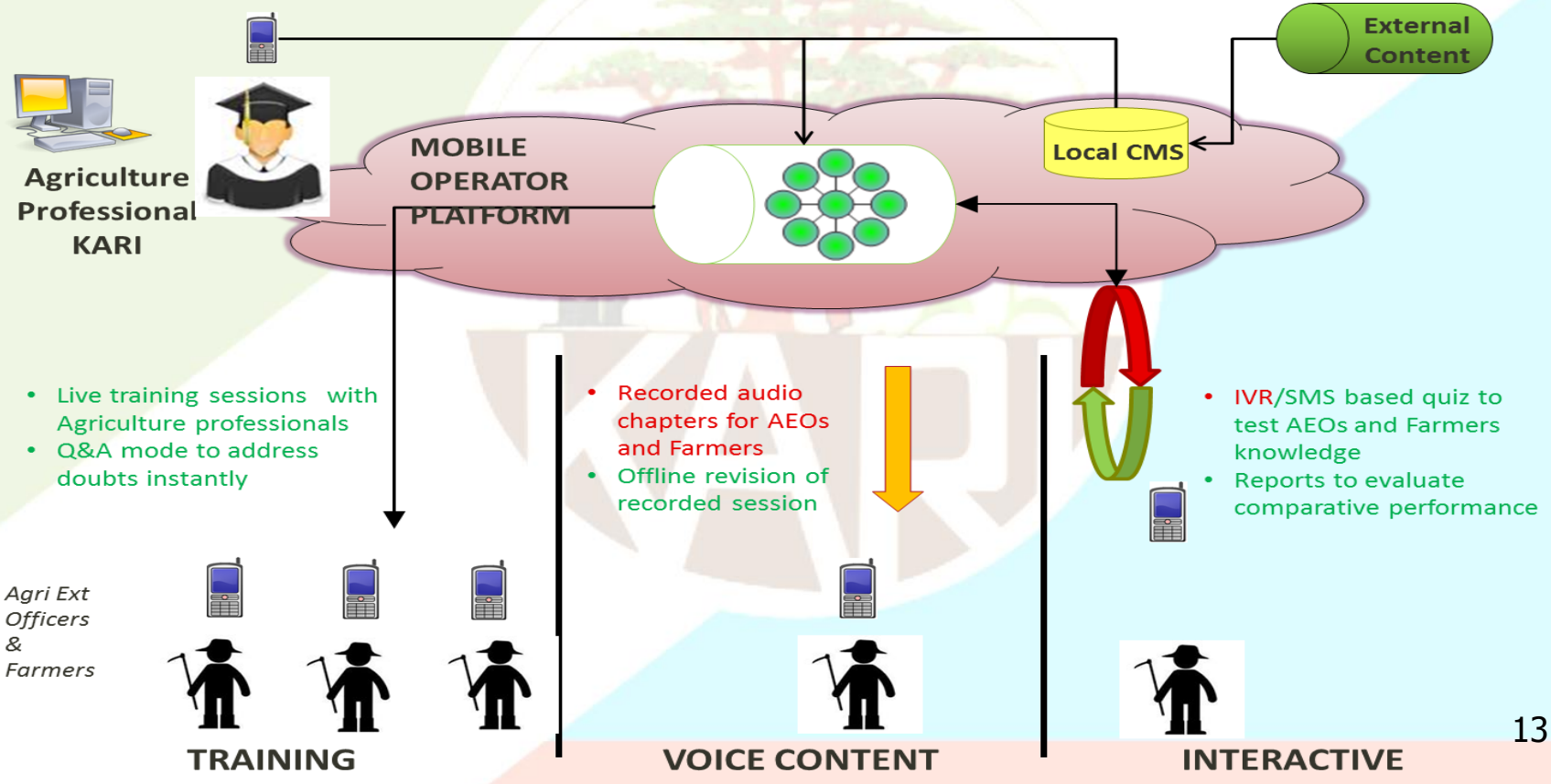
SMS Gateway

Knowledge Database

KALRO
Kenya Agricultural & Livestock Research Organization

Virtual Agriculture Community (VAC) Platform to Induct Agriculture Extension Officers and Farmers in Kenya

Agriculture Extension Officers (AEO) play a critical role in delivering cost-effective interventions



Objectives

1. To create a direct link with agricultural research professional to respond quickly to farmers problems and queries
2. To design and develop appropriate learning experiences, courses and required skills to reach and educate both extension officers and farmers by expanding the skill range.
3. To obtain feedback on the effectiveness of research findings and agricultural technological development
4. To make required information and knowledge available for stakeholders in a timely and efficient manner

Methodology

- The VAC platform is built into three main frameworks:
  - (1) Dial in service - individual can dial-in and speak to an agriculture specialist on live mode.
  - (2) Voice recorded information delivery services, and Interactive Voice Response (IVR) functionality
  - (3) Live and off-line training of AEO's and farmers from a central place

Dial in service

- This service is demand driven. The VAC IVR allows users to call a toll free hotline number from their mobile phones, IVR system options include for example dial #4 to "Speak to an expert".

- The call is automatic routed to an expert contact number, with "follow me" capabilities.

- The system dialer automate the call: (1) dial initiation and (2) outcome detection, the automatic dial outcome relies on the SIT signals.

Interactive Voice Response System (IVRs)

- IVR uses computer-telephone integration (CTI)
- Computer –IVR Communication ->dual-tone multi-frequency (DTMF) signals.
- Automation of outgoing messages- speech-to-text (TTS) software
- Computer generate customized text and read back to the caller using an automated voice
- Leave a message (LAM) functionality

Live and offline training of Agricultural extension officers and farmers

- Learner access training, from anywhere, anytime on virtually any device.
- The class members can interact via text chat, raise hands by pressing a specified number either #1, record the class offline and access class recording Later.
- Learners with smart phones can extend learning beyond the live event, use emotions, view content stream or download recording, loin session from email link, calendar invite and then communicate two way chat.

Short Messages Service (SMS) and Multimedia Messages Service (MMS)

- Both SMS and MMS are data driven services protocols used over wireless networks, they fundamentally work on voice network and is based on GSM, CDMA and TDMA network universal technologies.

Results: Extension Research Farmer friendly model linkage

- Knowledge gaps contribute to yield gaps
- Small holders' farmers are "resource poor",

The VAC model:

- The VAC platform is a productivity enhancing tool.
- VAC reduces Knowledge gap->increase yields
- VAC optimizes Research knowledge use

Results: Extension Research Farmer friendly model linkage

- 1% increase in agricultural productivity in Africa reduces poverty by 0.6%.

Therefore;

Smallholder-led growth strategy has potential to make a very significant impact on food security and poverty reduction" (FARA, 2007).

Results: Effective transfer of Research generated knowledge

- *Weak Research-extension and farmer linkages has created isolation in technology development and knowledge transfer.

- ✓ The VAC platform provides a strong linkage → effect influencing formulation of research agenda →based on problem identification and the need to evolve technology suitable for the prevailing socio-economic environment.

- ✓ Extension requires constant flow information on new and improved technologies and practices creating a dual communication.

Results: **Research priority definition**

- The disconnection between research, extension farmer linkage has led to research problems investigation- not according farmers priority needs but researchers' "thinking"
- The VAC addresses these historical differences
- Both strategic and adaptive research require understanding of users' priority needs→ the VAC will bridge the gap

Results: Appropriate Skills and learning experience development

- Extension is a dynamic concept & facing misunderstanding
- Therefore requires
  - appropriate skills and learning experience development.
  - Educator must also be a learner; education is not filling empty minds with knowledge.
- The VAC platform provides a two way communication, essential in understanding the practical environment
- Sustainable agriculture requires provision and adoption of appropriate skills and knowledge transfers to farmers, whereas knowledge transfer requires innovative applications

Results: Improved ICT based agricultural knowledge management increases productivity of smallholder farmer

- Agricultural sector has potential for improving rural livelihood and poverty eradication
- On the other hand
  - Knowledge if properly managed, is pivotal to enhancing agricultural productivity
- The VAC platform provide rapid, effective and cost effective knowledge management that supports users through innovation.
- Knowledge consists of attitudes, cumulative experiences, and developed skills that enable a person to consistently, systematically and effectively perform a function

Discussions: Before VAC

Discussions: After VAC

Discussions: After VAC

CONCLUSION

- Information access is key to increasing agricultural production which subsequently reduces poverty at household level.
- Harnessing these potential, however requires, a consolidated efforts and appropriate framework for ICT utilization

Parting Shot....

"We cannot become what we need by remaining what we are" John C. Maxwell

"The cry of a child wake up the mother: My cry is Knowledge Democratization and re-use, wake up please" Akuku Boniface

Merci!