



Tropentag 2009
University of Hamburg, October 6-8, 2009
Conference on International Research on Food Security, Natural Resource
Management and Rural Development

Information Technology for Agriculture and Rural Development in Africa: Experiences from Kenya

Anthony Gikandi Muriithi¹, Eric Bett², Sarah Ayeri Ogaleh³

¹Ministry of Agriculture, Nairobi, Kenya

²University of Natural Resources and Applied Life Sciences, (BOKU), Inst. Of Organic Farming, Austria

³Centre for Training and Integrated Research in Asals Development (CETRAD), Kenya.

Abstract

Access, efficiency and affordability of agricultural information continue to be a major impediment for raising agricultural productivity among smallholders in Africa. Recently information and communication technology (ICT) has provided a possible pathway to ameliorate this scenario. A variety of innovations that integrate ICTs into the dissemination of agricultural information to farmers (Farmers Information Services –FIS) have been developed at local, national and regional levels. They have currently demonstrated a promising field of new research and application in e-agriculture whilst bringing new sources of information and new tools for local knowledge dissemination. This paper reviews and discusses the role of ICT and its practical contributions to agriculture and rural development in Kenya. Data from various sources- Kenya's agricultural departments, ICT providers, NGOs and grey literature reviews were used. Results indicate use of ICTs especially mobile telephones is currently widespread in the rural areas of Kenya. Approximately one member of smallholder farming households own mobile phones. Extension service providers have harnessed this technology by putting it into profitable use in rural Kenya. For example, Kenya Agricultural Commodity Exchange (KACE) has developed a short messaging service- *SMS SOKONI* in partnership with Safaricom mobile phone provider. Any farmer anywhere in the country can access updated and reliable market information on prices and commodity offers at an affordable rate using their mobile phones. So far, the service is easy to use, reliable, convenient and affordable. The average monthly usage of this service increased from 1,273 in 2006 to 24,716 in 2008, demonstrating its subsequent usefulness and eagerness of farmers to explore the market information and linkage systems. Farmers are also able to access information on the right Hybrid Maize seeds to plant in their respective agro-ecological zones by way of texting to Kenya Seed Company Ltd a major seed distributor in East African region. This paper recommends adoption of such technologies by institutions such as Metrological Department to enhance provision of updated data on climate for appropriate decision making by agricultural farmers. This paper is critical to enhancing awareness on appropriate transferable technologies of 21st century that are still compatible to diverse cultural perceptions.

Keywords: *Access, Affordability, Agricultural Productivity, Efficiency, information Technology, Rural Development*

Corresponding author: Anthony Gikandi Muriithi, Ministry of Agriculture, Nairobi, Kilimo House Cathedral Road, Nairobi, Kenya, e-mail: gikandimuriithi@yahoo.com

1. Introduction

Agriculture is an important sector which majority of the rural population depend on. Smallholders form the bulk of agricultural producers. However, they remain the majority of the food and income poor (IFAD, 2007). Improving smallholder agriculture is therefore chief to poverty alleviation, and information and knowledge are critical to this effort. In the wake of growing demand for food, the sector offers opportunities for producers to sustain and improve their livelihood. Unknown to many, Information and communication technology (ICT) plays an important role in addressing these challenges and uplift the livelihood of the rural poor. The sector is confronted with the challenge of increasing production to feed a growing population in a situation of decreasing availability of natural resources. Of concern are water shortages, declining soil fertility, effects of climate change. However, demand for food offers opportunities for improving the livelihoods of rural communities. Effective agricultural research and extension systems are thus critical to cope with these challenges and improve the livelihood of farmers. The role of ICT to enhance food security and support farming cannot be ignored. Its role in agriculture, which includes use of computers, Internet, geographical information systems, mobile phones, radio and television — was endorsed at the World Summit on the Information Society 2005. A number of factors influence the decision whether or not to invest in ICT: higher costs, lack of competition, lack of relevant skills for effective use of ICT could be inhibitors (Caseli and Coleman, 2001).The use of mobile phones has been found to reduce information asymmetries, enabling users to access arbitrage, marketing or trade opportunities(Jensen,2007). Studies have attributed multiple benefits to the mobile phone (Bhavnani, et.al.2008).

Agricultural decisions on: timely land preparation, planting, weeding, irrigation, harvesting, storage and marketing have always been central concerns to agricultural stakeholders. ICT especially mobile telephones can speed the way farmers in rural areas of Kenya get, exchange and manipulate information. They rework the way farmers interact with markets and cities. A variety of innovations that integrate ICTs into the dissemination of agricultural information to farmers (Farmers Information Services –FIS) have been developed at local, national and regional levels. They have currently demonstrated a promising field of new research and application in e-agriculture whilst bringing new sources of information and new tools for local knowledge dissemination. They are increasingly enabling farmers to focus, search and extract useful and up-to-date market information. Because of its potential to ameliorate this old rural farming problem an evaluation of its usage among farming communities becomes necessary. This is what this study aimed at by reviewing the role of ICT and its practical contributions to agriculture and rural development in Kenya. Policy implications are drawn for up-scaling and making it more affordable for the end users.

2. Methodology

Data from various sources- Kenya's agricultural departments, ICT providers, NGOs and grey literature reviews were used for this study.

3. Results and Discussion

Results indicate that there has been an upsurge in the use of mobile telephony for agricultural information in the recent past. For example, there was an increase in the average monthly hits from 1,273 in 2006 to 24,716 in the year 2008 (Figure 1). This means that more farmers were making inquiries on agricultural information. There was a significant increase in farmers requesting for information on seed varieties to plant, hence more adoption of superior seeds for planting. The

Interactive Voice Response (IVR)which covered maize, beans, potatoes, tomatoes and cabbages showed a significant increase from 22 in 2006 to 76 in 2008 (figure 2). There is considerable evidence to suggest that the economic and social benefit of mobile telephony will be highest in rural areas, which currently have less telephony services. Both poverty and lack of information are common bed partners. Thus, the dissemination of information together with serving rural areas has double anti – poverty imperative.

Figure 1 SMS Hits 2006 to 2008

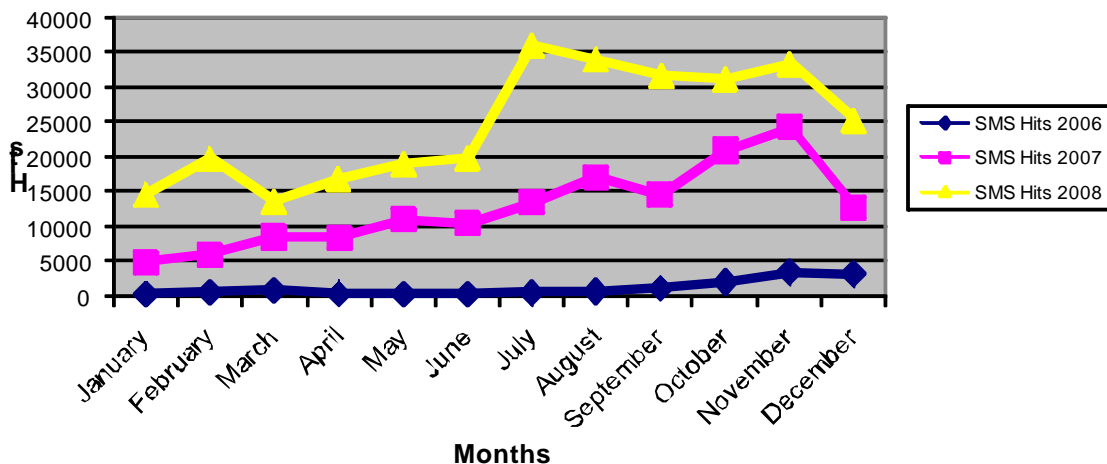
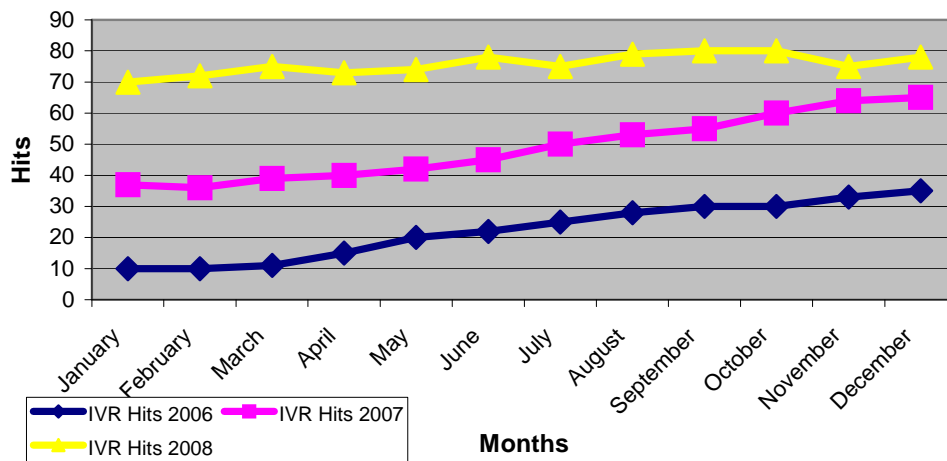


Figure 2 IVR Hits 2006 to 2008



4. Conclusions and Recommendations

The use of mobile phones may reduce information asymmetries, enabling users to access marketing opportunities that they otherwise would have missed out. Use of IT was found to enable traders of agricultural produce to arbitrage over price performance from potential buyers and coordinate sales; this has helped them to increase incomes and sales volumes. It is recommended that institutions like the Meteorological department adopt such technologies to enhance provision of updated data on climate for appropriate decision making by farmers. Public and private partnership involvement component has proven to be the way forward in countries already utilizing ICT in Agriculture development. Striking a win-win situation is a key to make

public-private partnerships work. This will enable the private sector to promote its products and the public sector to recoup some costs of running e-Agriculture initiatives and provide the communities and stakeholders with information and products. This requires practitioners to clearly spell out roles and responsibilities and address the interests of the parties involved along with their explicit commitments toward a common goal, understand different incentives that drive the public and the private sectors. Private sector has a profit motive for adding value and growing its customer base, which needs to be reconciled with the public sector's interest of reaching large numbers of the intended beneficiaries. Both can be combined to form a common vision.

Acknowledgements

We are grateful to the Kenyan Government which facilitated research work of this paper.

References

- Bhavnani, A., Won – Wai, R.C., Janakiram, S., Silarsky, P. 2008. The role of mobile phones in sustainable rural poverty reduction, ICT policy division, global information and communication department.
- Caseli, F. and Coleman, W.J. 2001. Cross country technology diffusion: The Case study of Computers. NBER Working papers No. 8130, National Bureau of Economic Research.
- Gakuru, K. Winters, F. Stepman “An inventory of Innovative Farmer Advisory Services” Forum for Agricultural Research in Africa, December 29th 2008.
- IFAD. 2007. International Fund for Agricultural Development Strategic Plan 2007-2010.
- Jensen, Robert. 2007. The Digital Divide: Information Technology, Market Performance and Welfare in the South Indian Fisheries Sector. The Quarterly Journal of Economics. Volume CXXII.