

Linking Farmers to Markets through Modern Information and Communication Technologies in Kenya

Mukhebi A.W., Kundu J., Okolla A., Wambua M., Ochieng W. and Fwamba G.

KACE, P.O. Box 59142-00200 Nairobi, Kenya

Abstract

This paper highlights a market information and linkage system (MILS) developed and tested by the Kenya Agricultural Commodity Exchange Limited (KACE) that increases the efficiency of agricultural markets to work better for smallholder farmers and other small and medium sized agro-enterprises (SMEs). The MILS involves harnessing modern information and communication technologies (ICTs) to empower farmers with low-cost reliable and timely market information to enhance the bargaining power of the farmer for a better price in the market place, and to link the farmer to markets more efficiently and profitably. The components of the KACE MILS are (www.kacekenya.com): Rural based Market Information Points (MIPs) which are information kiosks located in rural markets, District-level Market Information Centres (MICs), Mobile Phone Short Messaging Service (SMS), Interactive Voice Response (IVR), Internet based database system, rural FM radio and the Central Coordinating Hub in Nairobi. KACE has adopted a business approach to the provision of its services: users pay for the services. For instance it charges: placement fees per initial offer or bid (US\$ 1.5-15), commissions on concluded deals (0.5%-5%), subscriptions to price information recipients (US\$ 65 for 6 months or US\$ 125 for 12 months), fees to visiting foreign groups (US\$ 2,000-5,000/visit) and revenue sharing agreements with SMS and IVR service providers. When the KACE MILS services are scaled out and widely used by many farmers and SMEs across Kenya, the system will generate sufficient revenue to sustain its services without reliance on development partner funding. To enhance the financial sustainability of the MILS services further, KACE has recently initiated two innovations: franchising MIPs and MICs to local entrepreneurs, and establishing a virtual trading floor to improve the matching of offers and bids through a rural-based FM Radio program. A recent study of the impact of the KACE MILS concluded that the proportion of farmers and traders that say their incomes has increased and their bargaining positions have improved is very high (75% farmers and 60% commodity traders). Furthermore, the study concluded that it was clear that during the years in which the KACE MILS has been operational, market integration improved for two commodities studied (i.e. maize and beans). This study also highlights the challenges faced by the KACE MILS, including poor infrastructure that imposes high transport costs to markets, high costs of mobile phone calls and SMS and small quantities of produce of varying quality offered. Keywords: Information and communication technology, innovations, Kenya,

Background

Agricultural markets do not work for poor farmers

Agricultural markets in Kenya and indeed in Africa do not work efficiently for poor smallholder farmers. Following the market liberalization reforms undertaken by the Government in Kenya in the late 1980s and early 1990s, agricultural markets are characterized by the following constraints among others: long chains of transaction between the farmer and the consumer; poor access to reliable and timely market information; small volumes of products of highly varied quality offered by individual smallholder farmers; and poorly structured and inefficient markets. The lack of market information represents a significant impediment to market access especially for smallholder poor farmers: it substantially increases

transaction costs and reduces market efficiency. For any one crop, the marketing chain consists of multiple middlemen, each taking a margin at every stage of the chain, and price variations in space and time are often large and erratic. Liberalization of agricultural markets has introduced new challenges to farmers, especially poor smallholder farmers. Government marketing boards have either collapsed or can no longer guarantee the farmer the market for his produce. Equally, buyers of commodities from farmers (traders, processors or consumers) do not have sufficient information about commodity sources, or the quantities and quality of those commodities available and their prices. Farmers are now facing markets which are neither competitive nor transparent, and they are greatly disadvantaged, especially those in remote rural areas. They have no incentive to increase

the level of their productivity in order to escape the poverty in which many find themselves trapped.

Institutional innovations to make markets work for the poor

The development of institutional arrangements that are needed to make markets work better for the poor, especially those needed to lower transaction costs, improve market coordination and ensure availability of price information, is needed in order to improve access of the poor to new input technologies and output markets. In this regard, pro-poor market information and market linkage innovations are key to making markets work for the poor in Kenya and indeed in other countries in Africa. Market information is needed for farmers to choose what commodities to produce, what technologies to apply for production, when to produce, for whom to produce, and when and at what price to sell. Market information also empowers the farmer with bargaining power for a better price in the market place. Without this, the farmer is greatly disadvantaged against middlemen and traders who often have better access to market information. In addition, market information can bring about stability in product supplies and prices in time and space. However, the experience of KACE shows that besides market information, market linkage mechanisms to enable the farmer to actually sell her produce or purchase needed inputs on time and at competitive prices is another key plunk in making markets work better for the poor farmer. In the absence of market information and market linkage mechanisms, it is common to find situations of artificial food scarcities, as food surplus areas co-exist with areas of food deficits. This has the effect of lowering farm gate prices in surplus areas, resulting in reduced incomes for farmers, and raising consumer food prices in deficit areas, leading to food insecurity for the poor in those areas.

Revolution in information and communication technologies

A communications revolution is occurring across Africa. The liberalization of the communications sector in many African countries including Kenya has allowed cellular phone companies and FM radio stations to enter rural areas. Previously under-developed and excluded villages now have opportunities to access markets and market information with the help of mobile telephony and the FM radio stations. In a review of the state of

information and communication technologies (ICTs) in Kenya, Asaba (2006) shows that mobile phone subscribers increased from 4.6 million in 2004/5 to 5.7 million in 2005/6, a 24% increase in one year. This offers new opportunities to test new models for reaching the rural poor with market information and market linkage services.

Modern ICTs now offer unprecedented potential to deliver information to poor rural communities and link them to remunerative markets, and thus contribute to alleviating food insecurity, poverty and transforming social and economic conditions. It has been said that “information technology, together with the ability to use it and adapt it, is the critical factor in generating and accessing wealth, power, and knowledge in our time” (Njuki J. *et al.*, 2004).

The KACE Market Information and Linkage System

Since 1997, KACE has been developing and testing a market information and linkage system (MILS) designed to enhance the efficiency of agricultural markets, targeting smallholder farmers. MILS provides reliable and timely market information as well as links farmers to better markets through matching commodity offers and bids.

Components of KACE MILS

The KACE MILS involves harnessing modern ICTs to empower farmers with low-cost reliable and timely market information to enhance the bargaining power of the farmer for a better price in the market place, and to link the farmer to markets more efficiently and profitably. The components of the KACE MILS are (www.kacekenya.com): Rural based Market Information Points (MIPs) which are information kiosks located in rural markets and serve as sources of reliable and timely market information for farmers (e.g. current commodity prices in different markets), as well as provide market linkage through matching commodity offers and bids. There are 10 MIPs located in Western, Nyanza, Rift Valley and Eastern provinces of Kenya.

- District-level Market Information Centres (MICs) which have internet connectivity and serve as liaison points between KACE and the remote MIPs. There are 4 MICs: Bungoma in Bungoma District, Eldoret in Uasin Gishu District, Kisumu in Kisumu District and Machakos in Machakos District.

- Mobile Phone Short Messaging Service (SMS) which uses mobile telephony for information delivery to farmers; the service is provided in partnership with the Safaricom Limited, the leading mobile phone service provider in Kenya with currently over 5 million subscribers.
- Interactive Voice Response (IVR) service which uses voice mail for information delivery, where a user dials a special phone number (0900552055) to access the information through simple menu steps; this service is provided in partnership with the Interactive Media Services Limited.
- Internet based database system, where information is disseminated through the internet based electronic database and website: www.kacekenya.com
- The KACE Headquarter Central Hub in Nairobi which manages and coordinates the MILS.

Financial sustainability

KACE has adopted a business approach to the provision of its services: users pay for the services. For instance, among other services, KACE charges: modest fees for placement of initial offers or bids (US\$ 1.5 – 15 per offer/bid depending on volume); modest commission (0.5% - 5%) on concluded deals; and fees to organized foreign visiting groups (US\$ 2,000 – 5,000/visit negotiable). In addition, recipients of price information through the internet pay subscription fees (US\$ 65 for 6 months and US\$ 125 for 12 months). Furthermore, KACE has negotiated revenue sharing agreements with the SMS and IVR service providers.

To enhance the financial sustainability of the MILS services further, KACE has recently initiated two innovations: franchising MIPs and MICs to local entrepreneurs, and establishing a virtual trading floor to improve the matching of offers and bids through a rural-based FM Radio program.

Establishing Franchised Market Resource Centres. KACE has embarked on franchising of MIPs and MICs into market resource centers (MRCs) to local entrepreneurs to operate them on a commercial basis. Four pilot MRCs were established in August 2006 and were officially launched on October 27, 2006: Chwele and Kimilili in Bungoma District, Cheptais in Mt. Elgon District and Mumias in Mumias/Butere District, all in Western Province of Kenya. Each MRC is a legally registered limited liability company, owned

and operated by a Managing Director as its Chief Executive Officer.

In addition to market information and market linkage services, the franchised MRCs are developing and brokering a range of other services which are currently not available, or insufficiently so, but are beneficial to and in demand by poor smallholder farmers and their communities. Examples are transport, warehousing / storage, weighing, quality control services such as testing for grain moisture, supply of genuine farm inputs (fertilizers, seeds, agrochemicals) and e-services such as email and cash transfers.

The MRCs are designed to be financially self-sustaining after two years of operation, while providing affordable services targeted at the smallholder farmers and SMEs. KACE oversees the activities of the franchised MRCs to ensure that they develop services that are standardized, affordable and appropriate to the needs of poor smallholder farmers and their communities. KACE provided capacity enhancement business training and technical assistance to the franchisees, and also arranged guaranteed start-up phase credit through a micro-finance institution. The aim of the training was to equip franchisees with the necessary knowledge and skills to provide services to smallholder farmers and SMEs on sound commercial business lines and enhance the chances for their financial success.

The franchised MRCs are developing into one-stop shops for smallholder farmers and SMEs, stocking farm inputs and catalyzing e-commerce, thus helping to bridge the technology gap between remote rural areas and urban centers. The franchising model offers KACE the opportunity to scale-out the MRCs without the burden of financing and managing many such outlets across the country.

Establishing Soko Hewani, the Supermarket On Air.

KACE's experience is that besides market information, market linkage mechanisms to enable the farmer to actually sell her produce or purchase needed inputs on time and at competitive prices is another key plunk in making markets work better for the poor smallholder farmer. To assist franchised MRCs to improve and broaden the range of their market linkage services, KACE has developed a *virtual* trading floor through the use of a local FM radio station. This provides the opportunity to integrate the MIS

components of MRCs, SMS, email and radio to concurrently provide timely market information and facilitate market linkages for farmers and SMEs through an interactive radio program.

KACE and the West Media Limited (WML), proprietors of the *West FM Radio Station* located in Bungoma Town in Western Province of Kenya, have established an interactive radio program branded *Soko Hewani (The Supermarket On Air)*. This involves using WML's West FM Radio in conjunction with appropriate ICTs developed by KACE to match commodity and service offers and bids by smallholder farmers and other SMEs. KACE provides the content of the radio program (verified offers, bids, prices), while WML provides the radio platform, and the design, production and management of the program. *Soko Hewani* is broadcast once a week on Tuesdays from 0900 – 1000 hrs, a day and time recommended by WML as a prime time for farmer listeners for marketing produce in the broadcast catchment zone. The catchment zone covers Western, parts of Nyanza and parts of Rift Valley Provinces of Kenya and eastern Uganda, a region of an estimated 5 million inhabitants, most of whom are smallholder farmers. Both the length of time (1 hr) and the frequency (once a week) for the program will be reviewed according to demand. It is expected that the program time may increase to two hrs, and the frequency may increase to once daily Monday – Saturday.

How Soko Hewani works

Currently, franchised MRCs act as the licensed agents to trade through *Soko Hewani* on their own account or on the account of clients who are smallholder farmers and SMEs in accordance with the *Rules and Regulations* established by KACE. The MRCs provide or solicit commodity and service offers from sellers and bids from buyers. The MRCs must verify the veracity of an offer or bid, in regard to the commodity or service availability, quantity, quality and whatever other characteristics that are deemed necessary. The MRCs submit verified offers and bids to KACE through phone, fax, SMS or e-mail. A KACE *Soko Hewani* Program Manager examines, compiles and registers the verified offers and bids for trading through *Soko Hewani*. The Program Manager then goes to West FM Radio studio with the registered offers and bids for trading. The offers and bids are announced on the *Soko Hewani*. Listeners, mostly smallholder farmers and SMEs, are given an

opportunity to phone, send SMS or email messages into the radio program and bid on the offers, or offer on the bids. The radio program staff on standby during the *Soko Hewani* broadcast then match the offers and bids, using mobile phone calls and SMS, or reference back to the specific MRC which submitted the offer or bid for further negotiation and conclusion of deals.

KACE charges a placement fee (US\$ 1.5-15) per initial offer or bid depending on volume, and a negotiable modest commission (0.5% – 5%) on successful transactions through *Soko Hewani*. The radio program standby staff provide listeners with information on how to pay for or make a delivery of a commodity or service for concluded deals. MRCs broker at a negotiable fee complementary services to facilitate the trading activity, such as quality testing/control, packaging, warehousing / storage, transportation, financing and insurance.

On *Soko Hewani* sellers and buyers of commodities and services, through the placement of offers and bids, compete to sell and to buy commodities and services. In this way, fair market prices are established (discovered) by the forces of supply and demand. Smallholder farmers are more knowledgeable about prices and market outlets, and are no longer taken advantage of by buyers or middlemen.

Impacts, lessons and challenges

By providing reliable and timely market information and market linkage services targeted at smallholder farmers and other SMEs, the KACE MIS is expected to improve the efficiency of agricultural markets, and enhance the bargaining power of smallholder farmers in the market place for better prices, resulting in higher farm-gate prices and farm incomes. With higher incomes, farmers will afford to invest in modern technologies to increase productivity. With higher productivity at better prices, smallholder farmers will further increase their incomes, thus creating wealth and escaping the vicious cycle of poverty that they currently find themselves trapped into. In a study of MIC and MIP users, Asaba et al (2005) found that farmers and other SMEs in rural areas are willing and able to pay for additional marketing services beyond market information for more effective linkage to input and output markets. They are demanding services such as commodity grading, storage, transportation, short-term credit (for example to hire transport to market), access to inputs (timely and at affordable prices), document preparation, mobile phone and e-services

such as e-mail. However, there are no local entrepreneurs with the knowledge and capacity to develop and deliver the services in the remote rural areas where most farmers live. A further lesson from the KACE experience is that to scale out the KACE MILS in the form of MIPs and MICs design where it is owned and managed by KACE to provide an expanded range of services demanded by farmers and SMEs would create unsustainable financial and management burdens upon KACE, hence the adoption of the franchise model.

In a review of KACE in 2005, Tollens notes that most MIS in Africa limit themselves to market prices information. This is the essence of a MIS. But KACE also has a commodity exchange service through matching offers and bids, which are prominently displayed on blackboards at MIPs and MICs, and which are disseminated via SMS and the Internet. This is a big institutional innovation, unheard of until now, and that it could really be a major institutional breakthrough in the reform of agricultural markets in Africa (Tollens, E.F., 2006).

Most recently, Meuleman (2007) in a study of the impact of the KACE market information system concluded that the proportion of farmers and traders that say their incomes has increased and their bargaining positions have improved is very high (75% farmers and 60% commodity traders). Furthermore, Meuleman concluded that it was clear that during the years in which the KACE MILS has been operational, market integration improved for two commodities studied (i.e. maize and beans). This study also highlights the challenges faced by the KACE MILS, including poor infrastructure that imposes high transport costs to markets, high costs of mobile phone calls and SMS and small quantities of produce of varying quality offered.

KACE's future plans involve the scaling out of the Soko Hewani and franchised MRCs so that more smallholder farmers and other SMEs in Kenya can benefit from the system. In addition, KACE is willing to facilitate those interested in learning and adapting its MIS in other countries. KACE's vision of success is of farmers well linked to agribusinesses, with

significantly increased incomes through effective and profitable participation in agricultural input and output markets with the help of modern ICTs. By aiming to increase the incomes of farmers and other rural SMEs, these objectives contribute directly to the Kenya

Government's Strategy for the Revitalization of Agriculture (SRA), and also to the Millennium Development Goal No. 1 of eradicating extreme poverty and hunger by half by the year 2015 (50% reduction in number of people living on less than a dollar a day). Initial funding for KACE activities was raised by its directors. However, over time, KACE activities have attracted funding from development partners including the Rockefeller Foundation, the USAID Mission in Kenya, the Hans Seidel Foundation of Germany, the CTA in the Netherlands among others. When the KACE MILS services are scaled out and widely used by many farmers and SMEs across Kenya, the system will generate sufficient revenue to sustain its services without reliance on development partner funding.

References

- Asaba, J.F., R. Musewe, M. Kimani, R. Day, M. Nkonu, A.W. Mukhebi, A. Wesonga, R. Mbula, P. Balaba and A. Nakagwa, 2005. Bridging the information and knowledge gap between urban and rural communities through knowledge centers: case studies from East Africa. Unpublished manuscript, CABI, Nairobi, Kenya. Pp. 28
- Asaba, J.F., 2006. Expert Consultation on "Identification of Pathways to Improved Dissemination of Research Information in Sub-Saharan Africa" 24th Nov. 2006. CABI Africa, pp.11.
- Meuleman, L., 2007. Impact Study of the market information system of KACE in Kenya. M.Sc. Thesis, Catholic University of Leuven, Faculty of Bioscience Engineering, W. de Croylaan 42, 3001 Leuven, Belgium. Pp.121.
- Njuki, J, J.F. Asaba, A. Okolla and A. Wesonga, 2004. Strategies for pro-poor agricultural knowledge systems in East Africa. Draft report, CABI Africa, pp. 14.
- Tollens, E. F., 2006. Market Information Systems in sub-Saharan Africa: Challenges and Opportunities. *Poster* paper presented at the International Association of Agricultural Economists Conference, Gold Coast, Australia August 12-18, 2006.