

Research Application Summary

### **ICT Integration for Agricultural Extension in Kenya**

Kamande, A. W.<sup>1</sup> & Ruffeis, D.<sup>2</sup>

<sup>1</sup>Department of Applied Community Development Studies, Egerton University, P .O. Box 536-20115, Egerton, Kenya

<sup>2</sup>Institute of Hydraulics and Rural Water Management, BOKU University, Muthgasse 18, 1190, Vienna, Austria

**Corresponding author:** [annkennedys@gmail.com](mailto:annkennedys@gmail.com)

---

#### **Abstract**

The large number of farmers served by a small and shrinking national extension service necessitates more innovative methods of service delivery for effective coverage. This led to the introduction of the national e-extension service. For the same reason, the number of private and non-governmental organizations providing ICT based solutions for agricultural information delivery are ever increasing. Agriculture focused websites from which extension workers can get information demanded by farmers are also on the increase. Mobile applications and social media platforms are envisaged to be among the platforms that can be used for information dissemination. These are expected to give timely and useful information on best practise, input supply, markets/prices among others to enable farmers to reap maximally from their enterprise. Although an initial 654 extension workers were trained and equipped with necessary gadgets in the hope that county governments would add more workers to these, this has not been the case. Conversely, numbers of extension workers continue to decline while the sector contends with reduced budgetary allocation in counties. Morale is low among extension workers and ICT infrastructure inadequate. Frequent blackouts, low ICT literacy among farmers and lack of requisite gadgets also stifles the integration of ICTs into national extension systems. A holistic approach to all these challenges is needed to tap the immense potential of e-extension in Kenya and Africa as a whole.

Keywords: Agricultural information, enterprise, e-extension

#### **Résumé**

Le grand nombre d'agriculteurs servis par un petit service de vulgarisation nationale en diminution nécessite des méthodes de prestation de services plus innovantes pour une couverture efficace. Ceci a conduit à l'introduction du service national de vulgarisation électronique. Pour la même raison, le nombre d'organisations privées et non gouvernementales fournissant des solutions basées sur les ICT pour la fourniture d'informations agricoles ne cesse d'augmenter. Les sites Web axés sur l'agriculture à partir desquels les vulgarisateurs peuvent obtenir les informations demandées par les

agriculteurs sont également en augmentation. Les applications mobiles et les plateformes de médias sociaux sont envisagées d'être parmi les plateformes pouvant être utilisées pour la diffusion d'informations. Celles-ci sont supposées fournir des informations opportunes et utiles sur les meilleures pratiques, l'approvisionnement en intrants, les marchés / prix, entre autres, pour permettre aux agriculteurs de tirer le maximum de leur entreprise. Bien que 654 premiers agents de vulgarisation aient été formés et équipés des gadgets nécessaires dans l'espoir que les gouvernements des comtés y ajouteraient plus de travailleurs, cela n'a pas été le cas. À l'inverse, le nombre d'agents de vulgarisation continue de diminuer tandis que le secteur fait face à une allocation budgétaire réduite dans les comtés. Le moral est bas parmi les vulgarisateurs et l'infrastructure ICT est inadéquate. Les pannes fréquentes, la faible maîtrise des ICT chez les agriculteurs et le manque de gadgets nécessaires étouffent également l'intégration des ICT dans les systèmes nationaux de vulgarisation. Une approche holistique à tous ces défis est nécessaire pour exploiter l'immense potentiel de la vulgarisation électronique au Kenya et en Afrique dans son ensemble.

Mots clés: Information agricole, entreprise, vulgarisation électronique

---

## **Introduction**

In Kenya, there are about 5,000 extension workers. These are expected to serve over 7,000,000 farmers with agricultural information. Due to the large farmer-worker ratio, the Government introduced e-extension services in 2013 to ease service delivery. Use of Information Communication Technologies (ICTs) in extension, has gained increasing attention from the international development community since the 1990s. Increased use of mobile phones and investments in broadband infrastructure in Africa (Chavula, 2014) reducing prices of mobile phones and data in particular have also led to flexibility in information dissemination mechanisms (Rao, 2011; CTA, 2017). ICT4Ag is a tool that helps boost development of technologies and deal with such relevant issues as climate change induced risks. It also plays a role in distribution of knowledge and interchange of information, which in turn can be used to develop demand driven research and technologies, hence increase technology adoption. Private developers are also involved in the development of apps for agriculture. While newer and more attractive technologies are available, older technologies are still in use. Mixing the two can increase effectiveness of use of ICTs among farmers. Many farmer targeted radio programmes include call or SMS portions to increase interaction with and feedback from farmers (World Bank, 2011). In designing ICT interventions, it is crucial to research and recognize local information and communication mechanisms, obstacles to ICT-enabled empowerment, and priority information and communication needs of end users. Using conventional information and communication tools to address the needs of those who cannot access the ICT because of limitations related to literacy, isolation, and social norms is often required. According to Sanga et al. (2014), 80% of farmers access agricultural information through Short Message Service (SMS), and multimedia Messaging Service (MMS) services followed by 79% using telephone calls and community radios with 68%. The goal should be effective knowledge and information management in the agricultural sector in Kenya which will be achieved when the right knowledge and information is conveyed to farmers and other stakeholders at the appropriate time in a user-friendly and accessible manner (Odongo, 2013).

### **Aspirations of the e-extension programme**

The national e-extension programme introduced in Kenya in 2014 was meant to curb the overwhelmed number of agricultural extension officers in Kenya. With an estimated 5,000 extension workers serving 7 million farmers, traditional methods were ineffective. The approach was intended to integrate various ICTs in the provision of agronomic information to help foster food security through adoption of smart modes of mass communication to reach farmers. An initial crop of 654 e-extension agents were trained and equipped with a laptop and smart phone with an expected addition of 5000 more to be trained and equipped under the county system. Drawing information from websites such as [www.nafis.go.ke](http://www.nafis.go.ke), [www.kenyaseed.com](http://www.kenyaseed.com), [www.ikilimo.org](http://www.ikilimo.org), [www.infonet-biovision.org](http://www.infonet-biovision.org), extension agents can give information to farmers on a variety of topics. A realization that farmers had diverse information needs depending on the crop or animal husbandry practise they were involved in also necessitated use of ICTs in extension. E-clinic forums were also launched as ways of assisting farmers to tackle pests and diseases on their farms. The multiplier effect was expected to accelerate the rate of information dissemination since farmers could easily share information from their mobile devices with other farmers.

### **Private developers and Public-Private Partnerships (PPPs)**

Meanwhile, a tech-savvy young generation of agri-preneurs also began to develop multiple apps and databases aimed at improving farm level productivity and enhancing profitability among farmers. Others still formed partnerships with the government in building capacities of extension officers and equipping them to offer e-extension services. Examples of applications developed include eGrowers, E-prod, Farm At Hand, Farm Drive, Farmis, iCow, Infonet-Biovision, Insyt, VirtualCity, UmatiCapital, Soko+ etc.. These provide information on a range of services and practices such as input supply, best practise for crop and animal husbandry, credit and money transfer facilities, market linkages to recording and tracking of expenses (CTA, 2017) allowing farmers to procure inputs in a timely manner, increase productivity, get ready market for produce and receive premium prices for their output. Organizations such as Catholic Relief Services (CRS) have partnered with government through the ministry of agriculture extension using the SMART skills and farmbook ICT tool. These are meant to help farmers boost productivity and turn their farming into profitable businesses.

### **Drawbacks of ICT integration in Extension service delivery**

While e-extension is a novel idea, several drawbacks have been noted to the use of ICTs in extension. Inadequate information technology resources, inadequate ICT infrastructure, rising cost of electricity, frequent blackouts have been cited as some of the constraints limiting the use of ICTs by agricultural extension workers (Deichmann *et al.*, 2016). Nakasone and Torero (2016) found that use of ICTs for development is constrained by network coverage, content (appropriateness and usefulness of the information provided), and capacity of farmers and extension workers to use new technology. Socioeconomic factors such as gender, age, and education level of extension officers also play an important role in information technology use and adoption by both extension officers and the farmers.

Additionally, the e-extension programme initiated by the Kenyan government has been

stifled by county politics leading to underfunded and demoralised workers and unreached farmers.

## Conclusion

While there is a hunger for extension information among Kenyan farmers, extension workers are ill-equipped to reach them due to poor infrastructure and funding mechanisms. Large worker to farmer ratios also pose a big challenge. E-extension offers a great opportunity to eliminate many problems associated with face to face extension. The rolling out of the programme in 2014 is a positive step in this direction. However, County governments must train and equip extension officers with skills and equipment to offer these services. This will play a significant role in improvement of food and nutritional security in Africa.

## Acknowledgement

This paper is a contribution to the 2018 Sixth African Higher Education Week and RUFORUM Biennial Conference.

## References

- CTA. 2015. Facilitating change in agricultural value chains with app services. August 2015, ICT Update, Issue 80. <http://ictupdate.cta.int>
- CTA. 2017. Government-supported e-extension. June 2017, ICT Update, Issue 85. <http://ictupdate.cta.int>
- Deichmann, U., Goyal, A. and Mishra, D. 2016. Will digital technologies transform agriculture in developing countries?. *Agricultural Economics* 47 (S1): 21-33.
- Nakasone, E. and Torero, M. 2016. A text message away: ICTs as a tool to improve food security. *Agricultural Economics* 47 (S1): 49-59.
- Odongo, D. 2013. Agricultural Information Access among Smallholder Farmers: Comparative Assessment of Peri-Urban and Rural Settings in Kenya. *Agricultural Information Worldwide* 6: 133-137.
- Sanga, C., Mussa, M., Tumbo, S., Mlozi, M. R. Muhichel, L. and Haug, R. 2014. On the development of the mobile based agricultural extension system in Tanzania: A technological perspective. *International Journal of Computing and ICT Research* 8 (1): 49-67. Retrieved from <http://ijcir.mak.ac.ug/volume8-number1/article5.pdf>
- World Bank. 2011. Connecting smallholders to ICT in agriculture connecting smallholders to knowledge, networks and institutions. World Bank, (64605), 428.
- Zossou, E., Van Mele, P., Vodouhe, S.D. and Wanvoeke, J. 2009a. The power of video to trigger innovation: Rice processing in Central Benin. *International Journal of Agricultural Sustainability* 7 (2): 119–129.