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Presenter Information

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Accelerate scaling up forage intensification using novel digital extension approach in Kenya

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Abstract

Wide scale adoption of diverse forages improves livestock productivity and farmers welfare. However, limited access to information and knowledge on forage production results in slow adoption in Kenya. There is need to enhance information and knowledge exchange among farming communities for efficient and effective adoption and decision-making. An inter-institutional pilot project was initiated in 2017 to scale-up forages in Kenya using a novel extension approach - the village knowledge centre (VKC). A VKC is an information and communication technology (ICT) digital platform-based linking farmers through smart phones and social media as a conduit for faster and effective information and knowledge. This paper shares the experiences of VKC intervention to scale up *Urochloa* grass technology among smallholder farmers for livestock productivity. Through the VKC support there has been increased access of information and knowledge on *Urochloa* grass management, conservation and livestock feeding. Approximately 702 farmers out of which 28% were women visited the VKC to seek information on *Urochloa* grass from May 2018 to May 2020. It has trained 22 lead farmers on the establishment and management of *Urochloa* grass. The VKC has created two WhatsApp groups for networking among farmers with over 330 members. Between September 2018 and May 2020, the groups shared 2550 messages on *Urochloa* management, conservation, and livestock feeding with other farmers in their communities. Additionally, the VKC has improved availability of *Urochloa* grass seeds to farmers. Over 530 farmers received the seeds through the VKC, while 500 made request though mobile phone Short Message Services (SMS) and were supplied using courier services. It was evident that VKC intervention has not only improved the adoption rate, but also led to increased forage productivity and higher income for farmers. There is a need to continue using tools such as the VKC in the dissemination of information on *Urochloa* grass and explore suitable funding for sustainability of the centre after the end of the project.

Key words: Extension and advisory services, information and communication technology, smallholder farmers, *Urochloa* grass, village knowledge centre, Kenya.

Introduction

Information access among farming community is widely acknowledged as one of the critical factors for efficient and effective agricultural adoption decision-making (Birkhaeuser et al. 1991). However, there is limited access and exchange of information on good agricultural practices to enhance forage production among smallholder farmers in Kenya (Kidake et al. 2016). The dissemination of information on agriculture is skewed to food grains production while information on forages for livestock production is not regarded as a priority and as a result, adoption of forages is largely slow. Recent evaluation studies have identified high yielding and nutritious forages such as *Urochloa* grass but integration in the local farming system is limited. Wide scale adoption of forage intensification can improve livestock productivity and farmers income and welfare. Forages production is knowledge intensive, hence, effective demand based supply of knowledge and skills are necessary for management (Wambugu et al. 2011). Consensus exists that extension and advisory services (EAS) increases farmers' knowledge and assists them to improve farm management practices (Feder et al. 2004), and thereby contribute to successful technology transfer.

Furthermore, EAS play an important role in improving the information exchange between scientists, farmers and other stakeholders (Anderson and Feder 2007; Birkhaeuser et al. 1991).

Since 2010 when a new constitution was promulgated leading to devolution of extension services, there has been a decline in government funded extension services resulting in poor delivery of agricultural information in Kenya. This has resulted in poor logistical support for field staff and ineffective agricultural research-extension linkage thus hindering timely access of information to farmers. The high extension officer to farmer ratio, which averages 1:1000, compared to FAO recommended ratio of 1:400 compounded the problem (Manfre and Nordehn 2013). Consequently, there is a need to explore innovative approaches to accelerate scaling up forages to farmers. Access of information and communication technologies (ICT) offers a great opportunity in facilitating the flow of information and knowledge at reduced cost (Aker, 2011). Owing to the above challenges that slows down the adoption of forages in Kenya an inter-institutional project was initiated in 2017 to explore the effectiveness of using a novel extension approach - the village knowledge centre (VKC) in the upscaling forages technologies. In addressing the concept of scaling, we refer to reaching a greater number of people over time. The objective of this paper is to share the experiences on application of VKC in up-scaling *Urochloa* grass technology among smallholder farmers for livestock productivity in Kenya.

Overview of Village Knowledge Centre

A VKC is a ICT digital platform-based linking farmers through smart phones and social media as a conduit for faster and effective information and knowledge exchange. It has the potential to bridge the knowledge gaps, improve gender balance in agriculture extension, and improve their livelihoods and those of their households. A VKC that is gender sensitive can be effective tools to empower the community with timely knowledge on various dimensions of agriculture and livestock, including, inputs, marketing and rural development. The VKC concept was developed and implemented in India in 1980 and since then it has been used successfully to disseminate technologies to millions of smallholder farmers.

Methods and study Site

A pilot VKC was established in Kangundo shopping centre due to its strategic location as headquarter of Kangundo sub county and major trading centre for crops and livestock. Kangundo in one of the eight sub counties of Machakos county. Machakos county lies between latitudes 0° 45' and 1° 31' South and longitudes 36° 45' and 37° 45' East. It covers an area of 177 km² with about 22,000 households engaged in mixed crop-livestock production out of which 6,000 households are involved in commercial dairy farming. The dairy cattle are kept mainly under stall-feeding where feeds are delivered. Napier grass is the major forage cultivated for livestock. Seasonal shortfall of feed resources is common due to frequent drought and erratic rainfall. The government mainly provides extension and advisory services (EASs) but because of limited budgetary allocation to the agricultural sector, the numbers of extension officers are few with limited coverage and low effectiveness. The VKC thus complements the work of local EAS and does not compete with them. It generates knowledge based on farmers demand on a regular basis.

Operation of Village Knowledge Centre

The VKC was jointly established by Kangundo Constituency Development Funds office and local community in May 2018 through InnovAfrica project. The centre is equipped with ICT digital tools such as computers, internet connectivity, web camera, micro-phones, voice recorder, phone and public address systems. Local project staff is responsible for running the VKC under a management committee composed of different stakeholders from the local community. The VKC maintains a database on *Urochloa* grass-dairy value chain being tested/scaled up by InnovAfrica project and other crops and livestock technologies developed by Kenya Agricultural & Livestock Research Organization (KALRO). The VKC has created two WhatsApp groups, Grow Brachiaria Group and Grow Brachiaria Group2 and mobile phone Short Message Services (SMS) for networking among farmers. Other dissemination avenues include notice

boards, leaflets, posters, brochures and public address system. The centre is also involved in capacity building through training and awareness creation on new crops and livestock technologies and practices.

Results and discussion

Dissemination of information

Approximately 702 people out of which 28% were women visited the VKC from May 2018 to May 2020 (Figure 1). The visitors included farmers, extension agents from the public sector and non-governmental organization and other stakeholders. About 49% of visitors to the VKC were over 50 years old and slightly over 81% visited to obtain information on *Urochloa* grass. The VKC trained 22 farmers on the establishment and management of *Urochloa* grass production. About 140 farmers from neighbouring villages were sensitised on various services offered by the VKC through open day and in chiefs' meetings.

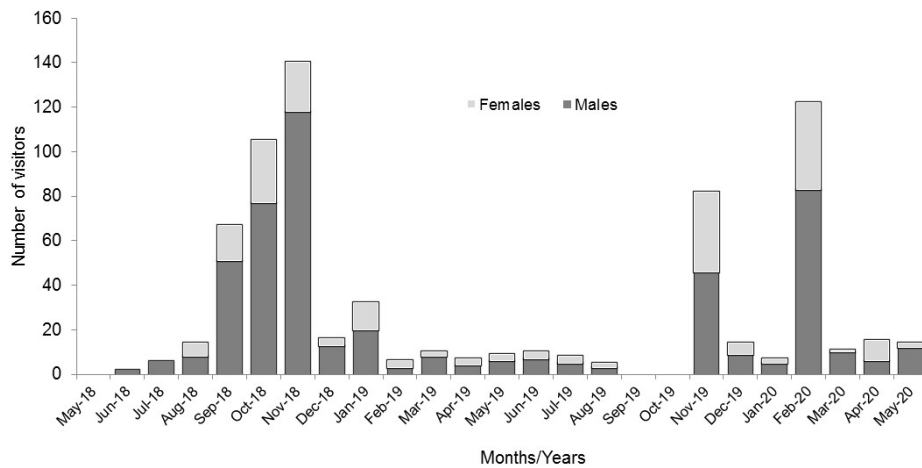


Figure 1. Number of visitors to the Village Knowledge Centre from May 2018 to May 2020 in Kangundo, Kenya

The VKC has significantly increased access to ICT based agricultural EASs and networking through connecting farmers to WhatsApp group (Figure 2). The WhatsApp groups, ‘Grow Brachiaria Grass’ and Grow Brachiaria Grass2 have a combined total of over 330 members. The groups consists of farmers, extension workers, scientists and other key actors along the *Urochloa*-dairy value chain. By May 2020, the groups had shared 2550 messages on *Urochloa* management, conservation, and livestock feeding.

Additionally, the VKC has improved availability of *Urochloa* grass seeds to farmers. Over 530 farmers made requests and were supplied with the seeds through the VKC while approximately 500 made requests through mobile phone SMS and were supplied through courier services.

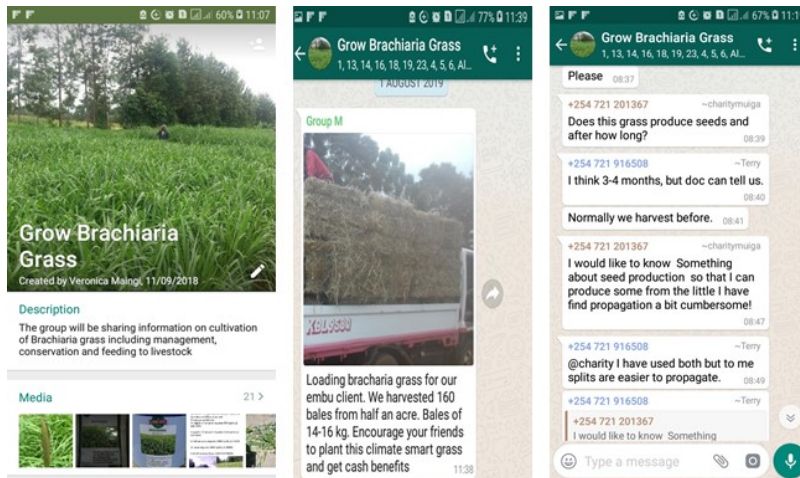


Figure 2. Screenshot of exchanges on WhatsApp groups, Kenya

Lessons learnt on VKC

- There is a good potential for scaling up technologies using VKC because it provides advice tailored to the audience demand in a timely manner.
- The VKC can complement the public extension worker in areas they are unable to reach farmers effectively due to their low numbers.
- The VKC is able to reach a large number of farmers within a short period through its digital platform. There is increased interest among different stakeholders including government departments on VKC relevance and needs.

Challenges of Village Knowledge centre

Some constraints that hinder farmers from making best use of the ICT services from the VKC include:

- Socioeconomic factors such as low education level of farmers' limits access of information on technology use.
- The ICT infrastructure is inadequate with low network coverage and weak internet connectivity for some of the mobile service providers.
- The rising costs of mobile phone services and limited access to electricity for recharging phones have been cited as a problem.
- There is limited capacity of farmers to use the new technology or applications such as WhatsApp due to lack of smart phones
- Sustainability of VKC beyond the project period is a major challenge as guaranteed funding for continuity have not been secured.

Conclusion

The study provided an insight on dissemination of EASs on *Urochloa* grass among smallholder farmers using VKC. Evidence indicates that within a relatively short period the VKC has increased farmers' access to seeds, information and knowledge on *Urochloa* cultivation, management and feeding to livestock thus considerably accelerating the scaling up of the grass. Nevertheless, there is need to continue using the VKC to disseminate information on *Urochloa* grass and explore suitable funding for sustainability of the centre after the end of the project, through public-private partnerships, increasing awareness and capacity building of youth , strengthening cooperation with EASs and improving infrastructure

Acknowledgements

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References

- Aker, J.C. 2011. Dial 'A' for agriculture: a review of information and communication technologies for agricultural extension in developing countries. *Agric. Econ.*, 42: 631-647.
- Anderson, J. R. & Feder, G. 2007. "Agricultural Extension," Handbook of Agricultural Economics. In: Robert E. and Prabhu, P. (eds.), *Handbook of Agricultural Economics*, 1(3), chapter 44, pp. 2343-2378, Elsevier.
- Birkhaeuser, D., Evenson, R.E. and Feder, G. 1991. "The economic impact of agricultural extension: a review." *Econ Dev & Cult Chng*, 39 (3): 607-650. doi:10.1086/451893.
- Feder, G., Murgai R, and Quizon, J. B. 2004. 'The Acquisition and diffusion of knowledge: The case of pest management training in farmer field schools, Indonesia', *J. Agric. Econ.*, 55 (2): 221-243.
- Kidake, B. K., Manyeki, J. K., Kubasu, D. and Mnene, W. N. 2016. Promotion of range pasture and fodder production among the pastoral and agro-pastoral communities in Kenyan rangelands: Experiences and lessons learnt. *Livest. Res. Rural Dev. Volume 28, Article #151*. Retrieved August 1, 2020, from <http://www.lrrd.org/lrrd28/8/kida28151.html>
- Manfre, C. and Nordehn, C. 2013. Exploring the promise of information and communication technologies for women farmers in Kenya (MEAS Case Study # 4, August 2013). Washington, DC: MEAS/USAID.
- Wambugu, C., Place, F. and Franzel, S. 2011. Research, development and scaling-up the adoption of fodder shrub innovations in East Africa. *Int. J. of Agric. Sust.*, 9 (1): 100-109, DOI: 10.3763/ijas.2010.0562.