Tropentag 2023
September 20-22, 2023
Conference on International Research on Food Security, Natural Resource Management and Rural Development
organised by the Leibniz Centre for Agricultural Landscape Research (ZALF), Germany in cooperation with Humboldt-Universität zu Berlin, Germany

Using video technology as an agricultural extension tool: a casestudy on climate-smart agriculture in Uganda

JAMES BILLY KASULE[1], CHRISTINE BOSCH[2]

[1]*University of Hohenheim, Hans-Ruthenberg-Institute, Germany*
[2]*University of Hohenheim, Inst. of Agric. Sci. in the Tropics (Hans-Ruthenberg-Institute), Germany*

Abstract

Videos can be used successfully in agricultural extension, particularly in reaching marginalized, resource-poor farmers mobilized in groups, particularly women, youth, and those with little prior knowledge of new practices and technologies. While there is a renewed interest in videos, there is a knowledge gap concerning farmers' perception of such videos, especially of female farmers.

The study aimed to understand how farmers in Uganda perceive video technology as an agricultural extension tool for Climate Smart Agriculture (CSA) practices and assess the extension agents' perception of using videos in extension services. The qualitative data collected resulted from the BMZ-funded project Reaching Smallholder Women Farmers with Information Services and Resilience Strategies to Respond to Climate Change in four districts in the Central Region of Uganda. The study comprised 1443 female and 770 male smallholder farmers who watched videos demonstrating soil and water management, integrated pest management, poultry and piggery management CSA practices, and 49 extension agents who were trained on the project's concept. From this study population, 111 female and 70 male smallholder farmers who watched videos demonstrating Climate Smart Agriculture (CSA) practices were chosen randomly to participate in the FGDs, and 6 extension agents were interviewed using semi-structured questionnaires.

The study findings revealed that smallholder women farmers found it motivating and easy to learn about CSA practices through videos and related discussions with extension agents. Extension agents perceived that CSA video technology could complement other existing extension approaches. On the other hand, the main challenges included unwillingness to invest in short agricultural videos, inadequate video infrastructure in rural areas, and technical know-how on using videos among farmers and extension agents.

To complement extension services, the study recommends investing more in creating and disseminating agricultural videos by the relevant stakeholders in Uganda's agricultural sector. Additional investments could include enhancing the quality of agricultural video production and messages, constructing video infrastructure in rural sub-counties, and enhancing the capacity of extension agents who use agricultural video technologies.

Keywords: Agricultural extension, climate-smart agriculture practices, female farmers, Uganda, videos

Corresponding author email: james.billk93@gmail.com

Introduction

Agricultural extension systems worldwide face numerous challenges, including political, capacity, and outreach constraints. These challenges are compounded by factors such as the high cost of reaching dispersed farmers and their limited willingness to pay for extension services.

Furthermore, the marginalisation of women in advisory services has been a persistent issue in many extension systems. Despite efforts to reform and invest in extension services, reaching women and impoverished smallholder farmers remains a formidable task. The absence of complementary services like access to rural financial systems further impedes the adoption of agricultural practices. Thus, there is a pressing need for alternative approaches to agricultural extension (Anderson & Feder, 2004; Graeub et al., 2016; Beevi et al., 2018; Meinzen-Dick et al., 2010; Mudege et al., 2015; Quaye et al., 2019; Benin et al., 2007; Rwamigisa et al., 2017).

In response to these challenges, innovative models such as the village-based agro-dealers and advisors' model (VBA) have emerged in various African countries. These models aim to bridge the gap between farmers and agricultural service providers. Additionally, the integration of digital tools into agricultural extension systems has become increasingly prevalent, leveraging mass media, telephone communication, smartphone-based platforms, and interactive voice response (IVR) technology to overcome geographical constraints and improve information dissemination (Agrilinks, 2021; Ragasa, 2020; Aker, 2011; Zoundji et al., 2017; Bell, 2015; Munthali et al., 2018; Ortiz-Crespo et al., 2021).

A particular focus of this study is the use of videos as a tool for agricultural extension. Videos have proven effective in facilitating farmer-to-farmer learning, motivating practice adoption, generating innovation, and activating latent knowledge. They offer a cost-effective alternative to traditional extension services, particularly in challenging contexts where changing farmers' beliefs is not the primary goal. Videos have been employed not only to train farmers but also to educate extension agents, showing promise in increasing access to extension services for women, with the potential for cost reduction through scaling (van Campenhout et al., 2021; Zossou et al., 2009; van Campenhout et al., 2017; Okry et al., 2014; Abate et al., 2023).

This study addresses the limited body of literature on the use of videos in agricultural extension, particularly concerning their effectiveness in reaching women farmers with agricultural information. It investigates a pilot study in which videos on climate-smart agricultural (CSA) practices were shown to male and female farmers in Uganda in collaboration with the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) and the public extension service. The unique characteristics of the extension network and its diverse target groups provide an opportunity to compare the use of videos and their integration into existing extension methods. Additionally, the study addresses gender inequalities within CSA, recognizing that women may have different perceptions of climate change and adaptation strategies (Brisebois et al., 2022; Bernier et al., 2015; Bryan et al., 2013).

The study's context, design, and data collection were conducted as part of the project "Reaching Smallholder Women with Information Services and Resilience Strategies to Respond to Climate Change" by the International Food Policy Research Institute (IFPRI) in Kenya, Uganda, and India. The project aimed to enhance climate change resilience, address gendered yield gaps, mitigate natural resource degradation, and improve food security among women in smallholder farm households. The project's implementation involved a multi-stage approach, including baseline and end-line surveys, the development and dissemination of CSA practice videos, and engagement with local extension services in Uganda. The choice of CSA practices and the targeted approach aimed to address specific gender-responsive needs and preferences of smallholder women farmers in these regions (Bernier et al., 2015).

Material and Methods

The study involved seventeen villages selected based on the districts where the video rollout was carried out. Farmers were randomly selected from the list of those who had participated in the

video rollout phase. In villages with many farmers, every third male and female farmer from the list was selected. In villages with fewer farmers, all farmers were asked to participate. A total of 111 female farmers and 60 male farmers were selected. Data was collected through focus group discussions, key informant interviews, and participant observation. The study aimed to understand respondents' awareness and knowledge of general CSA practices, the specific practices the videos provided, and their perceptions of promoted CSA practices. Additionally, respondents evaluated the use of videos as an extension tool.

Results and Discussion

Farmers' perceptions and adoption of the CSA practices disseminated in the CSA video technologies.

Farmers who watched CSA practices adopted various practices, such as soil bund construction, pruning methods, and animal shelter construction. These practices were perceived to be engaging, practical, and novel. Others were motivated by the need to improve agricultural techniques and output. Respondents acknowledged the need to increase household earnings and the usefulness of CSA video information. This aligns with Isiaka's (2007) research on using videos to teach rural children about agriculture, which found videos as successful as real-life demonstrations in increasing adoption. In Benin, over 95% of farmers who viewed rice parboiling videos embraced various good practices, compared to 50% who attended training workshops (Zossou, et al., 2009a). CSA videos helped farmers absorb the content, as seeing something done helps it stick in their memories.

Perceptions of extension agents on CSA videos technologies

Most extension agents found the CSA videos to be excellent. Because they were produced in the local languages and used fellow women farmers during their production, they were easily understandable and helpful to female farmers. This fits with Cole et al. (2016), who found that videos reduced farmers' knowledge gaps and made agricultural extension work better when farmers received information and help that was timely, relevant, and easy to use. However, Westermann et al. (2015) say that farmers with low literacy levels may need help understanding CSA practices due to their complexity and knowledge-intensive nature.

Conclusions and Outlook

This study used video to reach out to women farmers with agricultural information, considering their perspectives and including many stakeholders. The video intervention was created with local circumstances in mind, such as language and agricultural practices, and was intended to meet the needs of farmers. The study found that when latent knowledge was awakened, farmers' aspirations were ignited, and women's preferences were addressed, videos were more effective. Videos may be more appropriate for existing practices and developing knowledge, but other extension methods may be more appropriate for new practices.

However, there is an opportunity for improvement in video utilization, such as specialized content and public agricultural extension officers' collaboration. The video intervention increased farmers' access to agricultural information, inspiring them to improve their practices. More research on the programmes' resilience, welfare results, and cost-effectiveness is suggested. Furthermore, the study did not address the possibility of rising inequalities among farm households, as households that are not members of farmer organizations, are less connected, or lack financial capacity may be excluded.

The study contributes to the literature by investigating the gendered perceptions of farmers and extension stakeholders in Uganda regarding video-based agricultural extension and its potential application in agricultural advising services. Based on the research findings, it has been determined that videos possess significant potential as supplementary tools for extension systems that are private, NGO-based, or public-actor-based.

References

Abate, G. T., Bernard, T., Makhija, S., & Spielman, D. J. (2023). Accelerating technical change through ICT: Evidence from a video-mediated extension experiment in Ethiopia. *World Development*, *161*, 106089. https://doi.org/10.1016/j.worlddev.2022.106089

Agrilinks. (2021). *Village-Based Advisors Deliver Critical Extension Services to Smallholder Farmers*. https://www.agrilinks.org/post/village-based-advisors-deliver-critical-extension-services-smallholder-farmers

Aker, J. C. (2011). Dial "A" for agriculture: a review of information and communication technologies for agricultural extension in developing countries. *Agricultural Economics*, *42*(6), 631–647. https://doi.org/10.1111/j.1574-0862.2011.00545.x

Anderson, J. R., & Feder, G. (2004). Agricultural Extension: Good Intentions and Hard Realities. *The World Bank Research Observer*, *19*(1). https://doi.org/10.1093/wbro/lkh013

Beevi, C. N. A., Wason, M., Padaria, R. N., & Singh, P. (2018). Gender sensitivity in agricultural extension. *Commentary Current Science*, *115*(6). https://doi.org/10.18520/cs/v115/i6/1035-1036

Bell, M. (2015). *Information and Communication Technologies for Agricultural Extension and Advisory Services: ICT – Powering Behavior Change for a Brighter Agricultural Future* (MEAS Brief 5-14).

Benin, S., Nkonya, E., Okecho, G., Pender, J., Nahdy, S., Mugarura, S., Kato, E., & Kayobyo, G. (2007). Assessing the Impact of the National Agricultural Advisory Services (NAADS) in the Uganda Rural Livelihoods. *IFPRI Discussion Paper 00724*. https://ebrary.ifpri.org/utils/getfile/collection/p15738coll2/id/125292/filename/125293.pdf

Bernier, Q., Meinzen-Dick, R. S., Kristjanson, P. M., Haglund, E., Kovarik, C., Bryan, E., Ringler, C., & Silvestri, S. (2015). *Gender and Institutional Aspects of Climate-Smart Agricultural Practices: Evidence from Kenya*. CGIAR Research Program on Climate Change, Agriculture and Food Security. https://cgspace.cgiar.org/handle/10568/65680

Birner, R., Davis, K., Pender, J., Nkonya, E., Ponniah, Anandajayasekeram, Ekboir, J., Mbabu, A., Spielman, D. J., Horna, D., Benin, S., & Cohen, M. (2009). From Best Practice to Best Fit: A Framework for Designing and Analyzing Pluralistic Agricultural Advisory Services Worldwide, *15:4*, 341–355. https://doi.org/10.1080/13892240903309595

Brisebois, A., Eriksen, S. H., & Crane, T. A. (2022). The Politics of Governing Resilience: Gendered Dimensions of Climate-Smart Agriculture in Kenya. *Frontiers in Climate*, *4*, Article 864292. https://doi.org/10.3389/fclim.2022.864292

Cole SA, Fernando AN (2016). *'Mobile'izing Agricultural Advice: Technology Adoption, Diffusion and Sustainability*. Harvard Business School; 13-047. Available from: https://www.ideas.repec.org/p/hbs/wpaper/13-047.html

Isiaka, B. (2007). *Effectiveness of video as an instructional medium in teaching rural children agricultural and environmental sciences.* International Journal of Education and Development using ICT, 3(3), 105–115.

Meinzen-Dick, R, Quisumbing, A, Behrman, J, Biermayr-Jenzano, P, Wilde, V, Noordeloos, M, Beintema, & N. (2010). *Engendering agricultural research*. Washington, DC: International Food Policy Research Institute. https://www.wocan.org/sites/default/files/engendering%20agricultural%20research.pdf

Mudege, N. N., Chevo, T., Nyekanyeka, T., Kapalasa, E., & Demo, P. (2015). Gender Norms and Access to Extension Services and Training among Potato Farmers in Dedza and Ntcheu in Malawi. *The Journal of Agricultural Education and Extension*, *22*(3), 291–305. https://doi.org/10.1080/1389224X.2015.1038282

Munthali, N., Leeuwis, C., van Paassen, A., Lie, R., Asare, R., van Lammeren, R., & Schut, M. (2018). Innovation intermediation in a digital age: Comparing public and private new-ICT platforms for agricultural extension in Ghana. *NJAS: Wageningen Journal of Life Sciences*, *86-87*(1), 64–76. https://doi.org/10.1016/j.njas.2018.05.001

Okry, F., van Mele, P., & Houinsou, F. (2014). Forging New Partnerships: Lessons from the Dissemination of Agricultural Training Videos in Benin. *The Journal of Agricultural Education and Extension*, *20*(1), 27–47. https://doi.org/10.1080/1389224X.2013.783495

Ortiz-Crespo, B., Steinke, J., Quirós, C. F., van de Gevel, J., Daudi, H., Gaspar Mgimiloko, M., & van Etten, J. (2021). User-centred design of a digital advisory service: enhancing public agricultural extension for sustainable intensification in Tanzania. *International Journal of Agricultural Sustainability*, *19*(5-6), 566–582. https://doi.org/10.1080/14735903.2020.1720474

Quaye, W., Fuseini, M., Boadu, P., & Asafu-Adjaye, N. Y. (2019). Bridging the gender gap in agricultural development through gender responsive extension and rural advisory services delivery in Ghana. *Journal of Gender Studies*, *28*(2), 185–203. https://doi.org/10.1080/09589236.2017.1419941

Ragasa, C. (2020). Effectiveness of the lead farmer approach in agricultural extension service provision: Nationally representative panel data analysis in Malawi. *Land Use Policy*, *99*, 104966. https://doi.org/10.1016/j.landusepol.2020.104966

Rwamigisa, P. B., Birner, R., Mangheni, M. N., & Semana, A. (2017). How to promote institutional reforms in the agricultural sector? A case study of Uganda's National Agricultural Advisory Services (NAADS). *Development Policy Review*, *36*(5), 607–627. https://doi.org/10.1111/dpr.12318

van Campenhout, B., Spielman, D. J., & Lecoutere, E. (2021). Information and Communication Technologies to Provide Agricultural Advice to Smallholder Farmers: Experimental Evidence from Uganda. *American Journal of Agricultural Economics*, *103*(1), 317–337. https://doi.org/10.1002/ajae.12089

van Campenhout, B., Vandevelde, S., Walukano, W., & van Asten, P. (2017). Agricultural Extension Messages Using Video on Portable Devices Increased Knowledge about Seed Selection, Storage and Handling among Smallholder Potato Farmers in Southwestern Uganda. *PloS One*, *12*(1), e0169557. https://doi.org/10.1371/journal.pone.0169557

Westermann, O., Thornton, P., & Förch, W. (2015). *Reaching more farmers: Innovative approaches to scaling up climate-smart agriculture.* In CCAFS Working Paper (Issue 135). CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS). https://cgspace.cgiar.org/handle/10568/68403

Zossou, E., van Mele, P., Vodouhe, S. D., & Wanvoeke, J. (2009). The power of video to trigger innovation: rice processing in central Benin. *International Journal of Agricultural Sustainability*, *7*(2), 119–129. https://doi.org/10.3763/ijas.2009.0438

Zoundji, G. C., Vodouhe, S. D., Okry, F., Bentley, J. W., & Tossou, R. C. (2017). Beyond Striga Management: Learning Videos Enhanced Farmers' Knowledge on Climate-Smart Agriculture in Mali. *Sustainable Agriculture Research*, *7*(1), 80. https://doi.org/10.5539/sar.v7n1p80