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Access to and use of video-mediated agricultural information: lessons from the case of Sasakawa global 2000 rice videos in Uganda

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ABSTRACT

Video can be effectively used to provide information to small scale farmers. However, its effectiveness to enhance access to and use of information depends on certain organizational, social, economic and technical factors. This cross-sectional study assessed these organizational, social, economic and technical factors that affect access to and use of agricultural information from the perspective of video participants, using Sasakawa Global 2000 as a case. The study involved conducting six focus group discussions (FGDs) with 48 purposively selected video participants while 100 video participants were selected by census from the registers of the association for individual interviews. Geographical Positioning System (GPS) mapping was used to establish the video catchment areas. While content analysis was applied for qualitative data, quantitative data were analysed using SPSS 18.0 version. ArcGIS version 10.1 software was used to generate the maps. Findings indicate that majority (98%) of the farmers interviewed regarded farming as their major economic activity. Majority of the video participants (94%) approved the use of video for enhancing access by farmers to useful agricultural information. However, our findings revealed that more men (71%) attended the video shows than their female counterparts (29%), because they were favoured by the timing of the video shows which are often screened late at night. About 53% of the video participants travelled 1.5km to attend the video shows with distant video participants (3%) traveling about 7km. The video participants initially got to know about the video shows through their group leaders while others got to know about them by surprise. Use of more technical language in the video and the costs involved in implementing the acquired information respectively limited comprehension of the messages and utilization of the learnt knowledge. Overall, if the timing, location and awareness creation about video events are not addressed, it means that largely men and nearby farmers will continue to attend and benefit from the video shows. Also, if the issue of technical language is not addressed, use of the learnt knowledge is likely to continue being problematic. Thus, the modalities suggested by the farmers with particular efforts on documenting local farmers in their local languages, intensifying awareness creation through local channels, adjusting the timing of video shows and operating them on a rotational basis are vital if video is to enhance access and use of information by farmers.

Key words: Access, Africa, participation, smallholder farmer, Uganda, video-mediated extension

RÉSUMÉ

Les vidéos peuvent être utilisées de façon efficace pour fournir des informations aux petits agriculteurs. Cependant, leur efficacité dans l'amélioration de l'accès et l'utilisation de l'information dépend de certains facteurs organisationnels, sociaux, économiques et techniques. Cette étude transversale a évalué ces facteurs organisationnels, sociaux, économiques et techniques qui influencent l'accès et l'utilisation de l'information agricole du point de vue des participants, en utilisant Sasakawa Global 2000 comme cas. Dans cette étude nous avons conduit six discussions de groupes avec 48 télé-participants sélectionnés, tandis que 100 télé-participants ont été sélectionnés à partir des registres de l'association pour des entrevues individuelles. La cartographie par le système de positionnement géographique a été utilisée pour montrer les zones capturées. Une analyse qualitative (de contenu) a été faite sur les données qualitatives alors que les données quantitatives ont été analysées en utilisant SPSS 18.0. Le logiciel

ArcGIS version 10.1 a été utilisé pour générer les cartes. Les résultats indiquent que la majorité (98%) des agriculteurs interrogés considère l'agriculture comme l'activité économique principale. La majorité des télé-participants (94%) ont approuvé l'utilisation de la vidéo pour améliorer l'accès aux informations agricoles utiles. Cependant, nos résultats ont révélé que plus d'hommes (71%) ont assisté aux spectacles vidéo que leurs homologues femmes (29%), parce qu'ils ont été favorisés par le calendrier des émissions vidéo qui sont souvent filtrées tard dans la nuit. Environ 53% des participants vidéo ont parcouru 1,5 km pour assister aux spectacles vidéo avec des participants éloignés (3%) parcourant environ 7 km. Les participants ont d'abord eu l'information sur les spectacles vidéo à travers leurs chefs de groupe alors que d'autres les ont eu par surprise. Le langage plus technique utilisé dans la vidéo et les coûts liés à la mise en œuvre de l'information acquise, ont affecté négativement la compréhension des messages et l'utilisation des connaissances acquises. Dans l'ensemble, si le timing, la localisation et la sensibilisation sur les événements vidéo ne sont pas abordés, les hommes en grande partie, et les agriculteurs continueront à assister et bénéficier des émissions vidéo. De plus, si la question du langage (technique) n'est pas abordée, l'utilisation des connaissances acquises continuerait à être problématique. Les modalités suggérées par les agriculteurs ainsi que les efforts particuliers pour documenter les agriculteurs locaux dans leurs langues locales, l'intensification de la sensibilisation par les chaînes locales, ajustement du calendrier des spectacles vidéo et leur utilisation sur une base de rotation sont importants si la vidéo est destinée à améliorer l'accès et l'utilisation des informations par les agriculteurs.

Mots clés: Accès, Afrique, participation, petit agriculteur, Ouganda, vidéo-médiatisée

INTRODUCTION

Since the 1990s, there has been several endeavours globally to apply Information and Communication Technologies (ICTs) to enhance access to and use of agricultural information especially in the developing countries (Van Mele *et al.*, 2010a; Van Mele *et al.*, 2010b; Asenso-Okyere and Mekonnen, 2012). This is a result of lack of enough extension workers in the world to visit all the farmers to provide information when they need it (Bentley *et al.*, 2015b). In Uganda, for example, one extension worker serves about 3189 farmers (Danielsen *et al.*, 2015). In addition, the extension workers are not well facilitated to reach the sparsely distributed and uncoordinated farmers. Thus, there is need for appropriate approaches that enhance access to information (Van Mele *et al.*, 2010b; Danielsen *et al.*, 2015). ICTs have the potential to enhance access to timely, on-the-spot agricultural information to smallholder farmers (Bertus *et al.*, 2010; Sseguya *et al.*, 2012; Bentley *et al.*, 2015a) but the opinion about their appropriateness tend to differ (Van Mele *et al.*, 2010b). Farmer-to-farmer training videos are among the high potential ICTs for providing access to information in a range of agricultural domains (improving productivity as well as value addition and reducing post-harvest losses). However, the appropriateness of ICTs especially video in terms of its effectiveness in enhancing

access to and use of information by farmers is not yet clear regarding the organizational, social, economic and technical factors. The privatization of extension service delivery in Uganda initiated 15 years ago proved ineffective in transforming the smallholder farmers leading to its disbandment in 2015. It is thus critical to determine appropriate approaches that foster access to information by smallholder farmers who depend on agriculture for both food and income security (Van Mele *et al.*, 2005; Bashaasha *et al.*, 2011; Bentley *et al.*, 2014). Bentley *et al.* (2015b) found out that if ICTs including video are well employed, they may reach many people including the rural poor, marginalized, women and the youth. However, heavy focus on ICTs (in this particular case videos) has been on ensuring distributing and showing farmer learning videos (Bentley *et al.*, 2015b). There is limited attention on the factors that affect the effectiveness of video in addressing challenges related to access and use of information by marginalized groups (Van Mele *et al.*, 2010b; Bentley *et al.*, 2015b), hence the focus of this paper.

Video-mediated Extension Approaches (VMEAs) aim at providing agricultural information with the intention of enhancing access to information as well as behavioural change of the smallholder farmers to be more effective and efficient.

Whether VMEA ensures access to and use of agricultural information by smallholder farmers is an assumption this study was set out to investigate with particular focus on the factors that are likely to influence its effectiveness. Since 2007, the Sasakawa Global 2000 (SG 2000), a Non-Government Organization (NGO) has piloted VMEA in 14 districts of Uganda: Kamwenge and Ntungamo (Western region); Mukono, Buikwe and Wakiso (Central region); Jinja, Kamuli, Namutumba and Tororo (Eastern region); and Lira, Dokolo, Apac, Oyam and Gulu (Northern region). Particularly, VMEA was piloted in Kamwenge district during the period 2007-2010 to promote access to dependable agricultural information mainly on practices in rice production. Here, farmers were brought together on predetermined and publicized dates, time and location to acquire relevant information on the practices involved in rice production (Bentley *et al.*, 2013; Tumwekwase, 2013). Bentley *et al.* (2014), Tumwekwase (2013) and Van Mele *et al.* (2005) have highlighted reliability, location, appropriateness and timing of video shows as key attributes influencing access to agricultural information. They pointed out that these attributes have implications on the access and use of information by farmers. Danielsen and Kelly (2010) cited similar criteria for measuring access to information in this case focusing on plant clinics. They also point out that affordability and feasibility of the advice are likely to affect the use of the acquired knowledge which is also a key attribute for assessing effectiveness of VMEA in enhancing use of the acquired information. Kamwenge district in western Uganda is where use of VMEA is reported to have been successful in enhancing access to agricultural information on rice production practices. Therefore, this paper analyses the factors that affect access and use of video-mediated agricultural information from the perspective of video participants drawing lessons from the case of Sasakawa Global 2000 rice videos in Kamwenge district in western Uganda. In this study, video participants were the farmers who attended, viewed and accessed the information from the video. Access refers to the ease with which farmers acquired agricultural information from the video to influence their rice production practices while use refers to the ease with which video participants were able to apply the learnt knowledge or practice.

RESEARCH METHODOLOGY

A cross-sectional study was conducted in Mahyoro sub-county in Kamwenge district, Uganda from August 2015 to February 2016. The district was selected for this study because SG 2000 showed videos there from 2007 to 2010 and this provided an opportunity for an assessment of how video enhanced access and use of information by smallholder farmers. The study employed a qualitative approach, relying mainly on group interviews of the smallholder rice farmers targeted by SG 2000 in the district. To gain deeper understanding of the nature of access and issues related to the use of information provided through VMEA, 100 video participants who were selected through census by taking all video participants in Mahyoro Rice Farmers Association (MARFA) register were contacted for information through individual interviews. In total, seventy one men and twenty nine women respectively were interviewed to gain their insights about the potential of VMEA in enhancing access to agricultural information (Table 1). In addition, Table 1 shows eight villages with their respective number of interviewees. Six Focus Group Discussions (FGDs) were conducted in purposefully selected eight villages with 48 randomly selected farmers from a list of 100 video participants that attended the video shows. Out of 48 FGD participants, 19 were men and 29 were women (Table 1). Six key informants from among the FG participants were also purposively selected for follow up to clarify some of the key issues that emerged in the focus group discussions regarding access to agricultural information.

Together with the Chairperson of Mahyoro Rice Farmers' Association (MARFA), the video participants were sorted following the attendance lists to avoid double selection. Following the MARFA registers, FG participants were selected by taking at least eight participants from each of the three villages with their respective Geographical Positioning Systems (GPS). The three villages were Karere (longitude 30.247, latitude -0.114), Kyendangara (longitude 30.247, latitude -0.103) and Kitomi (longitude 30.264, latitude -0.103). These three villages had higher number of video participants. The remaining five villages such as Rwetuma (longitude 30.288, latitude -0.09), Buhindagi (longitude 30.236, latitude -0.113), Kitionzi (longitude 30.280, latitude -0.087),

Katanga (longitude 30.261, latitude -0.082) and Burembo (longitude 30.295, latitude -0.079) indicated with superscript star had registered low attendance of video participants. The participants in these villages were purposively selected and combined to form one FGD to discuss the issues related to access and use of information. Two FGDs of eight participants each were conducted for Karere and Kyendangara villages respectively and one for Kitomi village. Notably, in each village that had many farmers who attended the video, a sampling frame was developed to allow for systematic random sampling where every second video participant was selected. The focus of the interviews was to understand how the organizational factors (e.g. distance, publicity and timing of video shows), the social factors (e.g. gender, education and age), economic factors (occupation and nature of agricultural enterprise) and the technical factors (e.g. language spoken, comprehension of key messages, applicability of information/practices and adaptations) influenced use of information delivered through VMEA.

In this study, the attributes for understanding the nature of access were adopted from Danielsen and Kelly (2010). These were the criteria developed to assess the potential of plant health clinics in providing access to plant health services by smallholder farmers. Among these included

publicity, timing, gender, location and feasibility of the advice. Similar attributes were used to inform the use of VMEA in providing access to information by smallholder farmers. We added other attributes including language used, age, education, occupation and nature of enterprises to fully assess the effectiveness of video in enhancing access and use of information. Content analysis was applied using themes aligned to the variables of interest, namely organizational, social, economic and technical factors influencing access to information from the videos as applied by SG 2000. Quantitative data were analyzed using SPSS 18.0 version to generate the percentages of video participants' opinions on access and use of agricultural information. Quotes and pictures were used to support the explanations from video participants. GPS coordinates were entered into ArcGIS version 10.1 software to generate maps for the video catchment area and distribution of participants.

FINDINGS

Organizational factors

Distance. Informants had diverse opinions regarding the distance which they travelled to the location where video shows were conducted. About 53% of the video participants travelled 1.5km to attend the video shows with the distant video participant travelling about 7km. While

Table 1. Number of FGD video participants per village

Village	Number of men	Number of women
FGD participants		
Rwetuma*	1	1
Buhindagi*	1	1
Kitonzi*	0	1
Burembo*	0	1
Katanga*	1	1
Kitomi	3	5
Karere	7	9
Kyendangara	6	10
Sub-total	19	29
Individual and key informants		
Individual interviews	71	29
Key informant interviews	4	2
Sub-total	75	31
Totals	94	60

FDGs (n=48); Individual interviews (n=100)

Source: FDGs, survey and key informants' interviews

Legend: FDGs = Focus Group Discussions

*Villages with low attendance of video participants combined to form one FGD

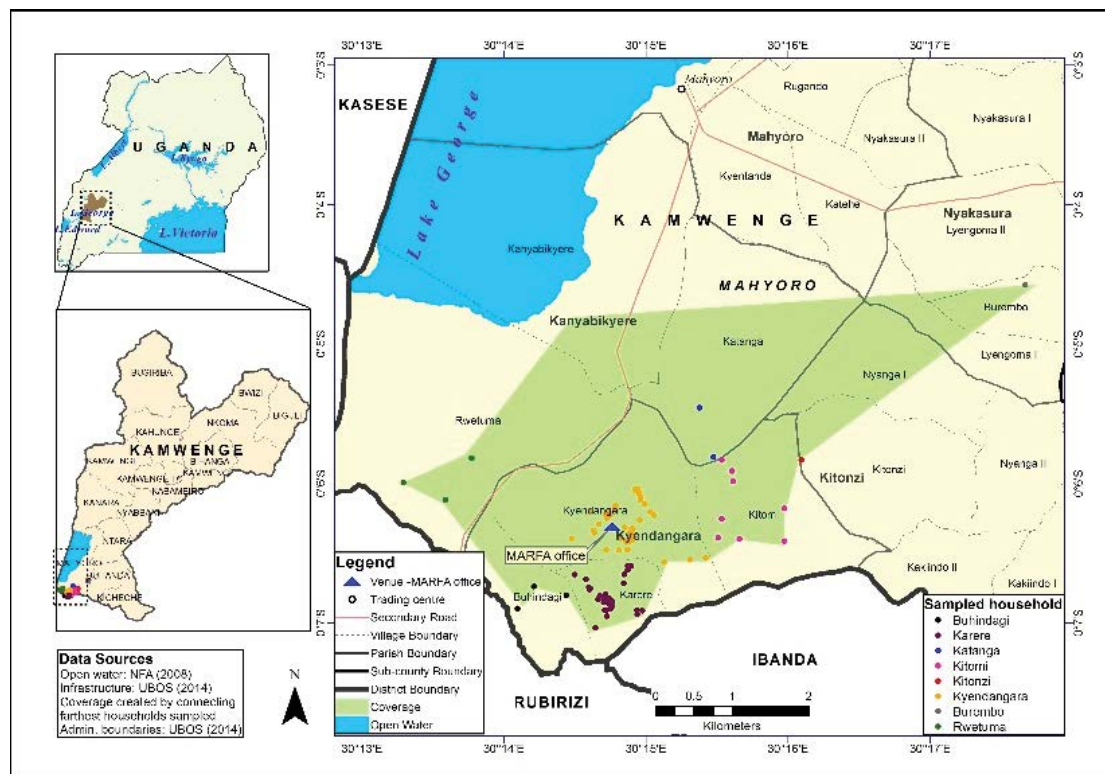


Figure 1. Video catchment areas and distribution of participants in Mahyoro sub-county, Kamwenge district

Kyendangara FG participants approved the distance as being walkable, the respondents from Rwetuma, Buhindagi, Kitonzi and Burembo regarded the location of the video shows as being distant from their homesteads. One of the furthest female video participant from Burembo village noted that it required her to travel 7km to the venue where the video was being shown despite lack of transport means. Furthermore, when this female farmer from the furthest village (Burembo) who had watched the video was asked during key informant interviews about what motivated her to do so, she noted that ‘because I was a vice chairperson of MARFA, I was compelled to go and attend the video shows. It would look funny for us the leaders to not watch the video, yet we were supposed to serve exemplary.’ On the contrary, the videos were well attended by Kyendangara farmers because they were located close to the video venue. For example, even old people from Kyendangara village found it easy to attend the video shows because they were able to walk the shortest distance of about quarter a kilometre (Old female video participant).

Regarding the spatial distribution (indicated by dots in Figure 1) of farmers, 97% of the farmers who watched the video came from the villages within Kyendangara parish where the video was being shown at MARFA office. The 3% of the farmers resided outside Kyendangara came from three distinguished parishes including Kanyabikyere, Kitonzi and Nyakasura. The few farmers from distant locations who watched the video were motivated by different reasons other than the urge for information from the video. Four of such from Rwetuma and Katanga villages indicated that they had gone to Kyendangara trading centre for leisure and the video show just got them there. Limited intensity of coverage of video in locations distant from the video venue seem to be explained by the inappropriate timing and the distance farmers were expected to travel to watch the video.

Principally, participants reported that distant farmers who attended mainly hired motor cycles while others used bicycles to get to the venue. Talking to some of the distant video participants from Kitomi and Rwetuma villages revealed that they came to watch the video to gain more knowledge about rice production while others particularly the youth regarded the video as source of entertainment. Distant informants recommended that rotating the

video shows in particular parishes or villages would provide an opportunity for easy access to video services as this would shorten the walkable distance on some days. Kitomi village FG participants also recommended that it would be easy for farmers to access video services if they were rotated within the farmer groups in their respective villages for more interactive sharing of experiences and learning among group members.

Publicity. Creation of awareness about the video events was cited by FG participants as an important organizational factor in providing prior information to individuals about when and where the video shows would take place. The FGDs revealed that two major ways were used by SG 2000 through MARFA chairperson to create awareness about the video shows: church announcements and writing letters to members. Sometimes, the letters were pinned in Kyendangara trading centre where the video would be shown. The chairperson during key informant interviews reported that the letters were used on the assumption that all people that passed by Kyendangara trading centre would easily access and read them. The use of letters was also attributed to lack of finances to advertise the video shows through local radio stations. This would necessitate advertising the video event at least four times prior to the video show. The unit cost of the advert on local radio stations was equivalent to 2USD. In his opinion, a resident from Rwetuma village pointed out that such a mobilization strategy of using letters mainly favoured individuals who lived or came to the trading centre (Key informant interview with Rwetuma video participant) and people who can read in English. Conversations with the FG respondents revealed that this form of creating awareness about the video show events favoured mainly the nearby people and a few distant individuals who frequently go to Kyendangara trading centre. One of the Karere village female farmer during a FGD commented that ‘even the individuals that saw the advert but could not read were not aware and missed the video shows.’ Many other informants made the same comment and this was confirmed by our findings where the many video participants that attended and accessed video services had not attained formal level of education (89%). Key informant interview with MARFA treasurer revealed that this had serious implications on diversifying the mobilization strategies despite

limited financial resources.

In some instances, individuals that belonged to particular farmer groups got to know about the video shows through their group leaders who were informed by the MARFA chairperson through phone calls. In his opinion, one of the Kitomi group leader felt that mobilizing group members using phone calls was inefficient because it was not possible for them to call all the group members given the cost of airtime. This necessitated them to move around their villages informing members about the video shows, which they saw as being a tedious exercise. This was attributed to the video shows being planned on a short notice. Besides, they regarded this as an extra workload to transect through various villages mobilizing group members despite the absence of incentives for performing the task (e.g. allowances or transport means). In other cases, thirty (30) FG participants that belonged to farmer groups reported learning about the video shows from fellow members while performing group-based activities such as planting, weeding and harvesting rice. Other participants (16) learnt about the video shows by reading the content on the sign post (Figure 2) while others got to know about video show events after hearing the sound coming from the video that was being played. For example, one of the male participant from Karere village during the FG interviews got to learn about video events by first seeing and reading the content on the sign post (Figure 2). He said that; *I first heard some voices of people talking and laughing. When I read the sign post with wordings such as “one stop centre”, it was enough motivation to force me to go and see what was taking place there. To my surprise I found the rice video being shown there. That is how I got to learn about the video shows (FGD interviews, 24 August 2015).*

Thus, relying on aforementioned modes of creating awareness about video show events is one of the factors responsible for low attendance mainly by distant farmers, according to the MARFA chairperson. For instance, some farmers missed attending the video shows because they were not aware and had earlier planned activities. As a whole, farmers particularly those from distant places got to learn about the video events as a surprise on their transit to other locations, since they lacked prior information. During FG discussions the video participants concluded that

the mobilization strategies employed by SG 2000 were not effective to create awareness about video events to a wider mass of individuals. They therefore recommended that besides the aforementioned channels there is need for use of more robust ways of creating awareness about video shows particularly via radio announcements, local leaders and mega phones that cover a wider geographical area. Using a mobile van to drive through the community playing local music was cited yet as another form of creating awareness before the video event to particularly attract distant people, mainly the youth to attend (Key informant interview with MARFA chairperson; 26 August 2015).

Timing of video shows. FGD participants stated that the video shows were slated to start at 6:00pm and to their surprise, the videos started at around 7:30pm and ended at around 10:00pm. On average each video show took about three hours instead of 90 minutes to show all the twelve steps in rice production. The FG participants commented that pausing and replaying of the video during the video show contributed to the length of time taken to watch the video. About 71% of video participants noted the timing of showing videos late in the evening was conducive because it was the time when farmers had accomplished their daily farm activities. While 27% of the farmers said the time for the video shows was not conducive, 2% of the video participants said it was fairly conducive. Majority of the video participants (76%) pointed out that it was at this time when the video was clear for the farmers to see. The clarity of the video was attributed to the low light intensity at night that allows for viewing with limited sight complications. Conversely, pausing the video was meant to help farmers to first ask questions as well as comprehend the message being communicated. The late commencement of video shows was attributed to the late arrival of the SG 2000 technical team to bring and set up the equipment. The late ending was partly attributed to late commencement of the shows and showing repeatedly the 12 steps in rice production. Basing on the opinions of the 18 FG participants, the timing of video shows to some extent prevented women, busy farmers and those from distant places to participate. One of the Rwetuma female FGD participant noted that; *We busy women have the desire to attend the video shows but because of the timing of these shows we find it difficult to attend as we cannot walk back home late in the night. Coming to the video show early is okay for us the distant farmers but when it comes to ending late in the night it becomes difficult*

and risky especially for women farmers to move because of insecurity cases associated with raping and fear of wild animals from Kyambura Wildlife Reserve and Queen Elizabeth National Park as well as disapproval from our husbands (FGD interview with Rwetuma village video participants, 23 August 2015).



Figure 2. Content on a sign post created awareness

Evidently, three women and two distant men from Rwetuma and Katanga villages respectively were limited to participate in the video shown at night as they feared to move late in the night because of fear of insecurity. The farmers neighbouring Kyambura Wildlife Reserve and Queen Elizabeth National Park said they feared wild animals as they attempted to move at night after the video show. The threat from wild animals and timing of video shows partly limited the attendance by women and distant farmers. Because of an interesting debate and dynamics about the timing of video shows, farmers were divided into sub-groups of four participants based on gender to discuss some of the issues that were associated with the timing of video events. The men argued that the timing of video show provided them with an opportunity to stay longer in the trading centre drinking and socializing. The Kyendangara female based group pointed out that attending the video show was not enough. It required an extra time for farmers to sit and discuss what was being screened. Lack of time for discussions after the video shows was attributed to the way the video shows were organized to start late in the evening hours. For instance, holding discussion with the same participants, one of the participants commented that;

Because the video was shown late at night, after the show we could not wait or sit down and discuss with fellow farmers about what we had observed in the video. Instead everybody rushed home since it was getting late (FGD interview, 25 August 2015).

In agreement with the above experience, the MARFA Chairperson pointed out that access to information precedes learning. For example, 'besides farmers accessing information, there is need for additional time to discuss what is being viewed in the video to provide an opportunity to share experiences and learn from each other.' (Key informant interview, 26 August 2015). Conversely, showing the video at night outside the hall was viewed by FG participants as being inconveniencing and problematic. Showing videos outside the hall was viewed by organizers as an alternative of managing the large audience. However, the nights are associated with cold weather, noted one old female participant from Karere village. The Karere FG participants reported that viewing videos outside the hall characterized by too much coldness and disturbing noise affected the viewers' level of concentration. As a result, this affected the video participants' capacity to learn. The FG participants recommended that the video shows need to start early preferably at midday to allow time for discussions as well as allowing women and distant farmers to go back home early. Conversely, if the issue of timing the video show events is not addressed, there is a likelihood of women and distant farmers missing out on attending and accessing video services. Further, there was a suggestion to show one video on a particular step in rice production lasting 12-15 minutes and not a series. This would allow time for participants to discuss what they have seen in the video as well as allowing for an opportunity for women and distant video participants to attend and later go home early.

Social factors. Table 2 below lists some of the social factors that determined the nature of access to video-mediated extension agricultural information by video participants. These are described briefly in the subsequent paragraphs.

Showing videos publicly was meant to provide an opportunity for all people to access the video services irrespective of their gender and location. Our findings in Table 2 above indicate that more

men (71%) than females (29%) attended the video shows. Experiences from the key informants revealed that the higher participation level of men was attributed to their relatively high level of mobility, having more free time to attend and being favoured by the timing of the video shows. Basing on the culturally established gender division of labour, key informants reported that the least participation of women was partially due to their heavy engagement in performing domestic chores such as cooking and taking care of children. Still, arising from the conversations with Kyendangara women based focus group, it was indicated that women preferred having the videos shown in the afternoon hours to provide them with an opportunity to attend and go back home early to handle other household responsibilities. In particular, men were reported to being favoured by the timing of video shows because they stayed longer in Kyendangara trading centre where video shows were situated. The FG participants stated that many men stay in the trading centre drinking and socializing. In addition, key informant interviews revealed that partially, the low attendance by women and distant rice farmers could be explained by the three year duration of the project which was deemed by the MARFA chairperson as being too short a period to reach diverse villages for more gendered access to video services.

Table 2. Access by gender, age groups and education

Attributes	%
Gender	
Men	71
Women	29
Age groups	
Youth (below 30 years)	25
Middle age (31-50 years)	54
Seniors (above 50 years)	21
Education levels	
No formal education	89
Primary	10
Secondary	1
Tertiary level	0

Source: Household survey, 2015

Contrastingly, the timing of video shows provided an opportunity for nearby people to attend. In addition, the youth were reported as being more involved in riding motorcycles as a business, playing chess or pool table and watching soccer at

the expense of involvement in farming. On some events, the children especially those from nearby locations close to the show venue attended as a result of intensive announcements made through churches. A participant from Karere village said that “many children attend church services and when the announcements were made about video shows during the Sunday services, children got to know about these events and those particularly around the trading centre where the video shows were ‘nested’ attended.” More boys attended the video shows than girls because the former deemed the video shows as a form of entertainment.

In terms of age, the respondents were categorized into three age groups as indicated in Table 2 above. The findings reveal that majority of the video participants (54%) were in the middle age group with the least (21%) in the class of senior citizens. Thus the video was seen as being more attractive to more productive age group than the older generation.

The findings in Table 2 above further indicate that most video participants (89%) had not attained any formal level of education. While only 10% had attained primary level of education, 1% of the video participants had acquired secondary level of education. The higher proportion of farmers without formal education depict that the video is effective in enhancing access and use of information by farmers who have not had formal education.

Economic factors. Majority of the farmers (98%) who watched the video were mainly dependent on farming with no other off-farm livelihood option. The farmers in Kamwenge were solely dependent on farming partly because of lack of formal education that denied them white collar jobs and their remote location within Kyambura Wildlife Reserve and nearing Queen Elizabeth National Park limited them from accessing the available off-farm opportunities. Only 2% who watched the video had personal businesses like shops and basically attended the video shows because they were shown late at night after they had closed their shops at around 9:00pm. They said that all the potential buyers had gone to watch the video and they had to close. However, they said that attending the video shows provided them an opportunity to watch the agricultural videos which they were not exposed to before. ‘It was a good moment for us buyers of agricultural produce to learn with the farmers who sell to us’. One of the shop keeper dealing in agricultural produce commented during individual interviews.

Nature of agricultural enterprises shown in the video. We found out that the video shows were attended by farmers involved in growing a diversity of crops such as rice, maize, millet, beans, cassava, cotton and ground nuts. The type of enterprises engaged in by farmers to some extent determined the attendance of video shows. Prior to attendance of the shows, farmers anticipated finding vast agricultural enterprises being shown in the video. To their amazement, the videos that were shown focused on only one crop, rice. In their opinion, showing videos on only a single agricultural enterprise to some extent limited the return of farmers to the shows. One of the female FG participant from Kyendangara village engaged in finger millet and maize production, explained why she did not attend twice the video shows where she shared that; *Not all farmers grow rice but there are those farmers who grow solely finger millet and maize. So when the video shown is only for rice, automatically other farmers with limited interest in growing rice will not come back and attend the video shows and this excludes them automatically. This is the same reason why I did not come back to watch the video (FGD interviews, 25 August 2015).*

This implies that in order to meet the demands of diverse farmers, there was need to show videos on different enterprises which the farmers are involved in.

Technical factors. Majority of the farmers (79%) who attended and accessed information from the video spoke Runyankore-Rukiga. Only 18%, 2% and 1% of farmers who attended, watched and accessed information from video spoke Rufumbira-Runyarwanda, Luganda and Rukonjo respectively. To worsen the situation, the video that was shown in Kamwenge was not in any of the languages spoken in the area but in English. However, despite these language differences, the video as an audio-visual aid communicated beyond the language barriers because of its ability to appeal to both the visual and hearing senses. These four languages spoken by the farmers who watched the video were totally different. The existence of farmers in Kamwenge district speaking different languages is attributed to the diversity in the origin of inhabitants. Kamwenge district where the video was shown is dominated by migrants from different parts of Uganda particularly from Kisoro and Kabale districts. The diversity of languages spoken by farmers in Kamwenge district makes video which is audio-visual an attractive extension

tool. The ability of the video to communicate to farmers with different languages at the same time was well explained by a Muganda female farmer from Burembo village who indicated that although she was not able to understand what was being communicated in the video because of the language that was being used (English), she was able to see, hear and learn because the video demonstrated the practices very well.

At the time of conducting this study, rice farmers were not yet exposed to rice videos translated in their respective local languages. Experiences presented here are based on opinions of informants who watched the English version of the rice videos produced in Benin Republic, West Africa and shown by SG 2000 to farmers in the period 2007-2010. The technical language used in the video was a concern that affected the comprehension by farmers of the information/practices being communicated in the video. The FG participants felt that despite the effort to translate simultaneously what was said in the video, the language used (English) affected their level of understanding the message being communicated. Seeing what is being demonstrated in the video is not enough to claim that the farmers have understood the practice (Kitonzi female FG participant, 24 August 2015). AccessAgriculture, an international NGO promotes rural mediated learning in Africa and Asia by distributing translated versions of video to organizations which they use to train farmers on rice production practices. Despite the efforts by AccessAgriculture to translate the videos into the respective local languages including Runyakitara (Figure 3), farmers in Kamwenge had not yet been exposed to these new versions of translated videos (MARFA Chairperson). Bentley *et al.* (2013) noted that despite the distribution of these translated versions to local organizations, no efforts were taken to show videos to the farmers as the leaders of these organizations were not fully engaged in the field to see whether videos were being shown to farmers.

Besides the technical language, the speed at which the video was moving was fast for the viewers to follow. This implied that the translated information lacked alignment to the fast moving pictures which was detrimental to the farmers' ability to follow and comprehend the information. In their opinion, informants pointed out that the technical language coupled with the speed of the video denied the viewers an opportunity to follow the video very well

and comprehend the message easily. This explained the need for pausing and translating the video during the show by the SG 2000 staff. The best arrangement would therefore be that the videos are cast whereby someone talks (voice over) as the show goes on as what happens with Televisions and popular soaps. This would make the video viewing more interesting; thus enhancing learning and sharing of information. Surprisingly, the translator only provided the summary of what was transpiring in the video other than giving the detailed information of what was being demonstrated. The FG participants felt that a lot more details were left out by the translator. They recommended that the translator should put more effort in providing the detailed information to the viewers to gain deeper understanding of what is being demonstrated. Van Mele (2011) finding on documenting and showing videos of 10-15 minutes would be suitable for training videos. This finding clearly confirms our findings where farmers recommended viewing a video for a short time and then discuss later after the show.

While video was able to communicate to the farmers speaking different languages because of its attributes of clear and attractive images, its efficiency would have been enhanced if it was translated in the local languages. During focus group discussions with farmers they recommended the need for a translator or even documenting the video on local farmers in their native languages for easy identification with actors and comprehension of messages. Our findings agree with Van Mele (2011) who reported that 85% of the respondents during an on-line survey regarded use of local languages as being very important for farmer learning videos. The use of videos in extension, however, is more effective when combined with other follow-up extension methods such as demonstrations, field days and exchange visits which build on and deepen social exchange and learning among farmers. This fosters comprehension and right application of learnt knowledge (Okry *et al.*, 2014).

Application of information/practice. The FG participants approved the information got from the videos as being vital and useful in fostering change in rice production practices as well as solving their production needs. Following the video shows, participants endeavoured to adapt and apply the practices as viewed from the video. For example,

multiple responses indicated that all the farmers (100%) started planting rice in lines using the forked rake or making imaginary lines using a hand hoe. They found use of a fork method as an effective method because it allowed use of lower seed rates (25 kg were planted in an acre using a forked rake compared to broadcasting where 40 kg were being planted). Planting in lines using forked rakes was thus accredited for controlling the plant population in the field as compared to broadcasting. In addition, farmers found it easy to weed, spray chemicals and move through the field when rice was planted in lines.



Figure 3. Generic languages of a translated video version

About 80% of the farmers used herbicides particularly Butanyl 70 to allow for quick and timely weeding of rice fields. For example, one of the male respondent in Kyendangara village said “I used to take about 2-3 weeks to weed one acre using a hand hoe but now when I apply Butanyl 70 it takes me only two days to spray the entire field and all the weeds get destroyed.” However, farmers faced challenges in implementing the practices shown in the video, mainly attributed to availability and affordability of production inputs, labour requirements, market availability, and failure to comprehend the message due to use of more technical language in the video. For instance, the use of a forked rake was deemed as being tedious to pull and associated with chest pains as well as being labour intensive. On the other hand, it was difficult for the forked rake to penetrate hard soils characterized by stones and not easy to penetrate poorly prepared seedbeds. To avert the situation, farmers resorted to using the hand hoe to make imaginary lines which they believed to be

quicker and less labour intensive. Some farmers adapted the fork method by mounting a 20 kg load of sand/soil on the rake for deeper and better penetration in the ground while others would have the children to sit on it as they pulled. Farmers said that in the video it was communicated that lines needed to be at a depth of 2 cm deep for better tillering. To ensure this, farmers had to adapt the fork method by mounting a weight. They say this allowed making of visible and deeper lines where rice was planted. It was also a requirement for the farmers to carryout secondary tillage to provide a fine seed bed for easy penetration of the forked rake and germination of rice. In addition, providing the information to improve rice production practices is one thing and accessing the inputs and technical expertise remains a challenging factor for farmers to implement the practices seen in the videos. For example, FG participants noted that the video showed good rice varieties and chemicals required to produce quality rice. As a disappointment, farmers could not access such varieties in order to increase production as well as access the expensive pesticides and fertilizers, and other inputs such as tarpaulins necessary for good post-harvest handling. In addition, farmers especially those with no formal level of education lacked technical expertise in applying what was observed from the video. They also argued that besides lack of technical capacity, there was no extension worker to consult in cases they needed more guidance on implementing particular practices as demonstrated in the video. There is therefore a need for mechanisms to facilitate access to affordable production inputs coupled with follow up visits by extension staff to assess whether farmers adopt or adapt the practices correctly as observed in the videos.

DISCUSSION

The rationale of operating rice videos at a more central location is to enhance access to reliable and timely information by all farmers. In Kamwenge district of Uganda, SG 2000 presumed that locating the video shows at the farmers’ association office would favour and attract all farmers to attend and access the video services. Instead, the location of video events created a selection bias against distant, old and female farmers. For example, our findings indicate that more men (71%) attended the video shows compared to women (29%). Thus, the physical location of the video shows need to be considered as a key organizational factor because it determines who would attend the video events. Bentley *et al.* (2015) confirm our findings where they found out that rural

women in Bangladesh were discouraged from leaving their homes or villages or making trips to the markets located far away from them. Thus, the physical distance travelled by the participants coupled with video shows ending late at night limited participation especially by females and other distant people. Our findings, however, disagree with those of Van Mele (2011) in Bangladesh where they found out that agricultural training videos had significant impact by reaching out to more women (54%) than men (46%). In Uganda, the failure of VMEA to enhance access to information by all farmers contests the idea that using the video as an extension tool would replace the already constrained conventional extension service delivery. Bentley *et al.* (2015b) clearly indicated that videos may help in addressing the access related challenges to information by enhancing outreach to poor, marginalized, women and young people especially if they are well organized. However, our study revealed the contrary because the video shows did not favour what Bentley *et al.* (2015) refer to as marginalized and targeted groups. Thus, the use of ICT-based tools particularly video need to be designed to complement the extension workers to perform their extension duties more effectively and efficiently in enhancing access and use of information by marginalized rural poor farmers (Sseguya *et al.*, 2012; Bentley *et al.*, 2015b). This confirms what Bashaasha *et al.* (2011) recommended that rural people need special attention to enhance their access to information through decentralization and use of appropriate extension approaches. Van Mele (2011) added that in Bangladesh attention was needed to be paid to the ways in which video complemented rural radio in enhancing access and learning among rural farmers. Thus, SG 2000 and other related organizations in Uganda and elsewhere need to redesign the mode of operation of videos by taking them closer to the farming communities in their designated parish or village levels. This would allow for more participation of women and other marginalized groups of people (Van Mele *et al.*, 2010b). Nonetheless, rotating the video shows at parish or village levels has serious implications on the costs involved in terms of finances and human resources. This poses two cardinal questions: 1) Who will meet the expenses of running the video shows across parishes or villages? 2) What can organizations manning the video events do to guarantee ownership and their sustainability? These questions call for concerted efforts of all concerned stakeholders promoting and using videos and also a change in the

way video events are organized if the use of video in fostering access and use of information/practices by smallholder farmers is to be embraced and sustained in Uganda and elsewhere.

Conversely, the timing of video shows affected attendance, especially by the distant and women farmers who were less mobile. This created imbalances in accessing the video services by mostly favouring men. The participation of men in video shows was attributed to their mobility and less engagement in performing domestic work. This can also be explained in a way that men stayed longer in the trading centre where the video shows were located which provided them with ample opportunity to attend the video shows that were screened late at night. Van Mele (2011) reports that sometimes there are dangers of ICT being socially exclusive especially if no special attention is paid to factors that limit different genders. Women culturally are limited in their movements as they are expected to take care of the home and the children (see also Bentley *et al.*, 2015b for similar findings). In order to ensure more inclusive and gender-balanced participation and access to video services, there is need for rescheduling the timing of video shows to start earlier in the day. This confirms the criterion of time as stated by Danielsen and Kelly (2010) as being a central organizational factor in assessing the potential of smallholder farmer participation in accessing plant health services. They pointed out that plant clinic services conducted at public market places needed appropriate timing. This also holds true for the VMEA if it is to foster access to agricultural information by smallholder farmers in Uganda and elsewhere. In particular, the kind of obligations involved in by women coupled with the distance and timing of video shows tended to limit their participation in the video events. This forces women to stay home performing such duties as determined by the culture of various communities (Bentley *et al.*, 2015b), yet they get heavily involved in performing most of the agricultural activities (Ibrahim *et al.*, 2012). Therefore, if videos are shown publicly in rural villages, likely more women would benefit (Bentley *et al.*, 2015b).

Along the same line, the timing of video shows did not only affect the nature of access to information by farmers but also never provided them with the opportunity to discuss what transpired in the video. Only limited social learning occurred during the

video viewing but not the actual learning. Learning occurred later after the video as farmers interacted and experimented as affirmed by MacGregor (2007) and reported by Van Mele *et al.* (2010b). This confirms our findings where farmers stated that learning did not occur in the halls when farmers were viewing the video but occurred on their way back and/or when they reached home and started discussing, reflecting and sharing experiences based on what they observed in the video hall (MacGregor, 2007). The video only allowed for awareness creation about the practices; in this case allowed the farmers to access the information. Van Mele *et al.* (2010b) added that even the use of the acquired knowledge occurs later as farmers start experimenting and adapting using local resources. Thus, commencing the video shows early would avail the participants some ample time to sit down, discuss, reflect and share their experiences, a key component in fostering a more interactive learning environment (MacGregor, 2007). Thus, coupled with the timing of video shows, the conflicting domestic and agricultural activities did not provide adequate time for women to participate in the video shows.

On a different note, the means used to create awareness about the video shows did not only affect access to information by farmers especially the distant one by limiting their attendance but also affected the learning. These distant farmers got to learn about these video shows as a surprise despite their earlier planned schedules. More robust publicity mechanisms to create awareness about video shows are needed to allow for equitable participation in these shows. Intensive publicity is a key attribute for enhancing access to information (Danielsen and Kelly, 2010; Danielsen *et al.*, 2015). Thus, if the issue of publicity is not well addressed, VMEA is likely to continue attracting and serving nearby farmers. Use of local means to create awareness about video events such as through local leaders, group leaders and announcements on social events are paramount. In order to enhance attendance by all people, it is important to identify more robust and effective mechanisms of enhancing awareness creation (Miir *et al.*, 2015). This as well would allow for more wide spread of information and a likelihood to attract more women and youth.

Lastly, the use of videos was intended to serve also non-formal educated farmers because it allows use of both senses of seeing and hearing in order to learn as affirmed by MacGregor, (2007), Van Mele

et al. (2010b) and Van Mele (2011). Video shows were meant to aid the farmers to quickly understand, learn and use the practices demonstrated in the video (MacGregor, 2007; Van Mele *et al.*, 2010b). However, our findings revealed a different scenario where the complexity of the technical language used in the video limited comprehension of information/practice by the video participants particularly those that lacked formal education. Given that video participants failed to understand the practices, even implementing them was seen as being problematic. Similar findings were reported by Mphahlele (2007) in Limpopo Province of South Africa and Bentley *et al.* (2015b) in Bangladesh. Van Mele *et al.* (2010) pointed out that production of locally appropriate and regionally relevant videos would enhance learning among farmers through enhancing modification of technologies and farmers adding their own creative ways. Farmers can easily accept ideas from others easily if the videos are translated into the local language (Van Mele *et al.*, 2016). Farmers suggestion of using a local language to document videos or capturing local farmers to ease the comprehension, use and identification with actors is paramount. This recommendation was also reported by earlier studies including Mphahlele (2007), Van Mele *et al.* (2010b), Van Mele (2011), Bentley *et al.* (2015a), and Bentley *et al.* (2015b). For example, Van Mele (2011) reported that over 85% of the respondents in Bangladesh indicated the importance of using the local language in farmer training videos for easy sharing and learning among farmers.

CONCLUSION

Our study has revealed that the video is an effective tool in enhancing access and use of video-mediated agricultural information especially among farmers without formal education. Evidently, the organizational factors such as distance to the video sites, publicity and timing of video shows compromised the videos' ability to enhance access and use of information by different social groups. Long distances to the video show sites and showing the videos late in the night denied women and other farmers from distant places from accessing the video-mediated agricultural information. While video as an audio-visual aid is expected to appeal to people of different languages and social back grounds, our study has shown that the language in which it is presented is a key access and use issue. Although farmers did not have concerns on the quality of pictures shown in the video, their comprehension of the message was adversely affected by presentation of the video in the

technical language. Even when attempts to translate the message into one of the local languages were made, the translations were too summarized and not well aligned to the fast moving pictures in the video. Summarized translations which lagged behind the fast moving pictures disrupted farmers' attention for continued access of information during the video shows, thus posing serious implications for learning and subsequent use of the learnt information. Hence, the modalities suggested by the farmers with particular efforts on intensifying awareness creation through local channels, adjusting the timing of video shows and operating them on a rotational basis are vital if VMEA as an extension approach is to foster inclusive service delivery. Finally, documenting the video on local farmers in their native languages would allow for easy comprehension of messages and identification with actors. There is therefore a need to customize and adapt videos to the local context.

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We the authors of this paper declare that there are no conflicting interests in this publication.

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