INTERNATIONAL JOURNAL OF AGRICULTURAL SUSTAINABILITY
https://doi.org/10.1080/14735903.2019.1567246

Smallholders download and share videos from the Internet to learn about sustainable agriculture

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ABSTRACT

Of 1,211 farmers and their representatives registered on www.accessagriculture.org, 142 participated in an on-line survey in November 2017, designed to learn farmer's opinions of Access Agriculture, an NGO which hosts a digital platform where anyone can watch or download videos and other information for free. These farmer learning videos all convey practical information on sustainable agricultural innovations, to encourage farmer experiments. Previous experience showed that smallholders liked having their own copy of videos (e.g. on DVD), but this study showed that farmers are now starting to find their own way to the internet to proactively search for information. Although some farmers learn about on-line videos by social contacts, most of the farmers found the videos on www.accessagriculture.org by surfing the web. This suggests that limitations of reaching farmers with traditional forms of video distribution (e.g. DVDs and village screenings) will be partly overcome by the Internet. Youth have become the new information brokers for communities, as elders may lack the digital technology skills needed to use the Internet to get agricultural information. To share videos with other community members, youth will benefit from additional tools, such as an app, to allow easy download and sharing with limited data consumption.

KEYWORDS

Videos; farmer learning videos; ICT; Internet; extension; sustainable intensification

1. Introduction

Most extension methods that convey deep biological and ecological information reach relatively small audiences. For example, farmer field school (FFS) is an acknowledged method for reaching smallholder communities with a high quality message. In an FFS farmers learn ecological and biological principles and apply them to adapt scientific innovations to suit the small farm (Davis et al., 2011; Gallagher, 2003; Pretty & Bharucha, 2015). However, even large FFS efforts reach just a small percentage of the total farm population, e.g. in Côte d'Ivoire a large-scale FFS programme for cacao growers reached only 3-4% of those farmers (Muilerman & Vellema, 2017). A recurring challenge when scaling up intensive learning methods is the loss of quality (Tripp, Wijeratne, & Piyadasa, 2005).

Conventional extension programmes are also being cut back, so that fewer farmers receive extension visits of any kind (Feder et al., 2006). On average there is only one extension agent per 1,400 farmers. In their global review of extension, Swanson and Davis (2014) estimate that there are just over one million extension agents for 1.4 billion farmers (see Conway & Toenniessen, 1999). Each country's advisory system is unique, but the tendency is towards greater privatization of extension (Swanson and Davis, 2014). Mass media for large audiences often convey commercial messages of dubious value, such as TV, radio and billboard ads used by multinational corporations to promote branded pesticides (Corets & Escalada, 2016).

Creating tools to support participatory learning is an important new challenge (Van Mele, 2006). Videos have the potential to bridge this gap between quantity and quality, e.g. by combining FFS with video. A farmer learning video can be made

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with graduates of FFS, who describe and demonstrate the innovations that they have adapted on their farms (Bentley, 2009). In a learning video, farmers can address their peers on camera, providing the testimony that adds credibility to the new ideas (Bentley, Chowdhury, & David, 2015). Farmer learning videos can be translated, allowing cross-cultural communication between farmers in different countries (Bentley & Van Mele, 2011). Scientific illustrations (like technical cartoons) can help to illustrate scientific concepts that are impossible to see with the naked eye, such as how fungus moulds secrete the aflatoxins that poison stored food (Agro-Insight, 2017), or how seeds of the Striga weed parasitize the roots of cereal crops (Agro-Insight & ICRISAT, 2016). Just watching videos has helped farmers in West Africa to drastically reduce their use of agrochemicals for small-scale commercial vegetable growing (Zoundji, Okry, Vodouhê, & Bentley, 2018; Zoundji, Okry, Vodouhê, Bentley, & Tossou, 2017).

However, videos are no good unless farmers see them, and distribution can be a bottleneck. Farmer learning videos can be distributed by compiling them onto DVDs. This allows the videos to be screened in communities by NGOs or extensionists (Van Mele, Bentley, Harun-ar-Rashid, Okry, & van Mourik, 2016). And while it is not always possible to reach all the remote villages with DVDs or with a team to show videos, farmers who do watch learning videos benefit by experimenting with the ideas presented (Bentley & Van Mele, 2011; Bentley, Van Mele, & Musimami, 2013; 2014; Karubanga, Kibwika, Okry, & Sseguya, 2017; Ongachi, Onwonga, Nyanganga, & Okry, 2017; Van Campenhout, Vandevelde, Walukano, & Van Asten, 2017; Van Mele, Zakaria, Begum, Harun-Ar-Rashid, & Magor, 2007; Zossou, Van Mele, Vodouhe, & Wanvoeke, 2009; Zossou, Van Mele, Vodouhe, & Wanvoeke, 2010; Zossou, Van Mele, Wanvoeke, & Lebailly, 2012: Zoundji et al., 2017; Zoundji et al., 2018).

Projects can distribute DVDs to farmers, but there are only enough projects to reach a fraction of the world's smallholders. Releasing videos without project support is a way of 'letting information flow' (Van Mele et al., 2016). Several ways have been tested. A study in Benin found that independent dealers, such as vendors of entertainment videos, and agro-input dealers, could effectively sell a DVD on vegetable production (Zoundji, Okry, Vodouhê, & Bentley, 2016). DVDs have been distributed through radio stations (Okry, Van Mele, & Houinsou, 2014), through research organizations, extension services, NGOs and private companies (Bentley, 2016a). The sound track can be played on the radio (Okry et al., 2014) or the video can be broadcast on TV (Chowdhury, Van Mele, & Hauser, 2011).

Since 2012, the international NGO Access Agriculture has placed learning videos in international and local languages on a video platform (www.accessagriculture.org) devoted to sustainable agriculture in developing countries. Recognizng that few smallholders have computers, Access Agriculture intended the videos to be downloaded by extensionists and shown to farmers. But farmers in remote parts of the countryside are starting to leapfrog over computer technology, and use their cell phones to access the web and to watch videos. The percentage of people accessing the video platform via their mobile has increased from 30% in 2016 to 42% in 2018 (Van Mele et al., 2018).

New technology now makes it much easier to distribute videos. In just the past few years cell phones have been massively accepted in rural communities in Africa, Asia and Latin America, even in villages without electricity. There is a massive potential for rural people to watch videos directly from the Internet, on their phones. Most farmers off the electrical grid in Mali and Burkina Faso now have cell phones, which they use to watch entertainment videos, but phones could also be used to share information (Sousa, Nicolay, & Home, 2016). In many low-income countries, young entrepreneurs copy movies and music videos onto memory cards for rural people to watch on their cell phones; these businesspeople can also be encouraged to share learning videos. Studies in Malawi have found that rural people without electricity at home visit youths called 'DJs' in the small towns to have entertainment videos loaded onto their ordinary (not smart) phones (Bentley, 2014; Bentley, Van Mele, & Udedi, 2016; Udedi, 2016).

Recently, some farmers with inexpensive smart phones have started to download and share learning videos on-line in India (Van Mele, 2017a), to watch the news and sports in Kenya (Bentley, 2017) and, with a little nudging, to register for downloading videos from the Access Agriculture platform in Bangladesh (Van Mele, 2017b). Ugandan farmers who watched videos screened by an NGO said that it was difficult for elderly and women to attend in the evening, at the NGO's office (Karubanga, Kibwika, Okry, & Sseguya, 2016): being able to access videos

over the internet should give farmers more control over when and where to watch them.

If farmers could access videos of their choice on phones at a low cost, smallholders could use the videos to learn about techniques for sustainable intensification such as intercropping with legumes, composting, crop rotation, alternate planting distances, seed saving and alternatives to antibiotics in livestock. The private sector may be unmotivated to share such ideas (because there is nothing to sell) and public extension services are too understaffed to teach all farmers about sustainable agriculture.

In a 2015 on-line survey for Access Agriculture, 953 people replied from 102 countries; about 60% from Africa. Respondents liked the videos on Access Agriculture because they were simple, with good images and sound, and practical messages presented by farmers. Users suggested that in the future, on-line videos should be cell phone friendly, easier to download, with translations to more languages, more topics, and more publicity to boost awareness. Access Agriculture has since responded to these concerns, e.g. by making a cell-phone friendly version (3gp) of each video on the site and making its entire video platform mobile enabled.

As of 31 October 2017, some 1,242 farmers and representatives of farmers' organizations had registered for the Access Agriculture video platform. At 20% of all registered users, this made farmers (and their reps) one of the biggest occupational groups registered on Access Agriculture. In 2017 the authors conducted an on-line survey of farmers and their representatives. The study was designed to learn how smallholders in the tropics were downloading and sharing videos from Access Agriculture.

Table 1. Where the survey respondents came from.

Country	Respondents
Kenya	30
Nigeria	19
Benin	10
Ghana	8
Uganda	8
Côte d'Ivoire	7
Cameroon	6
Burkina Faso	5
Mali	5
Togo	5
India	4
Senegal	4
Zambia	4
DR Congo	3
South Africa	3
Guinea	2
Malawi	2
Zimbabwe	2
Burundi, Chad, Greece, Guadeloupe, Guatemala, Haiti, Italy, Madagascar, Morocco, Mayotte, Mexico, Philippines, South Sudan, Tanzania, United Kingdom	One each
Total	**142**

Successful, large-scale experiences (on 10,000 farms or more) to redesign agricultural systems towards sustainable intensification always involve improving social capital, e.g. to build trust and cooperation among farmers and to discourage freeriding (Pretty et al., 2018). At first glance, it may not seem that people who download videos on cell phones are strengthening social capital – but these innovators often share videos with their communities or use the information in them to create or enhance social groups. For example, women who watch videos on rice parboiling are more likely to organize into groups and to experiment with rice processing (Zossou et al., 2010). There is also another twist; real farmers who show their innovations on camera inspire trust in the audience. Farmers watching learning videos in Malawi consistently spoke of the farmers in the videos as 'our friends' (Bentley, 2016b). High-quality, on-line videos appeal to youth and are a way of exchanging information between farmers across the global south (Van Mele et al., 2018).

In this paper we will see that farmers who access videos on-line are inclined to share them with their neighbours, as such overcoming the participant selection bias inherent to structured extension interventions. Pretty et al. (2018) ask 'What further evidence is needed to spread sustainable intensification innovations as options of choice and best practice globally?' Part of the answer to that question is not just which innovations to share globally, but how to communicate those crucial ideas. Sustainable intensification often involves complex ideas, such as IPM (integrated pest management), water management, conservation agriculture and trees in agricultural systems. Sharing these ideas with large audiences will require communication styles that are rich in quality, and capable of reaching all the farmers.

2. Method

The survey questions were designed in English and French. The 13 questions (Appendix 1) were pretested with selected colleagues, edited, and then entered into Survey Monkey (www.surveymonkey.com), a web-based questionnaire platform. One email address was entered for each of the 1,242 people

(farmers or their representatives); each of them received a note via e-mail in English and French on 21 November 2017 inviting them to take the short survey. A week later a reminder was sent to those who had not replied.

The team studied the replies as they came in, and wrote to respondents who had written comments on the questionnaire; 142 people took the survey, and of those 109 (77%) completed it. The authors wrote back to many of the respondents and asked for more feedback. Some replied by email and 13 agreed to be interviewed on the phone. Their case studies help to round out the numbers from the survey.

People responded to the survey from 33 countries, as shown in Table 1.

3. Results

3.1. Where did you learn about Access Agriculture?

Smallholder farmers have started to find their way to the Internet to search for information. When users register for Access Agriculture, they are asked 'Where did you hear about Access Agriculture?' The following data was gathered when users registered (between 2013 and 2017). By far most farmers learned about Access Agriculture from the Internet. Friends and social media were a distant second and third. Training centres came fourth (see Table 2).

Table 2. Where farmers and their representatives learned about Access Agriculture.

Where?	Farmer	Farmers' association	Total
Internet	500 (51%)	88 (37%)	588 (49%)
Friend or other personal contact	95 (9.7%)	31 (13%)	126 (10%)
Social media	86 (8.8%)	23 (9.8%)	109 (9.0%)
Training Centre	77 (7.8%)	7 (3.0%)	84 (6.9%)
Mass media	55 (5.6%)	9 (3.8%)	64 (5.3%)
Meeting or congress	28 (2.9%)	14 (6.0%)	42 (3.5%)
School	30 (3.1%)	5 (2.1%)	35 (2.9%)
Access Agriculture (directly)	15 (1.5%)	14 (6.0%)	29 (2.4%)
Farmer organization	4 (0.4%)	11 (4.7%)	15 (1.2%)
Research, international	8 (0.8%)	6 (2.6%)	14 (1.2%)
CTA (Technical Centre for Agricultural and Rural Cooperation)	6 (0.6%)	5 (2.1%)	11 (0.9%)
Extension	9 (0.9%)	1 (0.4%)	10 (0.8%)
NGO	8 (0.8%)	2 (0.9%)	10 (0.8%)
Other	55 (5.6%)	19 (8.1%)	74 (6.1%)
Total	976 (100%)	235 (100%)	1211 (100%)

Source: Access Agriculture.

Table 3. Where farmers and their representatives learned of Access Agriculture in seven countries.

	Inter-net	Friend	Training Centre	Social media	Mass media	Meeting	School	AA	CTA	NGO	Re-search	Farmer org	Ext	Other	Total (100%)
Kenya	67 (29%)	16 (7%)	14 (6%)	21 (9%)	46 (20%)	9 (4%)	11 (5%)	2 (1%)	1	2 (1%)	1	3 (1%)	3 (1%)	6 (3%)	232
Nigeria	126 (59%)	27 (13%)	6 (3%)	30 (14%)	8 (4%)	2 (1%)		1	4 (2%)		3 (1%)	1	1	6 (3%)	215
Benin	29 (21%)	8 (6%)	50 (21%)	3 (2%)	2 (2%)	8 (6%)	14 (10%)	11 (8%)		1	2 (2%)	2 (2%)	1	9 (6%)	139
Uganda	25 (37%)	15 (22%)	2 (3%)	10 (15%)	1	8 (12%)		1		2 (3%)	1			2 (3%)	67
India	34 (57%)	3 (5%)		3 (5%)			1	1		2 (3%)				16 (27%)	60
Ghana	38 (76%)	3 (6%)		4 (8%)				1			1			3 (6%)	50
Côte d'Ivoire	37 (76%)	4 (8%)				2				1				5 (10%)	49
Total	**356**	**76**	**72**	**71**	**57**	**29**	**26**	**18**	**5**	**8**	**8**	**6**	**4**	**46**	

Note: Abbreviations and definitions (in alphabetical order); AA = direct contact with the international NGO Access Agriculture; CTA = Technical Centre for Agricultural and Rural Cooperation; Ext = from extensionists or extension programmes; Friend = from a friend, relative or other personal contact, not including social media; Internet = by surfing the Internet, not referred by another person; Mass media = including TV, radio and newspapers; Meeting = such as conferences, symposia; NGO = non-governmental organization; Research = especially national research institutions; School = including secondary school and university; Social media = Facebook, WhatsApp, email etc.; Training Centre = organizations with a campus where adults take short courses.

Looking at the top seven countries, there are fundamental differences regarding how users heard about Access Agriculture. In Nigeria, the Internet was more common, while in Kenya Internet was still important, but mass media and social media also made strong showings. In Benin, training centres were important (because of Songhaï, a centre with strong ties to Access Agriculture). Some people in Benin also learned about Access Agriculture through the staff of the Regional Office of Cotonou. Friends and social media emerged as especially important in Uganda, where Access Agriculture does have various active partners. The internet is especially important in countries like Nigeria, India, Ghana and Côte d'Ivoire where Access Agriculture has little direct contact. In large countries where Access Agriculture has few people on the ground it is unlikely that farmers will meet a representative or a partner of Access Agriculture, but farmers are finding www.accessagriculture.org on the Internet (Table 3).

However, in all countries, surfing the Internet is the most common way to find Access Agriculture videos. This trend suggests that the limitations of distributing videos on DVDs will be partly overcome as more farmers start to use the Internet.

Most people (53%) watch or download five videos or fewer, but nearly all of the users have watched some videos. Thirty people (21%) watched or downloaded 11 videos or more (including six ambitious people who watched or downloaded over 50 videos).

Case study on learning about vegetables. Isaac Enoch grew up in a village in what was then the Sudan, until war drove his family across the border to Uganda. There was little for kids to do in the refugee camp, so Isaac and some of his teenaged friends started to grow small plots of vegetables near the river. When Isaac got enough vegetables to fill a bucket he would give them to his mother. He still recalls how impressed she was when she came back from the market with money, and she began to buy books and shoes for her children, who had been going barefoot. Isaac says this was his first experience farming as a business.

Isaac was able to get a B.Sc. from Makerere University in Kampala and went on to get an M.Sc. from Bangor University in Wales, UK in 2006–2007. When the new nation of South Sudan was created, Isaac was there. He had a project working with farmers, but he recalls that people were not taking agriculture seriously. So he said 'I'll show them how to do it'. He began growing vegetables on his own. He would also help farmers by giving them seed, agreeing on a price and coming back to buy the vegetables later. This was in a rural area, with lots of land, but when violence broke out, it became unsafe, and Isaac moved to Juba.

Land was scarce in Juba, so Isaac started a greenhouse on a small plot. He was not sure how to irrigate it. At first he drew on his own imagination, filling soft drink bottles with water, and placing them near the plants. Then he saw the video 'Drip Irrigation for Tomato' (Agro-Insight, 2013) on Access Agriculture, and he installed drip irrigation in his greenhouse. In the video, the tanks are filled by hand, with buckets. Isaac was able to fill the tanks with river water, using a small motor. That is exactly the type of innovation that the videos are designed to stimulate.

The drip irrigation worked so well that Isaac also began irrigating some land outside of the greenhouse. He covered the soil with mulch, to slow the rate of evaporation, and conserve water. So much of the food sold in Juba is imported, even the cereals, that anyone who can produce anything at all can find a ready market for it. Isaac's next plan is to start a piggery.

A version of the Isaac Enoch's story was previously posted as a blog, 'Drip irrigation saves water in South Sudan', on the Agro-Insight website.

3.2. Preferred format

Visitors to Access Agriculture can download ordinary videos (for computers) or 3pg (for cell phones). Those surveyed prefer ordinary videos, although 3gp makes a respectable showing at 24% (respondents could select multiple options, so the total is greater than 100%). This is significant, since the 3gp format is relatively new to the website (as of January 2016 – Figure 1).

Case study on downloading videos on computer. The videos downloaded on laptops do manage to reach some young farmers, like Collins Afeti Gadawusu in Accra, Ghana who sees a future in farming. In 2015, when Collins was 28, he noticed that there was an opportunity to grow high-value vegetables for the urban market. He also saw that many of the vegetables were unhealthy, because of the way they were treated with pesticides. He says, 'Most people did not follow the instructions. They tried some chemicals and if that didn't work they just increased the dosage. Someone can spray today and sell tomorrow in the market'.

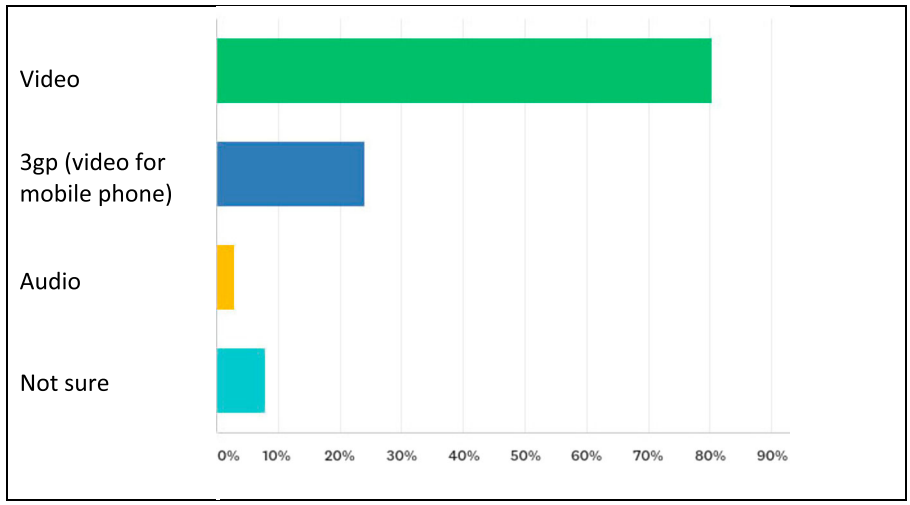

Figure 1. Replies to 'In what format did you watch or download the videos?'

So Collins did a market study, visiting international fast food restaurants and big hotels, but they had demanding requirements – the same amount of produce must be delivered each week. Collins distributed seeds to some farmers in the countryside, visiting them every week. This was partially successful. Sometimes he made money and sometimes he broke even. So in 2017 he decided to grow lettuce on his own. He borrowed a small patch of land, 900 square metres, 2 hours from the city, planted lettuce and irrigated it with PVC pipe held on posts, with small holes to let the water sprinkle onto the crop. It's too soon to tell if the harvest will pay off, but Collins is optimistic.

Collins says that if he needs a video, it's easy to find one on the platform. 'The videos save me time because they are comprehensive and are more tailored towards the needs of farmers in our part of the world. Hence there is no need for me to go searching online on different sites to see which of them meets my needs. So whenever I am looking for a 'how to' in agriculture that pertains to Africa, I search through your database first before looking elsewhere'.

One of the videos that impressed Collins was filmed in northern Ghana (Agro-Insight, 2016), and it explained that farmers could grow onions in the rainy season, and get higher prices, if they took some simple steps to manage diseases. That is an idea that Collins wants to try in the future, along with growing tomatoes and okra. He wants to develop a subscription list and have vegetables delivered to customers who are willing to pay a little more for healthy vegetables.

3.3. Choice of viewing device

Most users watch the videos on computers, but smart phones are also popular. Twelve farmers even saved videos on USB to watch later on their DVD player. The fact that downloading videos consumes bandwidth may explain why most farmers who responded make use of computers (instead of cell phones) so they can avoid the costs of paying for data consumption (Figure 2).

Case study on downloading videos to watch later. Meidimi Sokoto is a young man from a village near Nakuru, Kenya. Like many who have migrated in search of paid employment, Meidimi now realizes that there are opportunities to make money from agriculture, and videos are a way to learn how to do that.

After working in Sudan for a while, Meidimi relocated to Nairobi, where he looked for a job, until he decided to become a mushroom farmer, a profitable activity which needs little land and is not dependent on the weather. After becoming a successful grower of button mushrooms, Meidimi took an on-line course with the 2Scale project. That is where he learned about Access Agriculture. He watched many of the videos and became inspired with the idea of going back home, and getting into agriculture on a larger scale.

Meidimi went home in November of 2017. The first thing he did was plant a garden with bitter tomatoes and other vegetables. He downloaded many of the Access Agriculture videos on vegetables, to help him with this new, commercial enterprise. He is also starting to grow button mushrooms again. When Meidimi needs a video he goes to Egerton University in Nakuru,

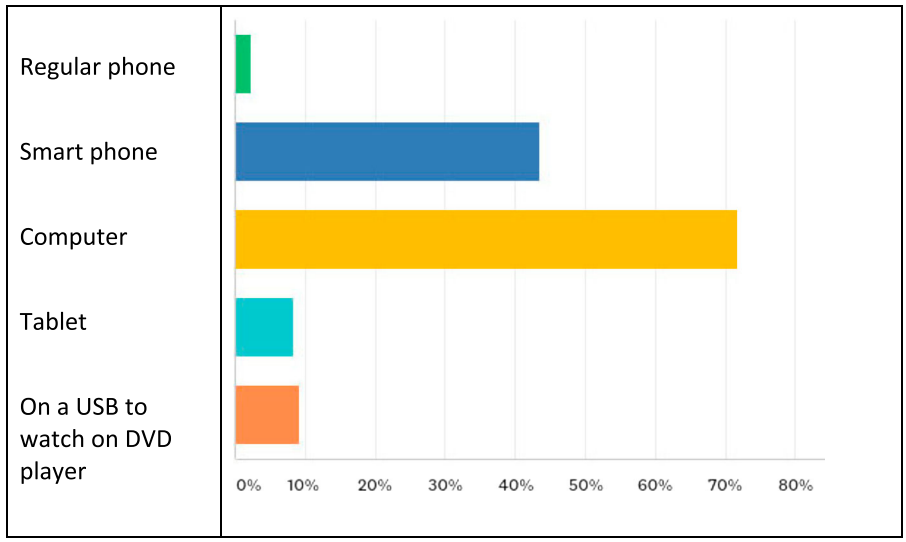

Figure 2. Responses to 'On what device did you watch or download them?'

which has free Wi-Fi. There he downloads a video in five minutes. That way he saves his airtime, and he watches the videos later on his phone.

3.4. Sharing the videos

Many are sharing the videos or the links, which is important for reaching large audiences. Slightly more people share the actual videos (36%) than the links (27%), but users are able to forward video links to their friends. Over half (57%) are downloading the videos to watch later, which suggests that many people have a good enough internet connection for downloading or find a place where they have free access to the internet. Half of the respondents (53%) watch the videos on the site (Figure 3).

Two case studies on sharing videos. Emmanuel Makokha recently graduated from university in Kenya with a degree in crop science. In an email he writes 'I am passionate about agriculture. One thing I have realized about African farming is: farmers have the desire to farm and practice agriculture, but they lack skills and appropriate information. The gap between agricultural extension officers and farmers on the ground is quite huge'. Emmanuel sees online-extension as a promising way to reach many farmers. He likes Access Agriculture so much that he joined Agtube (www.agtube.org, sponsored by Access Agriculture where anyone can upload agricultural videos). The Agtube videos helped Emmanuel to correctly identify pests, especially whitefly in tomato. The video on Agtube, 'Controlling whitefly in tomato', features yellow sticky traps (Mecozzi, 2016).

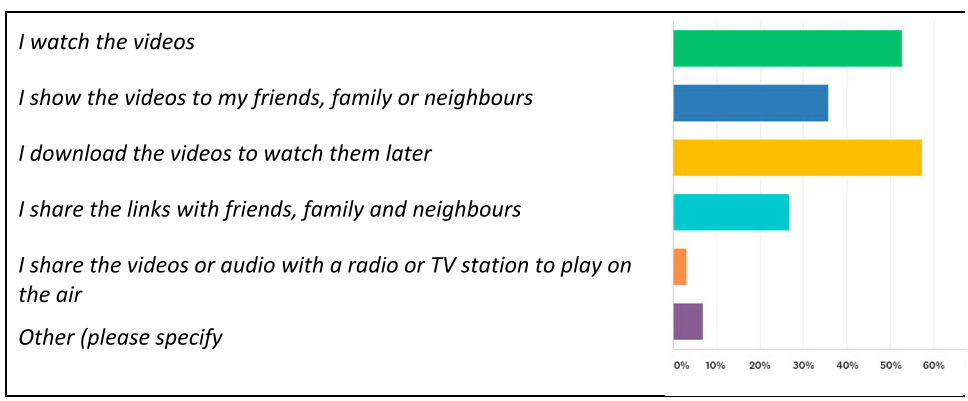

Figure 3. Replies to 'How do you use the Access Agriculture website?'

Emmanuel tried the yellow traps, and found that they did not eliminate whitefly, but did help to reduce the numbers. Emmanuel now plans to make short videos himself and post them on Agtube.

Emmanuel does not have his own farm, but he works on the farm of a friend, his mentor from university. Emmanuel writes 'When I'm not on the farm, I'm engaged in disseminating agronomic information to farmers through social media platforms (Facebook, Telegram and WhatsApp). On Facebook, we have a group known as Africa Farmers Club, currently with a membership of 54,900 farmers across Africa. Through the group, we share farming experiences and ideas. I have shared a number of videos on the platform'. For example, Emmanuel shared the video 'Managing onion diseases' (Agro-Insight, 2016), and four of the farmers shared it with their own networks. The reader can visit this Facebook group (http://bit.ly/2yhqfqQ), and see their interactions.

In Uganda, Enyang Bua Philips also shares videos with farmers. He grew up in the remote Lira District of northern Uganda, an area which is only now emerging from the devastation brought about by the war with the Lord's Resistance Army. Philips studied agriculture in secondary school. Then he went on to earn a diploma in marketing. In 2016 he was one of the co-founders of the Lango Family Farmers' Association, which he organized to help farmers with land, marketing and technical issues. The association has four staff and 569 members, including 333 women.

Philips explained that it was easy to encourage so many women to join the association. The women were already organized in village-based, self-help groups, and when he told them about the advantages of belonging to a larger association, all of these groups and their members signed up.

In March 2017, Philips read an article in the *Farming Matters* online magazine about the videos hosted on www.accessagriculture.org. He downloaded over 20 videos and has shown 10 of them to the members of the Association. He takes his laptop to the villages. There is seldom electricity, so he uses his battery to show the video to groups of about 30 people. He starts by introducing the video; afterwards he explains and discusses it with the members.

Philips recently shared the video on 'Managed regeneration of forests' (Countrywise Communication and CIS Vrije Universiteit Amsterdam, 2014) with several villages. Many of the local people were amazed to see crops growing among the trees. 'Here people cut down all of the trees before planting a garden', Philips explained over the phone. Although many of the videos are in Luo, Philips had not noticed this, and the lead author sent him links, to them, which Philips appreciated.

While some of the Ugandan farmers still doubt the wisdom of growing trees and crops together, other local people have started experimenting with the idea. In each community, the Association helps people set up a demonstration plot, where they can try out innovations shown on the videos.

The farmer groups loved the videos on maize, on striga biology (Agro-Insight & ICRISAT, 2016), and the one on mucuna, or velvet bean, a hardy legume that can be planted as a cover crop to regenerate degraded soils (Agro-Insight, 2012).

Mucuna seed can be hard to find in Northern Uganda, but these observant farmers quickly spotted wild mucuna growing on the edges of their fields. They gathered seed to plant in damaged fields during the next rainy season, to see if they could bring some of their land back to life.

The Internet is quickly spreading, but it will be a while before most farmers in Lira District are online. Meanwhile, a grassroots community organizer finds useful videos online, and shares them with groups of village farmers. That is one way that videos from the internet are reaching the most remote places. This farmers' association is not only helping farmers learn from videos, but also to understand the potential of the Internet as a source of knowledge. A version of this story was previously pos ted as a blog on www.agroinsight.com, called 'Families, land and videos in northern Uganda'.

3.5. The videos made a difference in viewers' work

Very few people said 'The videos have not made a difference in my work'. Most respondents have experienced some positive benefit from watching the videos. Videos have helped 40% of the respondents to improve their crop yields. Videos helped viewers to improve their pest management (29% of respondents), their soil (26%), and to care for animals (24%), among other impacts such as improved social cooperation and marketing (Figure 4).

Case study. The videos have made a difference for Tom Juma's work. Tom grew up in a small village in Homa Bay, in Western Kenya. As a young man he earned a B.Sc. in forestry, and studied soil science for an M.Sc. He nearly finished that degree, but was frustrated by a lack of money to pay his school fees. After university, in 2008, Tom started to work for various NGOs, especially ones that gave him an opportunity to help farmers improve their yields of cereals and other crops.

Figure 4. Responses to the question 'How have the Access Agriculture videos made a difference in your work?'

The start of a teaching herd
Photo courtesy of Tom Juma

Then in 2017, Tom decided to apply his love for agriculture into building a model farm. He now has turkeys, chickens, sheep and three cows. Tom is building a barn to hold 30 milk cows. He is motivated by 'the economic bit', as he puts it, but also by a desire to produce food for Kenya: 'We have so many mouths to feed'. Although Tom appreciated the learning videos, he had not realized that Access Agriculture hosts videos in Swahili, among other languages.

Tom wants to use the farm to educate young people. He is building the barn so it can accommodate learning visits by primary schools and others, to teach kids about agriculture. As a forester and a soil specialist, Tom feels that he is not really an expert on livestock, so he has educated himself, mostly through videos. He surfed the web for any videos on livestock and horticulture and estimates that he watched over 300 videos (from Access Agriculture and other sites).

Students will tour the barn to learn about livestock

Photo courtesy of Tom Juma

A version of this story was published as a blog, by Agro-Insight, called 'Watching videos to become a dairy expert'.

3.6. Gender

Almost 10% of the respondents to the survey are women. This is fewer than we expected. The authors do not know if this is because women have less access to the Internet, or for some other reason. The videos feature many women farmers and can be useful for female-centred programmes. As noted in once case above, the videos are a crucial part of training women's groups in Northern Uganda.

Case study on gender. Madame Penda Guèye Cissé in Senegal heads an organization called Fédération de Groupements et Associations des Femmes Productrices de la Région de Saint-Louis (FEPRODES). In December, 2014, ECOWAS (Economic Community of West African States) launched a rice initiative to upscale modern rice varieties from AfricaRice (the Africa Rice Center) in Senegal, Burkina Faso and Mali. FEPRODES trained 350 women to produce rice seed using the 'Rice Advice' videos. Two of the women extension agents in FEPRODES have also used the Rice Advice videos to teach themselves. They found the techniques for irrigation especially useful, and were able to teach the other women not to waste so much water. Previously farmers had been using so much irrigation water they seemed to be 'producing water lilies to control weeds', Madame Cissé says only half in jest. Madame Cissé has also shared the videos with the three big organizations that train farmers in Senegal: ANCAR (Service Encadrement des paysans du Ministère de l'Agriculture), the Institut de Technologies Alimentaires, and the Service de l'Horticulture, of the Direction de la Protection des Végétaux.

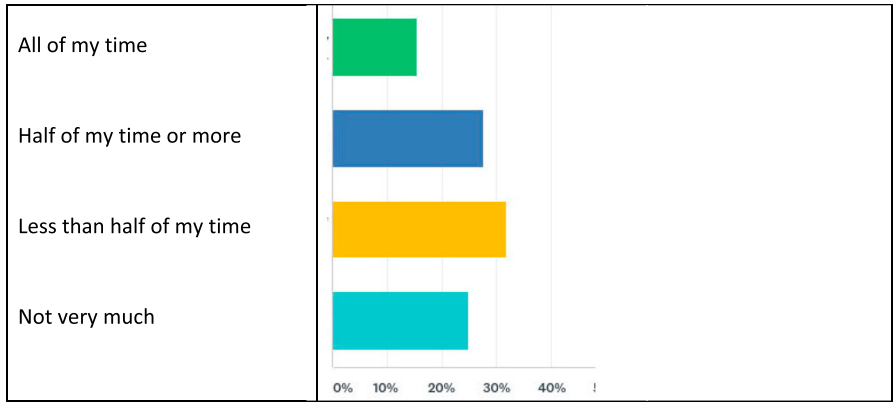

Figure 5. Replies to 'This past year, how much of your time did you spend farming, gardening or working with animals?'

3.7. Working on farm

Most of the respondents are at least part time farmers. There was little difference in responses, e.g. the farmers also prefer videos on vegetables and cereals. However, even some people with full-time jobs make an effort to stay in touch with farming and with their home community, as we see in the following case study (Figure 5).

Case study, staying rooted in the home community. Musa Sani grew up in a village in the Sahel, in Kebbi State, Nigeria. But he stopped working in agriculture after getting an education and taking a job with government customs in nearby Sokoto State. Mr. Sani never lost his interest in farming, but he says 'I was never taken serious and was totally discouraged from going into farming and some believed I was not built for it, because here we believe farming is all about manual labour with crude tools'. Even so, for the past seven years Mr. Sani has been farming again.

After watching some of the Access Agriculture videos in 2016, Mr. Sani got some new ideas he could try at home. Taking advantage of one of his monthly visits to his home village in Kebbi, Mr. Sani worked with another farmer to improve the soil with legumes, as he had learned in the videos. In 2016, on a two hectare piece of land they planted groundnuts and beans, to see if this would improve the soil. In 2017 they planted millet. The soil had been improved so much that the millet yield nearly doubled, from 20 to 25 sacks to almost 40.

Mr. Sani now has plans to get 10 acres (four hectares) of land and test different new techniques, to share the innovations with farmers. He wants to try different ways of applying fertilizer and of harvesting water, to improve the dry soil. Some of the new ideas will come from Access Agriculture videos. 'I learned so much from you about soil and it really solved some of my problems'.

Mr. Sani did not know that Access Agriculture had various videos in Hausa, the language of his home village. After we spoke on the phone, the lead author sent Mr. Sani links to all of the videos in Hausa. He was delighted. He wrote back a few days later saying 'All the videos are related to the farming activities here, even the ones about livestock. My people are the highest onion growers in this country. I'll make sure I share this information with some of them that can't have access online. I found most of the videos exactly helpful to my project, I downloaded the English version of some but getting it again in my language made it easier for more understanding'. As we have seen before, people love seeing videos in their own language.

4. Discussion

Although the survey was not aimed at youth and did not ask respondents to list their age or how many years they had spent in school, telephone and internet feedback from the farmer users of Access Agriculture revealed that many of them had attended university fairly recently. These young people know how to surf the internet to find information, download it and share it. Farmers often screen videos in communities or share links via social media, suggesting that videos can be part of the social networks of rural communities. The youth have become the new information brokers for farm communities as elder people may not have the digital skills to access the Internet for agricultural knowledge. Some of the users had not noticed that Access Agriculture hosts videos in local languages. The authors are now doing a follow up study to learn more about this.

Most smallholders in Africa and elsewhere in the global south have not attended university, but most of them do have cell phones and could access videos on the web, if they knew how to do so, and if they knew that such videos exist. The farmers in this study who are watching, downloading and sharing videos from the web are at the forefront of a major, up-and-coming extension method: on-line videos.

Smallholder farmers, led by educated youth, are starting to download learning videos from the Internet. These farmers feel that the videos have a positive impact on their agricultural activities, such as increased production, or caring for their soil better, or adopting a new crop or a new animal species. Downloading a free video from the Internet gives users their own copy of the video. People who watch the videos also share them, e.g. watching with friends, family, and neighbours and share the links with others, sometimes via social media.

Youth have become information brokers for their communities. The farmers who watch the videos online are well-educated smallholders who are trying out innovations for small-scale, high-value products for market, such as vegetables, mushrooms and

dairy. Videos can be a useful way to share information about sustainable intensification topics, such as soil conservation, IPM and better water management.

The proportion of farmers who registered for Access Agriculture was small. For example, 232 farmers were registered for Access Agriculture in Kenya (as of October 2017) of an estimated 4.5 million farms (FAO, 2018). And 215 farmers registered for Access Agriculture in Nigeria on some 16 million farms (FAO, 2018). However, a recent study shows that at least one million farmers also watched the videos when extensionists and other farmers screened them and the videos were seen by many millions on TV (Bentley, Chandra, Chadare, Okry, & Van Mele, 2019).

However, it is encouraging that farmers in Africa and the global South are starting to watch and download learning videos online. The authors were pleasantly surprised when farmers started to register for Access Agriculture; when the NGO began in 2012, some people scoffed at the idea that online videos would reach smallholders at all. 'Farmers don't have computers', said some of the critics. However, by 2017 many farmers in Africa, Latin America and Asia did have smart phones, which were essentially pocket computers.

The farmers who registered for Access Agriculture and took this survey may be more cosmopolitan than other rural people. Farmers who answered this survey tended to read and write well in English or French, had access to the internet, were computer literate and could find the site by surfing the web. Many were involved in commercial, family farming, often with high-value crops like dairy, vegetables or mushrooms. While these tech-savvy farmers may not be the most representative of tropical smallholders, they are genuine farmers and they do prove that farmers in the global south access information from the Internet.

Whatever their limitations of connectivity – electricity, bandwidth, phone signals – rural people in the developing world are working to overcome these, e.g. buying solar panels, and setting up businesses in market towns where villagers can charge their phone batteries. As creative entrepreneurs create new services for rural areas, such as mobile money, customers quickly learn to use their phones for new purposes, such as saving or sending cash. Access Agriculture is one such service that rural people are learning to use.

Charging cell phones in a barber-shop in rural Malawi

Photo by J. Bentley

Increasing ICT in the countryside will depend on the continued expansion of phone towers and smart phones. Rural youth are already using digital technology, e.g. for social media and for entertainment, so as some of these young people are attracted to become farmers, accessing information online will be as easy for them as playing a game. Access Agriculture will keep reaching out to extension organizations, farmer associations and to universities and others to promote its free, public service.

Access Agriculture is also poised to launch a new app that will make it easier and cheaper for farmers to download videos. Increasing farmers' access to videos in the future will also depend on having more videos in more languages. Word-of-mouth and social media advertising may become increasingly important to encourage farmers to use training videos; as this study showed, many of the avant-garde farmers who download videos from the web also share them with their friends and neighbours. There is still much to be done to bring farmers digital information for sustainable agriculture, but the first steps have been taken, and the concept works.

Acknowledgements

Ronald Kondwani Udedi, Gérard Zoundji, Ana Gonzales, Betty Khoury and Laura Tabet commented on the beta-version of the survey instrument. The help staff at Survey Monkey was always ready to answer technical questions. Vera Bentley helped to compile the data from the Access Agriculture registry. Many thanks to all the people who took this survey, especially the ones who agreed to be interviewed on the phone.

Disclosure statement

No potential conflict of interest was reported by the authors.

Funding

This study was generously supported by the Swiss Agency for Development and Cooperation (SDC) through the project 'Videos for Farmers' implemented by Access Agriculture (7F-08378.01).

References

Agro-Insight. (2012). Reviving soils with mucuna. Video. Retrieved from https://www.accessagriculture.org/reviving-soils-mucuna

Agro-Insight. (2013). Drip irrigation for tomato. Video. Retrieved from https://www.accessagriculture.org/drip-irrigation-tomato

Agro-Insight. (2016). Managing onion diseases. Video. Retrieved from https://www.accessagriculture.org/managing-onion-diseases

Agro-Insight. (2017). Managing aflatoxins in groundnuts during drying and storage. Video. Retrieved from https://www.accessagriculture.org/managing-aflatoxins-groundnuts-during-drying-and-storage

Agro-Insight & ICRISAT. (2016). Striga biology. Video. Retrieved from https://www.accessagriculture.org/striga-biology

Bentley, J. W. (2009). The right message and method. *International Journal of Agricultural Sustainability 7*, 79–80.

Bentley, J. W. (2014). Village movies in Malawi. Agro-Insight blog. Retrieved from www.agroinsight.com

Bentley, J. W. (2016a). The Luo translations: Farmer learning videos in northern Uganda. Retrieved from https://www.accessagriculture.org/publications

Bentley, J. W. (2016b). Friends you can trust. Agro-Insight blog. Retrieved from www.agroinsight.com

Bentley, J. W. (2017). Connected to the world. Agro-Insight blog. Retrieved from www.agroinsight.com

Bentley, J., Chandra, M., Chadare, F., Okry, F., & Van Mele, P. (2019). *On-line survey of users of Access Agriculture* (Report for Access Agriculture). In preparation.

Bentley, J. W., Chowdhury, A., & David, S. (2015). Videos for agricultural extension. Note 6. GFRAS good practice note for extension and advisory services. Retrieved from http://www.g-fras.org/en/knowledge/global-good-practice-notes.html

Bentley, J. W., & Van Mele, P. (2011). Sharing ideas between cultures with videos. *International Journal of Agricultural Sustainability 9*, 258–263.

Bentley, J. W., Van Mele, P., & Musimami, G. (2013). The mud on their legs – farmer to farmer videos in Uganda. MEAS Case Study #3.

Bentley, J. W., Van Mele, P., Okry, F., & Zossou, E. (2014). Videos that speak for themselves: When non-extensionists show agricultural videos to large audiences. *Development in Practice 24*, 921–929.

Bentley, J. W., Van Mele, P., & Udedi, R. K. (2016). Shave, haircut and a video. *ICT Update 83*. http://ictupdate.cta.int/2016/10/01/shave-haircut-and-a-video/

Chowdhury, A. H., Van Mele, P., & Hauser, M. (2011). Contribution of farmer-to-farmer video to capital assets building: Evidence from Bangladesh. *Journal of Sustainable Agriculture*, *35*, 408–435. doi:10.1080/10440046.2011.562059

Conway, G., & Toenniessen, G. (1999). Feeding the world in the twenty-first century. *Nature 402*, C55.

Corets, D. C., & Escalada, M. (2016). Interpretation of insecticide posters by rice farmers in selected villages in Leyte, Philippines. *Annals of Tropical Research 38*, 1–9.

Countrywise Communication and CIS Vrije Universiteit Amsterdam. (2014). SLM10 managed regeneration. Video. Retrieved from https://www.accessagriculture.org/slm10-managed-regeneration

Davis, K., Nkonya, E., Kato, E., Mekonnen, D. A., Odendo, M., Miiro, R., Nkuba, J. (2011). Impact of farmer field schools on agricultural productivity and poverty in East Africa. *World Development 40*, 402–413.

FAO. (2018). Family farming knowledge platform. Retrieved from http://www.fao.org/family-farming/data-sources/dataportrait/farm-size/en/

Feder, G., Ganguly, S., & Anderson, J. R. (2006). *The rise and fall of training and visit extension: An Asian mini-drama with an African epilogue*. Washington, DC: The World Bank.

Gallagher, K. (2003). Fundamental elements of a farmer field school. *LEISA Magazine 19*, 5–6.

Karubanga, G., Kibwika, P., Okry, F., & Sseguya, H. (2016). How the timing and location of video shows influence learning among rice farmers in Uganda. *International journal of agricultural research, Innovation and Technology 6*, 77–81.

Karubanga, G., Kibwika, P., Okry, F., & Sseguya, H. (2017). How farmer videos trigger social learning to enhance innovation among smallholder rice farmers in Uganda. *Cogent Food & Agriculture 3*, 1368105.

Mecozzi, M. (2016). Controlling whitefly in tomato. Video. Retrieved from https://www.agtube.org/en/content/controlling-whitefly-tomato-jinsi-ya-kupambana-na-nzi-weupe-kwenye-nyanya

Muilerman, S., & Vellema, S. (2017). Scaling service delivery in a failed state: Cocoa smallholders, farmer field schools, persistent bureaucrats and institutional work in côte d'Ivoire. *International Journal of Agricultural Sustainability 15*, 83–98. doi:10.1080/14735903.2016.1246274

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*, 27–47.

Ongachi, W., Onwonga, R., Nyanganga, H., & Okry, F. (2017). Comparative analysis of video mediated learning and farmer field school approach on adoption of striga control technologies in Western Kenya. *International Journal of Agricultural Extension 5*, 1–10.

Pretty, J., Benton, T. G., Bharucha, Z. P., Dicks, L. V., Flora, C. B., Godfray, H. C.J., Goulson, D., Hartley, S., Lampkin, N., Morris, C., Pierzynski, G., Prasad, P. V. V., Reganold, J., Rockström, J.,

Smith, P., Thorne P., & Wratten, S. (2018). Global assessment of agricultural system redesign for sustainable intensification. *Nature Sustainability 1*, 441–446.

Pretty, J., & Bharucha Z. P. (2015). Integrated pest management for sustainable intensification of agriculture in Asia and Africa. *Insects 6*, 152–182. doi:10.3390/insects6010152

Sousa, F., Nicolay, G., & Home, R., (2016). Information technologies as a tool for agricultural extension and farmer to-farmer exchange: Mobile-phone video use in Mali and Burkina Faso. *International Journal of Education and Development Using Information and Communication Technology 12*, 19–36.

Swanson, B. E., & Davis, K. (2014). *Status of Agricultural Extension and Rural Advisory Services Worldwide. Summary Report. GFRAS (Global Forum for Rural Advisory Services Worldwide. Summary Report*. Lindau, Switzerland: GFRAS (Global Forum for Rural Advisory Services) and Feed the Future.

Tripp, R., Wijeratne, M., & Piyadasa, V. H. (2005). What should we expect from farmer field schools? A Sri Lanka case study. *World Development 33*,1705–1720. doi:10.1016/j.worlddev.2005.04.012

Udedi, R. K. (2016). DeeJaying on the farm. In J. W. Bentley, E. Boa, & M. Salm (Eds.), *A passion for video: 25 stories about making, translating, sharing and using videos on farmer innovation* (pp. 31–32). Nairobi: Access Agriculture/Wageningen: CTA, 56 pp.

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

Van Mele, P. (2006). Zooming-in, zooming-out: A novel method to scale up local innovations and sustainable technologies. *International Journal of Agricultural Sustainability 4*, 131–142.

Van Mele, P. (2017a). Village smart phones. Agro-Insight blog. Retrieved from www.agroinsight.com

Van Mele, P. (2017b). A Connecting business. Agro-Insight blog. Retrieved from www.agroinsight.com

Van Mele, P., Bentley, J. W., Harun-ar-Rashid, M., Okry, F., & van Mourik, T. (2016). Letting information flow: Distributing farmer training videos through existing networks. *Indian Journal of Ecology 43*, 545–551.

Van Mele, P., Okry, F., Wanvoeke, J., Barres, N. F., Malone, P., Rodgers, J., Rahman, E., & Salahuddin, A. (2018). Quality farmer training videos to support South-South learning. *CSI Transactions on ICT*. https://doi.org/10.1007/s40012-018-0206-z

Van Mele, P., Zakaria, A. K. M., Begum, H-A., Harun-Ar-Rashid, M., & Magor N. P. (2007). Videos that strengthen rural women's capability to innovate. *Communication for Development and Social Change 1*, 273–294.

Zossou, E., Van Mele, P., Vodouhe, S. D., & Wanvoeke, J. (2009). The power of video to trigger innovation: Rice processing in Central Benin. I*nternational Journal of Agricultural Sustainability 7*(2), 119–129. doi:10.3763/ijas.2009.0438

Zossou, E., Van Mele, P., Vodouhe, S. D., & Wanvoeke, J. (2010). Women groups formed in response to public video screenings on rice processing in Benin. *International Journal of Agricultural Sustainability 8*, 270–277.

Zossou, E., Van Mele, P., Wanvoeke, J., & Lebailly, P. (2012). Participatory impact assessment of rice parboiling videos with women in Benin. *Experimental Agriculture 48*, 438–447. doi:10.1017/S0014479712000117.

Zoundji, G. C., Okry, F., Vodouhê, S. D., & Bentley, J. W. (2016). The distribution of farmer learning videos: Lessons from non-conventional dissemination networks in Benin. *Cogent Food & Agriculture 2*, 1277838.

Zoundji, G. C., Okry, F., Vodouhê, S. D., & Bentley, J. W. (2018). Towards sustainable vegetable growing with farmer learning videos in Benin. *International Journal of Agricultural Sustainability 16*, 54–63. https://doi.org/10.1080/14735903.2018.1428393

Zoundji, G. C., Okry, F., Vodouhê, S. D., 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*, 80–91.

Appendix 1. The survey questions

1 What categories of Access Agriculture videos have you watched or downloaded? Please check all that apply.

R1
- Cereals
- Roots, tubers and bananas
- Vegetables
- Pulses
- Fruits and nuts
- Other crops
- Livestock
- Aquaculture
- Integrated pest management
- Sustainable land management
- Mechanization
- Business skills
- Methods
- Others
- I can't remember, but I know I have watched or downloaded
- some videos
- None

2 In total, how many Access Agriculture videos have you watched or downloaded?

R2
- 1–5
- 6–10
- 11–20
- 21–50
- More than 50
- None. Please tell us why you have not watched or downloaded any videos

3 In what format did you watch or download the videos? Please check all that apply.

R3
- Video
- 3gp (video for mobile phone)
- Audio (for listening or for playing on the radio)
- I'm not sure

4 On what device did you watch or download them? Please check all that apply.

R4
- A regular phone
- A smart phone
- Computer
- Tablet
- On a USB to watch later on a DVD player

5 How do you use the Access Agriculture website? Please check all that apply.

R5
- I watch the videos
- I show the videos to my friends, family or neighbours
- I download the videos to watch them later
- I share the links with friends, family and neighbours
- I share the videos or audio with a radio or TV station to play on the air
- Other (please specify)

6 How have the Access Agriculture videos made a difference in your work? Please check all that apply.

R6
- Improved my crop yield
- I could feed my family more food, or better food
- I improved the way I managed pests, diseases and weeds
- I was able to use less chemical pesticides and chemical fertilizer
- I saved time or labour. Or I could hire less labour
- Now my soil is healthier, or more fertile
- I could use less irrigation water
- I started to grow a new crop
- I started to keep a new kind of animal
- I learned how to take better care of my animals
- I was able to sell new products or sell my products for a higher price
- The videos gave me more confidence to contact extension workers
- I was able to charge for doing a new kind of service
- I was able to manage my money better

- My fellow farmers and I were able to cooperate better
- The videos have not made a difference in my work
- Other (please specify)

7 We would like to know if the Access Agriculture videos have made a difference in people's lives. Have you harvested more or earned more money as a result of what you learned from the Access Agriculture videos? Your response is optional and confidential

R7
- No, I have not harvested or earned more
- Yes, I harvested or earned more for a value of less than 10 US dollars
- Yes, for a value between 10 and 49 US dollars
- Yes, for a value between 50 and 100 US dollars
- Yes, for a value greater than 100 US dollars
- Not applicable
- Other (please specify)

8 In the past, women often had less access to information than men had. We want to know if Access Agriculture is reaching women. We will keep your response confidential. Are you a man or a woman?

R8
- Woman
- Man

9 This past year, how much of your time did you spend farming, gardening or working with animals?

R9
- All of my time
- Half of my time or more
- Less than half of my time
- Not very much

10 What other video topics would you like to see on Access Agriculture? (Optional)

11 What can we do so that more farmers know about Access Agriculture? Please check all that apply

R11
- Advertise on TV, radio or in the newspaper
- Share Access Agriculture with extension agents
- Share Access Agriculture with universities and secondary schools
- Contact more farmer organizations
- Advertise on the Internet
- Communicate on social media, such as Facebook, email, WhatsApp, Twitter and others
- Other (please specify)

12 Thank you for taking our survey. If you have any questions or comments, you can write them in the box below. We would like to hear how you have used the Access Agriculture videos in your work.

13 Let's stay in touch!
Name
Country
Email Address
Phone Number