



RTB Report

Gender responsive communication tools and approaches for scaling the Triple S Technology in Ethiopia and Ghana

Sarah Mayanja, Issahaq Suleiman, Simon Imoro,
Thomas Van Mourik, Frezer Asfaw, Mihiretu
Cherinet, Margaret McEwan

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RTB Report

Gender responsive communication tools and approaches for scaling the Triple S Technology in Ethiopia and Ghana

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www.rtb.cgiar.org/

Contact:

RTB Program Management Unit
International Potato Center (CIP)
Apartado 1558, Lima 12, Peru
rtb@cgiar.org • www.rtb.cgiar.org

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Executive summary

The RTB Triple S Scaling project (3S+) is a 27-month project funded by the CGIAR Research Program on Roots, Tubers and Bananas (RTB) and was operational in Ghana and Ethiopia. The aim of the project was to scale out the Triple S technology – a root-based vine production technology suitable for arid and semi-arid areas.

Amongst the scaling strategies developed and implemented, was an outreach strategy based on three types of treatment:

- Core communities
- Informed communities
- Spillover communities

Subsequently, various communication tools and approaches were used for the three types of communities.

Following use of these strategies, there was a need to assess their effectiveness in aiding technology dissemination, uptake and scaling.

A study was designed to assess which communication methods were best suited to the needs of women and men in transmission and delivery of the Triple S innovation scaling package.

The study research questions included:

- How gender responsive are our different communication materials and channels and what are we learning?
- How do men and women beneficiaries perceive the training materials? Is their preference related to gender?
- Is access to information affected by gender? Are we accidentally excluding certain people in communities to access information?

Findings from the study indicate that the face to face communication channels was the most preferred by both men and women in Ghana and Ethiopia. Radio was not perceived to be a channel of choice for women given challenges related to access to radio sets and accessories and timing of the programs. Video was considered to be a new and educative channel especially by men who likened it to being in a classroom but was mostly appreciated by women in Upper West region, Ghana.

Nonetheless, a digital divide was evident between men and women in Ethiopia where women perceived radio and video to be inaccessible, the information delivered was deemed to be difficult to comprehend, apply and share.

Future interventions will need to obtain a deeper understanding of the intrahousehold dynamics related to communication equipment as well as existing gender norms within communities before designing communication strategies. This could enable better reach and utilization of technology information by women and men farmers.

Abbreviations

3S+	Triple S Plus
DA	Development Agent
F2F	Face to Face
FGD	Focus Group Discussion
HLC	Healthy Living Clubs
ICTs	Information and Communication Technologies
PRUDA	Partnerships for Rural Development
RTB	CGIAR Research Program on Roots Tubers and Bananas
SNNPR	Southern Nations, Nationalities, and Peoples' Region
SSA	Sub Saharan Africa

Gender responsive communication tools and approaches for scaling the Triple S Technology in Ethiopia and Ghana

1. Introduction and background to the study

The CGIAR Research Program on Roots, Tubers and Bananas (RTB) Triple S Scaling project (3S+) was a 27-month project operational in Ghana and Ethiopia. In Ghana, the project was implemented in the North and Upper West regions while in Ethiopia the implementation areas were in six woredas (districts) in the Southern Nations, Nationalities and Peoples' Region (SNNPR). The aim of the project was to scale out the Triple S technology – a root-based vine conservation and multiplication technology suitable for arid and semi-arid areas. Amongst the scaling strategies developed and implemented, was an outreach strategy based on three levels of intensity:

- Core intervention
- Informed intervention
- Spillover intervention



Subsequently, different communication tools and approaches were used for the three levels of intensity. In Ghana, core communities received the full package of communication, being face-to-face training (with demonstrations), video and radio messages on the Triple S; spillover communities received only video and radio messages and informed communities only received radio messages on Triple S. In Ethiopia, the core community package included face to face and radio, the informed communities package comprised of video and radio while spillover communities were reached only with radio.

A study was designed to assess which communication methods were best suited to the needs of women and men in knowledge transfer and delivery of the Triple S innovation scaling package.

The study research questions included:

- How gender-responsive are our different communication materials and channels and what are we learning?
- How do men and women beneficiaries perceive the training materials? Is their preference related to gender?
- Is access to information affected by gender? Are we accidentally excluding certain people in communities to access information?

The study was conducted in October and November 2019 in the project countries. This report provides findings from the study as well recommendations aimed at assisting future similar interventions.

2. Theoretical underpinnings

2.1. Gender and access to information and knowledge

Information and knowledge management play a crucial role in technology dissemination and uptake (McCormack, 2018). According to Vaughan et. al. (2019); farmer's access to information is determined by the type of information product, demand and the channel of delivery; hence the importance of understanding and defining such channels.

In Sub Saharan Africa (SSA), women farmers have been found to face more difficulty than men in accessing resources such as information which ultimately influences the types of crop they grow and markets they participate in (Doss, 1999). Limited access has also been attributed to women's limited mobility, restrictive social norms, limited access to extension agents and equipment (such as radio); among others (Gumucio et. al 2019). For example, Isaya et. el. (2018) found that 68% of female headed households in Tanzania had been in contact with an agricultural extension agent within 12 months as compared to 90% male headed households. For some respondents, access was once in a year. Yet, radio and agricultural extension agents were the primary source of information for women in the study (*ibid*).

Buehren et.al, (2019) found that female headed households in SNNPR, Ethiopia received less farming advice because either the content was not suited to their needs, or the mode of delivery did not enable them to utilize the information as much as men. Even where information has been relayed, women sometimes lack the ability to convert theoretical knowledge into practice (Ragasa, 2014). Thus, as reiterated by Ogato (2013), there is a need to identify information channels that are cognizant of women's conditions, needs, roles in the community, and match their mode of thinking. Indeed, as opined by Misuraca 2007 (in Ogato, 2013), research in this arena would assist in identifying strategies to minimize socio-cultural barriers that limit women's access to Information and Communication Technologies (ICTs).

Efforts to reduce disparity in access to and uptake of technology have come with concerted efforts to address women and men's needs. For example, by using female extension agents, women farmers have noted improved information delivery and use of the knowledge so attained (Meinzen-Dick et. al, 2012). However, information delivery needs to be augmented with other services e.g. fostering social learning. This is because though high initial adoption rates could be registered, this may quickly wear off if not supported, hence the need for holistic intervention packages, not single services (Patnam, 2014).

Agricultural technology uptake needs to ride on existing technologies that have successfully been introduced e.g. the mobile phone. However, studies have shown that while women may have access to mobile phones, they are not using them to access agricultural information and still largely depend on their spouses. Yet again; such information may not be relevant to their agricultural enterprises as their choice of crops may differ from the men (Isaya et. al. 2018).

Limited access to information limits women's options and chances to make decisions on whether or not to try out a new technology such as the Triple S. This limits their agency (capacity to make purposeful actions and pursue goals) to develop and grow their agricultural enterprises which greatly support food, and increasingly income security in their homes (Gates, 2014).

3. Methodology

This section explains how the study was conducted. It gives detailed information about the study design that was used, the sampling procedure and sample size. It further shows how data was collected, analyzed and reported.

3.1. Study design

A descriptive cross-sectional design was used to collect qualitative and some quantitative data. A cross-sectional design is one that explains and measures phenomena at a point in time. Russell (2000) recommends this approach because data is collected on many variables from a large number of dispersed subjects and questions on who, what, when and where can easily be answered at the same time. This design was appropriate because a wide diversity of respondents was covered through sex disaggregated Focus Group Discussions (FGD).

The approaches and methodology that guided the study hinged on the following phases:

- i. **Design phase:** This phase commenced during preparations of the project first annual review meeting which was held in January 2019 in Tamale, Ghana. A protocol was designed by a multi-disciplinary project team after the annual meeting and thereafter initial pretesting was done in Wa District (Wechau Bao and Diesi), Ghana. The tool was finalized and was adapted by each country team to reflect the communication approaches and tools that were used.
- ii. **Preparation for field data collection:** This phase focused on consolidating the study itinerary, training and orienting research assistants, after which reconnaissance and pretesting were done in Misrak Badewacho in Ethiopia and Wechau Bao in Ghana.
- iii. **Field survey:** The study was conducted in Hawassa Zuria, Misrak Badewacho and Dilla Zuria Ethiopia (Fig 2) and in the Northern and Upper West Region in Ghana (Figure 1). Study areas were purposively selected based on intensity of project interventions and knowledge flow segmented into core, spillover and informed interventions; as defined below:

Core intervention: these are communities where all the planned project activities were conducted and beneficiaries were reached out to using several communication methods such as radio, video and demonstrations.

In Ethiopia, farmers were exposed to face to face training through step-down training and radio dissemination. Under this approach, one ToT was conducted at regional level and attended by experts from the region, zone and woreda by CIP specialists. The knowledge so obtained was cascaded down to Kebele and woreda level to champion farmers, kebele managers and security official. In turn, each champion farmer trained 50 farmers at village level.

Additionally, face to face trainings were conducted at Healthy Living Clubs (HLC) in Gedeo zone in Ethiopia. Trainings focused on nutrition, sweetpotato agronomic and Triple S. This was complemented with radio programs.

In Ghana, farmers attended demonstrations that were facilitated by experts. Radio and video were used to relay information about the Triple S.

Spillover intervention: these were characterized by intentional information flow about the Triple S technology using targeted channels i.e. video and radio.

In Ethiopia, ToTS for video were conducted by digital green experts for extension communication experts from Zonal Bureau and woreda offices and Development Agents (DA) from Kebele offices. The trained DAs trained 200 famers who in turn screened the video locally for 25 farmers. Radio scripts were translated into four local languages, as were the videos.

In Ghana, videos and radio scripts were translated into local languages. Videos were screened to the farmers at suitable locations within the community.

Informed intervention: the communication channels used to scale out the technology in such locations were radio and word of mouth. The hypothesis was that people in these communities would ‘informally’ learn about the technology through tacit methods.

In the case of Ethiopia, scripts translated in the local language were broadcast three times a week for three consecutive weeks. Each radio program ran for 20 minutes.

Similarly, in Ghana, radio scripts were translated in local languages and broadcasted for close to a month.

Two communities were selected in each of the project treatment locations as detailed in Table 1 below:

Table 1: Study communities by treatment

Country	Region	Core	Spillover	Informed
Ghana	Upper West	Vieri	Chogsia	Lilisi
		Pulima	Suke	Nawia
	Northern	Nyesung	Shebo	Sajagban
		Tugbang	Nagunkpang	Namongbani
Ethiopia	SNNPR	Weyra Bushera	Tika Kokere	Jara Gelelcha
		Jara Dado	Tenkaka Umbulo	Weyra Mazroia
		Chichu (HLC)		
		Andida (HLC)		

The study areas in Ghana are further elaborated in Figure 1.



Figure 1: Map of Ghana showing the study areas

The study districts in Ethiopia (Misrak Badewacho Hawassa Zuria and Dilla Zuria) are also shown in Figure 2.



Figure 2: Map of SNNPR, Ethiopia showing the project intervention woredas

3.2. Selection of communities and respondents

The communities were purposively selected, but respondents were selected using stratified sampling method with the aid of contact persons such as extension workers and group leaders.

3.3 Data collection method

Sex disaggregated focus group discussions were held in 12 communities in Ghana and six communities in Ethiopia (Table 2). In each community, two FGDs were held i.e. one for men, and one for women so that a total of 36 FGDs (24 in Ghana and 12 in Ethiopia) were conducted. A total of 359 respondents (174M, 185W) participated in the study of which 124 respondents (64M, 60W) were included in Ethiopia. In the Northern Region of Ghana, 120 respondents (55M, 65W) participated in the study while 115 respondents (55M 60W) did so in the Upper West Region. In the course of the discussions care was taken to explore the perceptions of each sex on the communication approaches and channels in a bid to ascertain whether there was significant gender-based differences pertaining to their effectiveness in relaying Triple S information.

Table 2: Category and number of study respondents

Country	Regions	Respondent by exposure intensity and sex					Total respondents
		Core	Informed	Spillover	M	F	
Ghana	Northern Region	45(20M,25F)	35(15M, 20F)	40(20M, 20F)	55	65	120
Ghana	Upper West	46 (18 M, 28F)	34 (17M, 17F)	35 (20M, 15F)	55	60	115
Ethiopia	SNNPR				64	60	124
Total					174	185	359

3.4 Data management and analysis

Qualitative data collected in the focus groups was subjected to content analysis. Simple descriptive statistics (mean, percentage and frequencies) were used to analyze respondents’ perception of various communication methods that they had been exposed to in the quest to scale the Triple S technology.

4. Results

4.1. Description of the respondents

All the respondents were farmers were sweetpotato farmers. In Ghana, men were slightly younger and more educated than the women (Table 3). This could imply that men had a better chance of technology uptake given that they were more literate than women. Individual data for women from the Upper West region for example indicates that many of them had not been to school. All respondents reported large family sizes which could augur well for labour but also imply more mouths to feed. This could be a positive factor for the adoption of Triple S. Women from the northern region had not established Triple S beds and they mentioned that they had just started farming; as this activity was previously designated for men only.

In Ethiopia, men and women respondents were in the same range. Men were slightly more educated than women, while household sizes were the same. Having youthful head of families could be advantageous for Triple S adoption as youth have been noted to be more responsive to uptake of new technologies.

Table 3: Demographic descriptors of respondents

	Ethiopia M	Ethiopia W	Northern Reg M	Northern Region W	Upper West M	Upper West W*
Age	35	34	40	42	37	43
Education (years)	8	7	4	2	5	3
HH size	7	7	16	16	12	14
Vine plots metre ²	0.2**	0.1**	6.6	0	3.7	9.2

*data available for only two FGD ** sweetpotato plot size in ha

4.1.1. Access to agricultural information

Women respondents from the Upper West region of Ghana mentioned agricultural officers, radio, video and talking books obtained from local NGOs like PRUDA and Farmer Line as their major sources of agricultural information. Other sources cited included face to face and through meetings. In the Northern Region, women mentioned agricultural officers, radio and other organizations to be the most common sources of agricultural information. However, for Triple S, video and neighbors from other communities (on market days) were mentioned as additional and important channels by respondents from the core community.

In Tugbang, a core treatment community in Northern region of Ghana, men indicated that their most important source of agricultural information was the radio followed by agricultural officers, video/TV and friends. The men were of the view that they had similar access to information as women; though women could be better exposed since they dealt in shea.

Generally, men and women respondents in Ghana did not perceive differences in access to information by sex. The exception was in Chogsia, Wa West where women mentioned that they have better access to information than their spouses; and actually, shared information obtained from NGOs with them. The women further noted that while extension officers were their most important source of information and radio the least; the reverse was true for men.

In Ethiopia, agricultural officials were ranked to be the most important source of information followed by radio and family and fellow farmers. Women from Tika Kokele, Hadiya zone revealed that their major source of information was from agricultural officers at Kebele and Woreda levels. Some women respondents also mentioned family members, radio and video as sources of information; which corresponds to the communication channels used in spillover communities.

Most of the time I get the information from kebele Agricultural office, and sometimes from my brother and sister in law because they both are agricultural experts. (Participant, Women FGD, Tika Kokele, Misrak Badewacho)

In addition to extension officers, radio and video, women from Weyra Bushera, Hadiya zone (a core community for HLC) also mentioned model farmers, health facilities NGOs, trainings and meetings as sources of agricultural information.

When asked to assess information access between men and women, only female respondents in Tika Kokele Hadiya zone were of the view that men had better access to information than women, though no explanation was offered.

Men in Ethiopia mentioned similar information channels as the women; but also shared that the most important source of information was the farmer himself. They further indicated most of their information was passed down from their great grandfathers, a channel which they considered to be important. Aside from this, men mentioned channels which women did not such as 8028 Farmers' hotline service and magazines; as elaborated below:

We also get information from magazines: the magazine has a bimonthly news column about rural agendas and agriculture. We, farmers gather together, and the newspapers are read to us after which we then discuss the issues. Magazines are better than radio and television because there are discussions held on the issues raised after reading. Respondent, Men FGD, Andida, Dilla Zuria (Core, HLC).

Again, just like the women, the most important source of information for men was agricultural experts followed by experience sharing from various fora such as meetings; and radio. The general perception from most men was that women and men had the same access to information.

Both women and men have equal access to information in our area. For example, widowed women`s are invited exceptionally to trainings and meetings, in order to fill information gaps. Therefore, in our

area men's and women's do have equal chance and access to agricultural information. Respondent, Men FGD, Chichu, Dilla Zuria (Core, HLC).

Only one community in Ethiopia thought otherwise, mentioning that women mostly got information from men and radio. Respondents in this community further mentioned that women did not actively participate in trainings and meetings and so did not have equal access as compared to men.

Agricultural experts are the most common sources of information for men, while men are the main sources of information for women. They don't hear radio because they are busy on different housework. Sometimes when they attended trainings if they (women) are invited they can get information from the meeting and trainings they participate in. These are the only sources of information that women get. In most case women don't have chance to go other places like men. Respondent, Men FGD, Jara Gelelcha (Informed community).

Both women and men respondents mentioned that they shared information with family members, friends and group members who may have missed out on a knowledge event. They further indicated that they did not modify the information and shared it as is. Participant's in one men's FGD however mentioned that they sometimes forgot some of the information and being illiterate, they did not take notes. A woman participant indicated that she simplified the information from agricultural experts so as to make it easy for her recipients to understand.

Challenges in accessing agricultural information

The challenges highlighted by participants across the two countries were very similar and are discussed together below.

Untimely access to information

Men respondents from Ethiopia shared that untimely information and lack of immediate responses were the major problem they faced. Another challenge was cancellation of training programs especially where extension agents were urgently summoned to attend other meetings. Yet another challenge cited was scheduling of trainings at inappropriate times for farmers which led to low attendance.

In Sajagban, Northern Ghana (an informed community), women respondents mentioned that because of the bad roads, agricultural officers are not able to visit them frequently and when they do, they don't arrive on time.

Insecurity

Security problems in Ethiopia were seen to limit the movement of agriculture experts from place to place which affected timely dissemination of important agricultural information to the farmers.

Incomplete information

Respondents in both countries noted that at times they received incomplete information especially about agricultural inputs. This forced them to depend on input traders for information because at times agricultural experts did not provide advice. Information on the control of pests and diseases was noted to be generally lacking.

Software and connection problems

Power outages were highlighted as a cause to limited access to information relayed on radios. This is further exacerbated by the fact that radio programs are transmitted on a given schedule and they are rarely repeated.

In Ethiopia, women explained that they experienced difficulties in accessing information disseminated via radio due to power outage. In addition, most farmers did not have access to radio. A similar observation was made in Nangunkpang, Northern Ghana, by women respondents. Further, they noted that while radio was the second most popular channel, women also could not afford batteries, yet most communities do not have electricity; thus, constraining accessing to information. Where farmers are able to access radio, radio programs are interrupted when there is a power outage.

Farmer negligence and attitude

Respondents shared that farmers had a problem of negligence in accessing information. Farmers did not want to attend trainings where per diems were not paid and would miss the information relayed. Farmers also habitually turned up late for trainings and did not want to take notes.

Illiteracy

Most women farmers in core communities shared that they were not educated and found problems in understanding information relayed during training and experience sharing visits. At times, information transmitted through radio programs on Triple S was not clear and farmers found it hard to put such information into practice. This challenge was noted in both countries.

Differences in accessing information between men and women

Men in both countries were noted to have better access information sources as they could go to town and meet different people. Men also had better chances to see or be exposed to different new technologies unlike women.

Women shared that they had greater burdens than the men working at home. This made them busy and deprived them from getting adequate agricultural information. As such women often depended on men for agricultural information. In Ethiopia, even where women had mobile phones, they did not use them to obtain agricultural information due to low levels of literacy and lack of phone credit. In northern Ghana, women shared that men had been engaged in farming much longer than them; and so, the men had better access to

advance agricultural information. Besides, men were also perceived to have more mobility which enhanced their access to information.

4.1.2. Type of sweetpotato related information received

Women and men reported similar types of sweetpotato related information in Ethiopia and Ghana. The information is further elaborated under various themes below:

Planting materials

Information was noted to be on how to plant sweet potato and conserve sweetpotato roots for planting materials. This information was mostly relayed during field training and video shows; and was reported by core and spillover treatment communities.

General sweetpotato/agronomy information

Respondents shared that they had obtained information on how to cultivate the crop and also about the different varieties of sweetpotato that exist. In addition, they learnt how to plant in rows, appropriate spacing and benefits thereof. Other information received was on preparation of disease-free planting materials and how to protect crops from disease.

Nutrition related information

In addition, respondents shared that they had obtained information on the nutritional and health benefits of OFSP and how food is prepared from OFSP by mixing it together with other foods. For example, they learnt that leaves of OFSP can be cooked and consumed. In Ethiopia, this was majorly reported by respondents in HLC communities.

Postharvest/value addition

Women farmers mentioned that they had been exposed to different food recipes which could be prepared from sweetpotato. This improved the dishes they prepared as formerly they would only consume boiled sweetpotato.

Marketing/agribusiness

Men respondents in Vieri, Upper west region in Ghana (a core community) shared that they had received training on income generation and cost benefit analysis for sweetpotato based products. However, the respondents did not mention the source of this information.

4.1.3. Conservation of sweetpotato planting materials

In Ethiopia, respondents in three out of the eight male FGDs (two from spillover, one from core community) mentioned that they primarily conserved planting materials using the Triple S technology. Other methods of conservation included planting vines in wet areas like swamps, lakeshores, coffee and enset gardens and around the homestead. Other methods included intentionally leaving some roots in the soil (ground keeper roots) especially during piece-meal harvesting. Women did not mention Triple S at all but indicated that they used other conservation methods as highlighted by the men.

In Northern Ghana, respondents in three out of the six women FGDs used Triple S to conserve planting materials. Other methods mentioned include vine multiplication and leaving roots in the garden after harvest. These roots sprout during the first rains and the vines are used for planting. In Upper West, two informed communities, one spillover and one core community men respondents mentioned that they were using the Triple S method to conserve planting materials.

Storage of sweetpotato roots

Majority of the men respondents in Ethiopia indicated that they stored roots for food and planting material. For food, the methods highlighted included leaving the roots in the soil – by cutting off the vines; by storing roots in a dry place on a wooden shelf/bed on a layer of tef straw; and also, in sand. These three methods were used for storing roots for food for a period of one to three months. Men respondents also shared that they stored roots with the aim of obtaining planting materials using the Triple S technology, burying roots in Enset farms, burying small roots in cold areas and also cutting off foliage of plants and storing the roots. In such cases, roots were stored from three to 12 months.

Six out of the eight women FGDs in Ethiopia mentioned that they mostly stored roots for food using ground keeper roots but also for planting materials. ‘We just leave the sweetpotato in the farm’ mentioned women from Weyra Bushera. Two women groups indicated that they also stored roots using the Triple S technology – though they had not mentioned this in the earlier question on the methods used to conserve planting material. They nonetheless indicated that by using this method they were able to store the roots for three to four months. Two women groups indicated they did not conserve roots.

Women in Nyensung, a core community in Northern Ghana mentioned that men were the ones who mostly stored sweetpotato roots in sandpits. This was because the women did not have space to store the roots and when they tried to do so, the children would take them out of storage and eat them. Roots were stored for food, market and for planting materials, with women focusing on food and men on planting materials. Roots were sold off between three and six months after harvest.

In Namongbani, women explained that the major methods of storing roots were sandpit, storage barn, sandbox, and in barns raised on interspaced sticks during the dry season. The roots were planted at the onset of the rains to multiply vines. In Suke, Lambusie district; women elaborated the pit method as below:

‘We use the pit method, the one with the steps. We dig the pit in steps and put sand inside, and then place well-selected sweetpotato inside the first step, that is the deeper one, and cover with sand, we continue this way until we fill the whole pit.’

Roots were also stored for food and market for a period ranging from six to eight months, but some respondents were of the view that roots do not get spoiled for as long as they are monitored regularly.

4.2. Triple S communication channels

Below we define the communication channels used to relay Triple S knowledge:

1. Face-to-Face: Direct training or exchange of information with demonstrations by an expert such as Agricultural Extension Agent, an NGO Technical person, Lead/Model farmer.
2. Video: Projection of farmer training videos and facilitated discussions in the local languages.
3. Radio: Broadcasting of radio programs in Agriculture via rural radio stations.
4. Neighbor: Exchange of information between farmers by word of mouth at social events or through casual contacts.
5. Phone services: these include specially designated farmer lines for voice or text messages
6. Healthy Living Clubs: these are special clubs for promotion of healthy living styles (Ethiopia).

Respondents were asked if they had heard of the Triple S technology, and the channels through which the information had been relayed. Nearly all the men groups regardless of the treatment in Ethiopia had heard about the technology and indeed explained the process very well as elaborated below:

The first thing is selecting the right OFSP roots that have medium size, free from disease, free from damage by tools. The next step is preparing a container in which newspaper(papers) are laid at the bottom then selected dry sand is placed. Finally, the selected roots are place carefully placed in the sand allowing space between the tubers to avoid contact. The container containing the seed then will be put in a dry and dark place throughout the dry season till the rainy season starts. Respondent, Men FGD, Chichu, Dilla Zuria (HLC treatment community).

Amongst the channels mentioned were (i) face to face training (ii) video shows (iii) radio (iv) flip charts – through model farmers and development agents (v) booklets on OFSP (vi) posters and (vii) photos. Some five communities which received core and spillover treatments reported a combination of three or more channels while one community mentioned only one channel. Information was relayed at churches, model farmers homes and at FTCs mainly by agricultural experts and model farmers.

Practical training on farm and Video were used. We saw on video at one farmer home all the steps of “3S” method and face to face training. Also, we heard from radio which is broadcasted from Dilla area. Respondent, Men FGD, Tikare Kokere, Misrak Badewacho (spillover community)

Only one women’s FGD in Weyra Bushera had not heard of Triple S. This was quite surprising given that it was a core treatment community. Fewer channels were mentioned though including (i) face to face trainings – using flipcharts (ii) video, and (iii) other farmers or word of mouth. Respondents from Jara Gelelcha (informed treatment) only mentioned word of mouth and further mentioned that they knew very little about the Triple S.

In Ghana, women from Upper West region i.e. Suke; Lambussie district and Chogsia; Wa West district ably demonstrated the Triple S (Figure 3). They mentioned that they obtained the knowledge from video shows and from demonstrations conducted by PRUDA (an NGO) and CIP.



Figure 3: Women in Upper West Region, Ghana demonstrating the Triple S process

Women in Vieri elaborated the technology as below:

'It is done by digging a pit, or by creating a fence box and the use of a container. You look for clean and dry sand preferable from the river side fill the under part of any of the above mentioned with sand and place the root, leaving space in between them to protect them from weevils and insects which could move from one root to the other. Cover them with a layer of sand and repeat until you get to last layer then you add more sand'.

How the information has been used:

Respondents were asked to share how they had used the information obtained from the various information channels. Men in Ethiopia highlighted three information channels (in order of importance): (i) face to face (ii) video and (iii) radio. The most detailed explanations were provided on face to face with testimonies of implementation of the Triple S; as exemplified below:

Testimonies for face to face:

Using the information from the training about Triple S we planted OFSP at our backyards and we stored the roots and planted again when the planting season came. We used the roots and the leaves for food and for planting. The leaves are eaten like a cabbage and have health benefits. We use sweetpotato to prepare porridge and breads and you can even see it if you come to our homes now (Men, Ethiopia).

Based on the training received, we prepared Triple S and we stored 40 to 50 selected roots in the container carefully to avoid contact between the roots...then checking the roots every 3 to 4 days for sprouting and to avoid attack from livestock and rats. In this way the roots can be stored from October through February, till the rainy season starts. By the end of the dry season, the roots were planted the prepared plot for seedling production (Men Ethiopia).

Testimonies for video:

We saw some success stories and practices of sweet potato conservation on video. But we were not able to disseminate the information to others. Still the idea is in our mind and it needs further time to internalize the overall concept. Participants, Women FGD, Northern region Ghana

We tried to implement the new technology being in collaboration with DA that we saw in the video Participants, Women FGD, Ethiopia

Testimonies for Radio:

To improve our food security problem and become more productive we use the information we gain from radio.

Women provided very few testimonies for face to face and word of mouth:

I did it immediately I got the information. It was very efficient method to use and for production of sweet potato planting materials (Ethiopia).

In Ghana, women from Nyesung a core community mentioned as below (for face to face and video):

There is knowledge on how to produce planting material. But multiplication of the material is still not enough to meet the needs of the community.

At first, we only know the white SP; where the first rain sprouts the left-over roots in the soil. But with this new method, we know how to keep the roots and multiply the vines for our farm

Face to face – this one has helped us to prepare delicious and nutritious meals for our family (Women, Naawie, Upper West region Ghana)

Sharing information received on Triple S

In Ethiopia, both men and women farmers indicated that they shared Triple S information with other farmers, however they did not modify the information. One male respondent did mention that they may not be able to transmit 100% of the information due to lack of pre-recorded radio while another respondent mentioned that at first, he did not want to share considering the fact that the information was too 'precious'.

4.3. Farmer assessment of communication channels: advantages and disadvantages

In this section we elaborate on farmers perceptions of the various communications channels that were used to relay information on the Triple S. Respondents were asked to review each channel and highlight their perceived advantages, disadvantages as well as ways in which the channel could be improved. Where respondents had not been exposed or heard of a channel, they did not discuss the channel.

VIDEO

Advantages of Video:

Among the advantages cited for video were the fact that video shows all the steps in a practical way which makes it easy to apply to the technology. Respondents also noted that messages communicated via video were easy to understand and inspirational given that they could see other farmer's experiences, and one can see everything aired and cannot forget. In this way, the message remained in their minds for a long time. In Ghana, women in Viera, Upper west region (a core community) noted that video was 'pleasant' to the eyes.

Disadvantages of Video:

Two major disadvantages were cited by men and women in both countries: (i) limited access by farmers and (ii) lack of electricity/generator fuel to operate the machines. Aside from this, women farmers also noted that the program was short, and it was not available as and when they needed it. Also, the time videos were shown was not favorable to women because of house chores.

In Ghana, women from Upper West region noted that sometimes the video was not clear which made it difficult to absorb. In three FGD's the comment was that they could not ask questions on issues that required clarity. Women in Vieri also mentioned that 'we do not get it when we need it'; while in Naawie; the comment was 'this is once – the one time you finish watching; that is all'. This could have been due to the fact that this was an informed community which was not targeted to receive video communication.

Suggestion for improving the Video channel

Farmers suggested improved access to video shows as well as solving the electricity problem as major ways of improving this channel. Women suggested that copies of the videos should be availed to the community; which could aid more access for women.

RADIO

Advantages of Radio

Amongst the advantages mentioned by men and women in the two countries were the fact that agricultural information can be transmitted quickly using this channel. It was also noted that information can be accessed by many households at the same time, wherever people happened to be. Another point noted was the possibility to call in which enabled one to clarify issues that had not been understood, while the possibility of receiving of up to date information was also noted.

Women in particular noted that radio motivates them because they are able to learn a lot from other farmers while also obtaining information on sweetpotato in general, Triple S and prevention of pests. Further, they appreciated information from other towns and countries related to different planting methods and use of improved seed. Another advantage highlighted was using their phones to listen to radio especially where the broadcast was in local language and at a suitable time. This made radio very versatile since it could be used anywhere at anytime. Women also noted that people found it easier to share information from the radio which benefited women without radios.

Disadvantages of Radio

Among the disadvantages of radio were the fact that farmers do not see the practical sections and hence don't have a clue how to implement the technology. Also, the language used was difficult to understand. For some respondents who could not call in, some of the messages remain ambiguous as they are not able to ask questions. Yet to others, radio was not accessible due to lack of the sets. Men actually mentioned that women don't even have radio to listen, they listen to ours. Further, women mentioned that they had to wait for men to tune into the program for them to obtain information about sweetpotato. For those that had access, the challenge was power outage which led to missing the sessions. Respondents also noted that the programs were transmitted at an unsuitable time.

Suggestions for improvement

Men respondents suggested repeat airing of programs to enable listeners who may have missed information in the first transmission to catch up. They also advocated for programs to be aired in local language but during the night as it is when the farmers get time to rest. Further, women respondents suggested that programs should be adjourned at a suitable time; with more time spent on agricultural information as opposed to songs.

Face to Face (F2F)

Advantages of F2F

This method was highly rated by the farmers who mentioned a number of advantages including ability to merge both practical and theoretical facets of the technology which made it easy to understand. Another advantage was the possibility to ask questions for clarity in case of ambiguity especially during trainings, which were usually provided in line with the cropping calendar.

Women respondents were appreciative of the fact that the training was provided in the local language which made the technology easier to understand and apply. The timing was also further appreciated and so was the fact that one could ask the same question over and over again, which drove respondent's perception that it was better than radio in this sense.

Disadvantages of F2F

Some of the disadvantages mentioned were connected to unavailability of training materials which made the training lean more to the theoretical side. For women in Ethiopia, this meant that it was even much harder to implement the technology as they left without sufficient knowledge to apply the Triple S on their own. Lack of continuity and follow up was also cited as a weakness of this method, while cancellation of training sessions due to conflicting meetings further exacerbated the lack of flow. An important issue mentioned by men in Pulima, Upper west region in Ghana (a core community) was the lack of trainer capacity to provide sufficient knowledge and to respond to queries raised by the farmers. Training sessions were also noted to spill into prayer time, which was uncomfortable for the farmers as they lost concentration.

For women in Ethiopia, a key weakness was the fact that the channel targeted mostly male farmers, and the experts were hardly ever on time. Women also felt that the trainings were mostly theoretical in nature and yet the experts did not follow up to support the trainees.

Suggestions for improvement:

Trainers should be equipped with the necessary skills materials so that sessions are more practical in nature. Trainers should plan an appropriate time to deliver the training and respect the time agreed upon, and also ensure that the training is provided in a continuous manner. Priority should be given to women farmers and ensure equal participation of women and men. Also, women should be consulted for an appropriate training time e.g. 8 – 10 am instead of 6 pm. Another suggestion was change from oral to note taking sessions where farmers would be provided notebooks and pens; or trainers write notes on the blackboard. This would enable trainees to review and consult their notes when they are implementing the technology.

Health Living Clubs (HLC) - Ethiopia

Advantages of HLC:

Facilitators use guiding documents to discuss various topics which farmers contribute to and in so doing, learning occurs. Participating farmers are availed the guiding documents to take home and can always refer to them as and when need arise. Facilitators were also noted to provide follow-up and support e.g. on how to plant, how to prepare various OFSP based dishes and also check on farmer's progress in implementation. For women, the advantages highlighted were on obtaining information and training on preparation of healthy food using OFSP.

Disadvantages of HLC:

Some facilitators lack skills: they don't follow all the steps as stated in the guides; and also don't included all the recommended ingredients. Others were not easily available.

Suggestions for improvement:

Skilling the facilitators and encouraging them to follow the guide was a priority suggestion, as was improving their availability in office.

Experience sharing

Advantages of experience sharing

Men in Ethiopia explained that this method has been used by their forefathers and is easy to use and understand. Because it is done in the field, once can easily see the best practices and encouraged to adopt them.

Disadvantages of experience sharing

It is not easily accessible to all farmers as not all get the chance to go for the visit.

Suggestions for improvement

All interested farmers should be invited to join and obtain experiences from others.

8028 Farmers hotline

Advantages of the hotline

Only two men FGDs in Ethiopia reported this channel and mentioned that it could be used anytime and is a fast method for information dissemination since information is relayed via cellphones.

Disadvantages of the hotline

The channel is limited to farmers who have cellphones. However, even for those that have cellphones, they may not have adequate knowledge on how to receive and utilize the information.

Suggestions for improvement

The suggestion was to train farmers on how to use the hotline.

Meetings

Advantages of meetings

Men respondents in Ethiopia explained that they obtain a variety of information from experts in the areas of agriculture, education and health.

Disadvantages of meetings

After the information is relayed, there is no follow-up to support farmers to implement the knowledge so shared. The information is not practical.

4.4. Farmer preference of communication channels

To assess the most preferred channels of communication, respondents were asked to vote using seeds through a weighting method i.e. the most preferred channel was given three seeds, the second most preferred two seed and the third one seed. Voting was by secret ballot where a facilitator captured the decision of each FGD participant. Facilitators ensured that voting was done only for communication channels that had been used in the community. After the voting, the seeds were tallied, and the results relayed to the group.

Respondents were requested to discuss the results and give their opinion as to why some channels were most

preferred to others in their locality. The results of the voting in each region and country are presented in Figures three to five below.



Figure 4: Voting for preferred communication channels in Ghana and Ethiopia

Upper West Region, Ghana

In the Upper West Region, the most preferred communication channel was face to face as exhibited by the fact that it was prioritized in eight the ten FGD. All four communities except Suke Lambusie and Chogsia west (women); which were spillover community selected it as the most preferred option. In Suke Lambusie, video was voted first by both men and women, as did women in Chogsia west.

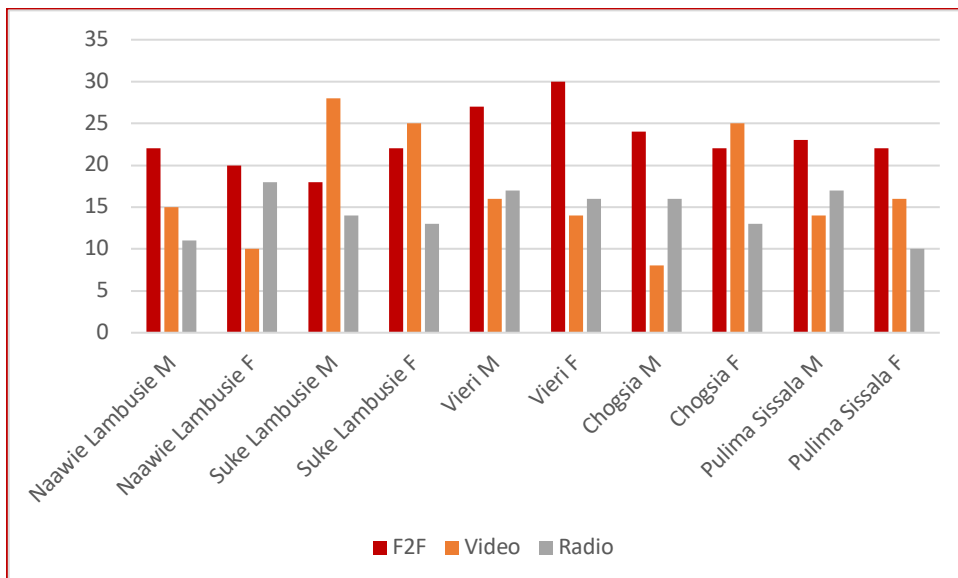


Figure 5: Preferred channels of communication channels by location and sex in Upper West Region, Ghana

In Naawie Lambusie, a spillover community, men and women converged on the first option but prioritization for the second and third channels differed. The women voted video second; despite the fact that the

community had not been gazetted for this channel. This indicates an overflow amongst treatments which in this case was a good output. In Chogsia West, a spillover community, there was complete divergence in prioritization for all the three choices amongst women and men. Communities in Lillixie did not participate in the voting exercise because they only had one communication channel (radio).

Northern Region, Ghana

From the Northern region of Ghana, results revealed that the most preferred channel in the region for men and women was the face to face (in seven out of twelve groups) in particular; as exemplified by results from Nyensung (core), Tugbang (core) and Nangunkpang (spillover) (Figure 4). Video was voted as the second most preferred channel for women, while for men; radio was the second most preferred channel.

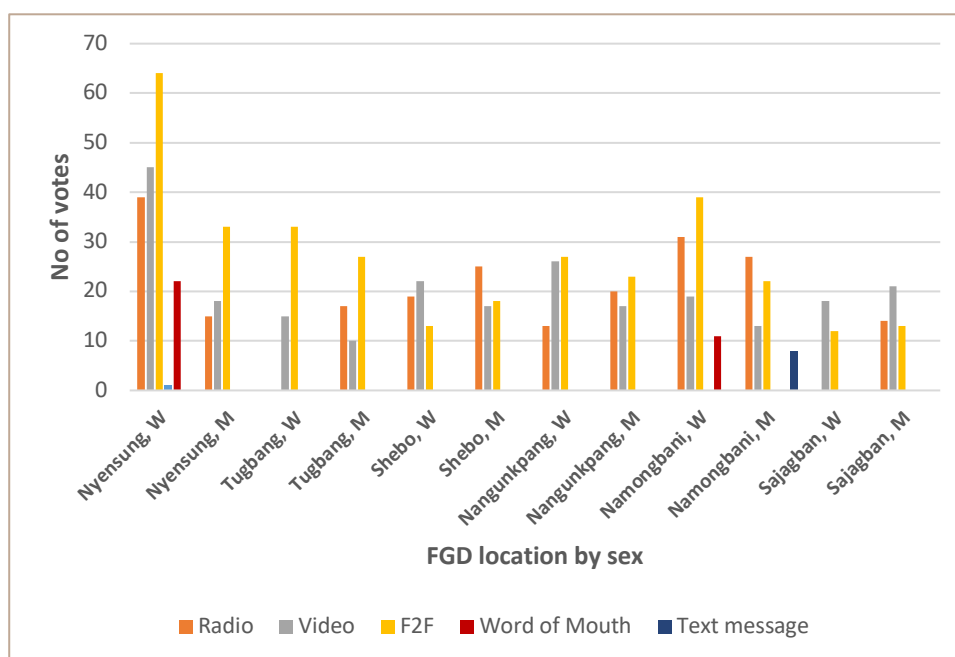


Figure 6: Preferred channels of communication by location and sex in Northern Region, Ghana



Figure 7: Counting the votes in Namongbani, Northern region, Ghana

After voting, respondents shared their views about their preferred channels of communication. For example, men mentioned that watching video was akin to being in classroom since you will learn all that is being taught. The graphic images of people making money from the sale of vines and roots as shown in the video were also motivational.

In Shebo, a spillover community, men explained why radio was the most preferred channel:

It is the radio that we would like to receive more information from. Because for the agricultural officers, they come at their own time but for the radio, any time you tune it, you will get information.

If you are at home on Sunday around 6 pm you get to hear a lot information about sweetpotato. I learnt all about sweetpotato and triple S from the radio. It was aired from the community that was cultivating it. But though I heard about it at that time, I had no access to planting material and so I lost interest.

Respondents, Men FGD, Shebo, Northern Region, Ghana

However, for women, radio was not easily accessible as shared below:

The radios are for our husbands. Sometimes you want to listen to a program, but he might have gone out and locked his door. That means you can't have access to the radio. Respondents, Women FGD, Shebo, Northern Region, Ghana

In Ethiopia, 12 out of the 16 FGDs voted for Face to face (with agricultural officers) as the most preferred form of communication. The prioritization for face to face was equally split amongst men and women i.e. six FGDs for each category. All the core and spillover communities voted for this channel except for women in Tenkaka Umbulo who voted for HLC. This was followed by HLC (three out of 16) and radio (one out of 16) which tied with face to face channel in Jara Dado (women).

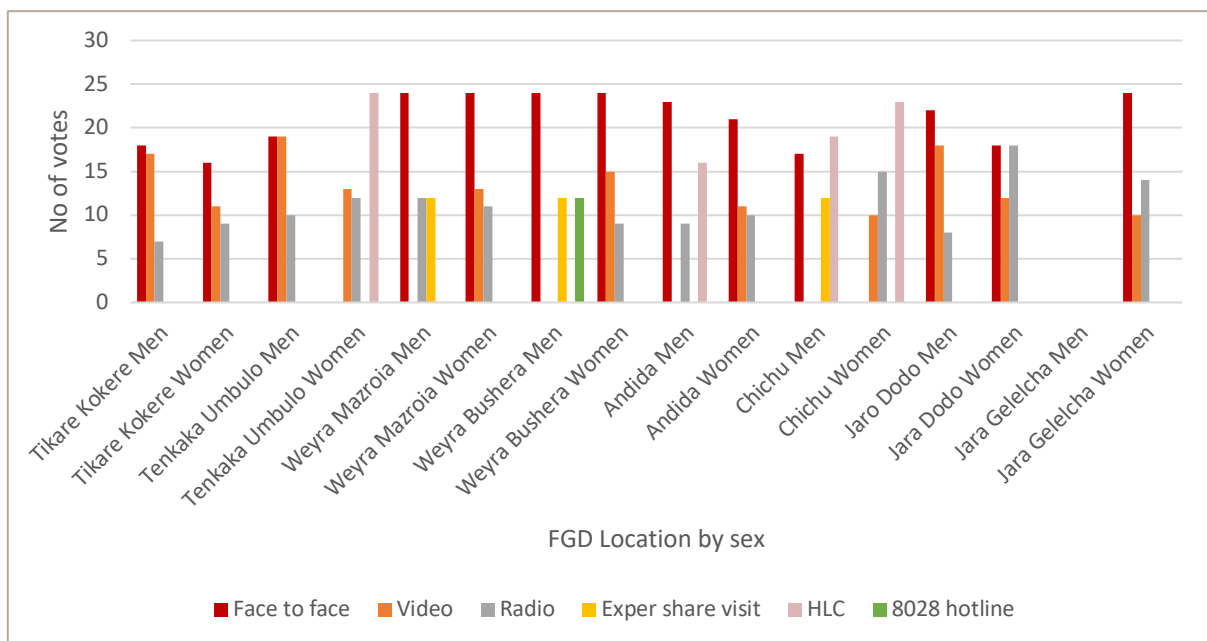


Figure 8: Preferred channels of communication by location and sex in Ethiopia

Though few communities were exposed to HLC, in the three communities that had this channel (i.e. Tenkaka Umbulo, Andida and Chichu) women selected it as the most preferred.

4.5. Perceptions on efficacy of the communication channels

To compare women and men’s perception of efficacy of the communication channels used to relay Triple S information, an aggregative index was constructed based on six indicators. The indicators were defined by the study team. They included (i) ease of access to the channel; (ii) ease to understand the information so relayed (iii) suitability of the time when the information was relayed; (iv) ease to share and (v) to ease to apply the information so obtained (Table 4). Using a five-point Likert Scale (5=Very easy or suitable; 1= Very difficult or unsuitable), respondents reflected on each of the channel, discussed and agreed on a score for each indicator. Facilitators ensured that communities only assessed communication channels they had been exposed to. Reasons advanced for each score were captured to further assist in assessment of each indicator. Indicators were weighted as shown in Table 2 below. Weighted scores of 0.80 and above were deemed adequate for each indicator.

Table 4 : Indicators used to estimate efficacy of the Triple S communication channels

Domain	Indicator	Weight
Access to channel	Ease of access	0.2
Comprehension	Easy to understand	0.2
Time	Timing in the year (suitability)	0.1
	Timing in the day	0.1
Dissemination	Easy to share with others	0.2
Application	Easy to apply	0.2

Northern Region, Ghana

Access to the information channels

This was the indicator women scored lowest especially for IT based channels i.e. radio and video. Women shared that many of them do not have radio’s and depended on their spouses for access.

We don’t have access to radio. It is when you are at home that when the radio is on that you listen to it, but if you are not at home, you will not be able to listen to it (referring to a radio program on agriculture). So it would have been nice for us to also have our own radios

If you have a radio, you will be able to hear information from across the world. But if you don’t have one, every information will pass you by and it is only when you go out of the house that you will hear others say they hear this or that from the radio Women, Nagunpkang (spillover community)

Similarly, while many of them indicated that they were able to watch the video shows, they noted that repeated access was difficult as they depended on the agricultural officers to schedule the shows. Men on the other hand indicated full access to radio (twice as much as women) and slightly higher access to video.

Both men and women had adequate access to the face to face channel, and women fell a little short for the personal communication channel.

Comprehension of the information relayed

Information related via face to face was deemed to be adequately understood by both men and women. Scores for video were adequate for women and just slightly below adequate for men and the reverse is true for personal communication. Surprisingly, men found information transmitted via radio much harder to understand than women did – with women attaining an adequate score.

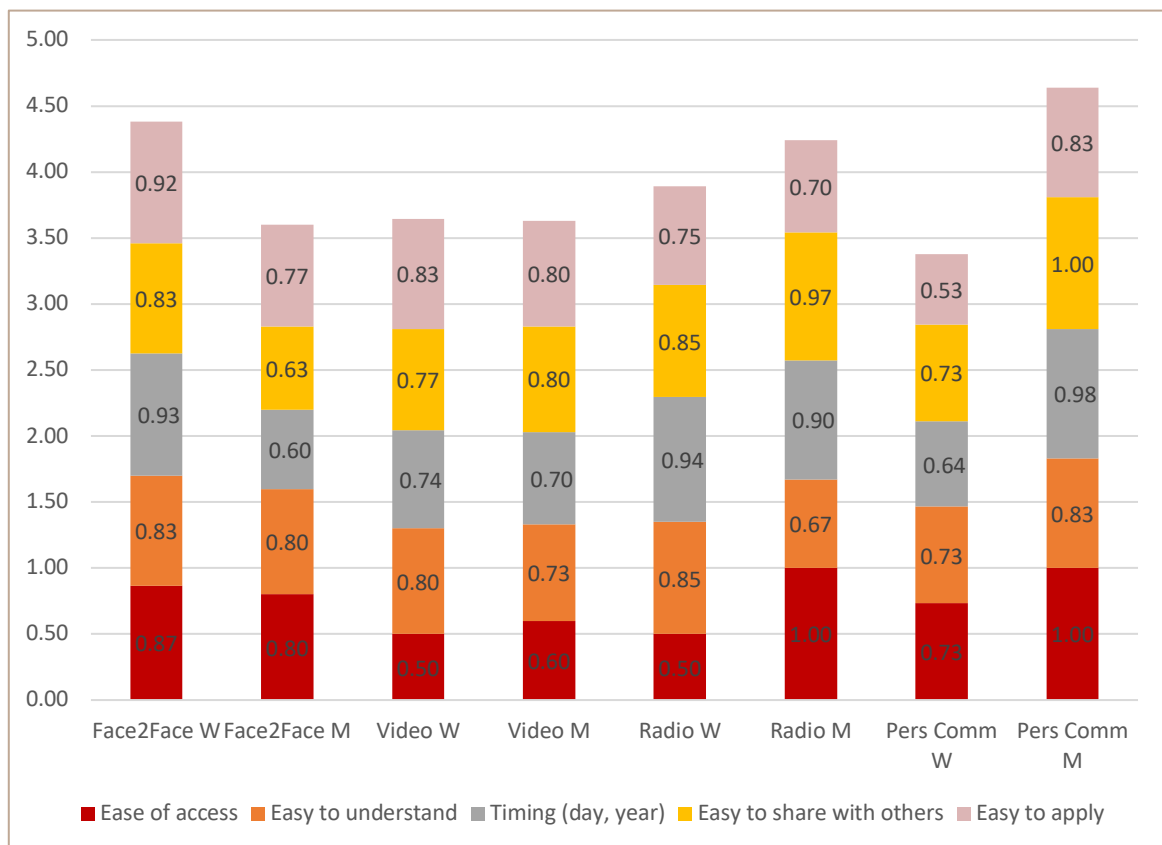


Figure 9: Assessment of efficacy of communication channels by women and men in Northern Region, Ghana

Timing:

The time at which information was relayed for personal communication was deemed inadequate by women and very adequate by men. Women mentioned that people who relay information using personal communication did so when the season had gone, and the information was not useful. On the other hand, men scored timing for face to face as inadequate while women considered it to be very adequate. Men and women’s perceptions converged on timing for radio as elaborated below:

Yes, the time they air agricultural programmes is always good. By then we have finished eating but if one does not own a radio, you can’t listen to the programme. Radio programmes give us a lot of information...when to plant, when to weed, when to harvest and when not plant...all of this information is very beneficial. Respondents, Men FGD, Shebo (spillover community)

Timing for video was scored slightly below adequate with similar scores for both men and women.

Easy to Share:

Women rated information received radio and face to face channels as easy to share, while video and personal communication were nearly adequate. Men scored all channels adequate save for face to face.

Easy to Apply:

Information obtained from video and face to face was deemed to be easy to apply by women. Men on the other hand scored video and personal communication as adequate with respect to ease of application. For women, the channel whose information was the most difficult to apply was personal communication.

Generally, personal communication was the most efficient channel for men while face to face was the most efficient for women. All five indicators for the respective channels were deemed adequate.

Upper West Region, Ghana

Ease of Access:

Men did not perceive adequacy for any of the five communication channels in relation to ease of adequacy, though personal communication and face to face nearly made the mark (Figure 7). Women found face to face and radio easy to access. Video was the channel that was considered least easy to access by both women and men, followed by radio.

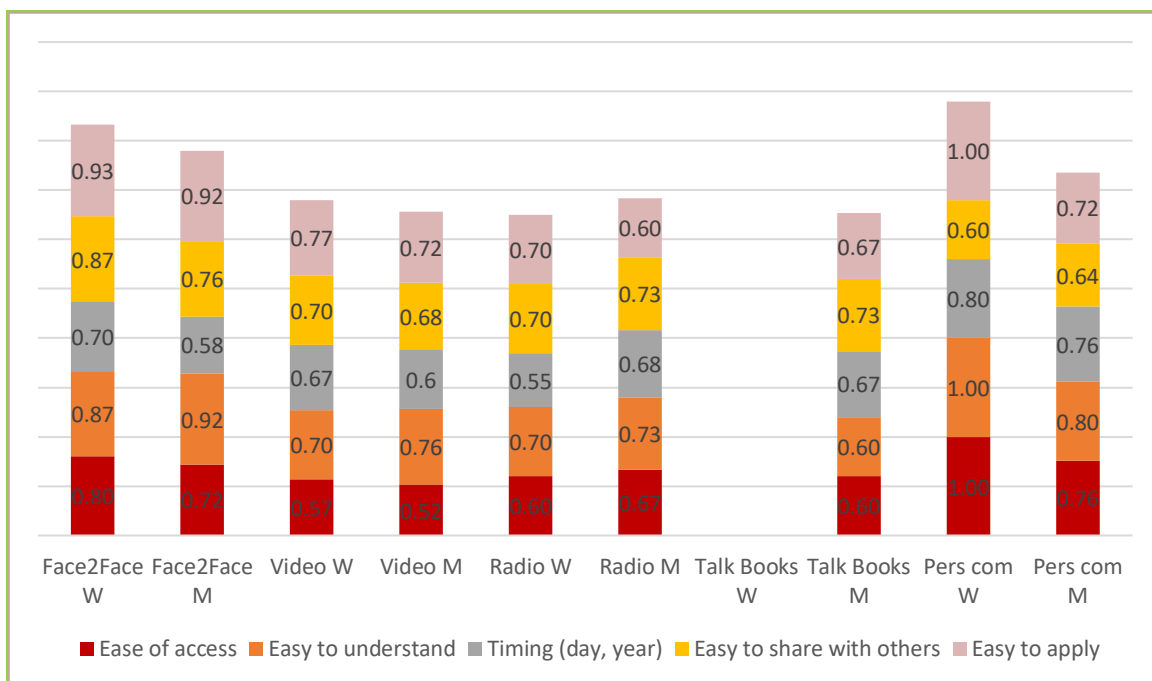


Figure 10: Assessment of efficacy of communication channels by women and men in Upper West Region, Ghana

Easy to Understand:

Both women and men perceived information relayed from face to face and personal communication as adequate with respect to ease of comprehension. Video and radio for both sexes nearly made the mark but talking books did not. This could imply a preference for information relayed by people in this region.

Timing:

Men did perceive any channel to have been adequate with regards to the time in which information was relayed. Women only perceived personal communication to have been adequate.

Easy to Share:

For women, only information received via face to face was deemed easy to share, though video and radio were close to adequacy. Men did not perceive any channel as adequate in this perspective but face to face, talking books and radio were close to being adequate.

Easy to apply:

Personal communication and face to face were seen to relay information that was easy to apply by women. Men converged with women on face to face; which was the only channel perceived to be adequate in this regard.

From a broad perspective, personal communication was the most effective channel for women followed by face to face; while for men face to face was the best followed by personal communication.

Ethiopia

Women assessed four channels i.e. face to face, video, radio and HLC. Men on the other hand assessed six channels – all the ones women assessed plus meetings and Radio 8028. Men mentioned that some meetings (e.g. those with partners outside the project) were different from face to face; but they were important as they received useful agricultural information.

Ease of access

Women deemed only the face to face channel as adequate with respect to ease of access. Video was the worst rated by women who had been exposed to the channel scoring 0.48 (Figure 8). For men a number of channels were deemed adequate including face to face, video, and meetings – which made the topmost score for this indicator.

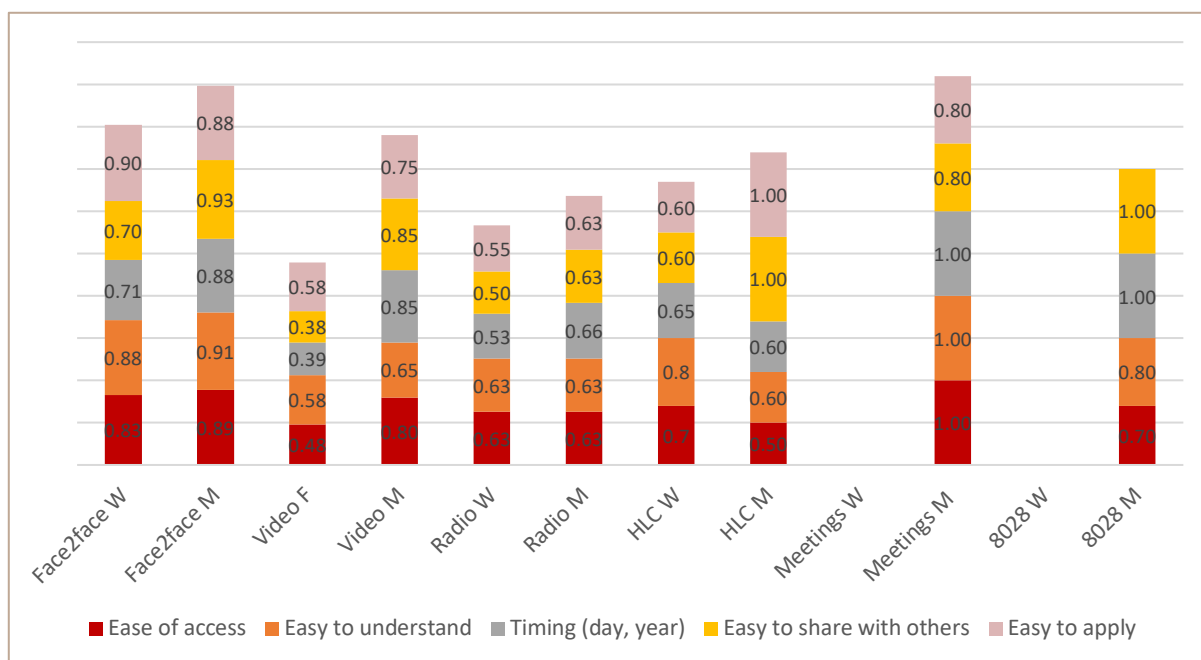


Figure 11: Assessment of efficacy of communication channels by women and men in Ethiopia

Easy to Understand:

Information from HLC and face to face channels was deemed to be easy to understand. Again, video scored the lowest in this perspective. Men perceived information relayed via face to face, meetings and radio 8028 to be easy to understand, while information from HLC was deemed to be the least easy to comprehend.

Timing:

For women, no channel was adequate with respect to delivering information at the desired time be it during the day or in the year. Men scored face to face, video, meetings and radio 8028 as adequate with respect to the time information was relayed.

Easy to Share:

Similar to the previous indicator, women did not perceive any of the channels to be adequate in this respect. All information received was deemed to be difficult to share – though face to face was close to making the mark. On the other hand, men again scored face to face, video, meetings, radio 8028 plus HLC as relaying information that was easy to share. Infact, HLC and radio 8028 were rated at 1.0. (topmost marks).

Easy to Apply:

Women perceived information received from face to face channel to be easy to apply. The rest of the channels fell way below the mark. Men rated all channels positively with regards to ease of application except for video and radio.

The most effective channel for women was face to face; while for men meeting and face to face were deemed effective given that all five indicators were adequate.

4.6. Perceived changes in access to planting materials since Triple S

Among the changes farmers cited included the ability to solve problems related to access to sweetpotato planting materials especially after the long dry season. They mentioned advantages related to storing the planting materials in a different form (root form) in addition to existing methods such as planting on lakeshores which included having excess to sell. Further, they mentioned that the information so availed has averted the threat of not having sweetpotato.

Women respondents shared that apart from easing access to seed, their production and yield have also increased; while also solving malnutrition problems.

Respondents also shared averting the challenges they previously experienced by loss of planting material to wild animals or damaged by cattle since the roots are stored at home in a safe place. One farmer from a core community in Ethiopia shared as below:

“I know I can get many seedlings for the next planting season from the stored roots using Triple S...I produce seedlings and cuttings for myself, and beyond that I sell to farmers in other areas. The facilitators told us that you have lots of benefits and don't sleep...fight hunger and poverty...I listened and I am using it, I don't go anywhere to get planting materials now, I use my own,,, this is not false information ... it is true and I can show you the evidence.” Participant, Men FGD, Jara Dado

Testimonies from Ethiopia

It is three years now since we have begun using Triple S technology and since then, we have seen changes. Using the traditional methods of planting material conservation, we get a few amounts of seedling. Our fathers used to leave roots in the ground to conserve planting materials for the next season. Now we cannot always conserve planting materials by leaving the roots in the ground in the same way because there is a shortage of farmland in the area and our landholding is small and we use the same land to produce various crops. So, we face shortage of planting materials and we need to buy or borrow when we don't have. But after we received the Triple S, we are using the technology to multiply the varieties and we are not going to other places in search of planting materials. Because we are producing as many as 50 – 60 seedlings from a single root. In addition, The Triple S technology is better in that the seed can be stored for longer time. When using traditional methods, the roots left in the ground will dry up when the dry season is strong, and this is not the case with the Triple S technology. Triple S technology is very good, and it is an interesting one. Participant, Men FGD, Andida (HLC)

One farmer said, “I know I can get many seedlings for the next planting season from the stored roots using Triple S...I produce seedlings and cuttings for myself, and beyond that I sell to farmers in other areas. The facilitators told us that you have lots of benefits and don't sleep...fight hunger and poverty...I listened and I am using it, I don't go anywhere to get planting materials now, I use my own,,, this is not false information ... it is true and I can show you the evidence.”

Sometimes, the vines are damaged when livestock graze on the crop field at night. Usually cattle are left to stay outside at night. Due to this, there are times when we lose the vines that are used for planting. But, after using the new technology, we don't worry about losing planting materials due to cattle since we store the roots at home in safe place. Participant, Men FGD, Andida (HLC)

Testimonies from Ghana

Yes, there is change. We can produce abundant amount of planting materials now and there is no problem in accessing the planting materials like we had previously. We are even sharing the planting materials beyond ourselves. Some farmers are even selling the planting materials/cuttings, which is prepared by cutting the vines in 30 cm. Participant, Men FGD, Vieri, Upper West region, Ghana (core)

Difficulties associated with sweetpotato planting materials solved particularly in dry season in this area there is problem of conserving planting materials the only method used were vine conservation but the three "3S" method helped us as an option to conserve roots for planting materials. We also started selling planting materials. Women FGD, Tugbang, Northern region, Ghana (core)

We started getting high yield and it also solved the sweetpotato planting material shortage problem. Participant, Men FGD Chogsia;(a spillover community) Upper West region, Ghana



5. Discussion and conclusion

5.1. Discussion

In this section, we aim to synthesize our findings keeping in mind our research questions.

Gender responsiveness of the Triple communication materials and channels

From the study findings, we note that women and men in both countries preferred communication channels which involved face to face contact. In addition, they mostly rated their effectiveness (with respect to the five indicators) as adequate. For women, what was important in this channel was comprehension, and the ability to learn by 'seeing' or doing, and; importantly, the ability to obtain clarity on unclear issues. Demystifying a technology from the class to the field may still need sessions of face to face for women (Mudege et. al; 2016). This stresses the importance of information being a two-way street where receivers can directly communicate to those relaying the knowledge. Given the lower levels of literacy for women, such channels will still be preferred and relevant for them.

Aside from obtaining technical information from interventions such as demonstrations; women also consider them to be importance social networking events where they catch up on a plethora of happenings in the community. Such gatherings also act as safety nets where women share, mentor and encourage one another to address challenges related to farming and personal wellbeing (Jones et.al, 2017).

For men, video and radio were appreciated as alternate channels of information. The fact that men in Ghana likened video to being in class shows how powerful this channel was in relaying practical information on the technology. Riding on the powerful testimonies of other users of the technology was absolutely beneficial especially for men who project beyond food to cash. This further confirms the importance of digital platforms as a means of strengthening delivery and uptake of technology (Aker, 2011). Whether video could assist in reducing the high costs associated to face to face information transmission however will depend on how associated challenges can be addressed.

The presence of a digital gender divide between women and men with regards to access to ICTs as evidenced in Ethiopia conforms to findings by Ogato (2013). Women perceptions for radio and video were below adequate, and much lower than that of men in Ethiopia. Generally, women in both countries noted lack of ownership of radio sets as a limiting factor to use of this channel. These findings conform to Kyazze et. al. (2012) who affirmed that lack of resources to procure radios and batteries limited women's access to climate related information services. McCormack (2018) further affirmed gender disparity in access to agricultural services; and the causal factors are mostly rooted in societal gender norms. affects women's ability to use these services. It is thus important to understand household dynamics that govern access to communication equipment such as radio before designing radio information packages. Strategies such as community radios or talking books could be explored as an add-on to household sets.

Where radio and video were accessible to women, respondents in both countries mentioned a challenge related to timing of the programs which at times conflicted with their domestic chores. This restricted their ability to understand the technology in its entirety given that they only received partial information. Similar findings were documented in Tanzania where women were forced to restrict time for listening to educative programs to attend to household and childcare related work (Poulsen, Sakho, McKune, Russo, & Ndiaye, [2015](#)). Planning for repeat sessions could help alleviate this challenge.

In some communities, we noted that men and women did not access the same communication channels. For example, in Ethiopia women did not mention meetings as a source of information. Also, in communities where the farmer's radio was mentioned (and rated as a highly effective communications channel), only men appeared to have used this channel. Aside from limited access to radio, women could have been constrained to attend meetings especially those held outside the community.

In a meta study conducted in 2019, Gumucio et. al. found that socio-cultural norms which define women and men's roles and responsibilities; can inherently restrict women's access to events (such as meetings) where information is relayed. The authors further noted that women's capacity to access information increases when services are located within the village where their childcare and household responsibilities are.

Thus, in designing communication channels it is important to be aware of existing social norms as this would require lobbying and advocacy to influence behavior change for the benefit of women.

5.2. Conclusion

This study has highlighted the importance of understanding the gender needs of communities before designing communication channels for technology uptake. While communities may appear to be similar, intrinsic gender dynamics may affect how women and men access and utilize information from various channels. This is especially so in ICT related channels such as radio and video, which would appear to be gender responsive but in reality, may not be fully utilized by women due to gender related constraints pertaining to access to resources, time poverty and restrictive social norms. Nonetheless, efforts have to be made to design strategies that will ensure increased subscription of women to ICTs as they are the future of communication.

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