

Comparing Farmer-to-Farmer Video with Workshops to Train Rural Women in Improved Rice Parboiling in Central Benin

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ABSTRACT *This article deals with the comparison of the conventional training based on two day community workshops and farmer-to-farmer video used as methodologies for the dissemination of improved rice parboiling process in Benin. From November 2007 to May 2008, we interviewed 160 women and 17 women groups who had been exposed to both, one or other of the methodologies. Data were analysed using ANOVA and logistic binomial regressions.*

Video reached more women (74%) than conventional training (27%). The conventional training was biased by participant selection, stakes in per diem payment and monopoly by the elite class. Video helped to overcome local power structures and reduced conflict at the community level. More than 95% of those who watched the video adopted drying their rice on tarpaulins and removed their shoes before stirring the rice, compared to about 50% of those who received traditional training and did not watch the video. Group use of the improved equipment was significantly higher for those who watched the video ($p < 0.05$). By 2009, the various rice videos had been translated into over 30 African languages by Africa Rice Centre (Africa Rice) partners and involved 500 organizations and over 130,000 farmers. This study helps to give a better understanding of the role that farmer-to-farmer video could play in agricultural extension. This comparative analysis is an opportunity for a better understanding of how farmer-to-farmer video improves farmers' practices and attitudes in agricultural technology dissemination.

KEY WORDS: Agricultural extension, Farmer-to-farmer video, Knowledge, Local power structure

Introduction

The role of extension in agricultural development depends on how one defines extension. According to van den Ban and Hawkins (1996: 9) 'Extension involves the conscious use of communication to help people form sound opinions and make good decision'. Agricultural extension is an educational process. Leagans (1961) noted that 'The process of extension education is one of working with people, not for them; of helping people become self-reliant, not dependent on others; of making people central actors in the drama, not stage hands or spectators; in short, helping people by

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means of education to put useful knowledge to work for them' (1961: 1–2). According to Bentley et al. (2007) extension methods should be chosen for the particular context. For a long time, most organizations adhered to the top-down approach in agricultural extension. Extension was seen as the linear function of disseminating knowledge developed in research stations to farmers. However, this top-down model in agricultural extension is inadequate because one cannot teach people without learning from them and about them (Röling, 1982). Traditional research and extension systems view farmers as end-users who must be persuaded or otherwise cajoled into adopting research outputs, rather than as partners in the process (Hakiza et al., 2004; Van Mele et al., 2005).

The success of any sustainable development programme is largely determined by the level of participation of farmers (Axinn, 1997). To engage with farmers on a level playing field, it is crucial to take a closer look at adult education. Currently, various agricultural research and development projects use participatory approaches, such as Farmer Field Schools (FFS) and Participatory Learning and Action Research (PLAR) to engage farmers in problem design, support adult education and farmer experimentation, and allow them to draw their own conclusions (Nederlof and Odonkor, 2006; Defoer et al., 2004).

As extension systems are increasingly decentralized and fragmented, non-governmental organizations (NGOs) and the private sector are re-defining their roles to fill certain niches (Van Mele, 2008). To strengthen rural learning and support the multitude of existing and emerging service providers, the Africa Rice Center (WARDA) has developed a series of farmer-to-farmer videos. The rice parboiling video (WARDA, 2005) aims to promote an improved way of parboiling that leads to better quality rice, an issue of regional importance. In this paper, we compare conventional training with the use of farmer-to-farmer video to promote improved parboiling among women in central Benin. We conclude by discussing the role farmer-to-farmer video could play in the dissemination of rice technologies and pose some strategic extension research questions.

Conventional Training

Following the creation in Benin of the Centre d'Action Regional pour le Developpement Rural (CARDER) in 1985, various extension approaches were implemented. These approaches include (i) the integrated rural development approach, (ii) the Training and Visit System (T&V), and (iii) the local network of professional extension agents in the national extension system (Tossou, 1996). The conventional method (T&V) was promoted by the World Bank and was the principal agricultural extension approach in the country from 1985 to 1999. This approach was based on producing large amounts of purely technical advice, using standardized, detailed and rigorously monitored schedules of contact farmer visits and staff training sessions. T&V drew heavily on the adoption and diffusion of innovation (Leeuwis, 2004). However, the farmers were unsatisfied with the extension activities because their real needs were not taken into account during the implementation of the extension approaches (Moumouni, 2005).

Like many African countries, agricultural extension services in Benin are facing many challenges and are under constant pressure to be responsive to agricultural

production and to show the impact of their activities. This pressure on extension services calls for changes in the traditional public extension systems which are now seen as outdated, top-down, paternalistic, inflexible, bureaucratic, inefficient and therefore less able to cope with the dynamic demands of modern agriculture (Rivera et al., 2000).

In our study, the conventional methodology consists of two day community workshops during which experts demonstrate the process with the improved parboiling to women. Apart from the fact that the experts are from local NGOs, this very much resembles the traditional extension system during which farmers are persuaded to adopt research outputs.

Farmer-to-Farmer Video

While participatory methodologies such as PLAR and FFS focus on learning between farmers, testing and modifying technologies, and building social cohesion, their scaling up remains a key challenge (Van Mele et al., 2005). To address this, one of us (Van Mele) started experimenting with the development of farmer-to-farmer video through an approach that draws on processes and outputs of such participatory methodologies while adhering to constructivist learning principles. In a well-structured format, graduate PLAR or FFS farmers share their learning with their peers through video.

Based on this experience, WARDA developed an approach called *zooming-in zooming-out* (ZIZO) for effectively communicating agricultural technologies to the rural poor. This approach provides guidance in producing high quality farmer education tools that are locally appropriate and regionally relevant (Van Mele, 2006). *Zooming-in, zooming-out* (see Figure 1) starts with a broad stakeholder consultation to define regional learning needs. Only then are communities approached to get a better understanding about their ideas, knowledge, innovations and the words they use in relation to the chosen topic. During this phase, farmers are ideally engaged in PLAR or FFS type of activities (*zooming-in*). Farmer-to-farmer videos are then produced with a few selected communities and building on the principle of

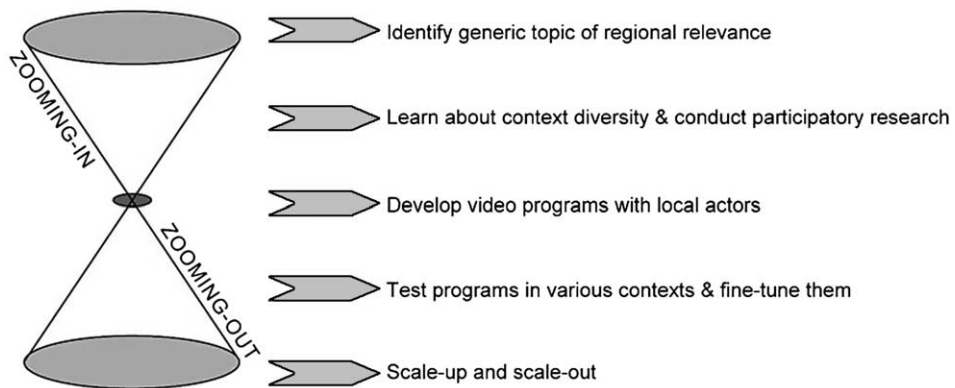


Figure 1. Zooming-in zooming-out: a new approach for scaling up sustainable innovations.

Source: Van Mele, 2006.

communicating ideas rather than ready-made technologies. Consequently, when showing the draft videos to further villages, new innovations may be identified and added, and confusing parts clarified (zooming-out).

In Benin, video was not commonly used as communication tool in the national agricultural extension system. Also, few researches were conducted on video in Benin. This paper assesses the farmer-to-farmer video *Cashing in with Parboiled Rice*, developed by WARDA, the National Research Institute (INRAB) and the NGOs Sasakawa Global 2000 (SG2000) and Songhaï Center. The video was produced following a research diagnostic phase on improved parboiling in Benin. With the active participation of women processors, the video was originally produced in French and Fon, a local language in Benin. In addition to conventional training workshops, the NGOs organized video shows in 80 villages in central Benin with technical and financial support from WARDA and the international NGOs Veco-Benin and Helvetas. To increase farmers participation during videos shows, local NGOs interact with them on the learning content.

Survey Method

The study was conducted in five municipalities in Collines, central Benin, where local NGOs (Recherche et Action pour le Bien Etre de la Masse Rurale (RABEMAR), Un Monde, CASTOR Appuis-conseils (CASTOR) and Levier pour le Développement Local Durable (LDDL)) operate for the development of rice production. The surveys were conducted from November 2007 to May 2008 and covered 16 villages in which the parboiling video was shown in 2006 and where conventional training had taken place from 2005 to 2007. We interviewed 160 women processors individually and 17 women groups (1–2 women groups per village). We also interacted with the local artisans, trained in making the parboilers, and NGOs staff. Data was collected through participatory observation, photographic documentation, structured and semi-structured interviews and focus group discussions. The villages and the women were randomly selected (four villages per NGO and 10 parboiling women per village). Data was analysed using ANOVA and logistic binomial regressions.

Rice Parboiling Methods

Rice parboiling is an important paddy transformation process that contributes greatly to enhancing physical, chemical and organoleptical quality of rice. In Benin, rice parboiling is exclusively done by women and girls, mainly from households in rice producing villages.

Traditional Methods of Rice Parboiling

In central Benin, specifically in the Collines, women use several traditional methods to parboil rice. They soak the paddy in cold or hot water for 12 hours (in other regions soaking can be as long as 72 hours) in a large aluminium pot. The rice paddy is then drained and pre-cooked in small quantities in the same pot containing a small quantity of water. After pre-cooking, paddy is dried in the sun for some days. Drying

is usually done on the rocks or on the ground without any precautions to avoid the parboiled rice getting mixed with sand and stones.

Improved Method of Rice Parboiling

The improved parboiling equipment consists mainly of a parboiling vat that is placed on top of a large aluminium pot. The equipment can be locally constructed with available materials and skills. The principle behind this improved technology is that after soaking the paddy is transferred to the vat and pre-cooked with steam, without the paddy touching the water. This improved method forms the key content of the conventional training and the farmer-to-farmer video and is summarized in Table 1.

Results

Most women surveyed were married (86%), young women around 25–40 years old (74%), and mostly illiterate (69%). Only 20% have a primary education and 6% can read and write their local language. The household size was 6.2 ± 2.1 members. The principal activity of women is agriculture (100%) and rice processing (parboiling) represents the major secondary activity (92%). For the sake of this study, we distinguished four types of women: those who learned through conventional training only (19%); those who learned about improved parboiling through farmer-to-farmer

Table 1. Key steps and ideas of improved rice parboiling

Topic	Key steps and ideas
Washing	Properly wash paddy in a basin containing a large quantity of water (3 litres for 1kg of paddy)
Soaking in hot water	Pour the cleaned paddy into a basket to drain the water
	Pour the paddy into a pot with clean water and heat it up to 60°C You can use your fingers to test the temperature. When the water gets so warm you can no longer dip your fingers into it, remove the cooking pan from the fire
Washing	Let the paddy cool over night
	Remove the paddy from the water
Pre-cooking with steam	Wash it with clean water and drained in a basket
	Pour the paddy into the parboiling vat previously placed on top of a pot containing about 10 litres of water. The water in this pot must not touch the bottom of the vat so that the rice will not be cooked. Boil the water. The steam generated passes through the holes in the tank and pre-cooks the rice
Drying	Stop boiling when you observe that most of the husks on top are opened. This is usually in less than half an hour
	Dry the parboiled paddy in the sun on tarpaulins or on drying areas for less than two hours. Drying in the hot sun for too long can cause the grain to crack (as happens with clay or earthen pots that dry too fast)
	Properly spread and continue drying in the shade on a tarpaulin Test the rice between your teeth to check if it is dry enough to mill If it is dry enough, it gives a dry cracking sound

video (52%); those who were informed by both farmer-to-farmer video and conventional training (8%); and those who were informed by their colleagues (21%). Although in total 74% of the women had watched the videos, 14% of women surveyed had participated in conventional training before viewing the video and were asked about how they had changed their practices prior to the video show. We categorized them in the group of women who participated only in conventional training.

Topic 1: Learning about Improved Rice Parboiling

Learning through Conventional Training. Resource persons typically demonstrated the whole process of rice parboiling with the improved parboiling equipment. The training process and the number of women who participated in the workshops differed between NGOs (see Table 2). Un Monde and LDLD first trained selected women in a central place for them to become trainers of other women in their village or district. Each woman trainer trained on average 3.0 and 1.4 women with the support of Un Monde and LDLD, respectively. RABEMAR and CASTOR adopted a different training approach. Resource persons directly trained a few selected women in their village and hoped these would share their learning with others in the community. About 27% of all women surveyed had been received conventional training.

Learning through Farmer-to-farmer Video. The parboiling video lasts about 13 minutes and was shown together with a post-harvest video; the total duration of both being about half an hour. The strategies for showing the videos in the villages differed slightly between NGOs, but they have some points in common. All NGOs first identified owners of video equipment (television, projector, CD player, generator and other accessories) with whom they agreed on the dates and modalities. Then they contacted the village heads to announce the dates of projection. Villagers were then informed through the traditional mode of information transfer by public announcers with a megaphone.

Before the beginning of the video show, traditional music was played to attract more people and to announce the beginning of the show. One NGO showed digital photos of village people taken at earlier events. LDLD, RABEMAR and CASTOR ended each video show with a question-and-answer session, whereas Un Monde interrupted the video to allow people to comment and discuss.

Table 2. Populations reached by conventional tanning

NGO	Number of villages	Number of participants		
		Women trainers	Women trained	Total
RABEMAR	20	0	56	56
LDLD	20	82	124	206
CASTOR	20	0	87	87
Un Monde	20	15	45	60
Total	80	97	312	409

About 8,700 people watched the videos, of which 58% were women (see Table 3). Of the women surveyed, about 74% had seen the videos. Women were most interested in the parboiling video.

Topic 2: The Effectiveness of Conventional Training and Farmer-to-farmer Video

The farmer-to-farmer video reached more women who parboil rice (74%) compared to those reached by conventional training (27%). Nearly two thirds of the women surveyed did not even know that conventional training workshops had taken place. In only 30% of the villages had the trained women shared their newly acquired knowledge with others, illustrating that conventional training is not really conducive to knowledge sharing between peers and to reaching the target population. The farmer-to-farmer video shows touched a much larger number of women and helped to disseminate and invoke response to the technology within the community. One of the advantages of video is that all the women in the community received the information at the same time. This dilutes the negativity that can be associated with the information ownership and leadership in the villages.

The proportion of women who started removing dirt from the rice and properly washing the rice was the same for those who took part in the conventional training workshops and those who watched the video, but differed significantly ($p < 5\%$) from those who received the information from their colleagues (see Table 4). Watching the video proved crucial to change behaviour related to drying rice on tarpaulins and removing shoes while turning over the rice ($p < 5\%$). Whether women had watched only the video or also attended a workshop made no difference. Therefore, farmer-to-farmer video proved the most effective and efficient methodology to trigger these behavioural changes. Indeed, most women declared that they were very excited to learn about these practices during the video show.

Also, significantly more women who watched the video used the improved technology in group, followed by those who learned from their colleagues. This result confirms Gandhi et al (2008) study in India which revealed that video was seen to increase the adoption of certain agriculture practices seven-fold over a classic T&V based approach.

None of the women who were trained by the conventional method alone used the improved technology within a group. A well produced video with clear content apparently stimulates information sharing and mutual assistance within the social network for promoting the dissemination of the improved technology.

Table 3. Populations reached by farmer-to- farmer video

NGO	Number of villages	Number of participants		
		Men	Women	Total
RABEMAR	20	1,304	2,060	3,364
LDLD	20	663	976	1,639
CASTOR	20	569	791	1,360
Un Monde	20	1,099	1,234	2,333
Total	80	3,635	5,061	8,696

Table 4. Percentage of women practicing improved rice parboiling after different exposures

Practice	Conventional training (n = 30)	Farmer-to-farmer video (n = 83)	Farmer-to-farmer video + conventional training (n = 13)	Information from colleague (n = 34)
Remove dirt from rice	96.6 ^{ab}	100.0 ^b	100.0 ^{ab}	91.2 ^a
Wash rice 2 to 3 times	96.6 ^b	100.0 ^b	100.0 ^b	88.2 ^a
Dry rice on tarpaulins	60.0 ^a	98.8 ^c	100.0 ^c	79.4 ^b
Remove shoes when turning the paddy over	40.0 ^a	96.4 ^c	100.0 ^c	70.6 ^b
Use of improved equipment in group	0.0 ^a	57.8 ^c	46.2 ^{bc}	35.3 ^b

Note: Values in rows with a different letter are significantly different at the 5% level with LSD test.

Topic 3: Participation Selection Barriers

Issues Arising with Conventional Training. Conventional training was affected by the fact that group leaders chose friends or parents and ignored target women. The choice of women for conventional training is often the responsibility of farmers' organizations themselves. Power is concentrated in one or a few leaders of such organizations and their selection of women for training is not based on any motivation to promote rice parboiling in their localities.

Another factor that affected the selection of women was the issue of per diem. Most women who participated in the training workshops were mainly interested in receiving the per diem (81%). This situation is well known (but rarely addressed) in rural development. Although convenient for outside development agents and donors, it often leads to corruption and creates conflicts within groups during the selection of participants for capacity building activities (Smith, 2003).

The criteria for selecting participants for training need to be set up according to the needs of the farmer groups. Promoting mechanisms of 'opposition' in farmers' groups or organizations may help to avoid the concentration of power in one person's hands or with a small number of group members (Vodouhè, 1996). For example, NGO facilitators or external people may be introduced into farmers' organizations offices or regularly consulted to better control the decision-making power of the group leaders.

Issues Arising with Farmer-to-farmer Video. Most villages in developing countries like Benin have no electricity and few households have equipment to play video. This affects further visualizations of the farmer-to-farmer video. Nevertheless, in some villages people have a video CD player, or equipment is at times rented from rural video shops.

Apart from the logistics, the level of impact of farmer-to-farmer video also depends on the intermediary and their relationship with the end-users. In our case,

the selection of local NGOs with experience in rice sector development has certainly contributed to the achievements presented in this paper. However, it is important to emphasize that, as with public extension services, also NGOs require the necessary means to organize rural video shows.

Whereas training workshops suffered from participant selection bias, open air video shows seemingly helped to overcome this. However, other factors than local power plays may have influenced whether women could take part in the video shows. Therefore, we introduced some socio-economic factors in a logistic binomial regression model to better appreciate which of them could probably affect the farmer-to-farmer video viewing at village level. These factors are: ethnic group, age, number of dependents in the household, education level of women, importance of rice parboiling activity, experience, religion, membership of a farmers' organization, awareness of the importance of rice parboiling and their motivation for the activity. Analysis showed that none of these factors influenced the viewing. Women in villages had an equal chance to watch the farmer-to-farmer video, confirming the democratic character of community-based, video-mediated learning (see Table 5).

Topic 4: Perceptions of NGO Staff and Women on the Two Extension Methods

In general, farmer-to-farmer video is very well appreciated for farmer education both by the NGO staff and by the target group. The images of video really caught the target groups' attention. Video allowed a wide dissemination of the technology and played a very important role in rural entertainment. NGOs also mentioned that the use of farmer-to-farmer video triggered many other changes in their methodological and organizational ways of working (Zossou et al., 2009). Videos are rich in images and are able to reach many more people compared to conventional training workshops. Target group interviews confirmed that farmer-to-farmer video helped farmers to discover the realities and change the ways they do things.

Our survey was conducted more than one year after the community video shows were organized, and women's impressions were still very vivid. They positively appreciated this 'mass training tool' that stimulates active communication (vision,

Table 5. Socio-economic factors likely to influence the viewing of the video in villages

Variables	*Estimated parameters	*Standard Error	*Probability
Ethnic group	-0.049	0.054	0.362
Age	-0.003	0.024	0.903
Number of dependents in the household	-0.009	0.099	0.926
Women education level	0.139	0.104	0.181
Importance of rice parboiling activity	-0.172	0.251	0.493
Experiences	0.042	0.039	0.279
Religion	-0.084	0.218	0.702
Membership a farmers' organization	0.303	0.404	0.453
Awareness of the importance of rice parboiling activity	0.303	1.108	0.235
Motivation of women	0.315	1.098	0.774

Note: *Logistic binomial regression model.

hearing and practical application) and self-learning. Of the 160 women interviewed, 89% considered farmer-to-farmer video an excellent tool for communication and to educate farmers. Only 11% had moderately appreciated the video. Among these, 78% of them had participated in conventional training and they regretted not having a per diem with the video show. The per diem issue featured strongly when discussing training at the village level and some women openly mentioned it during the interviews:

The video is of course a good way to learn because it allows the entire village to see the technology that only one or two people from the village saw during the conventional training. But the real weakness of this tool is that participants can not have a per diem. This is not the case with conventional training. That is the reason why we really prefer conventional training; because at the same time we learn, we also earn some money.

From the majority of women (89%) who strongly appreciated the farmer-to-farmer video, two characteristics emerged: (i) the video burns images in memory (mentioned by 74% of them) and (ii) the video helps people both to learn and be entertained (mentioned by 77% of them).

Conclusion

Video reached more women who parboil rice (74%) than conventional training (27%). Moreover, video was considered a powerful tool to solve the problem of participant selection bias in conventional training and to dilute the leadership power issue within farmers' organizations. It gives a fair chance to community members to learn and reduces the dependence on group leaders. Rural women had the same opportunities to watch the videos, regardless of their socio-economic background. With limited resources, training through farmer-to-farmer video seems the best approach to reach more people and to strengthen social networks within communities. Apart from triggering behavioural changes and helping to overcome participant selection bias, the study also showed that video proved more powerful than workshops to stimulate women to innovate (Zossou et al., 2009).

Currently the parboiling video is also available in Yoruba, a major local language of central Benin, in order to touch a large number of women rice processors. Partners in The Gambia, Sierra Leone, Benin, Nigeria and Ethiopia subsequently made their own translations. By 2009, the various rice videos had been translated into over 30 African languages by Africa Rice partners and had strengthened capacities of 500 organizations and over 130,000 farmers. This illustrates the importance of farmer-to-farmer video in strengthening the increasingly fragmented organizational landscape in rural extension.

Future research will need to address four main questions: (i) how does the effectiveness of video vary according to the complexity of the learning content; (ii) how does the type of intermediary affects video impact; (iii) how does video influence organizational and methodological change among service providers; and (iv) how do rural people organize themselves if they are given access to farmer-to-farmer videos in their own local language.

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