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Video as a tool for agricultural extension in Africa: a case study from Ghana

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ABSTRACT

The paper explores the effectiveness of video viewing clubs (VVCs) as a training method based on a formal survey of 32 Ghanaian women farmers who were trained on cocoa integrated crop and pest management (ICPM) using this method. Results suggests that the video viewing club is effective as a relatively low cost, interactive training method for providing low literacy populations with skills, information and knowledge on complex technical topics. While there was no significant difference between VVC participants and a control group in cocoa yields and implementation of selected ICPM practices,the study demonstrated that VVC training significantly improved farmers' knowledge of most topics covered. Farmers' perception of changes in their practices provided further evidence of the positive impact of the training, as did their high rate of knowledge diffusion. The use of local facilitators in the VVCs, which created a sense of ownership and added to the credibility of the technical messages, contributed to farmers' appreciation of the method. The paper concludes by discussing the challenges of scaling up VVCs and identifying issues for further research.

Keywords: cocoa, extension, training, video, ICTs, Ghana, women cocoa farmers

INTRODUCTION

The paradigm shift in agricultural extension from a transfer of technology to a demand driven approach has been accompanied by a plethora of new extension methods implemented through a variety of institutional arrangements involving state institutions, private sector agencies, farmer organizations and farming communities. Sustainability, reaching different farmer categories (the poor, marginalized farmers, women farmers etc.), providing a combination of technological and facilitation support and services of high quality and the need for methods that are participatory and involve farmers as clients, are some key concerns in the search for appropriate extension tools. Information, knowledge and skills for sustainable agriculture can be delivered in a variety of ways: through verbal means, typically involving a trained facilitator, printed materials and information communication technologies (ICTs), including two way ICTs such as mobile phones and the Internet and one way ICTs such as radio and video. ,Each method has advantages and disadvantages that must be considered within the context of the enabling environment and the target population. For example, the success of verbal, face-to-face extension methods depends largely on the availability of technically competent, formally educated male and female trainers, criteria that may be difficult to meet in many rural communities in Africa. While radio has been successfully used to provide farmers with information (Farm Radio International, 2008), this medium may be less appropriate for improving skills and decision making capacity.

Video, which combines both visual and verbal communication methods, appears to be an appropriate extension tool for less developed countries as this medium is suited for the transmission of skills, information and knowledge (Vidya & Chinnaiyan, 2010), allows for the standardization of information for accurate transmission from a technical source, in situations where high quality trainers may not be available, and is suitable for low literacy populations. Despite the enormous popularity of African movies for entertainment purposes and research confirming the effectiveness of video as a means of instruction in schools (Dannenberg & Capell

1997; Kumar, Sharm & Vyas 2003; Isiaka 2007), video has been underutilized in Africa as a tool for disseminating technical agricultural information to farmers (see Gakuru, Winters & Stepman 2009; Ovwigho et al. 2009). A video extension initiative by the Africa Rice Centre, which reached 130,000 West African rice farmers, demonstrates the enormous potential of this media (Van Mele, Wanvoeke & Zossou, 2010). The paucity of studies on the effectiveness of video as an agricultural extension tool (Gandhi et al. 2007; Zossou et al. 2009; Van Mele, Wanyoeke & Zossou 2010) is one reason for the slow uptake of this approach. This case study from Ghana provides empirical data on the effectiveness of a structured approach for using video as a training tool—the video viewing club (VVC), developed by the Sustainable Tree Crops Program (STCP) for training farmers on cocoa integrated crop and pest management (ICPM). The paper focuses on VVC implementation and does not discuss the video development process.

Developing approaches, methods and institutional arrangements for sustainable cocoa extension in West and Central Africa is a priority for stakeholders in this sector. Extension experts working with cocoa, and perennial crops in general, face the challenge of devising ways to train farmers on skills and practices at different stages of the crop's life cycle in a short period of time. With the decline of dedicated cocoa extension services in the main cocoa producing countries (Cote d'Ivoire, Ghana, Nigeria and Cameroon) starting in the mid 1980s, cocoa extension activities were taken over by already over-burdened "unified" extension systems using the T&V approach. It is however unclear whether this switch resulted in more efficient and effective delivery of technical information, training and other services to cocoa farmers. For example, just 13% from a sample of 1000 Ghanaian cocoa farmers cited the government extension system as their most important source of technical information (STCP 2003) compared with 66% who relied primarily on radio messages provided by both the state extension system and the private sector. The shortage of both state and private extension agents in West African cocoa producing countries, the need for a methodology that allows for technical messages to be transmitted accurately from a technical source to farmers and which compresses time to allow for the demonstration of practices and techniques that take place over a long period of time, prompted the STCP to develop the video viewing club method. The STCP, a public-private partnership innovation platform hosted by the International Institute of Tropical Agriculture (IITA), is mandated to develop innovative extension methods and tools for more efficient cocoa extension and farmer learning for use by a cross-section of organizations operating in the cocoa value chain including state extension, NGOs, projects and the private sector.

A video viewing club consists of a group of 20-25 farmers who meet weekly or biweekly for several months led by a trained facilitator. Three elements form the core of the methodology: watching the videos several times in a session, facilitator-led discussions on production practices with the aid of an illustrated guidebook (David 2007) and field demonstrations of production practices covered in the videos. Like farmer field schools, VVCs differ from conventional extension approaches in that the focus is on experiential learning involving experience (through the videos and field exercises), reflection and conclusion (through discussion), which is expected to lead to a change in behaviour. VVCs bear some similarities to rural radio forums organized by the Ghana government radio station in the 1960s (Abbey-Mensah, 2001), the biggest difference being that VVC is a training methodology, while the latter were largely used for information dissemination. Because the videos and guidebook were developed by farmers who had earlier been trained on cocoa ICPM through STCP-supported farmer field schools (Nathaniels 2005; David & Cobbah 2008), and all VVC facilitators were farmers, the VVCs as described in the present paper can be characterized as a farmer-to-farmer learning process. An important characteristic of participatory video, as a form of farmer-to-farmer diffusion, is the presentation of technical messages from a farmer perspective which encourages innovation and trust (Zossou et al 2009), thereby increasing the chances of technology uptake.

Five pilot VVCs were carried out between July and November 2006 exclusively with women cocoa farmers in three communities in the Amansie West and Efigya-Sekyere Districts of Ashanti

Region, Ghana. While the VVC methodology is gender-neutral, the focus on women during the pilot phase was solely in response to donor interest. Pilot VVCs trained a total of 180 women farmers on cocoa ICPM through 5 videos on the following topics: pruning cocoa trees, controlling black pod disease through cultural practices and using fungicides, harvesting, pod breaking fermentation and drying. Participants were selected on the basis of three criteria: gender and ownership and involvement in the management of a productive cocoa farm. Each club consisted of about 20 farmers led by a trained female facilitator, also a cocoa farmer from that community. All facilitators had at least 10 years of formal education. The project provided a video deck, a television, a small generator and fuel, but did not supply tools or pesticides during the pilot phase. Clubs met either weekly or biweekly in a variety of locations (homes, cocoa buying sheds and schools) to watch the videos and carried out field exercises in one participant's field. The illustrated guidebook developed to accompany the discussion was not available during the pilot phase. Between 2006 and 2008 STCP used the VVC method to train a total of 864 cocoa farmers in the Ashanti Region.

METHODOLOGY

A study of the five pilot VVCs was carried out in May 2008 using a combination of qualitative and quantitative methods to assess the effectiveness of the method in terms of the adoption of ICPM practices, productivity gains and knowledge improvement. The study also investigated knowledge diffusion behaviour among VVC participants and post-training activities. Based on semi-structured exploratory interviews conducted with key informants, a questionnaire was developed focussing on farmers' crop and pest management knowledge and practices in the 2007 farming season, perception of the VVCs and knowledge diffusion. The questionnaire included a knowledge test developed by STCP staff and administered verbally as part of the interview. The test consisted of 7 questions on 4 technical topics, namely, pruning, black pod management, farm sanitation and post-harvest operations. The test was scored using a numerical scoring system (scores ranged from 0.5 to 3) for each correct answer, depending on the complexity and difficulty of the question, and 0 for incorrect answers. To assess farmers' perception of the methodology, we drew on results from an STCP commissioned, independently conducted evaluation of VVC conducted in 2007 (Strategic Communications Africa Ltd, 2007).

The formal survey covered thirty two randomly selected VVC participants from two villages (Bipoa and Manso Nkwanta) and a control group of 30 female cocoa farmers from the village of Afamanaso in Efigya-Sekyere District who were not trained by the project. The control group was selected on the basis of ownership and involvement in the management of a cocoa farm. Two limitations of the study should be noted as they relate to any conclusions about the effectiveness of the VVC methodology. First, the use of an all female sample presents both advantages and disadvantages. On the one hand, since women are generally less educated than men and tend to have less access to technical information, they constitute a "lowest common denominator" group for testing the effectiveness and suitability of methodologies targeted at a diverse population. On the other hand, the gender specific characteristics of an all female sample of cocoa farmers (smaller farms, less access to male labour, lower use of inputs resulting in lower yields compared to male farmers) (Quisumbing et al, 1999; UTZ, 2009) make it difficult to separate the effects of the training methodology from gender related factors that influence impact indicators, notably yield, adoption of management practices and input use. The second limitation of the study relates to the timing of the survey. Assessing farmers' practices and yields over the 2007 farming season, just one year after the training, is insufficient time to expect significant changes in yields and management practices. To address these sample-related limitations, we regard results on the uptake of ICPM practices and cocoa yields as preliminary and emphasize farmer knowledge as a more immediate outcome indicator.

Description of the sample

The majority of women sampled for the survey were middle aged or elderly heads of households due to divorce or the death of their husbands, had low levels of education and were experienced cocoa farmers (Table 2). Compared with the control group, VVC participants tended to be younger, managed their farms themselves, had younger tree stocks and a larger area planted to hybrid cocoa. Average farm size was 1-1.5 ha for both groups. Women in both groups relied heavily on hired labour to carry out many tasks on their cocoa farms but VVC participants were significantly more likely to hire labour, particularly permanent workers. The high percent of women (82% of participants and 93% of control group farmers) whose farms were sprayed by the government mass pesticide spraying campaign in 2007, the small number who owned a knapsack sprayer (3% of participants and 10% of the control group) and applied purchased pesticides themselves (none of the participants and 3% of the control group) suggests that women farmers as a group benefit greatly from this initiative due to the gender division of labour in cocoa production.

Most surveyed farmers had undergone previous training related to cocoa production, although for half or more of the farmers (50% of participants and 60% of non-participants), this consisted of informal training provided by other farmers. VVC participants were on average more recently trained, with their last training having occurred 6 years prior, compared to 14 years for the control group. Overall, we conclude that VVC participants were better resourced than non-participants.

Table 2: *Socio-economic and farm characteristics of surveyed farmers*

	Participants (N=32)	**Control (N=30)**
Marital status (%)		
Married	47	37
Divorced	38	30
Widowed	16	33
Age (years)	54	63*
Education (%)		
Years of formal schooling	4.9	3.1
Unable to read and write *Twi*	78	83
Experience managing a cocoa farm (years)	19.7	21.9
Engages in non-agricultural income generating activities (%)	81	77
Household size	7.5	6.2
Cocoa farm ownership (%)		
Self	87.5	96.7
Self and husband	12.5	3.3
Number of cocoa farms owned	1.8	1.6
Size of cocoa farm (ha)	1.58	1.0
Proportion of all farms planted to hybrids (%)	87	46**
Previous training on cocoa production (%)	75	67
Uses hired labour on cocoa farms (%)	96.9	76.7***

***P < 0.002; ** P < 0.000 ***P<0.018**

ADOPTION OF ICPM PRACTICES

The survey investigated whether there was a difference between VVC participants and control group farmers in the following ICPM practices in 2007: cocoa tree pruning, shade tree removal, phytosanitary harvesting, disposal of diseased pods and pesticide application frequency. As Table 3 shows, while there was no significant difference between the two groups in terms of the proportion of farms pruned, the number of shade trees removed and frequency of phytosanitary harvesting, VVC participants were significantly more likely to dispose of diseased pods correctly and apply fungicide and insecticide more frequently. A change in how farmers dispose of diseased pods can be attributed to VVC training but establishing a linkage between frequency of pesticide application is more difficult as this practice depends on other factors such as the availability of funds for purchasing pesticides, and in the case of women farmers, funds for hiring labour to spray. Notably, a key probably reason for the lack of significant difference in management practices between trained and non-trained farmers is the limitation of a cross-sectional questionnaire survey in detecting qualitative behaviour changes in management practices (David & Asamoah, 2011).

Table 3: *Cocoa integrated crop and pest management practices carried out in 2007*

	Participants	**Non-participants**
Heavy pruning (% of farm applied)	86	72
Number of shade trees removed	8.5	5.9
Maintenance pruning (% of farm applied)	77	71
Frequency of phytosanitary harvesting		77
Routinely on all plots	87	10
Routinely on one plot but sometimes or never on others	6	13
Irregularly on all plots	7	
Disposal of diseased pods in 2007		
Threw on the ground on the farm	3.2	72*
Threw on the ground outside farm	19	21
Buried/burned outside farm	77.4	3.4
Sold	0	3
Mean number of fungicide applications		
By farmer	1.6	0.7*
By government	0.6	0.4
Mean number of insecticide applications		
By farmer	1.4	0.4*
By government	1.3	1.1

*P < 0.05

Given the aforementioned methodological limitations, we drew on qualitative data to assess the impact of VVC training on farmers' production practice. VVC participants' qualitative comparison

of their farm management practices before and after the training (Table 4) suggests that training led to the following changes: more frequent use of pesticides, more frequent maintenance pruning, mistletoe removal and weeding, thinning, correct removal of chupons, correct harvesting, longer fermentation period, correct fermentation procedure and improved drying. Farmers' ranking of mistletoe management, phytosanitary harvesting and chupon removal as the most important topics covered in the training is an indication of new knowledge acquired.

Table 4: *Changes in practices mentioned by VVC participants*

Old practice	New practice
Cultural practices	
• Maintenance pruning never or irregularly done	• Regular maintenance pruning to remove diseased/dead branches
• Leave all cocoa trees in the cocoa farm with the belief that this will increase yields	• Carries out thinning to improve air circulation
• Leave chupons to grow with the belief that they will increase yields; incorrect chupon removal	• Remove chupons with a sharp machete to avoid damaging the tree
• Leave mistletoe or remove once in a while	• Remove mistletoe regularly
• Leave stagnant water in the farm	• Drain stagnant water to reduce humidity
• Weed once a year	• Weed three times a year
• Applied insecticide/fungicide once a year (less than the recommended frequency)	• Apply insecticide/fungicide frequently
Post-harvest operations	
• Harvest by cutting close to the trunk	• Avoid cutting close to the stem
• Ferment beans for less than recommended time	• Ferment beans for 6+ days
• No turning of beans in fermentation heaps	• Turn beans in fermentation heap on 5th day
• No holes in the banana leaves used for fermentation	• Makes holes in banana leaves to allow liquid to drain
• Put banana leaves directly on the ground	• Put palm branches on the ground and lay banana leaves on the palm branches
• Dry beans directly on the ground	• Dry beans on a drying platform

VVC participants had higher cocoa yields both before and after the training compared to the control group, but the difference between the two groups was not statistically significant in either year (Table 5). Unexplainably, average yields among VVC participants were lower in 2007-08 compared with the previous year but remained the same among the control group. Fifty nine percent (59%) of VVC participants compared to 47% of control farmers experienced a yield increase in 2006/07 over the previous year, with the former showing a higher yield differential. Notably, all VVC participants attributed increased yield to the adoption of ICPM practices learned during the training. On the other hand, it is significant that the main reasons for yield decline among 41% of VVC participants and 53% of control group farmers were related to socio-economic factors (death in the family, illness, inadequate funds) and natural calamities.

Table 5: *Cocoa yields (kg/ha)*

	Participants	**Control**	**Significance**
2005/06 yields	473.8	241.0	0.174
2007/2008 yields	419.0	255	0.111
Differential yield increase between 2005/06 and 2007/08 (%)	78	52	0.392
Farmers who increased yields between 2005/06 and 2007/08 (%)	59	47	0.535

FARMER KNOWLEDGE OF ICPM PRACTICES

On average, VVC participants had higher knowledge test scores compared with non-participants for all topics except weeding, an indication that the videos provided information that the majority of Ghanaian cocoa farmers did not have access to (Table 6). These results show that participants had a better understanding of what causes black pod disease, the effects of chupons on tree health, how mistletoe affects cocoa trees, the recommended fermentation period and the causes of drying and moulding during fermentation. Non-participants had low scores (less than 50%) on black pod management, weeding and fermentation, while VVC participants performed poorly on questions related to weeding.

Table 6: *Knowledge test score (%) by topic among VVC participants and non-VVC farmers*

	VVC participants (n=32)	Non-VVC farmers (n=30)	Student t test of significance
Overall test score	68	46	0.000
Test score (%) by topic:			
Black pod management	64	30	0.000
Chupon removal	88	53	0.000
Mistletoe removal	91	72	0.002
Weeding	48	43	0.285
Fermentation	60	46	0.000

We carried out standard linear regression analysis to explore in more detail the relative contribution of VVC training and other variables to farmers' knowledge of cocoa ICPM among the two samples. We hypothesized that knowledge test scores would be positively influenced by VVC training, farmers' educational level, how long ago previous training on cocoa production practices took place, years of experience with growing cocoa, yields per hectare and whether or not the farmer planted a cocoa farm herself. We expected women who planted a cocoa farm themselves, as opposed to inherited one from their husband or relative, who had high cocoa yields and sought out training in recent years would be more motivated to acquire and retain technical knowledge and hence have higher knowledge test scores. We also hypothesized that age would have a negative relationship with knowledge test score and expected that younger women are more likely to be more educated and have smaller farms that they planted themselves. Almost all respondent (N=61) had complete records on the variables used in the model (Table 7). In line with our hypotheses, control group women had lower test score and were relatively older, had fewer years of formal education and less access to technical training on cocoa, although they had more years of experience growing cocoa compared to VVC participants. While VVC participants were better resourced, the difference between groups for most variables in the model was not significant.

Table 7*: Descriptive statistics for regression variables*

	Pooled (N=61)		VVC participants (n=32)		Control group (n=30)		t-test
	Mean	Std. Dev	Mean	Std. Dev	Mean	Std. Dev	Probability
Knowledge test score (%)	57.79	16.37	68.40	11.03	46.36	13.27	0.000*
VVC participation (dummy)	0.55	0.50	--	--	--	--	--
Age	57.39	10.80	54.28	9.67	63.20	12.13	0.002*
Years of formal education	4.11	4.38	4.94	4.34	3.13	4.95	0.132
Years of experience managing a cocoa farm	20.43	13.08	19.69	11.43	21.9	15.54	0.524
Initiated own cocoa farm (dummy)	0.48	0.51	--	--	--	--	--
Cocoa farm size (ha)	1.52	2.38	1.57	2.69	0.98	1.11	0.330
Cocoa yields, 2007-08 (kg/ha)	431.42	363.41	481.58	307.44	329.89	356.81	0.080**
No. of years since last training on cocoa	9.59	12.80	5.95	16.27	13.95	16.93	0.038*

*Significance level: P < 0.05; ** P < 0.10

A noteworthy result is the expected significant and positive effect of VVC participation on knowledge test scores (Table 8). The coefficient of this dummy variable being the single largest among the predictive variables, makes VVC training the major predictor of test scores. Farmers' age was negatively and strongly correlated with knowledge test score, although the relationship was not significant. The very low magnitude in coefficient and the negative effect of the yield variable is likely caused by the characteristic cyclical yield pattern of cocoa and the inadequacy of using yield data from a single year.

Table 8: *Factors explaining knowledge test scores among cocoa farmers (N=61)*

	Coefficient	t-ratio	Correlation
Intercept	70.82	4.73*	
Age	-0.48	-1.92**	-0.399
Years of experience growing cocoa	0.25	1.325	-0.027
Years of formal education	-0.16	-0.30	0.242
Number of years since last training on cocoa	0.04	0.26	-0.216
VVC participation	21.75	3.81***	0.659
Initiated own cocoa farm	-3.68	-0.70	0.311
Farm size	0.06	0.06	0.137
Cocoa yields per hectare, 2007-08	-0.001	-0.24	0.155
Adjusted R-square=0.391			

*Significance level: P <0.01; P <0.10

PERCEPTION OF VVCS

Participants provided feedback on the VVC methodology during an independent evaluation of the project. The majority preferred the VVC methodology to other cocoa related trained events they had taken part in (e.g. seminars offered by the state extension service and farmer organizations and demonstrations conducted by state extension service) (Strategic Communications Africa Ltd., 2007). As summarized by one farmer, "the VVC has allowed us to learn a lot in a relatively short period". Participants were generally impressed with facilitators' technical knowledge and facilitation skills (Table 9). One farmer expressed appreciation and pride in local facilitators by the following observation: "the facilitators are the managers of the VVCs and they are our people". Another farmer indicated that a farmer facilitated VVC makes the technical messages more credible.

The quality of the videos, as measured by farmers' satisfaction, no doubt had a positive effect on the learning process (Table 9), but without a control and in the absence of content analysis of the videos, it is difficult to ascertain whether and how the participatory nature of the videos affected the learning process. Farmers were clearly encouraged by the testimonies given by farmers in the videos and by seeing other farmers carrying out the practices on their farms. As one farmer pointed out, "I really believe these things as they come from fellow farmers. I am motivated to work hard like them to get a good harvest". Most participants highly appreciated the clarity of the technical messages and language used which suggests a positive outcome of involving farmers in the video development process. The sole negative feedback was the need to reduce the length of certain videos.

Table 9: *Participants' perception of elements of the VVC methodology (%)*

	Very good	Good	Not satisfactory
Clarity of message	91	9	0
Clarity of language	91	0	0
Length of video	59	38	3
Technical knowledge of facilitator	94	6	0
Facilitation skills	94	6	0

KNOWLEDGE DIFFUSION AND SOCIAL CAPITAL

All thirty two VVC participants shared some aspect of knowledge acquired from the training with others, reaching an average of 7.5 other farmers and a total of 240 farmers. The key topics shared were chupon, diseased pod and mistletoe removal. Participants were more likely to share knowledge with hired labourers (78%) and with men (5.3 on average) rather than women (2.2) (Table 10). Some VVC participants showed their eagerness to expose their hired labourers to new knowledge by bringing them to VVC sessions. As a result of these efforts, most participants seemed confident that knowledge sharing with hired labourers was an effective strategy for increasing productivity on their farms. Eighty four percent confirmed that their labourers always applied the techniques acquired from the VVC training, 12% mentioned that they did so sometimes, while 4% were not aware of how frequently improved techniques were applied to their farms.

Table 10: *Knowledge diffusion by VVC participants*

	%
Hired workers	78
Male relatives	38
Male friends/neighbours	53
Female relatives	50
Female friends/neighbours	44
Husband	19

Since demonstrating a skill/technique requires a certain mastery of that skill/technique, it can be hypothesized that the method VVC farmers use to share knowledge is an indicator of training effectiveness. VVC participants were equally likely to verbally explain (52%) skills and practices acquired through the training as they were to demonstrate new practices (48%). By contrast, Ghanaian farmer field school graduates nearly always used demonstration as a means of sharing knowledge (David & Asamoah, 2011) which may be explained by the greater time devoted to practical skills application in the farmer field school methodology. Since farmers' decision to verbally share information could result from several factors aside from having a limited grasp of the skills and practices concerned (e.g. lack of interest and time for knowledge sharing), future studies are needed to explore in more depth the reasons behind farmers' choice of diffusion methods. It is also notably that the diffusion method used by trained farmers has key implications for learning on the part of secondary knowledge recipient since research has clearly established that people retain 50% of what they hear verbally and 75% of what is shown and explained to them .

The VVCs in Ghana also contributed to developing new social networks that extended beyond the life of the project. Over 18 months after the training ended, 11 of the 32 participants

interviewed (34%) still met as a group without the facilitator to exchange and share information and assist each other to do farm activities.

CHALLENGES AND THE SCALABILITY OF VVCS

The VVC method has several positive attributes as an extension approach as illustrated in the Ghanaian case:

- **Promotes enthusiasm for learning**: since video is associated with entertainment, it increases people's attentiveness and attraction to the method
- **Intensive learning**: learning is reinforced by repeating the video several times, discussing the topic and demonstrating practices and techniques
- **Strengthens local capacity for facilitation**: use of local facilitators improves scalability and reduces cost but supervision by agricultural professionals is needed
- **Broadly applicability**: because the technical message is contained in the video, the methodology can be implemented by non-traditional extension service providers including private sector actors and farmer associations and can be used for training on a broad range of topics
- **Modest cost**: based on figures from a large-scale VVC project in Ghana, it cost $78 to train one farmer over a six month period (Table 11), excluding fixed costs associated with video production (estimated at $12,000 per episode)(Muilerman and David, 2011).

Table 11: *VVC costs, Ghana, 2010*

Item	U.S$
Cost of a workshop to train one facilitator[a]	182
Equipment costs[b]	305
Implementation costs per club (materials, supervision, facilitator)	1001
Total cost per club (workshop for facilitators, implementation, equipment)	1853
Average number of participants per club	25
Cost per farmer	78

[a] Assumes a trainer will cover at least 3 training cycles
[b] Assumes straight line depreciation for television sets, video players, and generators over a two year life and a salvage value of zero
Source: Muilerman and David, 2011

Equipment break-down, finding a quiet, dark venue that can be closed off from the public and improving sound quality are some of the challenges experienced in Ghana. Although not explored by STCP, training videos can also be used in a semi-structured manner with little or no facilitation by, for example organizing video screenings at village level. However research shows that using video as a stand alone is most effective when scientific principles presented in the videos are close to what farmers already know and do (Van Mele, 2006). This suggests that, a structured approach such as the VVC method may be more effective for training farmers on new topics and concepts or on broad range of topics such as ICPM.

Based on pilot results from Ghana and Cote d'Ivoire (Dji, David & Couloud, 2010), STCP proposes to work with partners to develop strategies for scaling up the VVC method, focussing on establishing institutional and financial mechanisms for video production, training of trainers, implementation and supervision of clubs. At the level of implementation, it is envisaged that the VVC method will be integrated into existing extension programs implemented by a range of organizations including national extension systems, NGOs, farmer organizations and private sector actors (e.g. companies, individual entrepreneurs). STCP proposes to catalyze the

development of innovative partnerships between delivery agencies, a training organization that would initially train trainers and ensure quality while building capacity within implementing institutions over a number of years and technical services (e.g. national extension services) that can provide supervision for quality control. Developing a video training program that covers agriculture, health and sanitation around entrepreneurially driven multipurpose community centres is the ultimate goal to reduce overhead costs and encourage sustainability. Such a goal will only be successful and sustainable if communities are directly involved in the design, management and evaluation of activities. To ensure financial sustainability, STCP, working with stakeholders will explore mechanisms for encouraging self-financing VVCs as well as designing a financial sustainability roadmap at local or national levels which targets national cocoa revenue or decentralized government funds to pay for fixed costs (e.g. video development, training trainers etc).

CONCLUSIONS

In a context of client-oriented, pluralistic extension provision, the need for multiple approaches to agricultural extension and for targeting methods to meet specific training objectives and clients is widely acknowledged. The Ghanaian case study shows that the video viewing club is an effective relatively low cost interactive training method for providing low literacy populations with skills, information and knowledge on complex technical topics. While there was no significant difference in farmers' reported implementation of selected ICPM practices or significant yield difference between VVC participants and the control group in the single year observed one year after the training largely due to methodological limitations, the study demonstrated that VVC training significantly improved farmers' knowledge of most topics covered. Farmers' perception of changes in their practices provided further evidence of the positive impact of the training, as did their high rate of knowledge diffusion. A key element of farmers' appreciation of the methodology relates to the use of local facilitators which created a sense of ownership and added to the credibility of the technical messages. While the study did not explore this aspect in detail, there was evidence that the participatory nature of the videos improved their effectiveness as a communication tool as farmers identified with the characters which caused them to consider changing their behaviour. An added spin-off effect of VVC in the Ghana case was stronger social capital, with farmers continuing to meet to exchange and share information and knowledge on their own many months after the training ended.

The study raised a number of research issues. There is need for a more conclusive study of VVC participants in Ghana, covering a sample of both women and men which would also assess cocoa productivity three or more years after the training. Research to compare the impact of participatory versus conventionally produced videos and the cost, effectiveness and scalability of video training relative to other face-to-face, interactive methods such as farmer field schools would provide evidence to validate the method. Finally, the effects of facilitation when using video as a learning tool needs further investigation.

Scaling up the VVC method involves multiple challenges including forging multi-stakeholder partnerships, developing appropriate financing mechanisms at various levels and creating a multi-sectoral, comprehensive video training package that links into other ICT-based programs. At each stage of the scaling up process, community consultation, participation and local ownership is critical.

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