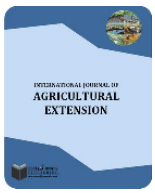

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AN ASSESSMENT OF EFFECTIVENESS OF PARTICIPATORY VIDEO AND DRAMA IN ENHANCING LEARNING OF "CLIMATE-SMART" PUSH-PULL TECHNOLOGY: A CASE STUDY OF BUTERE AND VIHIGA FARMERS IN WESTERN KENYA

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A B S T R A C T

This study assessed the effectiveness of participatory video and drama in enhancing learning of climate-smart push-pull technology in western Kenya. A total of 80 farmers who had no knowledge of push pull technology were exposed to participatory drama and video that had been developed by farmers who are adopting push pull technology. Validated questionnaires were used for data collection where sampled non push pull farmers were interviewed before and after exposure to push pull knowledge using participatory video and drama. Data obtained was analyzed using chi square at 0.05 confidence level set a priori and also presented using frequency tables, percentages, charts and averages relevant. Results show that the effectiveness of participatory video and drama in disseminating push pull content is significantly differentiated by the type or component of the push pull knowledge being disseminated. For instance, among farmers exposed to drama, 38.4% were rated as average and good in their understanding of Push Pull concepts, descriptions and definitions compared 19.2% for farmers exposed to participatory video ($\chi^2=15.949$, $p<0.05$). This is completely different for push pull knowledge contents of "establishment and management of Push pull fields", where among farmers exposed to video,46.1% were rated as good and average compared to 28.2% who were exposed to drama ($\chi^2=10.1921$, $p=<5$). The study concludes that while both methods are cost effective, drama is more effective in the attraction of larger crowd ,ignition of initial interest and educating farmers on minimum basics of push pull technology .Participatory video does better in explaining deeper details of push pull knowledge where farmers need not only to hear of the technology but also to adopt it .However no single dissemination method can work perfectly alone, whereas drama can be used as an introductory in attracting the crowd and teaching the basic technological knowledge of push pull technology, this knowledge can be affirmed for purposes of actual adoption by other dissemination methodologies like participatory video.

Keywords: Push Pull technology, Participatory video and Drama, Dissemination.

INTRODUCTION

Tajikistan Enhanced farm productivity and farmers' livelihoods largely depend on how the relevant technology information is accessed by farmers (Singh, 2011; Ganesan *et al.,* 2015). Nevertheless, dissemination of expert agricultural knowledge and practice has been identified as one of the major challenges in rural development (Toyama, 2011). *Robert Evenson* describes agriculture extension efforts as following an awareness-knowledge-adoption-productivity (AKAP) sequence (Gandhi *et al.,* 2009). Thus, identifying the right pathway for disseminating information to smallholder farmers who are often under-educated, illiterate, financially poor and living in remote rural areas would be key for successful adoption of technologies (Rollins, 1993). If ineffective pathways are used for transfer of technology information, potential for uptake would be limited and this will slow the adoption and diffusion process. Push-pull technology (PPT) is currently and widely promoted as a control measure for stemborers and Striga weed, as well as soil fertility improvement in cereal fields in Eastern Africa. Since it is a new and relatively knowledge-intensive technology, access to information about its efficacy is critical for maximum adoption and continued use (Murage *et al.,* 2012). Effective adaptation

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of this technology can only be achieved if farmers possess sufficient knowledge of the technology, which requires use of appropriate dissemination pathways in information transfer. Murage *et al.* (2012) identified field days as having the highest impact on both the probability and intensity of push pull adoption, attributing this to the field days' nature of stimulating the interest of many farmers, with a strong likelihood that majority of the participating farmers would adopt the technology. The study also highlighted that a combination of pathways can be used for purposes of utilizing each pathway's individual advantages. For example, Farmer Field Schools (FFS) have an advantage of providing intensive learning, while Farmer Teachers (FT) have the advantage of having knowledge of the social network within the community. These two approaches (FFS and FT) could complement each other as alternative pathways to field days FD.

Other studies like Amudavi, *et al.* (2009a; b) also unveiled that conventional pathways like farmer-to-farmer dissemination are the most commonly practiced among farmers due to the fact that most farmers tend to learn better about new agricultural knowledge from fellow farmers. Further, Feder *et al.* (2004) also indicated that a key source of information for farmers is other farmers, because they are readily available and their utilization does not impose high transaction costs.

It is therefore important that since most farmers tend to learn better about new agricultural knowledge from fellow farmers, that agricultural dissemination focuses on dissemination methodologies that are farmers participatory and are driven by farmers themselves. Participatory video and drama, are one of the dissemination methodologies that can be driven by farmers themselves.

Video is clearly confirmed to be a novel and expanding technology for positive behavioural strategies in teaching and learning. It is a form of participatory media in which a group or community creates their own film and video recordings in collaboration with professional practitioners (Shaw & Robertson, 1997). The idea behind this is that making a video is easy and accessible, and is a great way of bringing people together to explore issues, voice concerns or to simply be creative and tell stories (Nick & Chris Lunch 2006). This process can be very effective in empowering and enabling a group or community to take action to solve their own problems, and also to communicate their needs and ideas to decision-makers and/or other groups and communities (Sarker *et al.,* 2014).

Using drama to teach concepts and practices as a pedagogical approach is also gaining greater acceptance among educators (Fortino, 2012). Drama is used to educate, demonstrate a principle, and illustrate a point of practice. It is powerful because its unique balance of thought and feeling makes learning exciting, challenging, relevant to real-life concerns, and enjoyable (Moore, 2004). Drama is defined as the act of using the imagination to become someone or something other than yourself or the human process whereby imaginative thought becomes action. (Moore, 2004). It also works towards increasing awareness on how to solve issues at hand and brings emotion and learning together. In view of these findings, little is known of the effectiveness of participatory drama and video in disseminating push pull technology among smallholder farmers. It is to this end that this study is conceived to fill the existing gap in literature on effectiveness of participatory video and drama in disseminating push pull knowledge components among small holder farmers. We analyze the levels of understanding on various push-pull components when the technology is exposed to smallholder farmers using participatory video or drama. Push Pull knowledge components are classified as ;(a) Knowledge of constraints that necessitate uptake of push pull technology (b) Knowledge of the description of push pull technology (c) knowledge on setting up of push pull plot (d) Knowledge on maintaining push pull plot and (e) Utilization of benefits of push pull technology.

The specific objective of the study was to assess the effectiveness of participatory video and drama in enhancing learning of Climate-Smart push pull technology components including ;Knowledge of constraints that necessitates uptake of push pull technology , Knowledge on definition and description of push pull technology , knowledge on setting up of push pull plot ,Knowledge on maintaining push pull plot and Knowledge on Utilization of benefits of push pull technology among smallholder farmers in western Kenya.

MATERIALS AND METHODS

Study Area: The study was conducted in two districts of Western Kenya namely: Butere and Vihiga. Most of these study areas are classified as lower midland zones and receive a bi-modal type of rainfall, with long rains falling

between March and June and short rains between September and December. Their populace mainly depends on cereals as source of food and is immensely affected by stem borer and striga weeds in the farming of cereals.

Sample selection and Data Collection: A purposive sampling strategy was used, according to Carmines and Zeller (1988) to select the districts with predominant challenges of stem borer and striga weeds in the farming of cereals crops namely Butere and Vihiga. Purposive sampling ensures that certain important segments of the target population are represented and also allows selection of rich information that provides insight into the issues of central importance to the research (Patton, 1990). A sampling frame, consisting of farmers groups who had not heard or taken up push pull technology before was prepared from government records kept at ministries of social services. The sampling frame included farmers in groups that are registered, involved in cereal farming and have active and stable membership. The activeness and stability of a group was determined by how often the group meets, frequency of their activities and how long they managed to retain their members. From the sampling frame, 80 farmers were randomly drawn using a Research Randomizer accessible at www.randomizer.org. Before the administration of the questionnaire, the respondents were informed about the objectives of the survey while the enumerators were trained on the objective and contents. The derived sample was proportionately distributed among 2 selected regions where they were equally distributed based on the treatments i.e. farmers to be exposed with participatory Drama and farmers to be exposed to participatory Video.

Table 1. The table of distribution of the sample.

Region	Sample size	Farmers to be exposed to Drama	Farmers to be exposed to participatory Video
Butere	40	20	20
Vihiga	40	20	20
Total	80	40	40

Data Collection

Training of participatory video team: With the help of international center for insect physiology and ecology icipe staff, video trainers and some farmers with previous experience in video production, Ebuhanga farmers group which had most of its members practicing push pull technology were trained on farmer participatory video production. The training covered capacity enhancement on content development, storyboarding, shooting and editing, which later led to video shooting of various push pull components including; Push pull concept, constrains being addressed, Management of push pull fields and utilization of push pull technology benefits by the Ebuhanga farmers group members The farmer participatory video shots were consolidated into Compact disc (*CD*) and later broadcasted among selected non push pull farmers.

Training of participatory drama team: Based on the developed push pull drama script on push pull components (Push pull concept, constrains being addressed, Management of push pull fields and utilization of push pull technology benefits), Nabole Community CBO were trained on drama production and later continually rehearsed with the support of icipe team. The drama team was then facilitated to act before selected non push pull farmers. A team of data enumerators were recruited and trained on administration of semi structured questionnaires before the actual data collection. Interviews were carried out before respondent exposure to drama events and push pull video clips, for the purposes of establishing baseline data for the sampled non push pull farmers .The trained drama team and participatory videos were then exposed among selected non push pull farmers who were again interviewed to gauge their understanding on knowledge acquisition on different identified topics i.e Push pull concept, constrains being addressed, Management of push pull fields and utilization of push pull technology benefits as understood through video and drama. A post evaluation on the learning materials was also undertaken so as to measure the degree of dissemination material acceptability by farmers and quality of those learning materials.

Data Analysis: Statistical analysis was performed using

SPSS® statistical software version 22 (IBM, Armonk, New York, USA) where means, frequencies and percentages were conducted to analyze the socio economic, farm characteristics and agricultural characteristics aspects of the respondent farmers. With significance levels set at 0.05, Chi-square was conducted to assess the differences on knowledge ratings for farmers exposed to participatory video and farmers exposed to participatory drama.

To assess the effectiveness of participatory video and drama in enhancing learning of "Climate-Smart" Push-Pull technology, the study sought to evaluate the variations in knowledge ratings when farmers that have not been exposed to push pull technology are exposed to the technology using participatory video and participatory drama with push pull content. Push Pull knowledge components were classified as ;(a) knowledge of constraints that necessitates uptake of push pull technology (b) knowledge of description of push pull technology (c) knowledge on setting up of push pull plot (d) knowledge on maintaining push pull plot and (e) utilization of benefits of push pull technology .Structured questions based on each content were asked to each respondent farmers after they had been exposed to participatory drama and participatory video respectively. These questions were scored by offering combinations of possible answers a farmer could give, where a farmer could not mention anything or mentioned the wrong answer of a question of a specific knowledge component was given a score of 1(poor), where the farmer has some knowledge was given a score of average (2) and where the mentioned all the answers as explained by either video or drama was given a score of 3(Good). The scores were further aggregated as means and classified to form a dependent variable "total knowledge variable of Push Pull" categorized as poor, average and good.

RESULTS AND DISCUSSION

Socio economic and farm characteristics: Socio economic factors such as age, gender, income level, education level and farmers experience play a major role in determining the media through which farmers are likely to receive information (Adolwa, 2012). In this study the average age of respondents was 48 years with most of the farmers having more than 18 years of farming experience, explaining the extensiveness of their need for agricultural information.

Table 2. Educational level, marital status and primary occupation of participating.

	Farmers exposed to Video (%)		Farmers exposed to Drama (%)		
	Male	Female	Male	Female	Total
Highest level of Education					
None	3	4	3	3	12
Primary	14	18	18	12	62
Secondary	9	5	6	5	26
Tertiary	0	0	1	0	1
Total	26	27	28	19	100
Marital status					
Single	3	0	1	0	4
Married	19	24	24	17	85
Widowed	3	1	1	3	8
Separated	1	1	1	0	4
Total	26	27	28	19	100
Primary Occupation					
Farming	19	21	27	10	77
Casual labour-onfarm	4	3	0	6	13
Business	0	1	0	1	2.6
Saried Employment	3	3	1	1	8
Others	0	0	0	0	0
Total	26	27	28	19	100

The literacy levels among the respondents were relatively high with over half of the overall respondents having attained primary level education, depicting a higher probability of target farmers understanding the agricultural information. The majority of the men in the overall sample had at least primary level education (48%) compared to 39% for women. Majority (85%) of the respondents were married which as noted by Opara (2008) influences farmer access to information where married farmers are more likely to sought more agricultural information due to their desire to produce more for family consumption and also for sale.

Information plays a key role in strengthening a farmer's daily decision-making related to agricultural activities by enhancing their knowledge about agricultural information. While farmers utilized several pathways to get agricultural information, majority of farmers sourced their information majorly from their fellow farmers (37%), radio (37%) and field days (13%). Farmers described some pathways to be relatively more effective than others. For instance, sourcing information from fellow farmers was described as more effective (39%) as compared to other dissemination pathways (Figure 1). Effectiveness of sourcing agricultural information fellow farmers can be explained by farmers' preference to observe and learn from themselves in their network about the suitability and profitability of new agricultural production methods. The networks are particularly important for women, who often have less access to formal dissemination channels (Gundu, 2006). Such participation provides them with high access to information regarding innovations and stimulates information exchange with others (Granovetter, 1973). Farmers also mentioned various challenges in sourcing agricultural information including language barrier, informed people not being ready to share information, less extension services and few centres where farmers could ask for agricultural information.

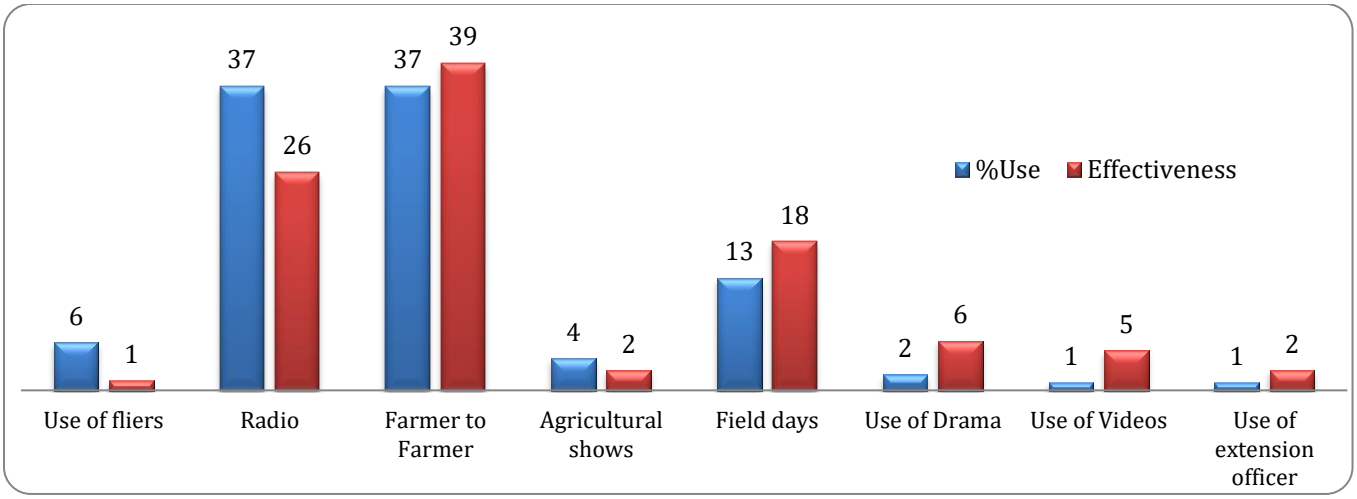

Figure 1. Sources of agricultural information and their effectiveness as stated by farmers.

Knowledge of push Pull technology through video and Drama: Use of participatory video and drama was found to be significant in dissemination and communication of various components of Push Pull technology. Farmers who were exposed to push pull components including Push pull concept and definitions, agricultural constrains Push pull is addressing, Management and utilization of push pull fields through drama, were found to mostly understand the " awareness aspect of the technology i.e. Push pull concept, its description and definitions while farmers who were exposed to push pull through participatory video were found to mostly understand the implementation aspects of the technology i.e. establishment, management and utilization of push pull fields.

Table 3. Understanding of Push-pull concept and its description among farmers exposed to video and Drama Push-pull content.

Rating of understanding	Type of dissemination exposure			Total	Chi-square	Sig. (2-sided)
Poor	9.0%	33.3%	42.3%	15.949a	2	.000
Average	25.6%	11.5%	37.2%			
Good	12.8%	7.7%	20.5%			
Total	47.4%	52.6%	100.0%			

As noted in Table 3 below ,among farmers exposed to drama, 25.6% and 12.8% of farmers were rated as average and good in their understanding of Push Pull concepts, its description and definition compared 11.5% and 7.7% for farmers exposed to video .Table 4 also notes that among farmers exposed to video 37.2% and 12.8% farmers were rated as good and average respectively in their understanding of establishment and management of Push pull field compared to 24.4% (rated good) and 3.8% (rated average) farmers who were exposed to drama. The same trend is noted in establishment & Management of Push Pull fields in Table 5. The results can be explained by the fact that while drama was found to be effective in its ability to attract a large uninvited crowd, its audience was more focused on the main topic of the drama and its entertainment leaving out deeper details on how to establish and manage push pull field. For instance, while the drama audience could easily recall what the drama was talking about (Push pull, what it does etc.) most respondents struggled to explain how they can actually establish and manage the plots. This means that for use drama to be effective in leading to adoption of the technology, it will have to be accompanied by other dissemination methods, where drama can be used as an introductory in attracting the crowd and teaching the basic technological knowledge before the actual teaching of the technology to the farmers by other methods.

In comparison to drama, though participatory video could not attract a large crowd (in exception of the invited audience), it was found to be able to help farmers not only to know the description and concept of push pull but also to know how to actually set it up. For instance, unlike farmers exposed to participatory drama, most farmers exposed to participatory video,37.2% and 12.8% were rated as good and average respectively in explaining how they can utilize push pull benefits compared 28.2% for farmers exposed to drama.

Table 4. Utilization of Push-pull technology.

	Type of dissemination exposure		Total	Chi-Square	Df	Sig.
	Drama	Video				
Poor	19.2%	2.6%	21.8%	15.630a	2	.000
Average	3.8%	12.8%	16.7%			
Good	24.4%	37.2%	61.5%			
Total	47.4%	52.6%	100.0%			

a. 1 cells (16.7%) have expected count less than 5. The minimum expected count is 4.74.

Table 5. Establishment and management of Push-pull fields.

	Type of dissemination exposure		Total	Chi-Square	Df	Sig.
	Drama	Video				
Poor	19.2%	6.4%	25.6%		2	.016
Average	11.5%	17.9%	29.5%			
Good	16.7%	28.2%	44.9%			
Total	47.4%	52.6%	100.0%			

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 9.49.

CONCLUSION AND IMPLICATIONS

Analysis of the relationships between variables in the study revealed that participatory video and participatory drama are significantly effective in dissemination of push pull information but only differ on the type of dissemination knowledge that is to be disseminated .For instance while drama is more effective in crowd attraction and passing out the initial push pull knowledge , Participatory video was found to be good to explaining deeper details of push pull knowledge to non-push pull farmers .

This means that for use drama to be effective in leading to adoption of the technology, it will have to be accompanied by other dissemination methods (use of farmer teachers, field days or extension officers to further explain), where drama can be used as an introductory in attracting the crowd and teaching the basic technological knowledge before the actual teaching of the technology to the farmers by the mentioned dissemination methodologies. The study also found out that while farmers utilized several pathways (fellow farmers, radio and field days) to get agricultural information, a majority of farmers (39%) described sourcing of information from fellow farmers as more effective compared to other dissemination pathways. This can be explained by farmers' preference to observe and learn from themselves in their network about the suitability and profitability of new agricultural production methods in comparison to learning from other dissemination methodologies. It is therefore important that since most farmers tend to learn better about new agricultural knowledge from fellow farmers, that agricultural dissemination focuses on dissemination methodologies that are farmers participatory and are driven by farmers themselves

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