

Accounting for Training Results: An Evaluation of the Training Activities of the Root and Tuber Improvement Programme

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Resumé

Osei, C. K., Berchie, J. N., Ansah, I. O. O., Gyasi-Boakye, S., Asante, S. N., Adjekum, A.A. & Danso, Salome. *Rapport de formation:- Une évaluation des activités formatives du Programme d'Amélioration des Racines et des Tubercules.* Cette étude a évalué l'efficacité d'un programme de formation agricole au niveau de la multiplication des robustes matériaux de plantation et des procédures de collection de données sur le changement en performance des participants sur le travail. L'étude a employé des multiples sources d'informations et de méthodes de collection des données pour rendre compte de l'utilisation des informations formatrices par les participants. Les données étaient rassemblées à travers une suite de plans d'actions de sorties (plans d'actions complétés à la fin de la formation) d'enquêtes et de questionnaires. Les participants ont utilisé la plupart des connaissances et des compétences acquises pour distribuer les matériaux de plantations parfaits et robustes aux paysans. Les participants ont également organisé des animations pédagogiques pour les collègues et des paysans qui a eu des effets énormes sur la multiplication et la distribution de matériaux de plantations parfaits et robustes.

Mots clés: Resultats de formation, evaluation, changement de performance, connaissance et compétence.

Abstract

This study evaluated the effectiveness of an agricultural training programme in multiplication of healthy planting materials and data collection procedures on the change in performance of participants on the job. The study used multiple sources of information and multiple methods of data collection to account for the use of training information by participants. Data were collected through follow up on exit action plans (action plans completed at the end of training), interviews and questionnaire. Participants used most of the acquired knowledge and skills to distribute clean and healthy planting materials to farmers. They also conducted in-service training for colleagues and farmers which had multiplying effects on the multiplication and distribution of clean and healthy planting materials.

Keywords: Training results, evaluation, performance change, knowledge and skills.

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Introduction

A major goal of training programmes is to bring about change in performance of participants through improved skills, increased knowledge, changed attitudes, and ultimately change in behaviour or performance (FAO, 1992). Training is, therefore, linked to change in performance or behaviour. To inform on training programmes, an evaluation is conducted to obtain information on the effects of the training programme. Kirkpatrick (1979) has identified four levels of evaluating training as reaction, learning, on-the-job application (behaviour) and results (also called the "functional" level by Hamblin (1970) and "organizational change" by Billes and Schuler (1986). However, most training evaluations are conducted at the reaction or learning level to measure satisfaction within the training environment. According to Newstrom (1978), "there is over-attention in training evaluations to reaction and learning with under-attention to behaviour and results". Too often training evaluations ignore the question of whether behavioural changes as a result of training are routinised within the day-to-day organizational work environment from which the trainee was extracted (Brandenburg, 1989). Evaluation conducted at the reaction or learning levels is far removed from evaluating behaviour or change in performance on-the-job. It is, therefore, uncertain how much former trainees learning produce change in performance

on-the-job. This is especially a critical issue with agricultural projects that spend large amounts of money and effort on training. The question of whether changes in performance occur back on-the-job is usually not answered. Training evaluation conducted after trainees are back home on-the-job and using what they were taught is a more meaningful benchmark against which effectiveness of training should be evaluated.

The Root and Tuber Improvement Programme (RTIP)

The Root and Tuber Improvement Programme (RTIP) is a six-year programme co-financed by the Government of Ghana (GoG) and the International Fund for Agricultural Development (IFAD) with the World Bank as the co-operating Institution. The programme, which became effective in January 1999, has an overall objective to enhance food security and increase the income of resource-poor farmers on a sustainable basis. It facilitates access to new but proven locally-adapted technologies of root and tuber crops such as cassava, yam, cocoyam, sweet potato and Frafra potato (RTIP, 2000).

The CSIR-Crops Research Institute

The CSIR-Crops Research Institute (CSIR-CRI) is one of the 13 national institutes and centres of research under the Council for Scientific and Industrial Research Ghana (CSIR). The

responsibility for research into crops (cereals, roots and tubers, legumes, plantain and banana and horticultural crops) lies with the institute. It has among its objectives, increasing the productivity of some major staple crops such as maize, legumes, root and tuber crops and horticultural crops (CRI, 1990). Crops Research Institute shares its research findings through collaborative activities with other partners of National Agricultural Research Systems (NARS) through training and other research-extension-farmer activities.

The Training Workshop and curriculum

As part of the capacity building efforts of RTIP, CSIR-Crops Research Institute trained over 50 District Agricultural Development Officers (DADOs) and Agricultural Extension Agents (AEAs) of the Ministry of Food and Agriculture (MoFA) in 1999-2000 in the multiplication of healthy planting materials and data collection procedures. The training workshops were conducted in Kumasi, Cape Coast, Ho and Wa and lasted five days in each location. The training workshop aimed at improving trainees' knowledge, skills and performance in multiplication of healthy planting materials and data collection procedures.

The training workshop consisted of five units:

- Basic agronomic concepts in

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cassava, yam, cocoyam and sweet potato with emphasis on production constraints.

- Discussion of strategies for overcoming constraints with emphasis on rapid multiplication of cassava and sweet potato.
- Harvesting, distribution and storage of stem and tubers.
- Data collection procedures such as monitoring, evaluation, farm area measurements.
- Field visits and discussions to complement topics studied.

The problem

With several MoFA staff benefiting from RTIP/CRI collaborative training programme, the problem became one of ascertaining the overall effectiveness of training courses and workshops in contributing towards the job performance of beneficiaries. In many instances the evaluation of RTIP/CRI collaborative training programmes has been limited to simple reactions of participants and learning at the time of training. While these evaluations are important in providing immediate feedback on the extent to which training objectives have been met, they do not offer adequate insight into the extent to which training is useful in the work environment (on-the-job). In 2001, a follow-up study was undertaken to

determine how effective RTIP/CRI collaborative training had been able to change performance on-the-job of former trainees. Follow-up studies have been conducted in some International Agriculture Centres and National Programmes (Osei, 1998; Kwarteng, 1994; Villareal and del Toro, 1993) to provide assessments showing contributions of training to job performance and feedback information of former trainees and their supervisors on ways to improve current and future training courses.

Methodology

Multiple methods of data collection (survey questionnaire, review of action plan, and interviews) and multiple sources of information (participants, supervisors and farmers) were used to provide reliable and valid information (Yin, 1984; Philips, 1996). Murdock and Franklin (1989) noted that questionnaires and surveys are effective methods for evaluating perceptions. A study questionnaire was developed, validated and used to collect data on participants.

Interviewer guide sheets were developed and validated to provide in-depth information on the relevance, benefits and achievements of training (Casely and Kumar, 1988) from former trainees and a purposively selected sample of supervisors and farmers on effects of RTIP training. The trainees interviewer guide requested

biographical information of participants, use of training on-the-job, achievements and additional needs. Supervisor and farmer interviewer guide sheets were used to collect in-depth information on the activities, performance and responsibilities of trainees. Reports have documented that action plans completed at the end of training is an effective method for evaluating training (Arubayi, 1988). An action plan was completed by each participant at the end of training. The objective of the action plan was to commit participants to a plan of action for using the knowledge and skills acquired during training on-the-job. The action plan was also used to verify whether former trainees applied what they gained from the training.

Population sampling

The population for the study included all participants who had participated in RTIP training in rapid multiplication of healthy planting materials for farmers and data collection procedures programme in the year 2000 from Ashanti and Brong-Ahafo Regions. The sampling frame was compiled from training reports submitted to RTIP and CRI and consisted of 32 names of MoFA participants. Given the relatively small population size, the research team did not draw a sample frame. Every participant-trainee available was sent a questionnaire. To this extent, therefore, our sampling frame matches the population. Nineteen and 22 farmers

were purposively selected to constitute part of the study population to provide corroborative information.

Data collection

Questionnaires were administered to 32 participants with the assistance of District Directors of Agriculture. Twenty-eight of the 32 questionnaires distributed were collected (representing a response or return rate of 87.5%). Survey methodology experts indicate that a well-done survey should yield a response rate of about 70% (Dillman, 1979).

Action plans completed by 32 former trainees were used to verify whether trainees successfully applied the knowledge and skills gained with their supervisors.

Interviewer Guide sheets were used to collect in-depth information (relevance, benefits and achievements) from 28 former trainees, 19 supervisors and 22 farmers, 6 to 12 months after the training. Information was collected on:

Bio-data of former trainees

Information on biography of former trainees included: academic qualification, type of training attended, number of RTIP courses attended, gender and job position. Bio-data information was to be used to determine ability of participants to perform higher responsibilities such as supervising the MoFA research stations, relating the

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type of training to job performance and differences in gender roles.

Usefulness and relevance of RTIP training to present job

Respondents were asked to assess the usefulness of the training after they returned to their jobs in terms of relevance of training to job, usefulness and extent of use of knowledge and skills acquired during training, factors facilitating use of training, and usefulness of action plan. The purpose for collecting information on usefulness was to find out whether change in behaviour as a result of training had been applied on-the-job by trainees.

Effect of training on improved job performance

Respondents were asked to assess the effect of training on improved job performance in terms of work activities. Responses to questions on effect of training on improved job performance were used to assess how the training programme affected work activities and performance of former trainees.

Obstacle to use training/additional training needs of MoFA staff

Respondents were asked to identify their training needs by indicating their current level of competence on RTIP activities. To corroborate information provided, respondents were asked also to indicate from a list of factors those that were obstacles to use of training, to enable management of RTIP and Training

programme of CRI appreciate the shortcomings of field workers which when resolved could result in higher work efficiency.

Data analyses

The statistical package SPSS was used to analyse the data. The questionnaires were coded and subjected to respondent and cross tabulation analysis to provide corroboration and in-depth information whenever necessary.

Results and Discussion

Bio-data of former trainees, academic qualification, job position status, type of training and gender

Majority (57.1%) of the respondents who attended RTIP training were AEAs who had an agricultural college certificate. However a relatively high percentage (42.9%) were DADOs who had a B.Sc. or M.Sc. degree in Agriculture.

With reference to type of training attended by respondents, 71% attended training in rapid multiplication of cassava and sweet-potato while 29% attended Monitoring and Evaluation courses. None of the respondents attended training in rapid multiplication of yams and cocoyam. In general respondents were males. Ninety-six per cent of respondents were males and four per cent females (Table1).

Usefulness of training to present job

A major objective of the study was to

Table 1. Bio-data of former trainees.

<i>Characteristics</i>	<i>Per cent</i>
Sex	
Male	96
Female	4
Academic qualification	
College certificate	57.1
B.Sc.	40
M.Sc.	2.9
Job position	
AEAs	57.1
DADOs	42.9
Type of training	
Rapid multiplication of cassava and sweet potato	71
Rapid multiplication of yams and cocoyam	0
Monitoring and Evaluation	29

determine the usefulness of the training to present job. Former trainees were asked questions to show how training was used on-the-job, factors facilitating the use of training and factors that have been obstacle to training.

Usefulness and extent of use of acquired knowledge and skills

The role of former trainees as trainers when they returned to their jobs was assessed as an indicator of use of training. All trainees indicated in their action plans that they will share their training experience with others. Results from the survey showed that almost all participants (96.4%) shared their

training experience with their colleagues, subordinates or farmers (Table 2). When asked how they shared their skills, respondents indicated sharing experiences through field days, farmer visits, demonstrations and in-service training programmes. Farmers confirmed field visits and demonstrations conducted by respondents.

In all, 75% of respondents indicated that they had used much or some of training in rapid multiplication of cassava and sweet-potato on-the-job. Only 3.6% said they used little of training in rapid multiplication of cassava and sweet potato on-the-job. However, it was observed that these trainees are mostly involved in the monitoring and evaluation activities of RTIP. During the interview of respondents, many indicated that as a result of their training experience, they were better able to distribute clean and healthy planting materials to farmers, establish field study plot in secondary multiplication sites, help farmers to recognize and identify diseases and pests of cassava and shared acquired training experience with colleagues and subordinates during staff training programmes.

A little over 67% of respondents indicated that they had used much or some of the training in monitoring and evaluation on-the-job. Only 10.7% said they used little of the training in monitoring and evaluation on-the-job. Respondents during the interview indicated they were better able to establish yield plots in farmers' fields and used survey equipment accurately after the training. During the farmer interviews, majority (85%) of them confirmed that respondents established yield plots in their RTIP fields.

Factors facilitating the use of training on-the-job

Nearly 86% of respondents mentioned preparation and use of action plans as facilitating the use of training on-the-job. Action plans indicate how the trainee would use the expected outcome of training on-the-job after training. All the participants interviewed indicated that, their continuous involvement in RTIP activities enabled them to use most or some of the training skills and experience. The involvement of respondents in RTIP activities, therefore, facilitated the application of their training experience. During the interview of AEAs and farmers, it

Table 2. Usefulness and extent of use of acquired knowledge and skills.

		<i>Frequency</i>	<i>Per cent</i>	<i>Valid per cent</i>	<i>Cumulative per cent</i>
Valid	Yes	27	96.4	94.6	96.4
	No	1	3.6	3.6	3.6
	Total	28	100.0	100.0	100.0

became apparent that AEAs were involved in the supply of improved planting materials to farmers. This might have informed on the over half the respondents (57%) indicating that the availability of improved planting materials facilitated the use of their training experiences on-the-job. The support of supervisors was the least factor mentioned (28.6%). This is a challenge for a more aggressive support from supervisors of field workers since effective supervision is an essential component to the success of every programme.

Effect of training on improved job performance

A concern of the study was to assess how the training programme affected the work activities and job performance of former trainees. When asked whether the training had an effect on their job performance, all respondents indicated that RTIP training had a positive effect on the performance of their job. When asked to name the important benefits gained by the trainees from their participation in the RTIP training, 70% indicated that the training improved their ability to select healthy planting materials. Similarly 58% responded that their skills in identifying diseases and pests of cassava and sweet potato had improved; 52% also indicated the training improved their skills in establishing yield plots in secondary multiplication sites. Activities of RTIP collaborating farmers corroborated the

claims of respondents. Some of the activities farmers are practising with support from former trainees are: stem cutting to required sizes, spacing, refilling, integrated weed control practices, coppicing, identification of diseases and pests and rouging out diseased materials.

Obstacles to use of training and competence level assessment of respondents on RTIP activities

Another concern of the survey was to identify obstacles to use of training and subsequently the training needs of respondents. In spite of the facilitating factors that contributed to use of learning, some obstacles to use of training on-the-job were indicated by respondents. More than half the respondents (63.7%) expressed the problem of 'lack of transportation' as the major constraint to the use of training on-the-job while 45% of respondents indicated that 'no re-imburement of claims' incurred on the job was an obstacle to use of training. Also 70% of respondents expressed concern about lack of support from their supervisors as a major obstacle to use of training on-the-job (Table 4). The poor support from supervisors accounted for the low (28%) response of supervisors support.

To identify the training needs of former trainees, they were asked to respond to some statements of perceived training needs related to their current RTIP activities. Respondents indicated some

shortcomings that could hinder their ability to perform some RTIP related activities satisfactorily. Table 3 provides information on the assessment of the level of competence of trainees on the parameters used. Scores below 4 were considered as areas where trainees

needed further training (Table 3).

The results in Tables 3 and 4 indicate that, there were some shortcomings that could hinder the ability of MoFA staff to perform RTIP related activities satisfactorily. Areas identified as

Table 3. Results of competence level assessment of MoFA staff on RTIP activities.

<i>To what extent do you agree with the following statements: I can</i>	<i>Competence level</i>					<i>Mean scores</i>
	<i>Agree</i>		<i>Neutral</i>	<i>Disagree</i>		
	<i>SA</i>	<i>A</i>	<i>N</i>	<i>D</i>	<i>SD</i>	
Select sites for secondary and tertiary multiplication	21		3		4	4.1
Select healthy planting materials	25		2		1	4.5
Cut cassava planting sticks to required length	24		3		1	4.4
Cut sweet potato vines to required length	17		5		6	3.6
Identify pests and diseases of cassava	13		1		14	2.9
Identify pests and diseases of sweet potato	16		5		4	3.4
Identify required varieties of cassava	9		1		18	2.4
Identify required varieties of sweet potato	19		4		5	4.1
Measuring farmers fields	9		2		17	2.5
Establish accurately yield plots in secondary farmers fields	19		2		7	3.8
Use survey equipment accurately	18		3		7	3.8
Estimate accurately yields of planting material	18		4		6	3.8
Supervise activities of research station	5		2		21	1.9
Conduct field training with farmers	14		4		10	3.3
Conduct field training with AEAs	13		6		9	3.3

Mean score of competence:

- 1 = Strongly Disagree (SD).
- 2 = Disagree (D).
- 3 = Neutral (N).
- 4 = Agree (A).
- 5 = Strongly Agree (SA).

Table 4. Major factors that have been obstacles to training.

<i>Factors</i>	<i>Respondent[■]</i>	<i>Per cent</i>
Non-availability of planting material	3	10.7
Transport problems	18	64.3
No re-imburement of claims	5	17.9
Lack of support from supervising officer	1	3.6
Others	4	14.3

[■]Multiple responses.

needing further training included; identification of pests and diseases of cassava, identification of pests and disease of sweet potato, identification of cassava varieties, measurements of farmers' fields.

Though majority of respondent rated supervision of MoFA research stations as an area needing further training, it was not found surprising since there are very few (four) stations nation-wide managed by trained officers.

Conclusions

The findings of the study are very significant to the stakeholders of the CSIR-CRI/RTIP training programme. It confirms that former trainees used most of the acquired knowledge and skills in rapid multiplication of cassava and sweet potato to distribute clean and healthy planting materials to farmers; establish field study plots in secondary multiplication sites; help farmers to recognize and identify diseases and pests of cassava and conduct in-service training for colleagues and farmers.

The findings also provide RTIP the benefits of the training workshops to farmers. It provides feedback of the training programme to training administrators in CSIR-CRI to aid decision making for the improvement of future collaborative courses.

Although participants indicated improved performance after training, other factors, namely, improper identification of pests and diseases of cassava, inaccurate identification of recommended varieties and measurement of farmers' fields were mentioned as shortcomings that must be addressed through training.

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