



ORIGINAL ARTICLE

Evaluating the outcome of the Training of Trainers Programme executed using the Farm Business School Approach in Sri Lanka

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Abstract

This study evaluates the outcomes of the Training of Trainers (ToT) Programme conducted for the Farm Business School under the Climate Smart Irrigated Agriculture Project (CSIAP) funded by the World Bank. The study was carried out across six provinces in Sri Lanka including Eastern, North Central, North Western, Northern, Southern, and Uwa, covering eleven districts and 47 agricultural service centre ranges. The ToT programme was designed to train Agricultural Extension Officers (AEOs), who are responsible for delivering extension services and facilitating farmer training at the field level. A total of six training programmes were conducted in Sinhala and Tamil mediums. All 157 AEOs employed during the study period were included in the study and grouped according to the training sessions. Data were collected using a structured questionnaire administered before and after the training, covering 32 knowledge elements across five modules. The data were analysed using SPSS, applying descriptive and comparative methods to assess changes in knowledge levels. A performance index was also used to measure individual achievement. The findings show a significant improvement in knowledge levels, with mean scores increasing from 15.95 before training to 19.29 after training. This indicates that the ToT programme had a significant positive effect on enhancing the technical knowledge of AEOs. Overall, the results suggest that the ToT programme was effective in strengthening the capacity of extension officers, providing a useful basis for improving future training interventions under CSIAP.

Keywords: *Agricultural Extension, farm business school, training of trainers programme*

1. Introduction

Farm Business School (FBS) is an agricultural extension approach developed on the concept of Farmer Field School (FFS). The approach is a participatory action learning activity by a selected group of farmers, which makes a forum to acquire, discuss, decide, and implement matters on commercial production and marketing-related aspects. Food and Agriculture Organisation of the United Nations (FAO) (2015) defined FBS as a forum or venue that brings farmers together to carry out collective and collaborative inquiry to address business and marketing practices and opportunities. Further, it aims to build farmer capacity in entrepreneurial and management skills. Naval et al. (2021) have recorded that FBS participation has improved the knowledge and skills of the vegetable farmers and created a platform for commercial farming. Further, experience with cocoa farmers in Ghana showed that FBS participants were more competitor-oriented in the market, in addition to having higher knowledge, skills, and positive attitudes (Tham-Agyekum et al. 2021). Owiredo et al. (2024) have recorded that FBS intervention has improved productivity and ensured food security. The FBS is a valid investment as it leads to economies of scale, and further, the formation of market-oriented committees will be a fruitful venture (Boer 2013). A study by Adetarami et al. (2022) has found that FBS is a profitable investment with a Benefit/Cost ratio of 1.09. All such follow the principles of lifelong learning and contribute to the participatory action learning process at the grass-root level. Further, it was clearly identified that the knowledge and skills of the farmers should be fortified in the areas of agribusiness and commercialisation. This is mainly because farmers must obtain knowledge on access to value chain actors, market analysis, prevailing prices, seasonal price fluctuations, profitable enterprises, farm planning, product quality, value additions, etc., to receive reasonable profit from their businesses and move forward towards commercialisation. Gaining knowledge and skills in the above aspects is crucial for a rural farmer to develop entrepreneurial skills and become an agripreneur.

To address these needs and enhance the entrepreneurial knowledge and skills of the farmers, the Climate Smart Irrigated Agriculture Project (CSIAP) adopted FBS approach as a strategic intervention. The project expects to reach 36,000 farmers in selected locations engaged in cultivating rice, horticultural crops, other field crops, fruits, and vegetables. Prior to implementation at the farmer level, it was decided to train grass-root-level Agriculture Extension Officers (AEOs), as they can act as facilitators in the organisation and delivery of FBS programmes. Accordingly, a Training of Trainers (ToT) programme was designed and implemented to equip AEOs with the necessary knowledge and skills related to the FBS approach as such programmes are known to enhance the knowledge, skills, and attitudes of the trainees (Mormina and Pinder, 2018; Som et al. 2020). Following the training, AEOs are expected to conduct FBS programmes for farmer groups, consisting of 20- 30 members each. In this context, the study addresses the question of the extent to which the ToT programme enhances the knowledge and facilitation capacity of AEOs for the effective

implementation of FBS. Accordingly, the present study aims to evaluate the outcome of the ToT programme.

2. Methodology

2.1 Study area

The study was conducted across six provinces in Sri Lanka: Eastern, North Central, North Western, Northern, Southern, and Uwa. These provinces collectively cover eleven districts: Ampara, Batticaloa, Trincomalee, Anuradhapura, Polonnaruwa, Kurunegala, Puttalam, Kilinochchi, Mullaitivu, Hambantota and Moneragala. The total target area included 47 agricultural service centre ranges. These regions represent diverse agro-ecological and socio-economic conditions, providing a broad context for evaluating the effectiveness of the ToT programme.

2.2 Brief description of the ToT programme

The ToT programme was designed to train AEOs, who should subsequently function as trainers and facilitators for FBSs. A total of six ToT programmes were conducted, consisting of four programmes in the Sinhala medium and two in the Tamil medium. Each programme was implemented as a five-day residential training session.

The curriculum, based on CSIAP (2022), was customised into 12 lessons under five major thematic areas (Annex 1). To deliver this content effectively, five training modules were developed as mentioned below.

- a) Module 1: Farmer Business School: Concept and Implementation
- b) Module 2: Climate Change and Climate Smart Agriculture
- c) Module 3: Enterprise Development and Value Chain
- d) Module 4: Agri-business and Agricultural Marketing
- e) Module 5: Capacity Building and Financial Management

Training methods include interactive lectures, group discussions, brainstorming sessions, debates, multimedia presentations, video demonstrations, participatory rural appraisal (PRA) sessions, and group work. Each module was supported by a handout, and all five handouts were compiled into a docket distributed to participants at the beginning of the training.

The programme primarily focused on enhancing knowledge areas that are less frequently covered in conventional AEO training, such as agribusiness, entrepreneurship, financial management, value chain analysis, and extension methodologies. Additionally, the programme emphasised the development of soft skills, including leadership, communication, teamwork, critical thinking, and decision-making abilities.

2.3. Target population and sample size

The target population of the study consisted of 157 AEOs operating within the selected provinces and districts. These officers were responsible for delivering extension services and facilitating farmer training programmes at the field level. All 157 AEOs attended the first day of the training programme, during which the pre-evaluation was conducted, while 150 attended the fifth day for the post-evaluation. Participants were grouped into six clusters corresponding to the six training programmes conducted.

2.4. Data collection

Data were collected before and after the ToT programmes using the same structured questionnaire, designed to assess AEOs' knowledge levels related to the five training modules. The questionnaire consisted of 32 knowledge elements, each representing a specific, measurable unit of knowledge derived from the training content. Each knowledge element was operationally defined as a distinct concept or skills assessed through a single multiple-choice question with five response options, of which only one was correct.

The knowledge elements were distributed across the modules as follows.

- a) Module 1: 10 elements
- b) Module 2: 5 elements
- c) Module 3: 6 elements
- d) Module 4: 6 elements
- e) Module 5: 5 elements

The number of elements in each module was proportionate to the relative weightage of the module in the training programme, determined based on the duration and extent of content covered in each module. Modules with greater content coverage were assigned more knowledge elements to ensure adequate representation.

Each knowledge element was measured using one multiple choice question with five response options. Each correct answer received one mark, with total scores ranging from 0-10 for Module 1, 0-5 for Modules 2 and 5, and 0-6 for Modules 3 and 4.

2.5. Data analysis

The data collected from the pre and post evaluations of ToT programme were coded, verified, and analysed using SPSS. Descriptive and comparative analysis were conducted to assess changes in participants' knowledge levels. A performance index was computed for each AEO by dividing the number of correct responses by the total number of elements in the questionnaire (32) and multiplying by 100. This index provided a standardised measure of participants' knowledge before and after the training. The difference between pre and post training performance indices was used to

evaluate the effectiveness of the ToT programme across the five training modules. Accordingly, this study tested the hypothesis that participation in the ToT programmes leads to a significant improvement in the knowledge of AEOs using paired sample t-test to evaluate the knowledge gained from pre-training to post-training for both the overall training programme and each individual training module.

3. Results and Discussion

3.1 Description of the surveyed sample

The sample consisted of 157 AEOs, including 102 Sinhala-medium and 55 Tamil-medium participants. Among these participants, 96 were female and 61 were male. All the participants were Diploma holders with an education up to National Vocational Qualification (NVQ) Level 5.

3.2 Knowledge advancement of the training programme

The ToT programme evaluated the trend of knowledge gain.

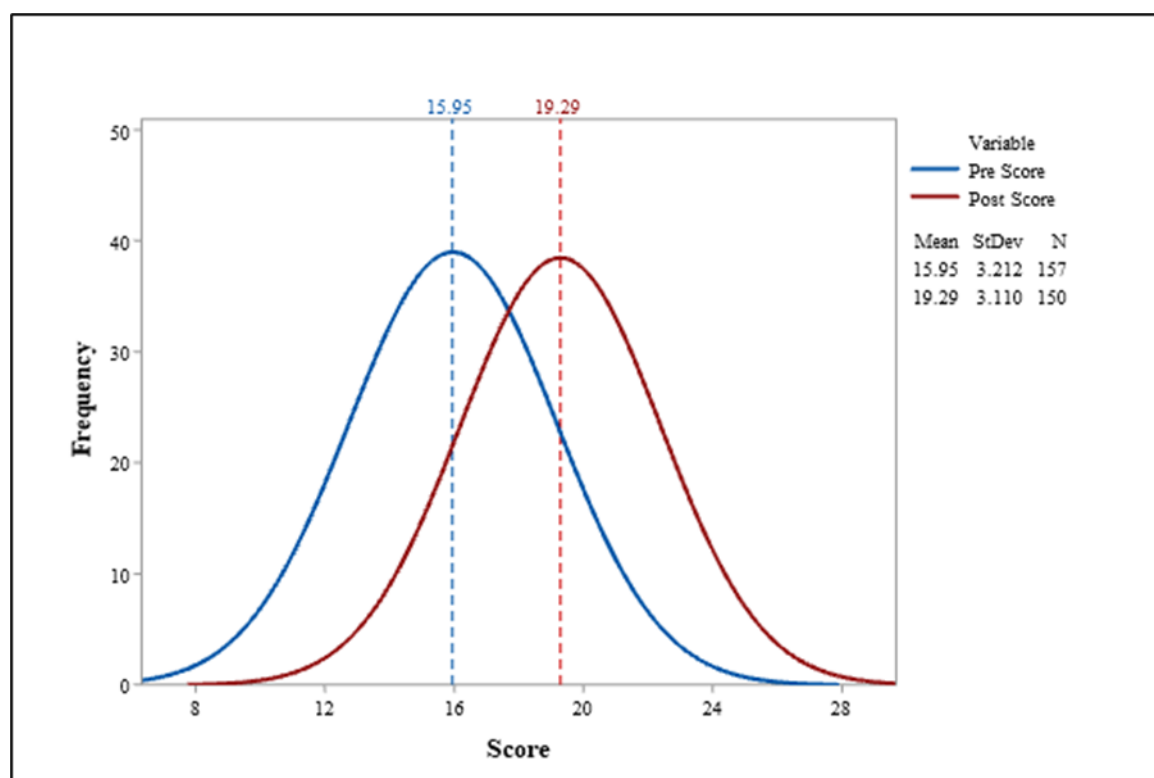


Figure 1: Shift in the mean knowledge levels of the trainees from pre-training to post-training

As shown in Fig.1, the mean knowledge scores increased from 15.95 (SD=3.21) in the pre-training assessment to 19.29 (SD=3.11) in the post-training assessment. A paired sample t-test showed that this increase was statistically significant, $t(149) = 9.60, p < 0.01$. The mean difference (post-pre) was 3.34 (95% CI: 2.72 to 4.12), indicating a significant improvement in knowledge levels following the

training programme. These results suggest that the training had a positive effect on the technical knowledge level of the extension workers.

3.3 Knowledge advancement of training modules

The trainees were equipped with five training modules in different subject areas. The knowledge gained in each module was estimated for the entire programme, and Table 1 depicts the results.

Table 1: The knowledge gained from each module in the programme

Module	Pre-evaluation		Post-evaluation		Percentage change	t-value	p-value
	Mean	Percentage	Mean	Percentage			
1. Farmer Business School: Concept and implementation	5.20	52.00	5.96	59.60	+7.60	-3.28	0.022
2. Climate Change and Climate Smart Agriculture	2.40	48.00	2.63	52.60	+4.60	-2.69	0.043
3. Enterprise Development and Value Chain	2.39	39.83	2.77	46.17	+6.34	-6.82	0.001
4. Agri-business and Agricultural Marketing	2.68	44.67	3.90	65.00	+20.33	-7.93	0.001
5. Capacity Building and Financial Management	3.11	62.2	3.13	62.6	+0.40	-0.03	0.974
For all modules	15.95	49.84	19.29	60.28	+10.44	-2.95	0.042

Table 1 presents the changes in knowledge scores across the five training modules before and after the programme. Overall, mean knowledge scores increased from 15.95 (49.84%) in the pre-evaluation to 19.29 (60.28%) in the post-evaluation, representing a 10.44% improvement. This overall increase is statistically significant ($t=-2.95$, $p=0.042$), indicating a positive effect of the training programme on participants' knowledge.

At the module level, knowledge gains varied. The largest significant improvement was observed in Module 4, where mean scores increased from 2.68 (44.67%) to 3.90 (65.00%), corresponding to a 20.33% increase ($t=-7.93$, $p=0.001$). Similarly, significant improvements were recorded in Modules 1 and 3, with percentage increases of 7.60% and 6.34%, respectively ($p<0.05$). Module 2 also showed a modest but significant improvement of 4.60% ($t=-2.69$, $p=0.043$). In contrast, Module 5 showed minimal change (0.4%) and was not significant ($t=-0.03$, $p=0.974$), suggesting that the training had little effect on knowledge in capacity building and financial management.

These findings indicate that, although the training programme was generally effective in improving participants' knowledge, its impact varied across modules, with particularly strong gains in agribusiness and agricultural marketing-related content. Similar patterns have been reported in

previous studies. For instance, a ToT programme conducted in Kenya using the farmer field school approach for advanced capacity building in forestry and agroforestry consisted of eight modules, of which only some produced significant improvements in farmers' knowledge, while others showed limited impact (Kessler et al. 2025). Likewise, a knowledge-based assessment conducted in India among trained certified farm advisors on organic farming reported significant improvements in trainees' knowledge and skills related to organic farming, organic standards, certification, and marketing networks, whereas improvements in technology packages and general knowledge were not significant (Bhanu et al. 2022).

3.4 The performance index

A performance index has been constructed for the trainees in pre and post training situations and Table.2 presents the frequency distribution of index values.

Table.2- Frequency distribution of performance index values

Range of performance index	Pre-evaluation		Post-evaluation	
	Frequency	Cumulative frequency	Frequency	Cumulative frequency
0-10	0	0	0	0
11-20	0	0	0	0
21-30	3	3	0	0
31-40	26	29	7	7
41-50	37	66	16	23
51-60	72	138	65	88
61-70	17	155	44	132
71-80	2	157	16	148
81-90	0	157	2	150
91-100	0	157	0	150

Table 2 presents the distribution of performance index scores before and after the training programme. Prior to the training, most participants were concentrated in the mid-performance categories, particularly within the 51–60 range (72 participants), followed by the 41–50 range (37 participants). Only a limited number of participants achieved higher performance levels, with 17 participants in the 61–70 range and 2 in the 71–80 range. No participants scored above 80 in the pre-evaluation, indicating generally moderate baseline performance.

Following the training, the distribution shifted towards higher performance categories. The number of participants in the 61–70 range increased markedly from 17 to 44, while those in the 71–80 range rose from 2 to 16. In addition, 2 participants reached the 81–90 category in the post-evaluation, a range that had no representation prior to the training. At the same time, the number of participants in the lower performance ranges declined, particularly in the 31–40 and 41–50 categories.

Overall, these results indicate a clear upward shift in performance levels, suggesting that the training programme was effective in improving participants' performance. Similar findings have been reported in previous literature. For example, a pre and post evaluation of a vocational training programme on beekeeping and mushroom cultivation revealed a significant increase in trainees' knowledge, which subsequently led to the continued adoption of beekeeping and mushroom cultivation enterprises among 20% and 51% of trained farmers, respectively (Singh et al. 2024). Similarly, findings from a safety leadership training programme conducted for dairy farm supervisors in the United States demonstrated a 50% improvement in safety-related behavioural practices associated with livestock handling on farms (Doupbrate et al. 2025).

Moreover, these performance index values were plotted as a trend. Fig.2 demonstrates the outcome.

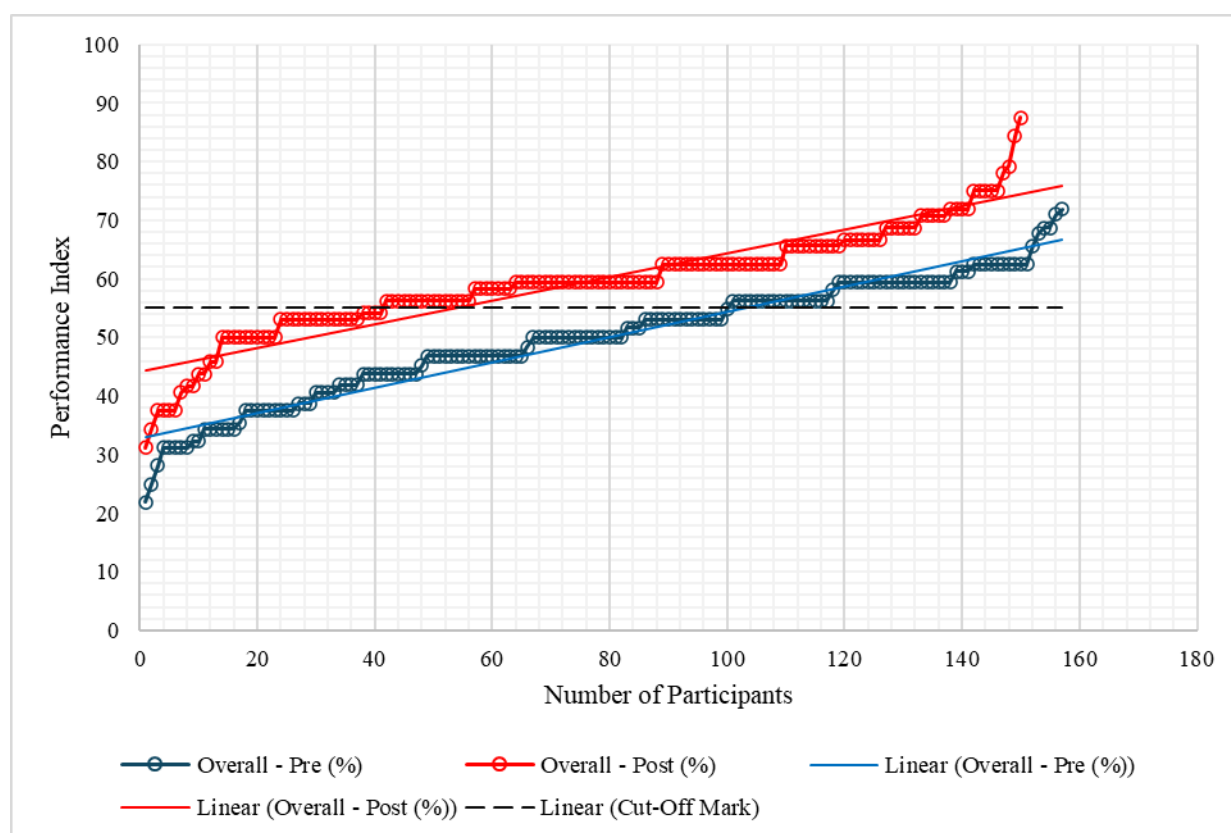


Figure 2: The trend of the performance index in pre-training and post-training

According to Fig.2, the indicator trend line has shifted upward in the post-evaluation situation. If the threshold value is taken as 55 (based on the average score), participants are below the threshold in pre-training, where it has been reduced to 60 in post-training. It implies that the training programme has a positive outcome on the knowledge level of the trainees.

From a policy perspective, these findings highlight the need to further improve training programmes under CSIAP. Future training programmes may benefit from allocating more time to complex modules such as capacity building and financial management, while also incorporating more practical and field-based activities. In addition, refresher training could be provided for participants requiring

further support, and stronger post-training follow-up and monitoring mechanisms could help track progress and improve future programmes. Similar recommendations have been reported in previous studies. For instance, Singh et al. (2024), in their evaluation of agricultural vocational training programmes conducted by Krishi Vigyan Kendras (Farm Science Centres) in Punjab, India, emphasised the importance of continuous follow-up support, specialised training, and periodic scientific evaluation to enhance the effectiveness and sustainability of training outcomes. The authors further highlighted that regular and robust evaluation should be an integral component of extension programmes to ensure the validity and long-term impact of training interventions.

At the same time, there is room to further strengthen the training and evaluation process. Follow-up assessments could help determine the extent to which knowledge is retained and applied in practice. Including measures of facilitation and practical skills would also provide a more comprehensive understanding of training outcomes. Furthermore, as a large amount of content is delivered within a short period, extending the duration of the programme or conducting the training in phases may improve overall learning effectiveness. Previous studies have similarly highlighted the importance of strengthening training design and evaluation approaches. For example, Douphrate et al. (2025), in their evaluation of a safety leadership training programme in the dairy farm industry, emphasised that effective training outcomes were strongly linked to the development of training content that reflected industry needs and active collaboration between practitioners and researchers. The study further suggested that participatory and context-specific training approaches can improve the effectiveness and practical relevance of training programmes.

4. Conclusions

To enhance the entrepreneurial knowledge and skills of the farmers, the Climate Smart Irrigated Agriculture Project (CSIAP) adopted FBS approach as a key intervention implemented through AEOs. Before implementing the FBS approach, AEOs were trained on its concepts and delivery through a ToT programme.

The results of the pre and post-evaluations show a significant improvement in knowledge levels among participants. The average knowledge score increased from 15.95 in the pre-evaluation to 19.29 in the post-evaluation. Improvements were observed across all five training modules; however, lower gains in the capacity building and financial management module indicate the need for greater attention in this area. Overall, knowledge levels improved by 10.44 percent.

The performance index also shows that the number of participants below the minimum competency level decreased after the training, indicating that the ToT programme was effective in improving the knowledge of AEOs.

Conflicts of interest: The authors have no conflicts of interest regarding this publication.

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Annex 1

Details of the training curriculum

Component	Curriculum Item
Topic 1	Starting and basic business concepts
<i>Sub-topic</i>	<i>Starting the Farm Business School (FBS)</i>
<i>Lesson 1</i>	1.1. Rationale for a Farm Business School 1.2. How to introduce FBS to the farmers 1.3. Developing group ownership and scheduling meetings with the farmer group
<i>Sub-topic</i>	<i>Understanding basic business concepts</i>
<i>Lesson 2</i>	2.1. How Farming will do as a business 2.2. The farmer as an entrepreneur: Characteristics of an effective entrepreneur 2.3. Understanding Farm Business Profitability
Topic 2	Assessing the current situation of the farm and identifying market opportunities
Sub-topic	Where are we now
<i>Lesson 3</i>	3.1. Assessing the current farm situation Translating analysis into action
<i>Lesson 4</i>	4.1. Understanding marketing and markets 4.2. Preparing for a marketing survey
<i>Lesson 5</i>	5.1. Market visit & Presenting Market Survey Report
Topic 3	Planning
<i>Sub-topic</i>	<i>Develop a farm business plan</i>
<i>Lesson 6</i>	6.1. Choosing an enterprise 6.2. Preparation of a simple budget for the selected enterprise according to the income & expenditure 6.3. Financial management

Lesson 7	7.1. Component of a farm business plan: Preparing a farm business plan 7.2. Preparing an action plan
Topic 4	Implementing
Sub-topic	Activities to be carried out in the production season
Lesson 8	8.1. Overview of record keeping 8.2. Record keeping for farm production and labour use 8.3. Record keeping for farm income and expenditure 8.4. Farm records to be maintained
Lesson 9	9.1. Marketing of farmer products 9.2. Group marketing 9.3. Group buying and saving
Lesson 10	10.1. Post-harvest quality management & value addition
Topic 5	Evaluation and re-planning
Sub-topic	Reviewing past business and planning for the next season
Lesson 11	11.1. Assessing the benefits of the Farm Business 11.2. Assessing the performance of the farm business plan
Lesson 12	12.1. Choosing farm enterprises for the next season 12.3. Preparing a farm business plan 12.4. Developing an action plan
