SCALING UP FARMERS’ CAPACITY STRENGTHENING

THE USE OF TECHNOLOGY IN THE FEATS PROJECT

MEDA

In partnership with Canada
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### ACRONYMS

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<th>Acronym</th>
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<tr>
<td>AEAs</td>
<td>Agricultural Extension Agents</td>
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<td>ATB</td>
<td>Amplio Talking Book</td>
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<td>CAD</td>
<td>Canadian Dollars</td>
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<td>FEATS</td>
<td>Farmers Economic Enhancement Through Seedlings</td>
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<td>FGD</td>
<td>Focus Group Discussions</td>
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<td>FFS</td>
<td>Farmer Field Schools</td>
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<td>GAPs</td>
<td>Good Agricultural Practices</td>
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<td>GDP</td>
<td>Gross Domestic Product</td>
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<td>GESI</td>
<td>Gender Equality and Social Inclusion</td>
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<td>GSS</td>
<td>Ghana Statistical Service</td>
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<td>HPTS</td>
<td>High Performance Tree Seedlings</td>
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<td>ICT</td>
<td>Information and Communications Technology</td>
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<td>IVR</td>
<td>Interactive Voice Response</td>
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<td>MAG</td>
<td>Modernizing Agriculture in Ghana</td>
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<td>MEDA</td>
<td>Mennonite Economic Development Associates</td>
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<td>MOFA</td>
<td>Ministry of Food and Agriculture</td>
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<td>SHFs</td>
<td>Smallholder Farmers</td>
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<td>SME</td>
<td>Small and Medium Enterprise</td>
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<td>T&amp;V</td>
<td>Training and Visit</td>
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ABOUT THE FEATS LEARNING SERIES

The FEATS Learning Series is carrying on the Mennonite Economic Development Associates (MEDA) tradition of sharing lessons learned during project implementation. This new series covers MEDA’s learnings in the tree crop industry in Ghana during a seven-year period (2015 - 2022). Topics include:

1. Building Sustainable Small-scale Cashew Nurseries: Key Results and Lessons from the FEATS Project
2. Establishing the Model for SME Operations: Designing the Benchmarks for Growth
3. Scaling Up Farmers’ Capacity Building: The Use of Technology on the FEATS project
4. Use of Groundwater in Tree Crop Irrigation: A Case of Cocoa in Ghana
5. Building the Capacity of Women Entrepreneurs: The FEATS Women-led SME Story
6. Gender Messaging through Talking Books: The FEATS Project
7. Supporting Women Farmers’ Access to Finance: The FEATS Project

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Special thanks to the Government of Canada, which provided funding for the FEATS project.

Thanks also to all FEATS partners – both private and public sector partners – and MEDA’s generous private supporters.
EXECUTIVE SUMMARY

A major pillar of the Farmers’ Economic Advancement Through Seedlings (FEATS) project activities is the promotion of farmer productivity through capacity strengthening. In Ghana, though the Ministry of Food and Agriculture (MoFA) has structures devolved from the national to district level to implement farmer education through its agricultural extension agents (AEAs), they are unable to fully carry out this mandate due to inadequate resources and large farmer numbers. To meet its objectives of increasing farmer adoption and use of quality seedlings, FEATS planned to train 65,000 men and women farmers and to disseminate information on the profitability of quality seedlings to 500,000 farmers across Ghana. Without existing examples of successful large-scale farmer capacity building initiatives other than face-to-face trainings, the FEATS approach was to use a complementary set of Information and Communications Technology (ICT) methodologies, such as a radio campaign, mobile phone-based technology and Amplio Talking Books (ATB) to provide training to farmers. This Learning Series document describes FEATS’ innovative strategies to deliver trainings to large numbers of farmers and results of its interventions for the information of development organizations, and public and private sector agencies involved in farmer development.

Key results

After a nine-month radio-broadcast campaign conducted in collaboration with 13 radio stations in seven regions, an estimated 556,500 farmers were reached with new knowledge which facilitated their adoption of good agricultural and environmental practices as well as the planting of grafted cashew seedlings. The mobile phone-based trainings broadcast 30-second messages to farmers at scheduled times, reaching 65,695 farmers. Amplio Talking Books (ATB), which deliver pre-recorded audio messages, were deployed as an alternative to mobile-based trainings for shea women farmers without mobile phones, enabling them to listen to recorded messages on a range of topics. These were highly successful, with 99.2% of shea women farmers happy with their ATB trainings. 94.2% indicated they were able to use the devices with no assistance.

Lessons learned

Each ICT channel has strengths and limitations. Radio-based media campaigns are an excellent strategy for disseminating training messages to a large group of farmers at the same time. Mobile phone-based technology is an effective training strategy but only to the extent that farmers can access mobile phones and have connectivity to use their phones. ATB devices allowed rural families
to listen to training programs and enabled repeat listening to achieve better understanding of a training topic.

This learning series paper complements the work done on another learning paper: Gender Messaging Through Talking Books which focuses more directly on the use of the ATB devices to train rural women.

The target audiences for this learning paper are development organizations, public and private sector agencies tasked with farmer development, and MEDA’s Global team.

1. ABOUT THE FEATS PROJECT

The Farmers’ Economic Advancement Through Seedlings (FEATS) project, was a seven-year (2015-2022) initiative funded by Global Affairs Canada (GAC) that aimed to improve the economic wellbeing of men and women farmers in export-linked tree crops industries of Ghana.

Ghana’s economy and workforce are heavily dependent on agricultural commodity exports, with the tree crops sector being one of the biggest contributors to the country’s gross domestic product (GDP). It is estimated that between 44.1% to 51.5%1 of Ghana’s labour force is engaged in agriculture, with the sector accounting for 18.2%2 of GDP in 2020.

Despite the significant contributions of tree crops to the export earnings of Ghana, the tree crop sector has yet to realize its full potential and is hindered by: (i) low participation of women, (ii) low area under cultivation, (iii) inadequate access to quality planting material, (iv) underdeveloped value chains for rubber and cashew, (v) non-existence of shea plantation establishment, and (vi) lower capacity of farmers to understand and effectively apply new knowledge to improve their farm operations.

The FEATS project was therefore designed to address some of the above-named challenges facing tree crop farming to encourage increased productivity and incomes for farmers.

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1 https://oxfordbusinessgroup.com/ghana-2020/agriculture
1. Increased Supply of Quality Tree Crop Seedlings

The project worked to improve both the technical and infrastructural capacities of small and medium enterprises (SMEs), mostly women-led, engaged in the business of producing tree crop seedlings to develop a sustainable market for quality seedlings to meet the needs of tree crop farmers across the country.

2. Increased Access to Quality Seedlings by Tree Crop Farmers

Through trainings and innovative incentive programs, the project educated farmers on the benefits of planting quality seedlings and how to profitably grow quality tree crops for enhanced productivity. Through its seedling purchase discount voucher program, the FEATS project worked to increase farmers’ adoption and planting of quality seedlings by facilitating their access and ability to purchase the needed quantity of quality seedlings for their farms.
3. Improved Business Environment

The project is strengthening the policy/strategy capacities of the Ghana Government, its agencies and leading private firms that need to foster commercial markets for High Performance Tree Seedlings (HPTS) and quality seedlings.

Over its seven-year mandate, the FEATS project aimed to support 100,000 male and female farmers by working through 25 tree-crop sector farmer and industry associations to plant 21 million tree crop seedlings. Additionally, 35 small enterprises and their employees were supported with technical and innovative matching grant assistance to ensure the quality tree crop seedlings that were produced could meet farmers’ needs.

2. STRENGTHENING THE CAPACITY OF FARMERS

Like all professions, farming goes through a continuous improvement cycle, ensuring farmers can continue to meet the world’s food needs. Issues such as population growth, land degradation, low areas under cultivation for certain tree crops like rubber and cashew, and increasing pressure on land, contribute to farmers needs to identify innovative and sustainable ways to farm and produce sufficient food out of the limited land resources that is available to them.

Beyond the core responsibilities of farmers, which are to plant and care for their production fields, farming has long evolved into big business in many cases which means today’s farmers need a lot more than just cropping knowledge. To be successful, farmers need to know:

- **Good Agricultural Practices**: Good Agricultural Practices (GAPs) are a set of standards for the safe and sustainable production of crops or livestock. It aims to support farmers to maximize yields and optimize business operations while also minimizing their production costs and environmental impact. Following GAPs makes it easier for producers to supply products with the quality demanded by buyers and consumers. Farmers must first understand the mechanics of growing staple and industrial crops to adequately supply the food and raw material needs of people and industries. Growing populations and the demands of industries require that farmers increase the quantities and quality of their produce to meet market demand. Upgrading farmer skillsets to increase production output has been recognized by many governments which provide farmers with capacity building assistance.
through appropriate agricultural policies, trainings, equipment, and infrastructure programs, as well as extension services from appropriate public sector agencies. The private sector, including international and local development agencies, contribute to the achievement of these government objectives by helping improve agricultural productivity and increase farmers’ incomes.

- **Business Management:** Increasingly, farms are being run as commercial businesses aiming for financial sustainability. They should know how to record expenditures and revenues from their farms, marketing, and sales of their produce so they know if their farms are generating profits or running at a loss.

- **Environmental Awareness:** As farmers, the natural environment is the most essential resource and as such, all farmers must understand how their operations affect the environment. Additionally, farmers must understand how climate change affects seasons, rainfall patterns and soil quality, and how they can adapt their cropping cycles to fully maximize their productivity. It is vital for farmers to recognize that, in addition to economic sustainability, they must also achieve environmental sustainability and adapt to climate change.

- **Technological Advancement:** Technology continues to drive innovation in every aspect of the world economy, and farming is no exception. Farmers need to know how to leverage technology to advance their farming operations. At a minimum, farmers need to know how to employ technology to achieve more efficient farming operations and to easily access information, such as weather and commodity prices, to improve planning and operations.

- **Gender Equality and Social Inclusion:**

  3 Women are crucial to the success of agriculture, especially in African countries. Though studies have shown women contribute a higher proportion of labor in the agricultural sector than men, they are continuously excluded from decision making and are marginalized when it comes to access to important resources such as land and capital. A concerted effort is needed to raise awareness of farmers to the benefits that gender parity brings to their agricultural operations and contributes to the productivity and sustainability of the agriculture industry.

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3 In addition to gender considerations in this paper, the FEATS Learning Series features three gender-focused papers:
1. Building the Capacity of Women Entrepreneurs – the FEATS Women-led SME Story
2. Supporting Women Farmers’ Access to Finance
3. Gender Messaging Through Talking Books
In developing countries such as Ghana, where almost 50% of the labor force is involved in agriculture, and most farm holdings are smallholder, educating farmers on the topics above can be daunting and requires significant effort. While literacy levels in Ghana are now at 69.8%, an improvement from the 2010 census at 67.1%, literacy levels among farmers remain low at 31.3%, thus creating a barrier to capacity strengthening and improvements in technology application to boost their operations.

2.1 Ghana’s Situation – Making a Case for Technology in Building Farmer Capacity

In Ghana, the Ministry of Food and Agriculture (MoFA) is the main government agency responsible for developing the agriculture sector. Its core duty is to develop and execute policies and strategies for the agricultural sector within the context of a coordinated national socio-economic growth and development agenda. Its structures are devolved from a national to district level, with each district having at least one agricultural office attached to the District Assembly. Farmer education is implemented at the district level through the activities of agricultural extension agents (AEAs).

Core functions of AEAs include the dissemination of information on GAPs, use of appropriate farm technologies, and generally assisting farmers to develop their technical and managerial skills. This is mostly achieved through conventional face-to-face teaching, using farmer field schools (FFS) and training and visit (T&V) approaches.

While there were some successes from the work done by private development agency extension agents, public sector AEAs are a vital part of Ghana’s agriculture ecosystem, and their work is complemented by additional extension agents trained and supported by international donors and development agencies. However, extension agents have struggled to increase farm productivity, farmer incomes, and reduce rural poverty and food insecurity. Effective agricultural extension services in Ghana are limited by problems such as:

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4 Charles Nyaaba et al, Smallholder farmer in Ghana’s food systems, September 2018
5 Population and Housing Census, GLSS 7, Ghana Statistical Service, 2021
6 2017-2018 Ghana Census of Agriculture, National Report, GSS, Sept 2020, Pg 144
7 Cai & Abbott, 2013; Waddington et al., 2014
8 Gideon Danso-Abbeam et al, Agric extension and effects on farm productivity and incomes: insight from northern Ghana, Agriculture and Food Security, October 19, 2018
• **Inadequate number of extension agents to serve all farmers.** The recommended farmer AEA ratio ranges from 1-50 but this depends on farm size and distance to farmer’s fields.⁹

• **Women farmers are not reached by extension services.** In Ghana, it is estimated that the ratio of AEAs to farmers is 1:1,500¹⁰ while AEAs to women farmers are at a ratio of 1: 1,125 and men farmers at a ratio of 1: 375.¹¹ The skewed 3:1 ratio against women farmers is mainly due to focus by AEAs on cash crop production dominated by men while women generally engage in less critical food crop production. Also, cultural norms restrict male AEA contact with women farmers and prevent them from benefiting from extension.

• **Inadequate access to transport prevents AEAs from reaching farmer communities.** While distance from district capitals to outlying farming communities is not a constraint for AEAs due to current district demarcations in Ghana, inadequate access to means of transport such as vehicles or motorbikes and bad road networks prevent the AEAs from visiting all the farm communities under their supervision to physically connect with farmers. Also, with AEAs spread out across the entire country, it is a difficult task for MoFA to train and ensure all AEAs are up to date with the latest farming technologies that can then be handed down to farmers. MoFA is generally under-resourced and is unable to adequately cater for optimum extension service delivery in Ghana.

• **Challenges in using technology by AEAs.** The issues constraining the use of technology by AEAs in farmer trainings are varied. These include inadequate access to new training technologies, the high cost of accessing these technologies and low literacy levels of farmers as users of deployed training technologies. The issues affecting use of training technologies by AEAs is well known to MoFA which took steps to launch a five-year (2017 – 2023) Modernizing Agriculture in Ghana (MAG) project with funding of CAD$135 million from the Canadian Government to research into strengthening extension services and improving agricultural productivity¹² through the use of alternate extension delivery methods and dissemination technologies to farm households and farmer-based organizations to increase farm productivity.

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⁹ Kwamina E Banson, Biotechnology and Nuclear Agriculture Research Institute, March 25, 2015
¹¹ Ziporah Appiah-Kubi et al, Quality of extension services: a gendered case study from Ghana and Sri lanka, Sept 2016
¹² Modernising Agriculture in Ghana (MAG) Project (agricinafrica.com)
• **Use of technology in farmer training.** Technology can assist scaling up trainings to reach a larger number of farmers and can assist to reach remote and rural communities. The use of technology can also systematize trainings to deliver a uniform message to recipients on subject matters. Technology can also help in overcoming language barriers especially in countries such as Ghana where different languages are spoken even nearby communities and assist farmers with limited literacy to listen to instead of read training messages.

### 3. FEATS PROJECT’S FARMER CAPACITY STRENGTHENING INITIATIVES

One of the main pillars of the FEATS project is to increase the participation of farmers in tree crop cultivation. FEATS aimed to achieve this by increasing farmer adoption and access to quality planting materials, and by educating farmers on how to profitably grow quality tree crops. The project’s target was to train 65,000 men and women farmers on such topics as good agricultural practices (GAPs), farm business management, environmental protection, and gender equality and social inclusion (GESI). Additionally, by disseminating media messages on the profitability of planting quality planting materials to about 500,000 farmers across Ghana.

When FEATS was launched, there were few examples of alternatives to face-to-face training in Ghana for successful deployment of large-scale farmer capacity strengthening initiatives. The project’s early approach was to conduct conventional workshop-style training sessions. However, the team quickly learned that this approach was unlikely to achieve the project training targets. Some of the challenges included the following:

• Difficulty in mobilizing large numbers of farmers in central locations for trainings with related logistical challenges in transportation, suitable training facilities in remote parts of the country, and providing food for attendees, making it difficult to run effective trainings.

• High illiteracy rates and diversity of local languages of farmers, making it difficult for FEATS to rely on the same set of trainers to run these trainings for all farmers.

• The high cost of delivering face-to-face trainings, which meant FEATS could not achieve its targets with the project’s training budget and time frame.
• Potential quality and consistency challenges in delivering training to such large and diverse numbers of farmers, using multiple trainers in diverse locations.

A decision was thus taken to explore alternative training delivery methods. The FEATS team decided to use three delivery channels: a radio-based campaign to deliver media messages to farmers, mobile phone-based training messages and Amplio Talking Book devices (ATB). These three were targeted to reach as many farmers as possible.

3.1 Radio-Based Media Campaign

FEATS partnered with a media firm, Newmark West Africa, to develop a radio-based media campaign to disseminate messages to farmers on the profitability of planting quality tree seedlings in an environmentally sustainable manner.

The FEATS team relied on a farmer needs assessment study conducted by Newmark West Africa to map out the best radio stations to use based on listenership and location in tree crop production areas. The needs assessment also helped to determine the most appropriate messages and best methodology for delivering information through radio. Considering factors such as districts with the highest concentration of targeted farmers, radio stations in these districts with the most reach and listenership, and which languages are widely spoken in each of the communities of interest, a total of 12 radio stations across seven regions of the country were hired to disseminate media campaign products.

The media campaign revolved around four main activities: (1) live presenter mentions, (2) jingles (a short song or tune), (3) radio drama series, and (4) radio quiz competitions. The FEATS team developed message content on all four tree crops under thematic areas such as the need to plant quality seedlings, good agricultural practices, good environmental practices, and the need for increased participation of women and youth in tree crop farming. Next, the team developed a radio drama series in two local languages, Ewe and Akan.

A jingle is a short song or tune used in radio advertising and for other commercial uses. Jingles are a form of sound branding. In this case, a short message/slogan on one of the thematic areas of the FEATS media campaign was delivered alongside the short tune so while the catchy tune attracted listener attention, they were then compelled to listen to the short thematic message as well. The radio jingles turned out to be the most popular medium for reaching farmers.

13 Estimation of Farmers Reached, Newmark Gh, 2021
These drama series were organized and aired in episodes, each focusing on a specific thematic area. Running alongside the drama series were live presenter mentions and jingles that introduced the FEATS project and its objectives to farmers and announced where farmers could access quality tree crop seedlings in their communities. Radio quiz competitions testing the knowledge of farmers on the FEATS project and quality tree crop seedlings were also run in some rubber planting communities.

3.1.1 Successes of the Radio-Based Media Campaign

The four radio-based programs under the media-broadcast campaign ran for nine months and analysis of the monthly listenership reports from participating radio stations revealed an estimated 556,500 farmers were potentially reached. Newmark West Africa, conducted an impact assessment to evaluate the effects of the radio-based campaign using 500 farmer respondents representing 1% of the total target population of 500,000 for the campaign. FEATS had been unsuccessful in reaching large numbers of farmers with information and radio turned out to be a solution.
Scaling Up Farmers’ Capacity Building

**Figure 3: Radio Stations and Listenership in Media Campaign**

- **Upper East – Shea**
  - Nabiina FM (60,750)
  - URA Radio (63,750)

- **Upper West – Shea**
  - Radio Upper West (58,500)

- **Bono East – Cashew**
  - ADAS FM (34,500)
  - Classic FM (29,250)

- **Western North – Cocoa**
  - Beat FM (33,000)

- **Western – Rubber**
  - Ogya FM (61,500)
  - Westend Radio (45,750)

- **Volta – Cashew**
  - Delta FM (46,500)

**Content Influenced Change in Farming Decisions**

- Cashew, Cocoa, Rubber: 318 (87%)
- Cashew, Cocoa, Rubber: 48 (13%)
- Shea: 125 (93%)
- Shea: 9 (7%)

**Figure 4: Impact of content on farming decisions**

Scaling Up Farmers’ Capacity Building 12
Not only was the radio-based media campaign successful in disseminating information to farmers but it was also widely successful in increasing the knowledge of farmers. Results of the evaluation conducted at the end of the radio-based media campaign revealed that 95% of respondents had heard at least one of the media broadcasts messages, with the jingles being the most popular among respondents. Respondents also found the contents of the media messages appropriate to their tree crop farms, with 87% reporting the messages\textsuperscript{14} had had a positive impact on their knowledge to engage in tree crop farming. Not only did it increase farmer knowledge but was also very instrumental in introducing the FEATS project to farmers as 49% of respondents said they first heard about the FEATS project through the media messages which were broadcast during the sixth year of the project in 2020, assisting to achieve a major target of reaching many farmers with new knowledge.

3.1.2 Client Feedback Stories

The preferred radio content mix played a key role in changing the behavior of respondents. Mary, a female cashew farmer from the Bono Region who participated in the radio campaign as a respondent, stated that she preferred to listen to a mix of radio content. “I liked listening to the radio jingles best, followed by the live presenter mentions and the quiz programs. As for the radio dramas, I scarcely had time to listen because of other activities,” Mary said.

The radio jingles and live presenter mentions were the most preferred, likely because they were the most aired content, were catchy, fun, and played on average three times daily. This is compared to the quizzes, which aired once a day and dramas, which aired once per week, and played in different locations based on the specific tree crop grown in the area.

3.1.3 Lessons Learned – Factors to Consider for An Effective Radio-based Training Campaign

Though proving to be a very effective approach to disseminating information to farmers, the FEATS experience using this medium established that the success of any such radio-based campaign will be affected by how well the following factors are handled:

- A careful mapping out of the target listeners’ geographical area and confirmation of the radio station of choice. The farmers’ preference for local radio stations led to the project shifting the program from the regional radio stations to local district-based radio stations. The preference was based on the use of local languages well understood by target listeners and familiarity with subject matter likely to have been used for quizzes and drama.

\textsuperscript{14} End of Project Implementation Report, Newmark Ghana, 2021, p34
• A clear understanding of the needs of the target farmer group, especially their radio listenership behavior and cross-cutting issues including gender and youth were important in supporting the organization to identify which radio stations are mostly listened to by farmers, and the time of day they listen to the radio.

• A very clear understanding of the objectives for deploying a campaign and a concise expression of the messages to be disseminated. Radio airtime is very expensive, so organizations should limit messages to only the most relevant content. Also, the attention span for radio listenership is very small, between seven to ten minutes, so messages must be concise so that farmers hear key information in the few minutes that they are listening to the program.

• An effective monitoring and evaluation system to assist the organization to track if the radio stations are running the programs per agreed schedule, and to estimate the reach of the campaign and what the farmers do with the information received.

3.2 Mobile-Based Training Program

To achieve its objective of reaching a targeted 65,000 tree crop farmers with trainings in good agricultural practices (GAPs), business management, and gender equality and social inclusion, the FEATS project signed a two-year contract with Information and Communications Technology (ICT) firm Esoko Ghana to develop and disseminate mobile-based training messages to its farmers. The program involved the development of training messages, the conversion of training messages into an electronic format, and actual training of the 65,000 farmers through broadcasts of 30-second training messages to farmers. Once a day, an automated system placed phone calls to farmers at scheduled times, playing the training messages once the farmers picked up the call. If the farmer did not answer the call, the message was sent two other times per day. To participate in this training program, farmers needed to have working mobile phones and know how to use them. A needs assessment study carried out at the start of the program indicated that mobile phone ownership as an indicator to access extension information was also good among shea group members. Ninety percent (90%) of participants indicated they owned or had access to functioning mobile phones used to receive and make calls. According to 80% of participants, the mobile network coverage within their communities was good year-round.

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15  http://www.audiencedialogue.net/pmlr3-4.html
16  FEATS Needs Assessment Study on Mobile Based Trainings, 2020, Pg 15
The voice messaging sought to inform and create greater awareness among women and men farmers on the benefits of Good Agricultural Practices (GAPs) and gender equality/leadership and business management. The purpose of the voice messaging was also to increase the farmers’ level of knowledge, skills, and increase their adoption and planting of enhanced cashew, cocoa, rubber and shea seedlings.

3.2.1 Successes of the Mobile-Based Training Program

A study conducted to assess the effectiveness of the mobile-based training programs indicated that about 96% of farmer respondents had received the training messages, as seen in Figure 5. This showed that most of the messages reached their intended targets. Delivered messages were more likely to be listened to and their content used to improve farming activities. The remaining 4% who did not receive the training messages gave reasons for not receiving the messages. The most frequent reasons were poor network connectivity and loss of mobile phones.

Most respondents (98%) could remember more than half of messages that were disseminated. Only 2% could not remember any of the training messages. Below are some messages that respondents could remember:

- **Farm Business Management:** Records keeping and how to plan farm activities.
- **Good Agricultural Practices (GAPs):** Messages on farm weeding, lining, and pegging, pest and disease control.
- **Environmental Management:** The prevention of bush fires, proper disposal of used agrochemical bottles and the washing of hands after using the chemicals.
- **Gender and Leadership:** A leader can be a man or woman, depending on who the group selects, your sex is determined biologically, but gender roles are influenced by society and culture.

Figure 6 gives details of the topics the respondents were able to recollect and the various combinations. Most farmers paid attention to training messages that were delivered to them and were able to recollect some of them. This
was a clear indication of the importance respondents attached to the training messages, which explained their ability and willingness to practice skills that they were taught. Clearly, most farmers (61%) tended to remember messages on GAPs while the combination of environmental management and farm business management were the least remembered at 7% of respondents. The combination of farm business management and GAPs came second at 35% while the combination of farm business management, gender & leadership, and GAPs was third. Clearly, farmers were keenly interested in GAPs messages to assist them in farm operations and saw farm business management as a second area of interest. Interestingly, the issues of gender and leadership came a close third in importance to the first two and may have been influenced by the interest of women farmers in this topic.

![Figure 6: Training topics remembered](image)

Based on Figure 7, the majority of respondents (98%) expressed their satisfaction based on the usefulness of training messages highlighted. Reasons given were:

- Improvement in farm sanitation
- Improvement in quality of beans
- Knowledge in pest and disease control
- The simplicity of training messages
- Knowledge in record keeping
- To gain knowledge of leadership
- Serves as cropping calendar
The majority of farmer respondents were satisfied with the training messages and used them to improve their farming activities; one in five respondents went a step further, making major decisions based on the training messages. Respondents were encouraged to make decisions based on the messages if they felt they were beneficial and some key areas where this occurred were:

- Farmers improving their record keeping
- Pruning their farms and early weed control
- Increasing the number of times nuts are collected from fields based on the advice that nuts do not last more than 3 days on the farm when ripe
- Drying cocoa beans well to improve quality
- Collecting all empty agro chemical bottles and sachets used on the farm and burying them

All farmer respondents indicated they had gained useful lessons from listening to the mobile-based training messages received. Things they took for granted had been highlighted in the messages, including farm maintenance, pruning, proper ways of disposing used agro-chemical bottles and proper records keeping. Figure 7 (above) presents the new knowledge gained by farmer respondents and distribution among them. It can be inferred that impactful lessons were learned from the messages which farmers now apply in daily activities. About 94% of farmer respondents rated the training messages to be
relevant to tree crop farming. The high rating of training messages was due to the perceived benefit to farmers by providing information at the right time and helping them keep records on their farms. Also, farmer respondents indicated that training messages were listened to completely because of their relevance.

However, while there was widespread satisfaction with the trainings, there were a few areas where due to poor mobile connectivity issues, farmers could not receive messages on time or missed the messages. In these instances, the farmers had to find locations in their communities where connectivity was better to receive their phone messages.

The study to evaluate mobile-based trainings also explored whether farmers required the content of training messages to be changed or other modifications made to improve their dissemination. While 91% of farmer respondent indicated their satisfaction with the message content and delivery, about 9% of farmers wanted changes to be made to the dissemination mode to include text messages. They also wanted more farm production messages to be included, especially nursery activities for new farmers. Others wanted access to a phone number they could call back if they had further questions or needed clarification.

### 3.2.2 Client Feedback Stories

Most farmer respondents indicated that the mobile-based messages had increased their knowledge of tree crops. This was the case for Agyare, a cocoa farmer who lives in Baakokrom. "From the mobile messages, I have learnt to keep my farm clean and also harvest regularly. The new information has helped me to increase my harvest as compared to what I used to harvest before," Agyare said. Ali, a rubber farmer from Aiyinase, also agreed. "My farm hands are happy because they are also enjoying extra wages from the increases in the latex harvest. Also leaving chemical bottles on the farm is not good. I have learnt that it is better to weed then to spray," Ali said.

To demonstrate the knowledge gained from the mobile-based trainings, some farmer respondents showed books in which they kept records of their farm activities.

### 3.2.3 Lessons Learned – Factors to Consider in Deploying an Effective Mobile-Based Training Campaign

The data from the study to assess the mobile-based training program pointed to successful implementation and adoption of new learnings by farmers from messages received. However, lessons learned for future program execution includes:
• The requirement for a thorough needs assessment to be carried out on target farmers for mobile-based training programs to know their precise locations, understand their literacy levels, and above all, to understand their daily socio-economic activities to determine the right times that messages should be disseminated to ensure they are adequately received.

• As part of the process to select recipient/target communities for mobile-based messages, assessments should be carried out on mobile connectivity and where possible, to select only communities which have efficient connectivity to facilitate program success.

• Mobile-based training messages must be translated into the local languages best understood by targeted farmers and resources must be allocated for translation.

• If mobile phone-based learning is selected as a delivery channel, clients may need training to ensure they can use mobiles to receive and access the training messages.

• Esoko was not able to use the full Interactive Voice Response (IVR) service that they sometimes deploy for such training. IVR allows clients to send voicemail inquiries in response to pre-recorded mobile training messages. However, in Ghana, this would have required Esoko to set up a call center with multiple languages, and this was not logistically possible.

### 3.3 Amplio Talking Book Training Program

During its training needs assessments for implementation of mobile based trainings for its clients, the FEATS project discovered that most of its shea women farmers who were to be reached with trainings preferred other means of training other than use of mobile phones. Secondly, the women farmers did not have or know how to work with mobile phones. This required the project to find an alternative means to effectively reach this client segment. As an alternative for the shea women farmers groups, FEATS decided to use the Amplio Talking Book (ATB), a battery-powered device that plays pre-recorded audio messages. The ATBs allow audiences to listen to recorded messages either individually or in a group.

The messages for the mobile-based training were modified to suit the ATB devices and were translated into five local languages, specifically Dagbani, Wale, Kasim, Sissala, Kusal. The ATB devices were distributed and shared among each household.
3.3.1 Success of the Amplio Talking Book Training Program

Results from studies conducted on the outcomes of the ATB program indicated that though women shea pickers were the main targets of the ATB device training, a few men also benefitted from the program, with results showing 3.9% of respondents were men. Interestingly, women strategically listened to the ATBs when their husbands were within earshot, so they also heard the messages. Also, though this was not the first time shea pickers were being trained, as 46.7% of them said they had received prior trainings, the previous trainings had focused largely on Good Agricultural Practices (GAPs). See Figure 9 for Study Respondents with Previous Training.

This means for most of the shea women farmers, this was the first time they were receiving trainings on Gender Equality and Leadership, Health and Safety, Bookkeeping and Group Dynamics. Also, for most clients, this was their first experience using ATBs to learn. All their previous training programs had been face-to-face or on-the-field trainings. The ATBs supported them to listen to training messages at their own convenience and conduct other activities while listening. Additionally, though most of the shea women farmers had prior training in GAPs, they were most excited about the ATB training. This gave an indication that most farmers believed they still had to improve their farm productivity by gaining new knowledge. The results from the post-training ATB assessment showed a marked improvement of the previous trainees’ knowledge. The women scored above 80% on all questions except on bookkeeping where despite an increase in score of 18.5%, the overall score was 56%. See Figure 10 on Results of Assessment after Training.

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17 Study on Effectiveness of ATB as Training Tool, Esoko, 2021, p3
The shea women farmers were happy with the information they received while using the ATB devices and the explanations they received on the objectives of the trainings. They found the topics were very relevant to their work, though a few of them (4.4%) expected more from the training, with another 6.4% of respondents unsure if their expectations had been met. Additionally, a large percentage of trainees, 24.6% were not happy with the time spent with the ATB devices. This was because of the shorter period of one day they spent using the ATB devices instead of the one week used by others. Overall, about 99.2% of the shea women farmers were happy with the ATB training while 94.2% indicated they were able to use the devices with no assistance. A major reason for using the ATB devices for future programs is its ease of operation. The women advocated for the provision of the same training opportunities for other members of their communities.

3.3.2 Lessons Learned – Factors to Consider in Deploying an Effective Amplio Talking Book Training Program

An advantage of the ATB devices is the opportunity to reach large numbers of indirect clients, which may not be always possible through face-to-face trainings due to logistical challenges such as training venues and resources. As with all methodologies discussed in this paper, ATB devices should be used based on detailed needs assessments to ensure that training messages are tailored to
topics and areas of relevance to trainees. Lessons learned on the advantages and disadvantages of ATB devices are listed below:

Advantages of using ATB devices:

• Using the ATB devices to train large numbers of clients, such as shea women farmers or farmers, is an effective alternative to face-to-face trainings.

• ATB devices assist more trainees to be trained at their own convenience.

• Shorter learning times. Overall, it takes about one week to learn by using ATB devices.

Disadvantages of using ATB devices:

• Service providers could not answer trainees questions despite the ATB devices being able to record feedback.

4. CONCLUSIONS

Conclusions on the effectiveness of radio campaigns, mobile-based trainings and ATB devices were as follows:

4.1 Radio-Based Trainings

• In terms of reaching large client groups, clearly none of the three technologies deployed by FEATS reached the target audience of 556,500 farmers. Here, the project overachieved its set targets by 11.3% over the nine-month implementation period for its radio-based media campaign.

• The fact that 95% of study respondents to assess the program’s effectiveness had heard at least one of the media broadcast messages showed how useful it was in reaching farmers with training messages. Furthermore, the use of catchy jingles proved to be a highly effective strategy in attracting listeners.

• While proving its effectiveness as an approach to disseminating information to large farmer groups, it was clearly established that to be successful with such radio-based trainings, there is a need for a clear understanding and knowledge of target farmer needs and listenership behavior to determine message content, suitable radio stations, and message delivery times.
• Radio messages must be concise, as they are expensive to deploy, and the time people spend listening to the radio is short so key messages must be relayed quickly.

• A monitoring program is always essential to track the implementation of agreements with partner radio stations to ensure that messages reach the intended audiences.

• The quiz programs in the radio-based trainings allowed phone-in by listeners to make contributions or ask questions.

### 4.2 Mobile-Based Trainings

• The conclusions on the usefulness of the mobile-based training messages indicate that they were beneficial to target farmers based on data (Section 3.2) from client responses.

• The majority of farmers were satisfied with the frequency and timing of delivery of mobile-based messages.

• Most farmers could recollect messages they had listened to before, illustrating clearly their interest in the training messages. Some farmers took major farm decisions based on the training messages they had received, and this helped them in their farm operations.

• It can be concluded that the training of clients using mobile-based technology was effective but only to the extent that farmers could access mobile phones as listening devices or had connectivity to mobile phone grids to facilitate the usage of their phones.

### 4.3 ATB Trainings

• The deployment of the ATB devices to facilitate training to women farmers was necessitated by the limited access shea women farmers had to mobile phones.

• Also, ATBs are good for deployment in areas where cell phone services are weak or non-existent to reach farmers with training messages.

• The search for alternatives led to the ATBs devices which especially supported rural audiences to listen to recorded messages, either individually or in groups.
• An important outcome of using ATB devices was participation by men in its listenership although women shea pickers and processors were the main targets of the trainings. Women actively brought this about by listening to the devices when men were nearby, so they heard the messages. This had benefits for women because apart from the technical and business issues discussed, the men now understood gender awareness and inclusiveness messages disseminated using the ATBs and have begun to change their behavior towards their women partners.

• The ATB allows trainees to listen at their own convenience and revisit topics on which refresher training sessions were required.

• A drawback of ATBs is the necessity for backup batteries and agreement on convenient times when all target groups can converge to listen.

In conclusion, FEATS had to explore the use of alternate technologies when it realized that it could not easily reach the large numbers of farmers with trainings using traditional methods. The project resorted to using ICT which turned out to be wholly successful in ensuring that it met its set targets for farmer trainings. However, there were several factors which had to be considered to be effective. This required the need to conduct initial assessments to understand the socio-economic characteristics and activities of target clients to enable messages to reach them successfully. Also, while the deployment of the three ICT methods assisted FEATS to reach large farmer numbers with trainings, the high cost of deploying the technologies can be a drawback to their use by similar programs.