



Supporting Transformation by Reducing Insecurity and Vulnerability with Economic Strengthening (STRIVE) Final Project Report: ACE Program February 2014



Value chain actors, partners, project beneficiaries and ACE staff pose for a group photo at the project close-out event in Saclepea, Nimba County.

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ACRONYMS

ACE	Agriculture for Children's Empowerment
CARI	Central Agricultural Research Institute
DCOF	Displaced Children's and Orphans Fund
FaaB	Farming as a Business
FFD	Farmer Financial Diary
FHI 360	Family Health International 360
HH	Household
LEAD	Liberia Entrepreneurial and Asset Development
LIFARCO	Liberia Farms and Cooperatives
LMA	Liberia Marketing Association
LOP	Life of Project
PMP	Performance Monitoring Plan
STRIVE	Supporting Transformation by Reducing Insecurity and Vulnerability with Economic Strengthening
VSL	Village Savings & Loan
USAID	United States Agency for International Development

1. PROJECT DESCRIPTION

1.1 Goal and Approach

A. Goal

Agriculture for Children’s Empowerment (ACE) was designed to stimulate the entrepreneurial skills and mindset of farmers while linking them to profitable value chains, with the aim of measuring and documenting the effects of these economic activities on child wellbeing.

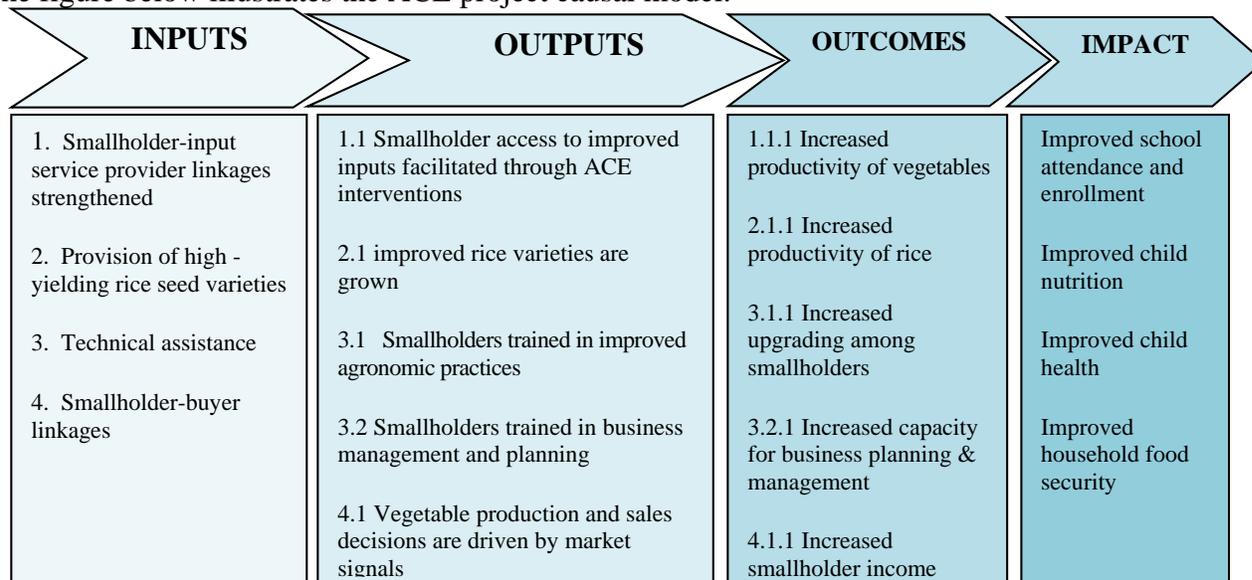
B. Approach

Initially, ACE had two main program components, one focusing on economic strengthening of caregivers utilizing the value chain approach and one focused on school-based activities with children. The child-focused activities included demonstration plots for the production of high-value vegetables and stimulation games on farming as a business and strengthening Parent Teacher Associations to provide awareness on child education and nutrition. In September 2009, following an assessment visit, USAID/DCOF directed ACE to end its child-focused activities and concentrate solely on the economic strengthening of caregivers to ensure that project resources were not spread too thin to see economic results in the value chain work.¹

ACE’s economic strengthening approach focused on improving agricultural value chain linkages and upgrading of farming practices in Liberia’s Bong, Montserrado and Nimba counties. ACE worked in the vegetable and rice value chains and used a combination of technical assistance, facilitation and small grants to foster upgrading practices among participating households. By supporting economic strengthening in the target communities, ACDI/VOCA aimed to have significant and sustainable impacts on household income, the economic viability of communities, and the wellbeing of Liberian children.

1.2 Causal Model²

The figure below illustrates the ACE project causal model.



¹ DCOF Assessment Report on ACE, May 17-22, 2010, p 14.

² The causal model reflects revisions to the program requested and approved by DCOF in Year 3.

This report addresses the inputs, outputs and outcomes of the causal model based on monitoring data collected by ACE throughout the project and from reports by project staff. The impact level will be addressed in a separate report produced by FHI 360.

1.3 Project Background

The five-year (2008-2013), \$3.2 million ACE project was implemented by ACDI/VOCA in Liberia under an associate subaward from FHI 360 (formerly AED), as part of the Supporting Transformation by Reducing Insecurity and Vulnerability with Economic Strengthening (STRIVE) project funded by the USAID Displaced Children and Orphans Fund (DCOF). The STRIVE program aimed to fill knowledge gaps about effective economic strengthening approaches and their impact on reducing the vulnerability of children and youth. In partnership with Action for Enterprise (AFE), ACDI/VOCA, Mennonite Economic Development Associates (MEDA) and Save the Children, STRIVE implemented four economic strengthening projects in Africa and Asia between 2008 and 2014. Coupled with a robust monitoring and evaluation framework and learning strategy, STRIVE documented the impacts of these diverse interventions on children.

ACE worked in the vegetable and rice value chains in Nimba (Saclepea district), Bong (Kpaili and Jorquelleh districts) and Montserrado (Mt Barclay and Fendell districts) counties providing a package of assistance to over 1,000 smallholder farming enterprises. The package consisted of technical assistance in farming as a business, improved farming practices, and value chain facilitation targeting linkages with marketing outlets and agricultural supply firms. The project was implemented under four key objectives:

- Strengthening linkages between input providers and farmers
- Increasing rice production
- Strengthening linkages between buyers and farmers
- Upgrading through technical assistance

1.4 Results Overview

Over the life of the ACE project the following key results were achieved:

- Farmers' income from growing vegetables increased substantially—from \$71 to \$313—thanks to improved production techniques, access to inputs and marketing relationships with buyers.³
- The yields of 674 rural vegetable farmers in Bong and Nimba counties increased from an average of 314kg to 458kg/household (HH) as tracked in the farmer financial diaries and reported by field staff. Traditional vegetables (peppers and bitterballs) constituted 70 percent of the total yield increases while high-value vegetables (tomatoes, lettuce, cucumber) constituted 30 percent.
- The following farmer upgrading practices were introduced and adopted:
 - Construction and use of solar dryers to dry surplus vegetables during the rainy season bumper harvest for sale during the dry season when prices appreciate. The PMP tracked 663 rice and vegetable farmers who adopted at least three

³ Data Source: 250 farmers were randomly sampled from 800 ACE farmers in Bong, Montserrado and Nimba counties by the project research group. Out of 250, 135 grew rice only, and 115 grew vegetables and their production activities and income were tracked using the programs' farmer financial diary (FFD)

sustainable post-harvest technologies, out of which 179 (27 percent) used the dryers to process 2,039 kg of assorted dried vegetables valued at \$8,884 during the life of project (LOP).

- Procurement of motorized water pumps for off-season vegetable production led to market price premiums of approximately 200 percent for bitterballs and 400 percent for peppers.⁴A total of 56 farmers (10 percent) were involved with off-season vegetable production using five motorized pumps co-owned by 34 farmers bought through loans from Liberia Entrepreneurial and Asset Development (LEAD), Inc.
- The project introduced high-yielding rice varieties (NERICA 14 and LAC 23) and modern agronomic and post-harvest handling practices to smallholders. Rice paddy production increased from 360 kg to an average of 550 kg/HH farmer.⁵ This amount was enough to satisfy a family of six throughout the hunger season and beyond, contributing greatly to food security throughout the year.
- A value chain linkages assessment conducted by ACDI/VOCA indicates that the value chain facilitation approach strengthened linkages between value chain actors (input providers, farmers, buyers, service providers) creating sustainable business partnerships that contributed to a stronger market system. The results of this assessment are detailed in a separate report.

2. ACTIVITIES AND RESULTS

ACE focused on four key objectives that contributed to the overall project goal of increased income and food security for households.

Objective: 1.Strengthening Linkages between Input Providers and Farmers

Overview—At the inception of the project in 2008, the linkages between input service providers and farmers were very weak, and sometimes nonexistent. ACE initially provided a grant of \$18,189 to two Liberian-owned input service dealers based in Monrovia (ANARCO and Green Farm) to provide inputs and extension services to farmers in the three counties of project implementation. The grant was intended to strengthen the input service providers' capacities to recruit community extension and sales agents, and to buy down the risk associated with entering a new market segment, as input firms were used to selling directly to NGOs rather than to smallholders. ANARCO worked with farmers in Montserrado and Nimba counties, while Green Farm worked with farmers in Bong County. They conducted promotional events in ACE communities by displaying inputs such as NPK 15:15:15 fertilizer, insecticides, assorted seeds, cutlasses and hoes. However, the intervention proved challenging because very few farmers were willing to buy inputs when many humanitarian and relief programs were sponsoring the free distribution of inputs. This led to the closure of ANARCO and Green Farm market outlets in both Bong and Nimba counties; both companies moved back to Monrovia to concentrate on their main business clients.

Facilitation of Promotional Events—In 2011, ACE altered its strategy and focused on strengthening local input service providers based in Bong and Nimba counties. By this time the private input market had become more promising, due to the decline of free input distribution and the establishment of several local agro-input dealers in Bong and Nimba. ACE coordinated

⁴ Data source originated from the market price analysis that was conducted by ACE field staff.

⁵Rice production reports from 831 rice farmers.

with these firms to facilitate promotional events at local market centers where farmers were introduced to new products and services. In all, ACE identified seven input dealers, four in Bong, one in Montserrado and two in Nimba counties. ACE also linked two of the input dealers in Nimba and a farmer group in Montserrado with WIENCO, a major multinational inputs firm that conducted community-based promotional events.

Bulk Purchasing—The relationship between the farmers and input dealers gradually developed through ACE facilitation as the result of farmers’ understanding of FaaB concepts. ACE worked with farmer groups that were interested in and capable of initiating bulk purchasing agreements to contribute to the upfront payment to access inputs on loan. A total of six groups (three in Bong, two in Nimba and one in Montserrado) organized themselves into informal groups with the cluster head serving as chairman. With ACE support, these groups began purchasing inputs in bulk receiving discounts of 10-15 percent from input dealers. The challenge initially was that those farmers who could not make an upfront payment were not eligible for membership in the group. This was overcome through ACE’s technical support in vegetable production and marketing.

The five groups in Bong and Nimba were able to leverage their success in these relationships to procure motorized pumps through loans from LEAD, which gave them the opportunity to produce vegetables during the dry season, the period during which vegetables are in high demand and prices are appreciably higher.

Inputs on Credit—As the result of these linkages, WIENCO provided inputs such as improved seeds, fertilizers, sprayers and insecticides on a credit scheme of 50 percent up-front payment and 50 percent on loan to two community-based input dealers that ACE worked with, Becky Agro Retail Dealer and GLA-PAW-JAY. Each received inputs valued at \$3,000 through the credit scheme. At the time of writing the repayment process was going smoothly and WIENCO was considering expanding a similar offer to the remaining four agro-input firms that partnered with ACE. The ACE farmer group in Montserrado also engaged in an input loan arrangement with WIENCO.

Agricultural Inputs Safety Training—ACE also organized and trained 42 participants—six community-based input dealers, 32 lead farmers and four district agriculture officers—in input use and safety. Topics discussed during the training included the importance, usage, and management of agricultural inputs, as well as associated safety measures. The safety of children during the application of inputs on the farm was highlighted. After the training, input dealers continued the awareness and training in communities, utilizing ACE’s cluster farmers to mobilize communities to attend trainings. The input dealers also participated in several agricultural radio programs to explain the proper usage and management of agricultural inputs.

<i>Summary of Results and Cumulative Achievements:</i>	<ul style="list-style-type: none">• Seven agriculture input dealers identified and linked to farmers, resulting in increased availability and access to inputs by farmers and expanded customer base for input dealers
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- 81% of the 400 vegetable farmers consistently bought inputs (mainly fertilizers, assorted seeds, insecticides and tools) from both input dealers and the open market⁶
- 38 community-based promotional events were conducted
- WIENCO, a major importer of agricultural inputs was linked with farmers and community input dealers that accessed inputs on loan to increase their sales capacity and expand their businesses

Objective: 2. Increasing Rice production

Overview—Activities under this component began in early 2010 when it was determined that farmers were very concerned about rice production—rice is essential to meeting the food security needs of their families. Most smallholders had returned to their communities in late 2009 from IDP camps and many were no longer eligible to receive humanitarian food items. The focus of the relief organizations in the re-integration process was to provide smallholders with agricultural inputs such as seeds, fertilizers, cutlasses, hoes and shovels. There was a high demand for rice seeds as farmers had lost most of their local rice seeds as a result of the war.

Rice Seed Loan Scheme—As part of its rice production strategy, ACE used a rice loan scheme to introduce new rice varieties to farmers. ACE partnered with LIFARCO, a local rice seed broker, to introduce two high-yielding, short-duration, up-land rice varieties: NERICA 14 and LAC 23.

LIFARCO recruited interested farmers to participate in the riceloan scheme and then signed agreements with each participating household. The loan scheme enabled each farmer to receive 25 kg of seeds that they were originally expected to pay back in full after harvest. However, due to the lack of facilities to store this quantity of rice, LIFARCO asked farmers to repay 10 kg (40%) of the loan. LIFARCO partnered with the Central Agricultural Research Institute (CARI) to conduct field monitoring activities and certification to ensure that the best agronomic practices were being followed by participating farmers as part of rice seed certification process. Involving CARI in the field monitoring activities allowed LIFARCO to meet

precertification criteria as an outgrower since CARI was responsible for certifying the repaid rice seed before redistribution to new rice farmers. Concurrently, ACE field staff delivered agronomic training and extension in rice production as well as post-harvest handling and storage.

NERICA 14 vs. LAC 23—Initially, the NERICA 14, a 75-day short-duration maturing variety was introduced. The early maturing nature of the variety frustrated farmers as they were forced to begin bird scaring and harvesting earlier than accustomed. This put a demand on their labor resources and negatively impacted their vegetable production meant for income generation and nutrition. Additionally, there was a general supply shortage of certified NERICA 14 seed in Liberia. Therefore, the project decided to focus efforts on introducing the LAC 23 variety. The

Average Rice Consumption in Liberia

The per capita consumption of rice in Liberia is approximately 60 kg per year, compared to the average in West Africa of 19 kg per year.¹ The average household in ACE communities has six members. Given this information, it is estimated that one person will eat an average of 5 kg per month, which translates to 30 kg per month for a family of six. The 361 kg of average rice grain production provided 60 kg per capita consumption: enough to satisfy a family of six throughout the hunger season to the next harvest contributing to food security throughout the year.

¹USAID Global Food Security Response Liberia Rice study, 2009, p 8, (micro REPORT #157); Reynolds, C; Field, M, et al.

⁶ ACE did not collect information on the total value of inputs purchased by farmers.

LAC 23 variety takes 140-150 days to mature and is closely linked to other local variety harvest cycles, but is much higher yielding. The introduction of the LAC 23 greatly reduced the hunger gap for participating households. Farmers were able to achieve average paddy yields (unprocessed rice) of 550 kg per household, a 53 percent increase over the previously used local variety yield of 360 kg per household. Out of LAC 23 average yield of 550 kg per household, 25 kg was kept as seed for next season production and 10kg was used to service the loan. 515 kg of paddy was kept for household consumption.⁷ The food security gains enabled farmers to move their focus beyond meeting basic food needs to focus on income generating vegetable crops.

Post-Harvest Practices and Storage—ACE also addressed post-harvest losses and storage through training and extension on post-harvest management techniques such as drying, threshing, winnowing, bagging and proper storage to prevent infestation from rodents and insects.

Private Sector Participation—The partnership with a private company was a major success factor for the high rice seed loan repayment rates of 96 percent over the life of the project. ACE participated in the Rice Sector Working Group, a forum organized by the Ministry of Agriculture where all partners involved with rice production meet monthly to provide an update on rice production activities. Other NGOs participating in the rice sector working group reported difficulties collecting repayment of rice seeds during management of seed loan programs. The presence of a private company reinforced the conditions of repayment.

ACE provided support to LIFARCO throughout the process and encouraged them to develop a business plan that would allow them to keep the final repayment of rice seeds in order to continue and expand the rice seed scheme independently of ACE. However, LIFARCO encountered financial challenges and ceased operations after the end of the ACE rice loan program.

Therefore, in 2012, ACE supported several communities in establishing rice seed banks with their surplus seed to ensure a consistent supply for community members. In collaboration with the community leadership, three community-based seed banks were established through ACE facilitation in Tomato Camp, Kpiai and Laworta in Bong county, servicing 144 farmers. These seed banks were registered with the Kpiai District agriculture office to ensure the management and sustainability of the seed loan program. The seed loan arrangement under the seed bank establishes that a farmer who receives 25kg of seed will payback 37.5 kg (50% interest). The selection of these communities was based on their predominance in rice production.

Summary of Results and Accumulated Achievements

- Increased average rice yields by 53 percent from 360 kg/HH to 550 kg/HH farmers satisfying the needs of an average family of six throughout the hunger season and beyond
- Two improved rice seed varieties were piloted, NERICA 14 and LAC 23, with LAC 23 observed to show greater success among farmers

⁷ To translate the amount into grains (polished rice), it is estimated that 30 percent is lost during polishing as a result of the removal of the husk and bran, leaving an estimated 361 kg for household consumption.

- 975 rice farmers accessed 25.8 MT of LAC 23 and 2 MT of NERICA 14 improved rice seed during the LOP through a rice seed loan program
- The ACE rice seed loan repayment rates averaged 96 percent, comparing more favorably to other repayment rates of programs managed by other NGOs
- Three community-based rice seed banks were established in Kpaili, Laworta and Tomato Camp, Bong County with a total of 3.6 MT of LAC 23 providing seed to approximately 144 farmers

Objective: 3. Strengthening Linkages between Buyers and Farmers

Value Chain Selection—ACE’s initial step in linking farmers to buyers was to carry out a price analysis of the vegetable sector, which included high-value vegetables such as sweet pepper, lettuce and tomatoes. This analysis favored high-value vegetable production such as lettuce, sweet bell pepper, tomato, carrot, water melon and cucumber in the three counties (Bong, Montserrado and Nimba) because there was a strong market demand in Monrovia. However, farmers encountered perishability issues due to the long distance from Monrovia markets, lack of storage facilities and bad road conditions. In late 2010, local traditional vegetables such as bitterballs, peppers and okra prices were analyzed as well. The analysis determined that it was profitable to grow pepper and bitter balls in Bong and Nimba as there was a strong market demand and infrastructure. The analysis also determined that high-value vegetable crops in Montserrado were preferable due to favorable market prices and proximity to target end markets such as restaurants and hotels in Monrovia.

Market Facilitation Activities—ACE initially identified private sector buyers based in Monrovia, such as GITCO Ltd. and the Liberia Marketing Association (LMA), that were willing to buy vegetables and introduced them to farmers through a series of meetings in the communities and during regional market days. As relationships improved, buyers entered into preharvest agreements with lead farmers for the production and supply of vegetables. Subsequently, GITCO Ltd. and LMA buyers travelled from Monrovia to ACE communities in Bong and Nimba counties to buy fresh vegetables. However, during the rainy season, transportation became difficult due to the deplorable road conditions coupled with increased transportation fares. As a result, the buyers’ travel to ACE communities to purchase the farmers’ produce was inconsistent, and this created a lack of confidence and trust in the relationship. As a result of the challenges with Monrovia-based buyers, ACE changed its strategy and identified local buyers who were based in the counties and linked them to the farmers. This arrangement increased farmer-buyer access and eliminated farmers’ uncertainty about whether buyers would arrive in regional markets to buy produce.

Farm-Level Aggregation—ACE supported and encouraged farm-level aggregation and coordination. ACE facilitated this process through clusters of approximately 40 farmers. These clusters aggregated their produce and sold through a lead farmer who served as an aggregator and marketer negotiating on behalf of the farmers for a competitive price. The lead farmers also informed buyers before the harvest season of the various vegetables being produced and the expected volumes from each production site. At the same time ACE targeted its technical

assistance to focus on producing traditional vegetables (pepper and bitterballs) in Bong and Nimba counties to meet buyer specifications. These relationships were nurtured through project facilitation resulting in increased sales of vegetables.

High-Value Vegetable Market Facilitation—ACE also linked the Monrovia-based vegetable buyers to farmers in Montserrado County who produced exotic vegetables, such as lettuce, cabbages, cucumbers and tomatoes, that were supplied to restaurants, hotels and supermarkets. In order to improve market access for high-value vegetable farmers in Montserrado, ACE interacted with USAID staff and the U.S. Embassy liaison officer to discuss establishment of a farmers’ market that could meet the fresh vegetable needs of the Embassy staff and create a niche market opportunity for farmers in Montserrado. The idea was embraced and the ACDI/VOCA-U.S. Embassy farmers’ market was established in 2010. A group of eight ACE farmers consistently sold to the farmers’ market through the end of the project. The supervision of the farmers’ market has been turned over to the Farmers’ Union Network of Liberia (FUN) to continue providing updates to embassy staff on the availability of fresh vegetables, a role initially played by ACE.

<p><i>Summary of Results and Accumulated Achievements:</i></p>	<ul style="list-style-type: none">• 473 farmers sold a total value of \$192,545 through regional markets over the LOP, exceeding the target of \$150,000 (data source: farmer financial diaries [FFDs])• 201 farmers sold produce through preharvest arrangements for total value of \$111,233, exceeding the target of \$37,500 (data source: FFDs).• Through preharvest arrangements, 95 lead farmers served as aggregators linked to 17 direct buyers in Bong, Montserrado and Nimba Counties.• Average farmer income increased from \$71 to \$313 over a period of two years (collected from FFDs of 115 of the 250 randomly sampled farmers who grew vegetables)• ACDI/VOCA- U.S. Embassy farmers’ market established in Monrovia for farmers to sell directly to U.S. Embassy staff.
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Objective: 4. Technical Assistance

Private Sector Driven Technical Assistance—ACE originally planned to facilitate the delivery of technical assistance through the private sector, primarily through private input dealers. However, the input dealers identified initially (ANARCO and Green Farm) were observed to have weak capacity to provide technical assistance on best agronomic practices. Moreover, these input firms were unwilling to invest in extension services for smallholder farmers since the future of the input market was uncertain due to the sporadic distribution of free inputs, despite ACE’s efforts to buy down the risk through two matching grants to both companies.

Transition to Direct Technical Assistance—ACE shifted its strategy to provide more direct technical assistance to farmers. In late 2009 and early 2010, ACE recruited 17 junior and final year students from one of Liberia’s leading agricultural universities to work as extension agents, living in the rural communities and interacting daily with the farmers. This helped build farmers’ production capacity and increase their confidence in the potential benefits of vegetable

production. Subsequently, ACE recruited five agriculture extension agents as facilitators to cover all of ACE’s communities, some of whom included the university students who had graduated.

ACE Farmer Categories—In order to target extension work more effectively, in 2011, the extension agents categorized farmers into three groups (A, B and C) in relation to the farmers’ capacity to respond to the technical assistance that was provided to them. The definitions of the three categories were as follows:

Category A farmers:

- Have mostly applied the training that they received
- Have production capacity of at least 1 acre
- Are aggregators of at least five other farmers
- Have direct buyers
- Are fast adopters of best agronomic practices and FaaB concepts
- Are lead farmers and willing to serve as demonstration farmers, etc.

Category B farmers:

- Have production capacity of at least ½ to about 1 acre
- Are aggregators of four or fewer farmers
- Sometimes have buyers
- Have applied about 55–60 percent of production best practices
- Have applied about 55–60 percent FaaB concepts

Category C farmers:

- Most vulnerable farmers, especially female single parents and widows
- Slow adopters of agronomic practices
- Production capacity is usually one lot (1/4 of an acre) or less
- Trade labor for inputs (seeds, fertilizers, etc.) as a result of being unable to purchase inputs
- Usually “waiting to see what happens,” etc.
- Mostly sell locally due to the small quantity of vegetable being produced and sometimes in regional markets if quantity increases

Quantitative Summary of Farmer Categories—This table reflects vegetable and overlapped farmers who participated in vegetable production. The categorization process targeted only income-generating activities such as vegetable production since vegetable farmers had different technical assistance and farm management needs. Rice-only farmers are not included in the below totals.

	Category A	Category B	Category C	Total
Vegetable Only	46	93	109	248
Rice and Vegetable (overlapped)	29	60	213	302
Total	75	153	322	550

The technical assistance provided to the farmer groups included:

- **Establishing demonstrations on lead farmer plots** to try new varieties of vegetables and promote modern agronomic practices such as the application of organic fertilizers (compost) and the proper usage and management of pesticides. Twenty-three demonstration plots (Bong—11, Montserrado—3, and Nimba—9) were established and managed by 20 cluster heads in Bong and Nimba, and three lead farmers in Montserrado. The demonstration lasted for one production season.
- **Support for dry-season production** led to the introduction of irrigation using motorized water pumps. Both treadle and motorized pumps were piloted before determining that motorized pumps were the most efficient equipment for farmers. The mechanized pumps were financed through loans provided by a local microfinance institution to five groups of farmers. Dry season production also included promotion of vegetable solar drying during the rainy season for eventual dry season marketing. A total of 2,039 kg of dried pepper, bitter ball and okra were processed, of which 1,835 kg was sold to buyers and 204 kg (10 percent) was consumed by farmers.
- **Access to equipment loans through microfinance institution (LEAD, Inc.)**—ACE facilitated and linked five farmers’ groups, comprising 34 farmers, to LEAD for the purpose of providing irrigation equipment (motorized water pumps) on loan to farmers for off-season vegetable production. Clustered farmers contributed an initial amount of \$300 per water pump and LEAD loaned \$350, for a total of \$650 per pump. The loan component repayment of \$350, with an interest rate of 18 percent, was scheduled to be paid in three installments over a six-month period. Three of the five groups repaid ahead of schedule in two installments, and two completed on schedule, thereby increasing their credit worthiness with LEAD and eligibility to access direct cash loans.⁸ As a result, farmers consistently supplied vegetables to their buyers throughout the calendar year, which they reported increased their income and strengthened their relationships within the marketplace.
- **Training and mentoring on Farming as a Business practices** for 800 farmers was introduced along with farmer financial diaries (see Annex F) to assist farmers in managing their operations and tracking their financial goals. The IRIS research team sampled 250 of the 800 participant farmers in 2010 and used their farmer financial diaries as a primary source for data collection for evaluation purposes. ACE contextualized the ACDI/VOCA FaaB manual to suit the Liberian farmers. Some of the farmers’ children helped their semiliterate or illiterate parents to record their farm business records.
- **Radio programming**—ACE provided a grant of \$16,782 to Radio Gbarnga, in partnership with Radio Saclepea, to promote agricultural radio programming in Bong and Nimba counties. The radio program was designed to reach out to a wide audience (5,000 estimated listeners) with various topics on best agricultural practices and FaaB concepts. The program was broadcast weekly over the period of 11 months (January-November 2013). Messages on protecting the safety of children when handling agricultural inputs were emphasized. In order to increase listenership and encourage farmers’ interaction after the broadcast of each program, Radio Gbarnga established 10 radio listeners’ clubs (six in Bong and four in Nimba). The establishment of these clubs enabled Radio Gbarnga to gather farmers’ feedback and recommendations for the improvement of the radio program. The establishment of the radio listener clubs was a precursor for several groups to form their own farmers’ associations. A total of 203 farmers directly

⁸ At the time of writing no new loans had been distributed to ACE farmers.

participated in the radio program through mobile phone-ins. See Annex E for a list of radio topics and call-in responses. As a result of the radio programs, CARI signed an agreement with Radio Gbarnga to produce a similar agricultural program. Additionally, several input dealers have begun advertising their products through the radio station.

- Value chain stakeholder workshops organized**—ACE organized two vegetable value chain stakeholder workshops in December 2011 and February 2013 in Monrovia, Gbarnga and Saclepea that brought together value chain actors (input dealers, farmers, buyers, Ministries of Agriculture and Internal Affairs and NGO partners) to strengthen relationships, identify opportunities and constraints in the vegetable value chain, and draw up action plans for short- and long-term strategies to address identified constraints. The two workshops were followed by a validation workshop in August 2013 that aimed to validate progress made after the two stakeholder workshops in addressing identified constraints. The final stakeholder workshop concluded that ACE had contributed to increased confidence between farmers and buyers. It also added value through construction of nine solar dryers and improved financing for farmers linked to the microfinance organization LEAD to access equipment loans for off-season vegetable production.

Value Chain Constraints	Value Chain Opportunities
Weak market linkages as a result of lack of trust among actors, especially farmers and buyers	Strong end-market demand and accessible market outlets
Lack of storage facilities for vegetables	Water resources available for year-round production
Lack of agricultural finance	Willingness for value chain actors to communicate and share information

- Nine solar dryers constructed in Bong and Nimba**—ACE facilitated the construction of nine solar dryers in nine communities; six in Bong and three in Nimba Counties to address vegetable post-harvest losses mainly during rainy season harvest time. Farmers provided labor and local materials (wooden poles and mats) while ACE provided non-local materials (plastic sheets and assorted nails) for the construction of each dryer. In total, 179 farmers accessed the dryers and dried a total amount of 2,039 kg of assorted vegetables during the life of the project. Each member of the farmer cluster paid a monthly due for the maintenance of the dryers and a drying service fee based on the quantity dried. The clusters plan to use the service fees for the expansion of the drying facilities as well as the construction of additional dryers.
- Agricultural inputs safety**—ACE organized and trained 42 participants, including six community-based input dealers, 32 lead farmers and four district agriculture officers in agricultural inputs handling. Topics discussed included the importance of agricultural inputs and their safe usage and management. Keeping children safe during the application of inputs on the farm was also highlighted. After the training, input dealers continued providing awareness on input handling in farming communities with cluster farmers, and participated in the radio program, explaining the proper usage and management of agricultural inputs.

Summary of Results and Accumulated Achievements:

- 400 vegetable farmers received a package of training in vegetable production best practices and FaaB
- 975 rice farmers were trained in quality rice seed production and post-harvest handling
- Three vegetable value chain stakeholder workshops were organized to identify common opportunities and constraints
- 42 participants, including lead farmers, input dealers and District Agriculture Officers were trained in agro-inputs handling and management
- Five farmer groups comprising 34 farmers were linked to microfinance institution LEAD, Inc. and obtained equipment (motorized water pump) loans that increased dry-season vegetable production and income
- Nine solar dryers were accessed by 179 farmers, who dried a total of 2,039 kg of dried vegetables valued at \$8,884 to address vegetable post-harvest losses during the rainy season
- Launched a one year radio program and 10 listeners' clubs established with an estimated listenership of 5,000

3. Key Successes

The following key successes were achieved over the life of the ACE project, that led to observed positive effects on children.

- **Increased volume of rice available for household consumption**—Rice is the main staple food in Liberia and considered essential to a family's food security needs. ACE introduced high-yielding varieties coupled with best agronomic practices and post-harvest handling techniques that improved 975 rice farmers' production yields. This resulted in an increase in volume of rice available for household consumption from an average of 360 kg to an average of 550 kg, the amount of rice needed for a family of six over the hunger season (see text box on pg. 5 for further breakdown of household consumption requirements). Consequently, money that would have been used to purchase rice was observed by ACE staff to be used for the wellbeing of children; school enrollment and school material purchases during the hunger periods increased noticeably.
- **Increased vegetable production**—Vegetable production significantly increased, from 314 kg per household to 458 kg per household, as a result of the introduction of modern farming practices such as irrigation during the dry season when vegetables are scarce. The increase was also a result of low-cost production methods and links to consistent input supplies. Staff observed that the increased vegetable production also contributed to increased vegetable consumption by households.
- **Increased household income**—Farmer financial diary data indicated that household income increased considerably from \$71 to \$313 (over 400 percent for sampled farmers) as a result of the sales of excess vegetables, linkages with buyers and increased marketing activities. Field staff observed that, with this increased income, farmers could more easily purchase their children's school supplies and clothes.

4. CHALLENGES

The following section describes key challenges that ACE faced and the related actions it took to overcome these challenges:

- **Shortage of certified rice seed**—At the onset of the rice activity in 2010, ACE encountered a shortage of certified NERICA 14 seed and therefore decided to focus on LAC 23 in 2011 by establishing seed loan targets of 20 MT of LAC 23 seed to 800 farmers. Though the LAC 23 was found to be more suitable for farmers' needs as compared to NERICA 14 (see pg. 5), it was also in short supply. As a result, ACE had to reduce its farmer target by 26 percent, reaching 591 farmers and its seed target by 19%, distributing a total of 16.2 MT after sourcing the seed through one of CARI's outgrowers. However, ACE was able to reach an additional 240 new rice farmers in 2012 and 144 in 2013 utilizing the seed repaid by farmers through the seed loan scheme managed by the local private sector seed broker, LIFARCO.
- **Poor Infrastructure**—As a result of the 14-year civil conflict, infrastructure such as roads, market structures and storage facilities were severely damaged. The road networks, especially in Bong and Nimba counties, are limited and poor. During the rainy season, roads were flooded and bridges were impassable, which cut production areas off from the main roads and made it difficult to transport produce to regional markets. This has led to high transport fares for farmers and traders. The government is making some efforts to address the situation, with several new road construction projects, however, transportation is still a major hindrance.
- **Lack of cold storage facilities**—Another challenge is the lack of cold storage facilities to store fresh vegetables due to the lack of a national electricity grid. To overcome this, ACE introduced solar dryers to dry crops during the bumper harvest to mitigate the spoilage of vegetables. This also addressed the issue of transportation challenges as farmers could wait to sell their produce during the dry season when road transport and prices were more favorable. The prices of bitter balls and pepper during the surplus period August-October were \$0.15–0.20/ kg and \$0.35–0.65/ kg respectively, as reported from regional market price surveys conducted by ACE field staff. Alternatively, the prices for dried bitter balls and pepper during the period February-March were reported as \$3.60–5.00/kg and \$8.00–10.00/kg respectively. Therefore, the price margin differential on dried vegetables as compared to the fresh ones sold during the surplus period is more than 1,000 percent over the six-month period.

Before the construction of the solar dryers, ACE linked farmers to buyers who were mainly involved in the sale of dried vegetables. The buyers consistently visited the communities to observe the drying process and observed the produce before the drying process was concluded. All transactions were done in the communities, which reduced the amount of time and expense farmers spent traveling. It also reduced these costs for buyers who had been traveling to neighboring Guinea and Ivory Coast to source dried vegetables.

- **Lack of access to financing for vegetable farmers**—Access to finance is essential for farmers to expand and increase their production. Financial institutions consider agricultural production, especially for the vegetable subsector, as a high risk and are reluctant to lend to farmers, the majority of whom are self-financed. ACE was able to encourage LEAD, a local microfinance organization, to provide equipment loans to five farmer groups through a grant

that helped reduce these perceived risks and which has provided an incentive to LEAD to expand their agriculture lending portfolio. The repayment of the loans by these five groups made them eligible for cash loans from LEAD.

- **High cost of inputs**—The cost of inputs such as seeds, fertilizers, pesticides and farming tools are high in Liberia as compared to other neighboring countries in the West African subregion. For example, a 50 kg bag of NPK 15-15-15 fertilizer in Liberia is sold on the open market for \$55–60, whereas it is sold for \$30–35 in Ghana or Guinea. To mitigate the situation, ACE introduced local seed selection techniques among farmers, organic fertilizer preparation and usage, and soap solution as a low-cost pesticide substitute, and encouraged farmer clusters to bulk purchase inputs from local input dealers, thereby lowering input costs.

5. KEY LEARNING

The following is the key learning that ACE captured over the life of the project:

- **Value chain approaches must be in line with current market conditions**—At the beginning of ACE in 2008, the private sector was very limited and the few existing agribusiness firms had little interest in working with subsistence-level farmers. Firms preferred instead to concentrate on marketing seeds and fertilizers to NGOs and international aid programs. ACE’s initial assessment overestimated the capacity of these firms to drive value chain development and also underestimated the market distortion caused by relief and humanitarian programs. A value chain linkages assessment at the beginning of project implementation would have given ACE a better understanding of the market conditions. The assessment would have considered the market infrastructures and segments as well as the ability of the private sector to drive the process.
- **Regional and local value chain actors are better equipped to service smallholders**—ACE’s strategy of targeting Monrovia-based input firms such as ANARCO and Green Farm and buyers such as GITCO Ltd. and the Liberia Marketing Association were not successful, as the Monrovia firms were unprepared to deal with the difficult transportation infrastructure as well as the weak demand from mostly subsistence-level farmers. ACE changed its approach to focus on regional and local firms that were closer and were more attuned to ACE farmers’ communities needs. These firms were better equipped to service smallholders rather than the NGOs and government programs. ACE eventually linked the regional firms to a national-level firm called WIENCO, which was able to deliver a steady supply of goods on credit for distribution through the local agrodealers. Similarly, regional buyers were linked to national level players such as the LMA where produce could more easily be transported through local distribution networks.
- **Rice seed loan program was a first key step to increasing market-oriented behavior**—ACE’s seed loan program attracted many farmers as rice seed was in very high demand because traditional varieties were low yielding. This was the initial first step to integrating subsistence farmers into the value chain. Farmers’ interaction with a private rice seed broker through the rice seed loan program increased their confidence in engaging in commercial agriculture production. This helped lay the foundation for future relationships with input dealers and buyers. Additionally, 302 rice-only farmers later became involved in vegetable production; these farmers are reported as overlapping farmers in ACE’s database.

- **Repayment of seed loans is more successful through private partnerships**—Many NGOs, as well as the government through the Ministry of Agriculture, were running direct seed loan programs with farmers, who had low repayment rates. ACE’s engagement with a local private seed broker to manage the seed loan program was a key factor contributing to high repayment rates (96 percent average repayment), because farmers perceived the program as a loan and not as a free handout, like other programs managed by the government or NGOs.
- **Lead farmers are key to spurring adoption and farming upgrades**—Lead farmers (A-level farmers⁹) took first steps to making their farmland available for demonstration of new varieties and practicing modern farming techniques. They also took steps to engage in pre-season buying agreements, served as aggregators, and were first adopters of new technology upgrades such as irrigation and drying equipment. In order to disseminate best practices among farmers, ACE facilitated exchange farm visits allowing B- and C-level farmers to visit A-level farms. ACE also used the regular monthly cluster meetings as a venue for A-level farmers to explain best practices introduced by ACE and their successes with buyers to other farmers. As a result of the increased interactions, some B- and C-level farmers followed afterwards by adopting best agronomic practices.

⁹ A-Level farmer – There were 73 farmers considered A-Level farmers. Selection criteria were based on production capacity of at least one acre, aggregator of at least five farmers, fast adopter of best agronomic practices and FaaB, and served as a demonstration farmer.

6. MONITORING AND EVALUATION

6.1 ACE Performance Monitoring Plan System

The following table provides an explanation of indicators and methods of data collection used during the ACE project.

Indicator	Indicator Definition	Unit of Measure	Disaggregation	Source of Data	Method for Data Collection	Responsible	Frequency of Data Collection	Frequency of Reporting
Child Level Impact Learning Indicators *These learning indicators were evaluated by FHI 360/IRIS.								
Improved school attendance and enrollment								
Improved child nutrition								
Improved child health								
Improved household food security								
Input 1: Input service provider linkages								
Input level indicators								
1.1 Smallholder access to improved inputs facilitated through ACE intervention								
1.1.a - # of promotional events conducted	Promotional events are defined as input-service-provider-led advertisements of agricultural products on the radio or during community-based events.	# of events	community & input firm	records from radio stations, input firms and monthly field reports, smallholder diary	ACE conducts document review of internal records of firms and smallholder diary	Field teams & Field Coordinator	Before each production cycle - twice a year	Semi-annually
1.1.b - # of smallholders purchasing inputs	The definition refers to the number of smallholders purchasing inputs (for both vegetable and rice production) from private input firms and the open market as a result of ACE facilitation activities such as linkages and promotion of improved agronomic practices	# of smallholders	community & sex of the head of the household	IP records & smallholder diary	ACE conducts document review of internal records of firms and smallholder dairy	Field teams & Field Coordinator	Before and after each production cycle-twice a year	Semi-annually
Outcome level indicators								
1.1.1 Increased productivity of vegetables								
1.1.1.a-Total production of vegetable	Total production of selected vegetable crops generated with the assistance of ACE. Volume will be measured in kg. Selected crops will be: bitter balls, peppers, watermelons, lettuce, etc.	kgs/HH	Community, sex of household head & crop (pepper, bitter balls, high-value, etc.)	smallholder diary & monthly field reports	ACE tracks crop yields through review of smallholder diary and field reports	Field teams & Program Manager	Before and after each production cycle	Semi-annually

Indicator	Indicator Definition	Unit of Measure	Disaggregation	Source of Data	Method for Data Collection	Responsible	Frequency of Data Collection	Frequency of Reporting
Input 2: Provision of improved rice seeds								
Output level indicators								
2.1 Improved rice varieties are grown								
2.1.a- Volume of improved rice seeds supplied to smallholders	Improved rice seeds are seeds purchased through a certified source (e.g.,CARI, MOA, FAO) and are supplied to farmers through ACE supported firms. ACE firms are CARI certified seed out-growers (smallholders & firms)	kgs/acre	community, sex of the head of household & seed variety	input firm records, smallholder diary & field reports	review of firm records and smallholder diary & interviews with smallholders	Field teams & Field Coordinator	Before every upland rice production cycle	semi-annually
2.1.b- # smallholders who receive improved rice seeds	Recipients are defined as smallholders who purchase (loan or cash) improved rice seed varieties either through ACE facilitated firms	# of smallholders	community, sex of the head of the household & seed variety	input firm records, smallholder diary & field reports	review of firm records and smallholder diary & interviews with smallholders	Field teams & Field Coordinator	Before every upland rice production cycle	semi-annually
Outcome level indicators								
2.1.1 Increased productivity of rice								
2.1.1.a- Average Yield of rice	Average yield of rice is defined as $Y=P/A$, where Y is the average yield and P is the total production in kgs/bags. And A is the area of the field harvested.	kgs/acre	community, sex of the head of the household & seed variety	Review of firm records and smallholder diary and interviews with smallholders	review of firm records and smallholder diary and interviews with smallholders	Field teams & Program Manager	After every upland rice production cycle	semi-annually
2.1.1.b- Volume of rice available for household consumption	Total volume available to the household measured by the number of bags/kgs stored at the household (at the end of the harvest)	kgs	community, sex of the smallholder & rice variety	smallholder diary, triangulated by staff field reports and interviews with smallholders	review of smallholder diary and interviews with smallholders	Field teams & Program Manager	during the hunger season between July-September	semi-annually
Input 3: Technical Assistance								
Outcome level indicators								
3.1 Smallholder trained in improved agronomic practices								
3.1.a- smallholders who received short-term	The number of smallholders to whom significant knowledge or skills have been imparted in agronomic practices, through formal or	# of smallholders	community, household & type of training	field reports & partner records	review of field reports, partner records and interviews	Field teams & Field Coordinator	quarterly	quarterly

Indicator	Indicator Definition	Unit of Measure	Disaggregation	Source of Data	Method for Data Collection	Responsible	Frequency of Data Collection	Frequency of Reporting
agricultural training	informal means. Knowledge or skills gained through technical assistance activities facilitated by ACE staff and partners				with smallholders			
3.1.b-extension visits to smallholders by project staff	Extension visits are defined as in-community and on farm consultations with project staff and partners during which constraints and opportunities for increased productivity are addressed with smallholders	# of visits	community, field team & partner	field reports & partner records	review of field reports, partner records and interviews with smallholders	Field teams & Field Coordinator	monthly	quarterly
Outcome level indicator								
3.1.1 Increased upgrading among smallholders								
3.1.1.a-smallholders households who adopted at least 3 three sustainable agricultural production technologies	Number of households in the survey population that have adopted a minimum of three sustainable production technologies or practices being promoted by the project and are aimed at increasing productivity and income. The identified practices: nursery preparation; field layout, planting in rows, weeding, irrigation, etc. The formula is adoption/number trained	# of smallholders	community, sex of the head of the household & type of technology	smallholder diary& field reports	interviews with project participants and internal review of ACE field reports	Field teams & Program Manager	during every production cycle	semi-annually
3.1.1.b-smallholders who adopted at least 3 three sustainable post-harvest technologies	Number of households in the survey population that have adopted a minimum of three sustainable post-harvest technologies or practices being promoted by the project and are aimed at increasing productivity and income. The identified practices: solar drying, storage, packaging etc.	# of smallholders	community, sex of the head of the household & type of technology	smallholder diary& field reports	interviews with project participants and internal review of ACE field reports	Field teams & Program Manager	during every production cycle	semi-annually
Output level indicator								
3.2 Smallholder trained in business management and planning								
3.2.a-smallholders trained in	Farming as a Business training refers to classroom and on-the-farm training in farm enterprise management	# of smallholders	community & sex of household head	field reports & partner records	review of field and partner reports and interviews	Field teams & Field Coordinator	after every training session	quarterly

Indicator	Indicator Definition	Unit of Measure	Disaggregation	Source of Data	Method for Data Collection	Responsible	Frequency of Data Collection	Frequency of Reporting
farming as a business	solutions. The curriculum is designed by ACDI/VOCA corporately and implemented by project staff & partners.				with smallholders			
Outcome level indicator								
3.2.1 Increased capacity for business planning & management								
3.2.1.a- smallholders keeping farm business records	Business records are defined as the smallholder diary. The diary provides a summarized view of major business transactions for every crop, including profit & loss statement. The diary is used by smallholders following an ACE facilitated training. Filling out the diary will be a measure of improved record keeping capacity.	# of smallholders	community & sex of household head	smallholder diary & monthly field reports	review of partner records and smallholder diary and interviews with smallholders	Field teams & PM	quarterly	quarterly
3.2.1. b # of smallholders reporting making informed production and sales decisions	This refers to the number of smallholders who report that they use market information to make agriculture production and sales decisions as a result of ACE interventions. Market information would include: prices, seasonal peaks and lows of commodities, types of crops, buyers' reliability, relationships with buyers, input providers, project staff, etc.	# of smallholders	community & sex of household head	smallholder diary &, monthly field reports	review of partner records and smallholder diary and interviews with smallholders	Field teams & PM	before and after each production cycle	semi-annually
Input 4: Smallholder-Buyer Linkages								
Output level indicators								
4.1 Vegetable production and sales decisions are driven by market signals								
4.1.a. # of smallholders reporting selling through formal and informal agreements with buyers organized before the harvest	Number of smallholders reporting selling through formal and informal agreements with buyers organized before the harvest	# of smallholders	community, sex of the head of the household, buyer & crop	smallholder diary, monthly field reports & buyer records	review of partner records and smallholder diary & interviews with smallholders	Field teams & Field Coordinator	quarterly	quarterly
4.1.b- smallholders selling in	Number of smallholders who report selling their crops into regional market as a result of	# of smallholders	community, sex of the household	smallholder diary, monthly field	review of partner records and	Field teams & Field Coordinator	quarterly	quarterly

Indicator	Indicator Definition	Unit of Measure	Disaggregation	Source of Data	Method for Data Collection	Responsible	Frequency of Data Collection	Frequency of Reporting
regional markets	ACE interventions instead of selling at farm gate. Regional markets are held weekly and are at a central location at the district level.		head, buyer & crop	reports & buyer records	smallholder diary & interviews with smallholders			
Outcome level indicators								
4.1.1 Increased smallholder income								
4.1.1.a- Average value of vegetable crops sold (through facilitated pre-harvest agreements)	Average value is defined as the dollar value of crops sold through preharvest (e.g., advance) agreements facilitated by ACE per production cycle/number of smallholders in targeted areas.	Dollar value of crops sold through pre-harvest (e.g., advance) agreements/year	community, sex of household head ,crops &buyer	firm records, smallholder diary, monthly field reports	review of partner records and smallholder diary and interviews with smallholders	Field teams & PM	after every production cycle	quarterly
4.1.1.b- Average value of vegetable crops sold (into regional markets)	Average value is defined as the dollar value of crops sold into regional markets per production cycle/number of smallholders in targeted areas.	dollar value of crops sold at regional markets /year	community, sex household head, crops & buyer	firm records, smallholder diary & monthly field reports	review of partner records and smallholder diary and interviews with smallholders	Field teams & PM	after every production cycle	quarterly

6.2 Performance Monitoring Plan (PMP) Achievements

The table below highlights the actual PMP achievements over the LOP. FY 2009–10 were used as a baseline throughout the LOP.

Indicator	Performance Indicators	Baseline	LOP Targets	LOP Achieved	% of LOP Target Achieved
IR.1	Input service provider linkages				
IR.1.1	Smallholder access to improved inputs facilitated through ACE interventions				
1	# of promotional events conducted (# of events)	5	48	39	81%
2	# of smallholders purchasing inputs from input firms (# of smallholders)	441	960	1,219	127%
IR.1.1.1	Increased productivity of vegetables				
3	Total production of vegetable crops (kg/HH)	314	360 ¹⁰	458	127%
IR.2	Provision of improved rice seeds				
IR.2.1	Improved rice varieties are grown				
4	Volume of improved upland rice seeds supplied to farmers (kg)	1,975	29,600	25,800	87%
5	# smallholders who receive improved rice seeds (# of smallholders)	396	1,104	975	88%
IR.2.1.1	Increased productivity of rice				
6	Average Yield of rice (kg/ha)	1,800	1,800 ¹¹	1,440	80%
7	Volume of rice available for household consumption (kg)	263	551	525	95%
IR.3	Technical assistance				
IR.3.1	Smallholders trained in improved agronomic practice				
8	Smallholders who received short-term agricultural training (# of Smallholders)	475	1,104	1,348	122%
9	Extension visits to smallholders by project staff(# of Visits)	210	1,104	3,175	288%
IR.3.1.1	Increased upgrading among smallholders				
10	# of smallholder households who adopted at least 3 three sustainable agricultural practices (# of smallholders)	430	768	760	95%
11	Smallholders who adopted at least 3 three sustainable post-harvest technologies (# of smallholders)	430	768	663	86%
IR.3.2	Smallholders trained in business management and planning				
12	Smallholders trained in farming as a business (# of smallholders)	219	1,000	1,271	127%
IR.3.2.1	Increased capacity for business management and planning				
13	# of smallholders keeping farm business records (# of smallholders)	0	768	727	95%
14	# of smallholders reporting making informed production and sales decisions (# of smallholders)	0	537	507	94%
IR.4	Smallholder-buyer linkages				
IR.4.1	Vegetable production and decisions are driven by market signals				
15	# smallholders selling through preharvest arrangement (# of smallholders)	219	120	201	168%
16	# smallholders selling in regional markets(# of smallholders)	45	480	473	99%
IR.4.1.1	Increased smallholder income				
17	Average value of vegetable crops sold through preharvest arrangements(\$/kg)	\$7,788	\$37,500	\$65,793	175%
18	Average value of vegetable crops sold in regional markets(\$/kg)	\$11,034	\$150,000	\$138,367	92%

¹⁰ ACE estimated a 5 percent annual increase from the 2009–10 baseline of 314 kg/HH.

6.3 M&E Overview

M&E System Overview—The M&E system went through a series of changes. At the inception of the project in 2008/2009, the M&E component began with the gathering of baseline information for each of the proposed indicators. However, during the process, we realized that substantial quantitative data, such as production and sales data, was difficult to locate from the targeted communities. As a result, we decided that the 2009/2010 results achieved by ACE would be used as baseline value for the indicators. Subsequently, in 2010, performance indicators that were closely related were consolidated from the original 24 to 18. Additionally, direct child impact indicators were initially included in the ACE PMP. The indicators included were: improved school attendance and enrollment; improved child nutrition; improved child health; and improved household food security. These child level impact indicators were removed in 2010 as they were difficult to track since the ACE project was not directly working with children. It was subsequently decided that the direct child impact indicators would be evaluated by the University of Maryland’s IRIS Center, an international development research institute. The IRIS Center was subcontracted by FHI 360 and subsequently signed an MOU with ACDI/VOCA to develop a revised research plan, which included both monitoring and evaluation components that reflected changes in the project and donor focus. Eventually in 2012, the responsibility for child-level impact indicators was transitioned again over to FHI 360 when the IRIS Center ceased its operations.

Farmer Financial Diaries (FFD)—To support the M&E system, ACE developed a farmer financial diary as the primary tool for farmer-level data tracking and collection. The diary provided a summarized view of revenues and expenses for crops under cultivation, including profit and loss analysis. IRIS then randomly sampled 250 farmers from a pool of 800 ACE farmers in Bong and Nimba counties whose vegetable and rice production activities were monitored from 2011 to 2013 that formed part of the research data gathered by IRIS and FHI 360. The regular diary entries were also a measure of farmers’ improved recordkeeping capacity and overall ability to manage their farming enterprises.

Using the FFD not only served as a data collection tool, but as a practical methodology to shift the farmers’ perception of “farming being a way of life” to “farming as a business.” One major challenge that came to light from the FFDs was that the vast majority of project farmers (approximately 90 percent) could not read and write sufficiently well to be able to track their production activities in the FFD. Even the very few who could read and write struggled with understanding the idea of farm recordkeeping and its significance in terms of managing their farming business. With the high ratio of farmers to ACE field staff, it was difficult for staff to help farmers complete the monthly FFDs and data collection process. To address this, ACE trained 20 cluster heads and several literate farmers in the entire FFD process to help record the production activities of those clustered farmers who were illiterate. Additionally, ACE trained farmers’ school-aged children (in the fifth and sixth grades) to help record their parents’ farm activities. With this assistance in place, ACE field staff used the monthly cluster meetings as an

¹¹ 1,800 kg/ha was the yield taken from the CARI research fields and assumes a high input regime along with professional-level knowledge of agronomic practices. In retrospect, a target of 1,500 kgs/ha would have been more realistic, since rice farmers in Liberia do not use inputs, but instead depend on fallowed land to boost yields.

opportunity to review each farmer FFD and make corrections, while at the same time collecting production data for reporting purposes. The continuous participation of school aged children who were trained in the farm recordkeeping process was not sustainable for some families, however, since several children left their farming communities to go to the district capital city to continue their school after the completion of the sixth grade. This created another gap that led to inconsistencies in the recordkeeping ability of the farmers who depended on their children to record their farm business records.

Another challenge was that even though illiterate farmers agreed to be assisted by other farmers and cluster heads who were trained in the use of the FFD, several smallholders were not willing to disclose their financial information to a second party. It was noted that the column in the FFD on sales was widely under-reported among smallholders, because farmers felt that disclosing true sales records to a second party for the purpose of farm record keeping meant that they would be denied future benefits from the project. This is a common mentality that persists in Liberia, resulting from the humanitarian needs-based approach of delivering aid.

Farmer Harris Waygbeh of Guawin, Nimba County, was asked by field staff why there was a difference in the market price and what was recorded in his farmer financial diary by the cluster head. He explained by saying, *“Tell me, I who have the farm and the man (cluster head) who is writing in my farm book (FFD), who is the boss man. If he is writing for me, then I am the boss, so anything I tell him to write that’s what he will write in my book (FFD).”*

Another identified factor for low levels of record keeping was the extent of vulnerability and the embarrassment faced by their level of illiteracy. Farmers who were more dependent on free inputs or the trading of labor for agricultural inputs showed lower levels of FFD record keeping and adoption. Though ACE recruited cluster heads to work with illiterate farmers in record-keeping, field staff observed a difference between the market survey prices and what was reported in the FFDs, including the 115 of the 250 sampled farmers that grew vegetables. The underreporting of sales by farmers was supported by the above revelation made by farmer Harrison Waygbeh of Guawin. This factor may have led to lower household incomes reported through the FFDs than was actually achieved. .

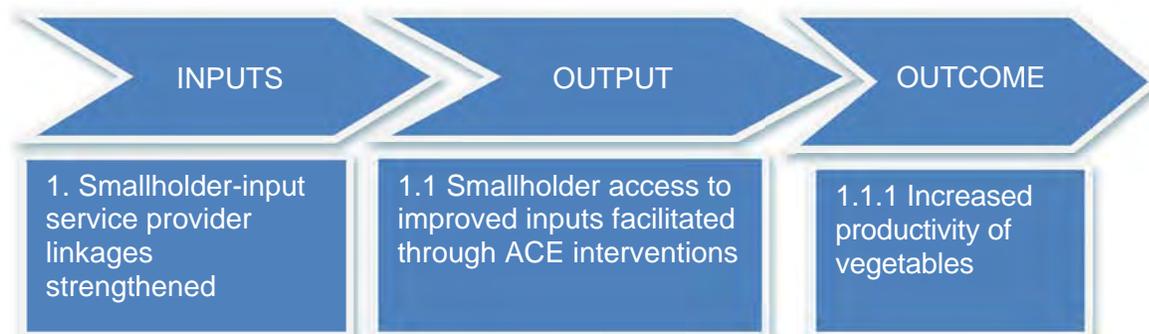
Cluster Farmers—ACE also organized 20 farmer clusters in project communities, which became an effective social network where farmers met at the end of each month to share their experiences and challenges related to production and the sale of vegetables. Each cluster had a total membership of about 40 farmers and was headed by a lead farmer, or cluster head, that organized and coordinated cluster activities including meeting dates and time. The network also promoted the adoption of best farming practices among smallholders. Field staff used the cluster meetings to conduct monthly routine data review and collection exercises used to fill in the quarterly PMP. The M&E officer also conducted field visits in the three counties of project implementation to carry out data quality audits.

6.4 M&E Analysis

The following section of the report provides achievements under the four key components reflecting inputs, outputs and outcome levels as shown below:

Component 1: Increasing Vegetable Production

INPUTS LEVEL: Smallholder-input service provider linkages strengthened



The assumption under this component was that linking smallholders and input service providers would increase smallholder access to inputs and at the same time increase the customer base for the input service providers to grow their businesses. In order to achieve this, a total of nine input service providers (ANARCO, Green Farm, A.S. Agro Business Center, Jacob Agriculture Business Center, Two Brothers Business Center, GLA-PAW-JAY, J. Miller Bee Agro Business Center, Becky Agro Retail Business, and WIENCO Liberia Limited) were identified and linked with farmers. As a result of the linkages facilitated by ACE, promotional events were conducted in the communities and relationships with farmers were strengthened. In all, 39 promotional events were conducted. Furthermore, ACE facilitated the link between community-based inputs providers with Radio Gbarnga and Radio Saclepea to promote their products.

OUTPUT LEVEL

1.1: Smallholder access to improved inputs facilitated through ACE interventions

The number of farmers who purchased inputs for both rice and vegetables increased from the baseline of 441 to 1,219 over the project period. Farmers were encouraged as inputs were made available in their communities and at the regional markets. They purchased inputs in bulk and also accessed inputs on loan from larger input dealers such as WIENCO.

OUTCOME LEVEL

1.1.1: Increased productivity of vegetables

As a result of the availability and access to inputs by the farmers through ACE facilitated linkages and promotional events in the communities and regional markets, as well as the adoption of best agronomic practices through ACE extension services, vegetable production increased considerably from the baseline of 314 kg to 458 kg.

Component 2: Increasing Rice Production



INPUT Level: Provision of high-yielding rice seed varieties

The premise under component two was that the provision of high-yielding rice varieties would increase food security as rice is the main staple food in Liberia. At the inception of the rice activities in 2010, ACE searched for high-yielding upland rice seeds, first through the CARI, the national agricultural research agency, to ensure that high-quality rice seeds were made available to farmers. CARI then referred ACE to one of its outgrowers, LIFARCO. Through LIFARCO, ACE managed several rice seed loan activities from 2010 to 2013. Overall, ACE reached 975 farmers with 25.8 MT of improved rice seed, achieving 87 percent of its original target of 29.6 MT.

ACE Rice Seed Loan Program Results				
Loan program (year, variety, mass)	Volume of Rice Seed Loaned to Farmers	# of Farmers	Amount of Loan Repaid	Repayment Rate
2011, LAC 23, 25kg loan	16.2 MT	591	6 MT / 591 farmers	91%
2012, LAC 23, 25kg loan	6 MT	240	3.6 MT / 240 farmers	100%
2013, LAC 23, 25kg loan	3.6 MT	144	NA ¹²	NA
Totals	25.8 MT	975	9.6 MT	96%

OUTPUT LEVEL

2.1 Improved rice varieties are grown

The availability of improved rice seed ensured the continuous planting and growing of rice in ACE communities. ACE supplemented the improved rice seed loan program with a package of technical training and monitoring and extension visits described further in the technical assistance section below.

OUTCOME LEVEL

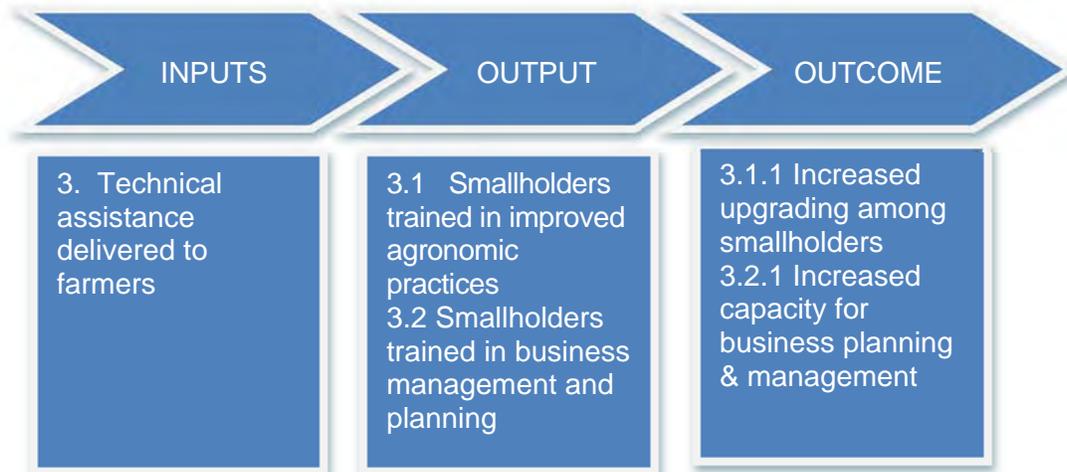
2.1.1 Increased productivity of rice

Farmers cultivating the traditional upland rice varieties were only able to achieve an average yield of 900 kg/ha. With the introduction of high-yielding upland rice varieties, especially the LAC 23, and adoption of improved production practices, such as timely weeding and harvest and

¹²The process was not concluded when ACE closed.

post-harvest handling practices, farmers increased the productivity of rice considerably, increasing average yields from 900 kg to an average yield of 1,440 kg per acre.

Component 3: Technical Assistance



INPUT LEVEL

The underlying assumption under component three was that the adoption of agricultural production best practices through technical assistance would increase farmers' productivity. At the beginning of the project in 2008, we realized that the agricultural knowledge and skills of smallholder farmers was lacking. ACDI/VOCA rolled out a package of technical assistance in best agronomic practices and FaaB. ACE conducted a significant number of extension visits. Over the life of the project, ACE carried out 3,175 extension visits to farmers, which was 288 percent over the target of 1,104. In addition to ACE staff providing these extension services, 20 lead farmers were selected as cluster heads to support extension outreach. They organized farmers into clusters and held cluster meetings.

Overall, a total of 1,423 farmers were reached with technical assistance over the course of the project. Of these, 384 dropped out of the project for various reasons, such as the relocation of farmers from ACE communities, death, or transition from farming to other business opportunities. The total number of farmers who stayed through the end of project was 1,039.

OUTPUT LEVEL:

3.1 Smallholders trained in improved agronomic practices

As part of its technical assistance to farmers, smallholders were trained in improved agronomic practices for both rice and vegetable production. The total number of smallholder farmers trained was 1,348, an increase of 22 percent over the target of 1,104 farmers.

Under the rice component, training included timely weeding to avoid competition with weeds, pest and disease management (bird scaring and fencing of farms to deter rodents), preharvest management and seed selection practices (healthy panicle selection), seed management (threshing, drying, winnowing and bagging), and germination testing. The vegetable production farmers were trained in best agronomic practices such as site selection, clearing, planting methods, timely weeding, pest and disease management, soil management, which included the application of wood ash to reduce soil acidity, compost making, and crop rotation.

3.2 Smallholders trained in business management and planning

The FaaB concept was introduced to farmers and formed the basis of training for smallholders in business management and planning. In total, 1,271 farmers were trained in FaaB, exceeding the target of 1,000.

The significance of the business management and planning training was to increase farmers' knowledge in farm business skills and marketing, and to also transform the mindset of farmers from "farming is a way of life" to "farming as a business (FaaB)." The FaaB training included basic recordkeeping skills, production planning and management, crop budgeting, and profit and loss analysis. A basic and simple-to-understand training guide was developed by ACE staff and used to train the smallholders based on the ACDI/VOCA FaaB training manual (see Annex C). The recordkeeping tool used was the FFD (see Annex F), which captured basic financial information on the particular crop under cultivation. It was also used for farmers to set production goals and household financial targets.

OUTCOME LEVEL

3.1.1 Increased upgrading among smallholders

ACE also introduced several technological upgrading practices for farmers. The upgrading practices included the introduction of nine solar dryers and five motorized water pumps that were procured through financing from LEAD, Inc. The solar dryers were used to dry vegetables, especially peppers and bitterballs and okra, during the rainy season harvest. The dried vegetables were then kept and sold during the dry season when vegetables are scarce, resulting in an increase in the price of pepper at an average of 400 percent and 200 percent for bitterballs. As a result of the introduction of solar dryers, the number of smallholders who adopted at least three sustainable post-harvest technologies increased over the life of the project from the baseline of 430 to 663.

3.2.1 Increased capacity for business planning and management

At the onset of the project in 2008 through 2009, recordkeeping among smallholders did not exist because of the low literacy levels previously mentioned in section 6.3. The introduction of FaaB concepts to farmers resulted in increased capacity for business planning and management. The number of smallholders keeping farm business records increased from the baseline of 0 to 727 as a result of assistance provided in farm recordkeeping to illiterate farmers by cluster heads and farmers' children.

Component 4. Smallholder-Buyer Linkages Strengthened



The assumption for component four was that by facilitating smallholder-buyer linkages, relationships would be strengthened between buyers and smallholders, thereby increasing sales for farmers. ACE facilitated linkages between smallholders and buyers through hosted meetings in some of the ACE communities and in the regional markets that resulted in eventual sales.

OUTPUT LEVEL

4.1 Vegetable production and sales decisions driven by market signals

The interaction between buyers and smallholders increased access to market information, and the development of FaaB training skills allowed smallholders to understand specific peak periods within the year to produce vegetables and to target those profitable market windows such as holidays and off-season production periods. The number of smallholders who reported that they used market information to make agriculture production and sales decisions increased from the baseline of 0 to 507.

OUTCOME

4.1.1 Increased smallholder income

Smallholders improved their income as a result of the increased production and sales of vegetables. They sold through two market channels: sales through preharvest agreements and through regional markets. In total, 201 smallholders sold through preharvest arrangements that amounted to a total value \$111,233 against the target of \$37,500. Likewise, 473 smallholders sold through regional markets, which amounted to \$138,367 against the target of \$150,000.

7. Questions to Explore and Considerations for the Future

Comparative study on the impact of economic strengthening on children—ACE staff believe that the project would have provided richer learning for USAID and development partners had it kept the child-level focused interventions throughout the project. At the beginning of ACE, there were several activities targeting children, such as the establishment of school gardens, support to parent-teacher associations, and public information campaigns about children’s nutrition and the value of education. These interventions would have provided an interesting opportunity for a comparative analysis of communities that only received economic strengthening activities or communities that did not receive any support at all. As the ACE program was very much concerned about how economic strengthening impacted children, it would have been interesting to have various intervention models comparatively analyzed.

Post-conflict environments have unique challenges—Liberia’s post-conflict environment provided unique challenges for ACDI/VOCA’s market development and value chain oriented approach. Significant adjustments were required as activities transitioned from a relief to a development orientation over the course of the project. In retrospect, Liberia may have not been the best country to test a pure economic-strengthening approach on the impact of children, given its ongoing humanitarian needs and the long-lasting effects on communities’ ability to adapt to the transition.

Impact of increased savings and loan activities—As ACE smallholders showed strong credit worthiness through the rice seed loan program and the equipment loan program, it would have been potentially more impactful to include a village savings and loan (VSL) component within the project. The VSL would have served as a platform for smallholders to increase savings and

investment in agricultural purchases such as inputs, hired labor and new technologies to increase vegetable production.

How to manage dependency syndrome among farmers?—ACE worked with smallholders who were mostly illiterate. The challenge in most cases was that illiterate smallholders under-reported their sales information to the cluster heads with the aim of receiving more benefits from the program. To them, recording the actual transaction in their FFDs represented a risk that they could be denied benefits from either ACE or other NGOs in the future. Since this behavior was not observed among cluster heads and literate farmers across project counties, it raises the question of whether these illiterate farmers would have continued to under-report if a numeracy program was introduced to enhance their quick learning of FaaB concepts or if they reached a certain level of productivity and income generation?

Pathways of ACE beneficiaries?— Was there a noticeable trajectory of different beneficiary segments from lower to higher production capacity levels? What were the underlying factors of success for different beneficiary categories?

Corresponding benefits to children—Did ACE's different beneficiary groups invest more or less in their children's well-being over the life of the project? How did more-successful farmers balance the need between investing in the household and investing in their farms?

Annexes

Annex A. ACE Project Communities and Farmers Reached

Annex B. ACE PMP Time Series Tables

Annex C. ACE Farming as a Business Manual

Annex D. ACE Training Guide for Rice Production

Annex E. Agriculture Radio Program Performance Monitoring Tracker

Annex F. ACE Farmer Financial Diary

Annex A. ACE Project Communities and Farmers Reached

COUNTY	COMMUNITY	Total # of Farmers Reached	# of Dropout Farmers	# of farmers that stayed on through the end of project
BONG	Beletanla	39	16	23
	Denta	71	16	55
	Gbenequelleh	118	31	87
	Gwatayta	5	1	4
	Joe's Town	23	5	18
	Kpaii	150	16	134
	Laworta	127	10	117
	Palala	29	9	20
	Rainbow Town	5	5	0
	Sengbeta	19	5	14
	Tamayta	62	19	43
	Tomato Camp	244	44	200
MONTERRADO	Careyburg/VOA	20	2	18
	Fendell	27	8	19
	Glozon Town	8	0	8
	Kponbah Town	3	0	3
	Mount Barclay	38	7	31
	Robert-king Town	3	0	3
	Vai-Tartee Town	4	0	4
NIMBA	Fleedin	35	8	27
	Garwonpa	39	14	25
	Gogein	29	18	11
	Guawin	61	17	44
	James Tiah Village	2	1	1
	Kpaytuo	122	68	54
	Massaquoi Village	22	9	13
	Nyansin	103	51	52
	Talk Camp	15	4	11
TOTAL	28	1,423	384	1,039

Annex B.ACE PMP Time Series Tables

Chart 1:

Smallholder access to improved inputs facilitated through ACE intervention				
Performance Indicator	Baseline	Total Achieved FY 2011	Total Achieved FY 2012	Total Achieved FY 2013
# of promotional events conducted (# of events)	5	1	13	25

Graph 1:

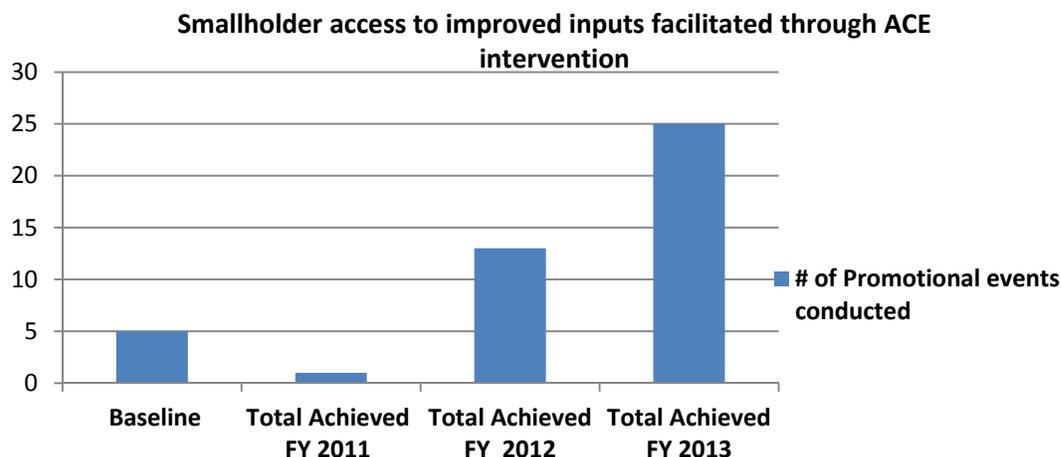


Chart 2:

Smallholder access to improved inputs facilitated through ACE intervention				
Performance Indicator	Baseline	Total Achieved FY 2011	Total Achieved FY 2012	Total Achieved FY 2013
# of smallholders purchasing inputs from input firms (# of smallholders)	441	835	736	324

Graph 2:

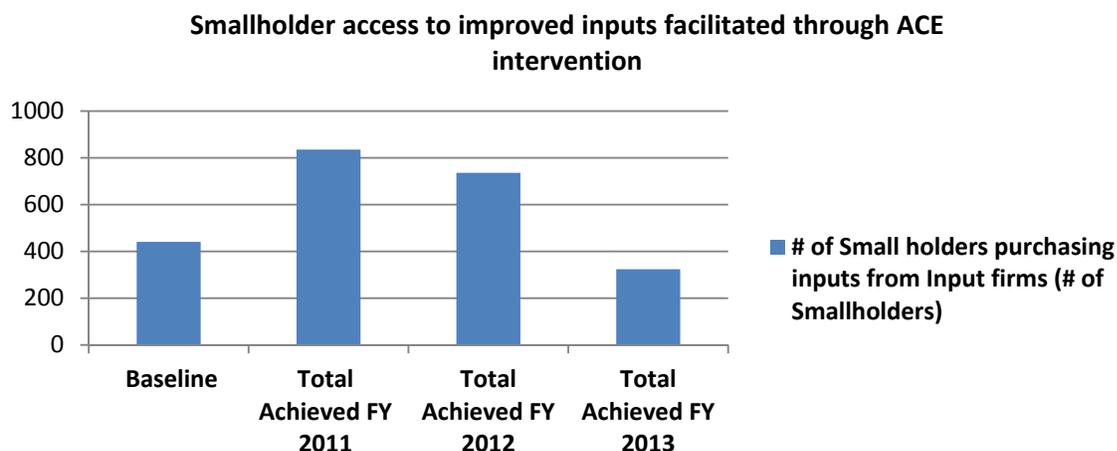


Chart 3:

Increased productivity of vegetables				
Performance Indicator	Baseline	Total Achieved FY 2011	Total Achieved FY 2012	Total Achieved FY 2013
Total production of vegetable crops (kgs/HH)	314	360	344	669

Graph 3:

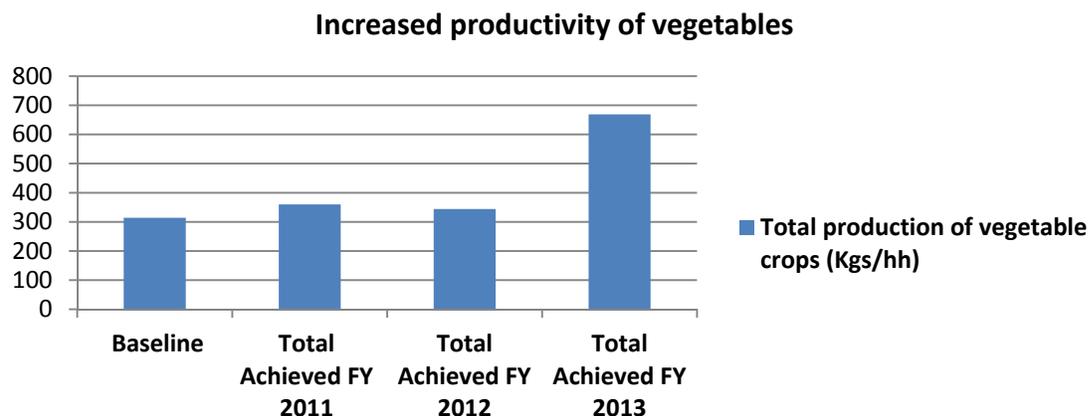


Chart 4:

Provision of improved rice seeds				
Performance Indicator	Baseline	Total Achieved FY 2011	Total Achieved FY 2012	Total Achieved FY 2013
Volume of improved upland rice seeds supplied to farmers (kgs)	1,975	16,200	6,000	3,600

Graph 4:

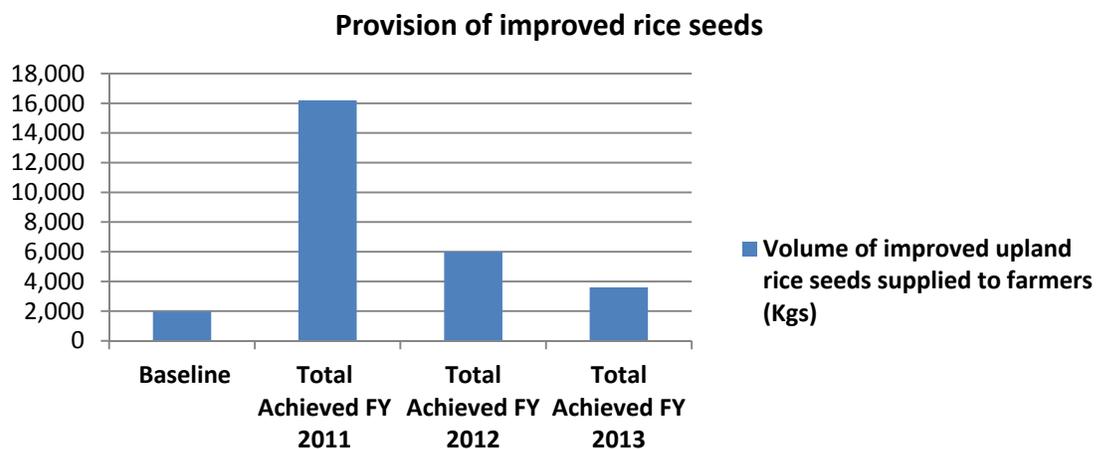


Chart 5:

Provision of improved rice seeds				
Performance Indicator	Baseline	Total Achieved FY 2011	Total Achieved FY 2012	Total Achieved FY 2013
# of smallholders who receive improved rice seeds (# of smallholders)	396	591	240	144

Graph 5:

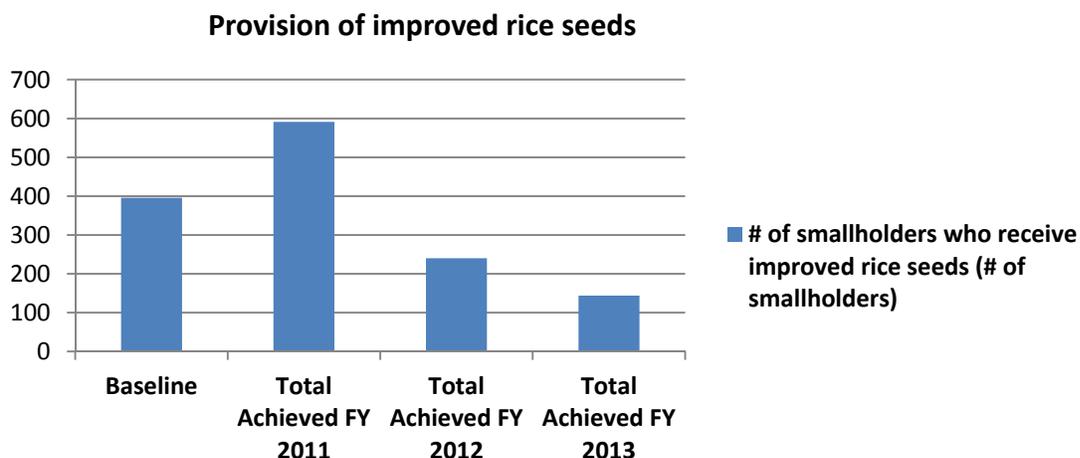
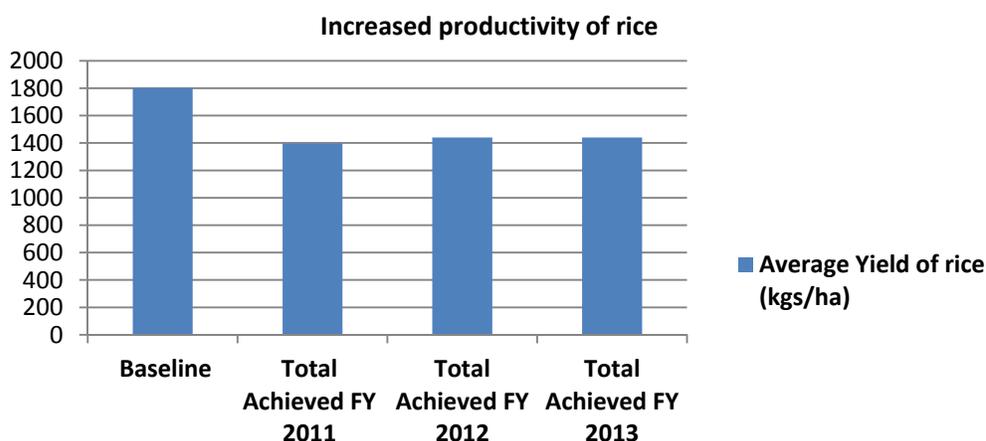


Chart 6:

Increased productivity of rice				
Performance Indicator	Baseline	Total Achieved FY 2011	Total Achieved FY 2012	Total Achieved FY 2013
Average yield of rice (kg/ha)	1,800 ¹³	1,397	1,440	1,440

Graph 6:



¹³ As noted in Footnote 11 on page 21, ACE believes that using data from CARI's output resulted in the establishment of an unrealistic baseline.

Chart 7:

Increased productivity of rice				
Performance Indicator	Baseline	Total Achieved FY 2011	Total Achieved FY 2012	Total Achieved FY 2013
Volume of rice available for household consumption (kgs/ha)	263	524	536	536

Graph 7:

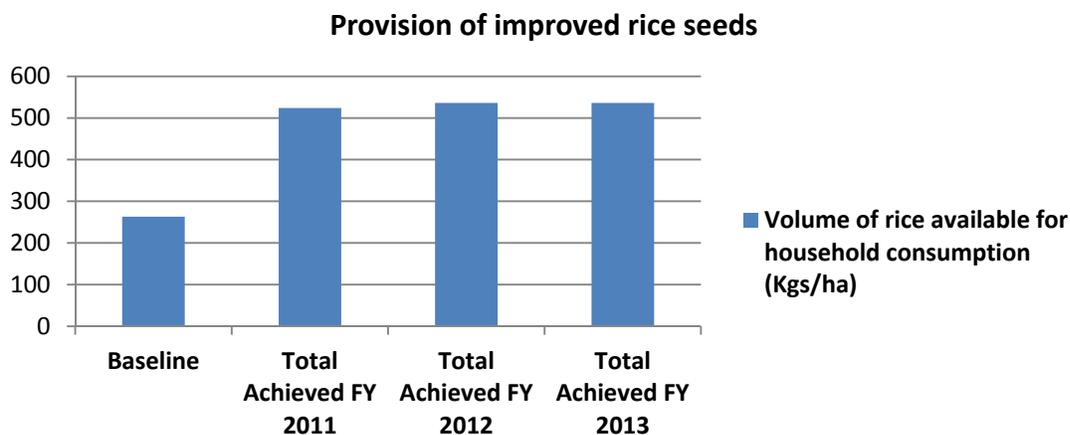


Chart 8:

Technical assistance				
Performance Indicator	Baseline	Total Achieved FY 2011	Total Achieved FY 2012	Total Achieved FY 2013
Smallholders who received short-term agricultural training (# of smallholders)	475	808	488	52

Graph 8:

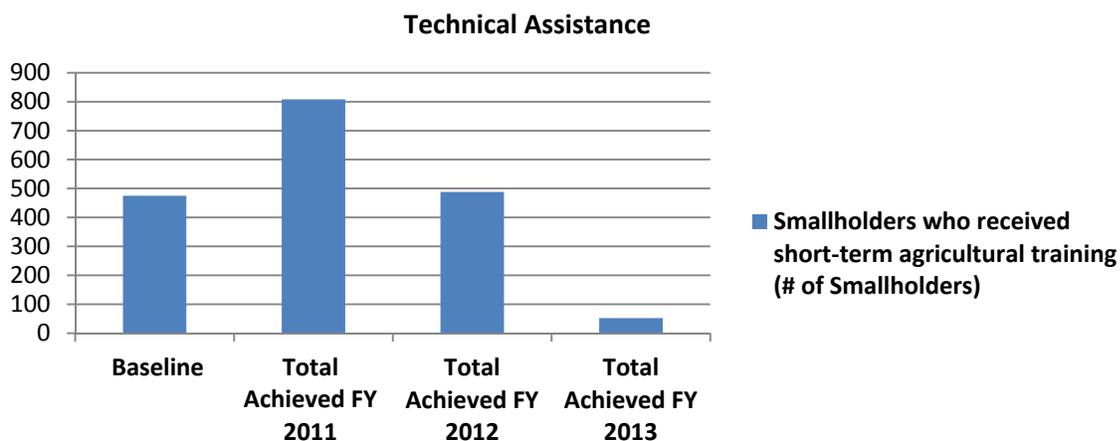


Chart 9:

Technical assistance				
Performance Indicator	Baseline	Total Achieved FY 2011	Total Achieved FY 2012	Total Achieved FY 2013
Extension visits to smallholders by project staff (# of visits)	210	1,036	1,079	1,060

Graph 9:

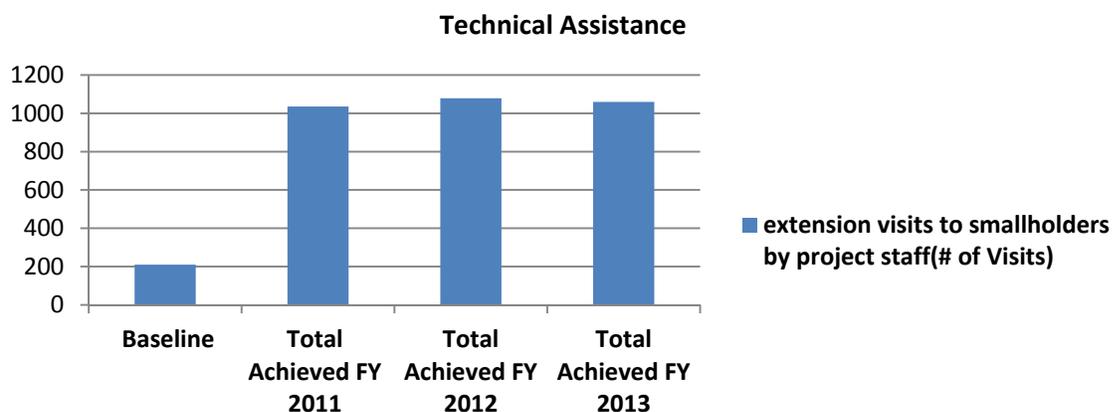


Chart 10:

Increased upgrading among smallholders				
Performance Indicator	Baseline	Total Achieved FY 2011	Total Achieved FY 2012	Total Achieved FY 2013
# of smallholders who adopted at least three sustainable agricultural practices (# of smallholders)	430	342	738	387

Graph 10:



Chart 11:

Increased upgrading among smallholders				
Performance Indicator	Baseline	Total Achieved FY 2011	Total Achieved FY 2012	Total Achieved FY 2013
# of smallholders who adopted at least three sustainable post-harvest technologies (# of smallholders)	430	640	663	384

Graph 11:

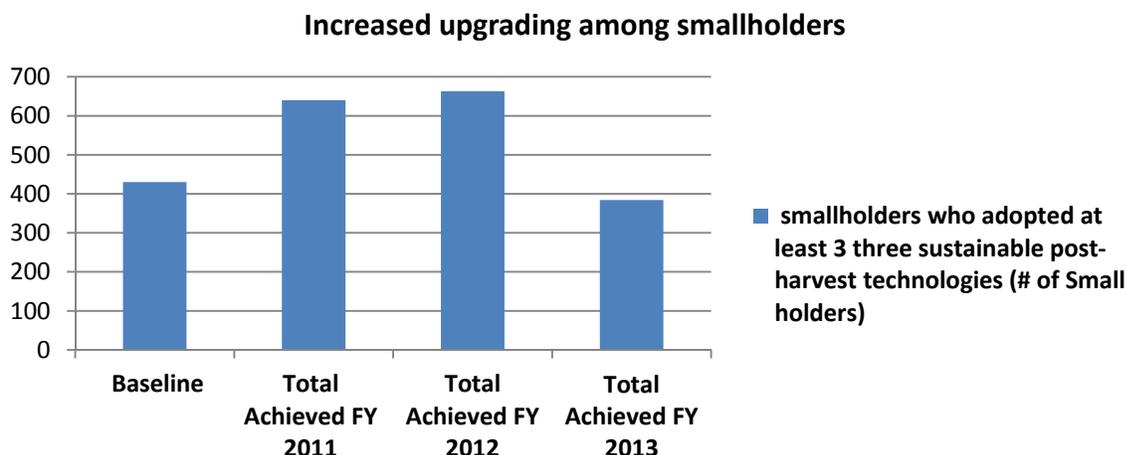


Chart 12:

Smallholder trained in business management and planning				
Performance Indicator	Baseline	Total Achieved FY 2011	Total Achieved FY 2012	Total Achieved FY 2013
Smallholders trained in farming as a business (# of smallholders)	219	808	413	50

Graph 12:

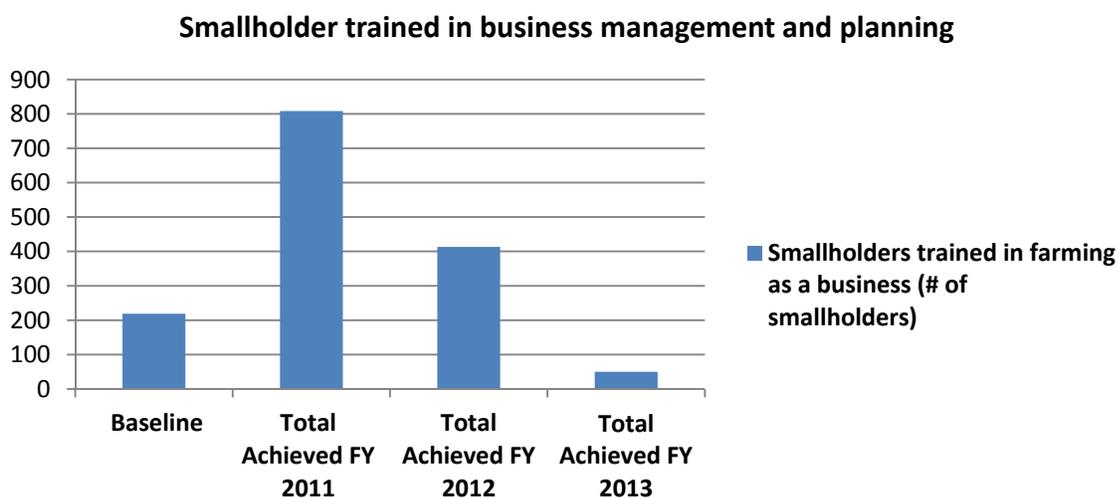


Chart 13:

Increased capacity for business planning and management				
Performance Indicator	Baseline	Total Achieved FY 2011	Total Achieved FY 2012	Total Achieved FY 2013
# of smallholders keeping business records (# of smallholders)	0	648	727	621

Graph 13:

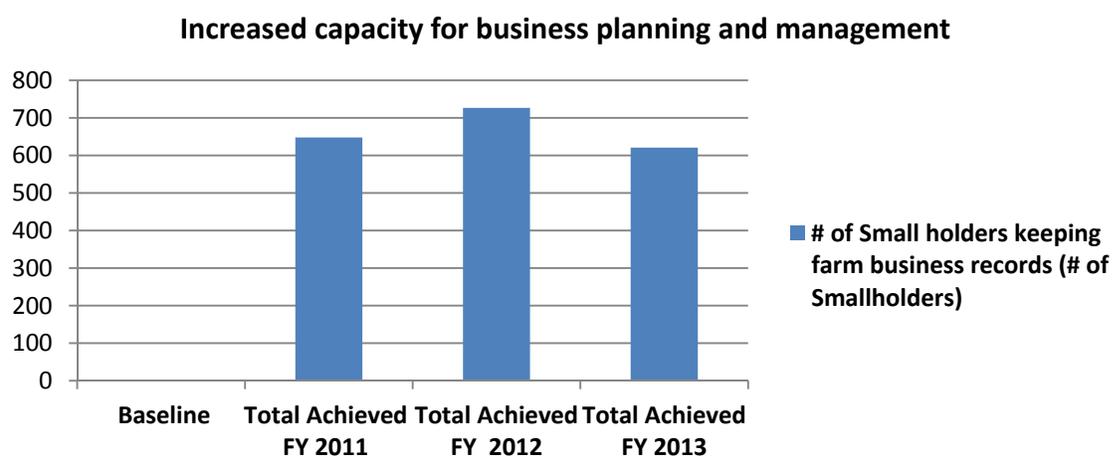


Chart 14:

Increased capacity for business planning and management				
Performance Indicator	Baseline	Total Achieved FY 2011	Total Achieved FY 2012	Total Achieved FY 2013
# of smallholders reporting making informed production and sales decisions (# of smallholders)	0	342	507	223

Graph 14:

Increased capacity for business planning and management

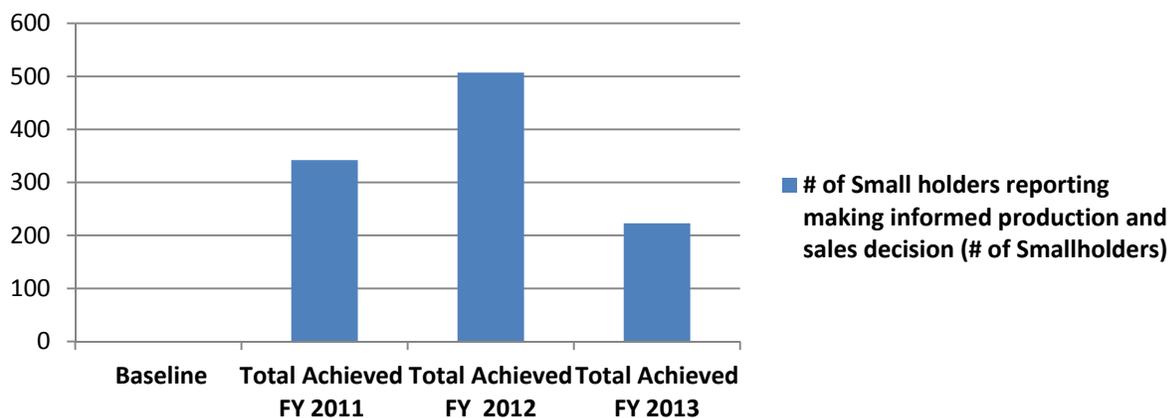


Chart 15:

Smallholder-buyer linkages				
Performance Indicator	Baseline	Total Achieved FY 2011	Total Achieved FY 2012	Total Achieved FY 2013
# of smallholders selling through preharvest arrangement (# of smallholders)	219	65	201	125

Graph 15:

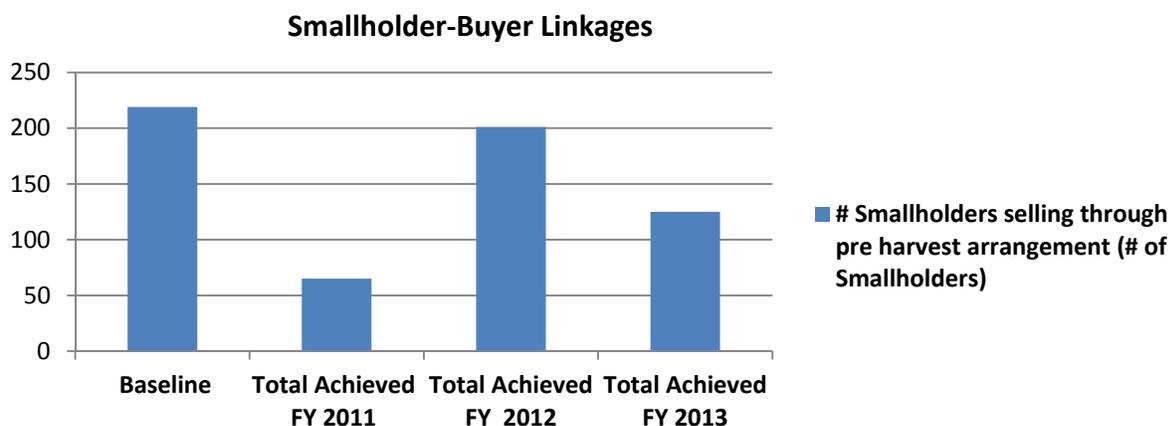


Chart 16:

Smallholder-buyer linkages				
Performance Indicator	Baseline	Total Achieved FY 2011	Total Achieved FY 2012	Total Achieved FY 2013
# of smallholders selling into regional markets (#of smallholders)	45	330	473	228

Graph 16:



Chart 17:

Increased smallholder income				
Performance Indicator	Baseline	Total Achieved FY 2011	Total Achieved FY 2012	Total Achieved FY 2013
Average value of vegetable crops sold through preharvest arrangement (US\$/kg)	\$7,788	\$8,694	\$34,385	\$68,154

Graph 17:

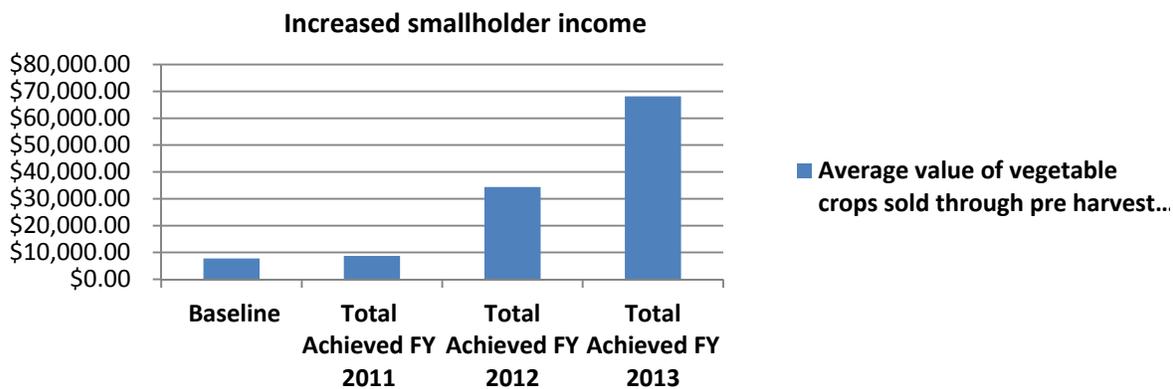
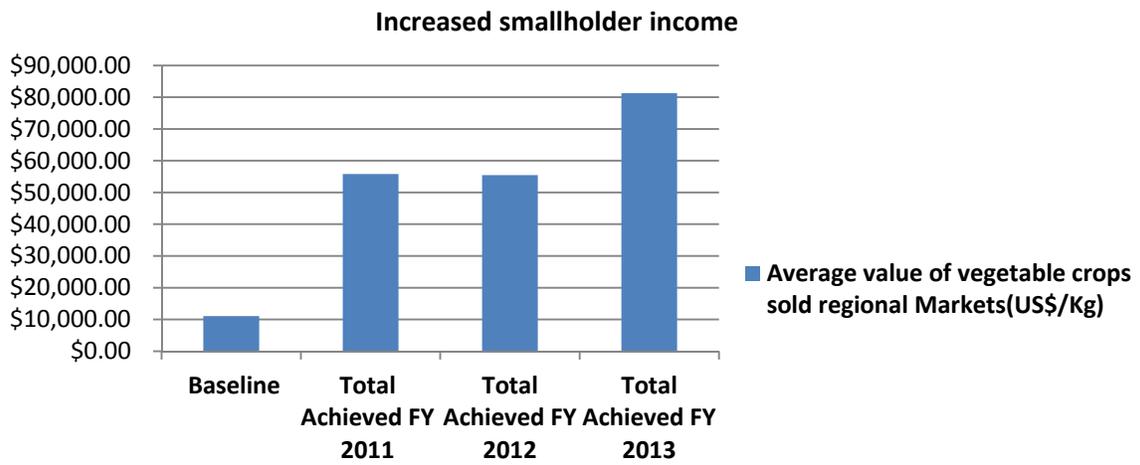


Chart 18:

Increased smallholder income				
Performance Indicator	Baseline	Total Achieved FY 2011	Total Achieved FY 2012	Total Achieved FY 2013
Average value of vegetable crops sold through regional markets (US\$/kg)	\$11,034.00	\$55,822.77	\$55,456.00	\$81,266.00

Graph 18:





**AGRICULTURE FOR CHILDREN'S EMPOWERMENT
(ACE) PROGRAM**

**MONTSERRADO, BONG & NIMBA COUNTIES
LIBERIA**

**FARMING AS A BUSINESS (FaaB)
TRAINING**

**A PRACTICAL GUIDE FOR VEGETABLE
FARMERS**

Introduction

The concept of Farming as a Business (FaaB) is relatively new, especially to rural vegetable farmers. These farmers still consider farming as a way of life rather than a business, and many farmers are looking to receive handouts from NGOs and other institutions. This situation has placed these farmers at a disadvantage rather than identifying the many business opportunities that come with farming. There are two main words covered in this training:

- Farming
- Business

It is very important for our farmers, especially rural vegetable farmers, to understand that Farming is a Business. As such, farmers **NEED** to understand what business is all about. This guide simplifies and focuses on the fundamental practices of FaaB.

Who is a Business Farmer?

All business farmers are farmers, but **NOT** all farmers are business farmers.

A business farmer is a person who uses business skills to produce a particular crop or crops, for example, pepper, bitter ball, watermelon, cucumber, etc., for the purpose of making a profit. He or she pairs or combines best production practices with business skills to produce a crop for sale.

A mathematical formula:

Farming as a Business = Best production Skills + Good Business Skills
--

How does the Business Farmer start?

- I. The process begins with planning
 - **What to grow?** At this point, the business farmer will decide what crop to grow and for what reason
 - **When to grow?** During the July 26 celebration, Christmas season, rainy season or dry season
 - **How to grow?** A business farmer will decide on the land size and the production cost (type of inputs and labor)
 - **Who are you growing for?** Very, very important! Who are your customers or buyers, whether retail or wholesale? A business farmer will make this point a priority.

Vegetable Farmer's Planning Tips
<ol style="list-style-type: none">1. What will I do with the money I am going to earn this season? (This will give you your goal and help you focus.)2. How much money will I use for this season's production? (Projected expenses; calculate your production cost.)3. Which crop(s) do I need to grow to make profit? (A business farmer WILL NOT grow a crop because everyone is growing it, or grow it at the same time everyone is growing it. A business farmer will make use of what is called "production timing")

4. How many bags (yield) do I need to harvest to make that money (market-customer/buyer and price—very important)?

Note: Participants can be split into smaller groups. Each group can prepare one enterprise budget for a specific crop (pepper, bitter ball, water melon) and do a presentation

Ask the participants “If you have two farmers living in the same community, one has good production skills but little business/marketing skills and the other farmer has good business/marketing skills but little production skills. What will be your advice to these two farmers?”

Budgeting

A budget involves collecting and organizing the resources you have and the resources you need to get to succeed with your plan. Every farmer’s plan must have a budget.

Parts of a Budget

A budget has three parts:

- 1) The expenses: assign costs to all the resources (inputs) needed for production (cutlass, fertilizer, labor, etc.)
- 2) The income source(s): estimate how much money you will make from the farm (number of bags and amount)
- 3) The net income (profit): subtract your expenses from your income to know what your profit will be

A simple production budget for one lot of bitter ball during the rainy and dry seasons. This can also be used for peppers.

A simple production plan for one lot of bitter ball farm RAINY SEASON PRODUCTION				
ACTIVITIES		Required Person or Day	Unit Cost LD	Total Cost LD
1.	Site selection	1	150	150
2.	Brushing	2	150	300
3.	Burning	0.5	150	75
4.	Clearing	1	150	150
5.	Field layout & digging	2	150	300
6.	Nursery preparation	1	150	150
7.	Transplanting of seedlings	2	150	300
8.	Watering	5	150	750
9.	Weeding	12	150	1,800
10.	Fertilizer application	1	150	150
11.	Insecticide application	1	150	150
12.	Harvesting crops	2	150	300
Subtotal		30.5		4,575
INPUTS		Qty	Unit Cost	Total Cost
13.	Fertilizer	25kg		3,500
14.	Cutlass	1	350	350
15.	Hoe	2	350	700
16.	Transportation	48	75	3,600
Subtotal				8,150
TOTAL PRODUCTION COST				12,725
TOTAL SALES		48bags	200.00	9,600
PROFIT/LOSS				-3,125

A simple production plan for one lot of bitter ball farm DRY SEASON PRODUCTION				
ACTIVITIES		Required Person or Day	Unit Cost LD	Total Cost LD
1.	Site selection	1	150	150
2.	Brushing	2	150	300
3.	Burning	0.5	150	75
4.	Clearing	1	150	150
5.	Field layout & digging	2	150	300
6.	Nursery preparation	1	150	150
7.	Transplanting of seedlings	2	150	300
8.	Watering	30	150	4,500
9.	Weeding	8	150	1,200
10.	Fertilizer application	1	150	150
11.	Insecticide application	1	150	150
12.	Harvesting crops	2	150	300
Subtotal		51.1		7,725
INPUTS		Qty	Unit Cost	Total Cost
13.	Fertilizer	25kg	N/A	3,500
14.	Cutlass	1	350	350
15.	Hoe	2	350	700
16.	Transportation	48	75	3,600
Subtotal				8,150
TOTAL PRODUCTION COST				15,875
TOTAL SALES		48bags	2,000	96,000
PROFIT/LOSS				+80,125



Agriculture for Children’s Empowerment (ACE) Program

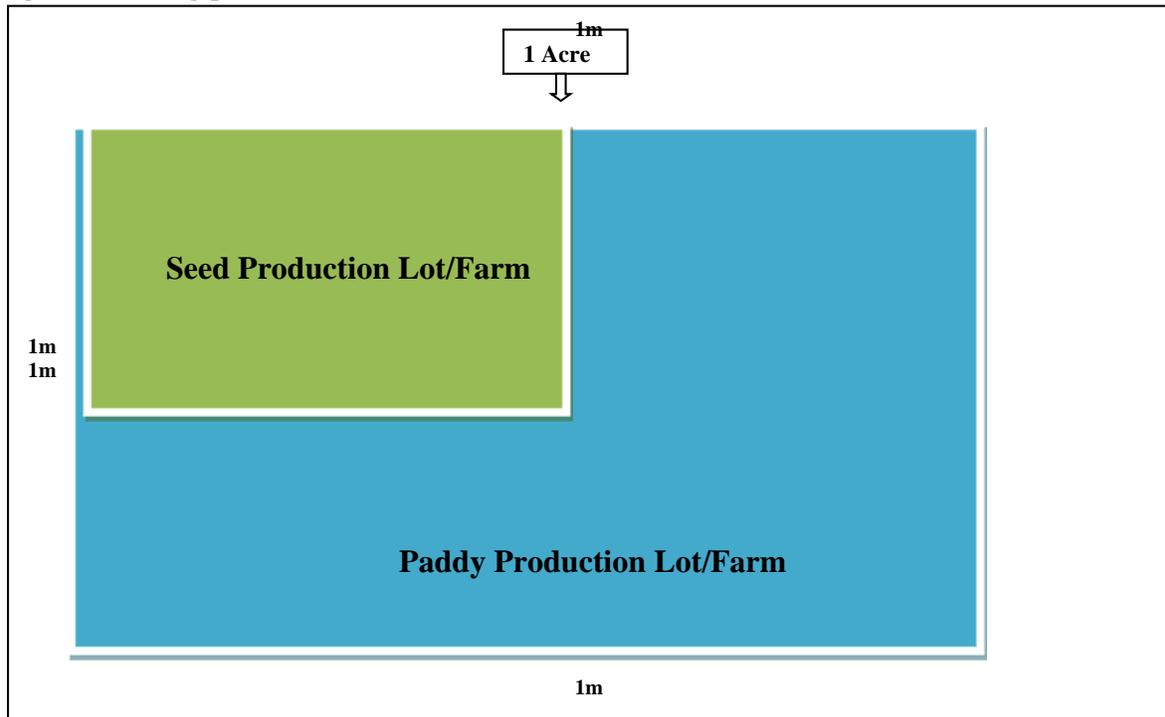
A TRAINING GUIDE FOR RICE PRODUCTION

The rice component of the ACE program is geared toward promoting smallholder rice farmers’ food security through the production of both seeds and paddy. The ACE program extension outreach strategy emphasizes best production practices for quality rice seed production, beginning with seed management to post-harvest handling (PPH).

Each farmer who receives 25kg of LAC23 rice seed for production will be trained using this guide. Each of the **25kg** will be grown on **1 acre** of prepared farm land with an expected yield of **600kg**.

One lot out of the 1 acre will be for seed production, while the remaining three lots will be used for paddy. Best agronomic practices will be applied throughout during the production period. The training is summarized below.

Diagram showing production site:



WHAT MUST I DO AS LAC 23 RICE FARMER TO OBTAIN 600KG IN YIELD FROM 25 KG OF LAC 23 RICE SEEDS?

1. Seeds Production Lot

These are practices that must be applied on the seed production lot:

- No mixed/intercropping in the rice seed production lot, meaning **DO NOT** plant cassava, plantain, pepper, bitter ball, and other crops among the rice.
- The seed production lot should be free of stumps, meaning the tree stumps should be cut to ground level so they do not serve as possible hosts for pests.
- Weed regularly, a minimum of two times; the field should be free of weeds.
- Keep a distance between the rice farm and the bush (1 meter)
- Keep a distance between LAC 23 and other variety; you can plant corn or other crops between the two different varieties.

2. Paddy Production Lot

- The farmer can do intercropping on the paddy production lot. For example, intercropping with cassava, corn and plantain.

3. Post-Harvest Activities

- The seed lot should be harvested on time, dried, threshed, winnowed and bagged; carrying out these processes carefully will significantly reduce post-harvest losses.
- The yield should be weighed separately.
- The yield from the seed lot will be used to determine the total yield of the 1 acre.

4. Expected Yield

- The expected yield of LAC 23 is **1,800kg/ha** or **720kg/acre** at the research station, but is being put at 1,500kg/ha or 600kg/acre at the farmer's level.
- The expected yield from a farmer who received 25kg of LAC 23 is **600kg**.
- If all of these practices are carried out by participating farmers, the total yield of each farmer should not fall below 90 percent of 600kg (**540kg**)

**Radio Gbarnga Agriculture Radio Program
ACE Performance Monitoring Tracker**

Station: Radio Gbarnga Location: Bong County

Date	Topic	Discussant(s)	# of Callers	Callers/Farmers' Concerns/Issues Raised
01/08/2013	Introduction of ACDI/VOCA ACE – Radio Program	Laveto Akoi- Forkpa Nathaniel Johnson	None	No concern was raised
01/15/2013	ACE program implementation approaches: a) VC concept b) technical assistance c) FaaB	Nathaniel Johnson Joe Mynen	2	The two callers who participated on the program wanted to know how to get in direct contact with ACDI/VOCA's ACE Program
01/22/2013	Access to irrigation for vegetable production, the importance of irrigation, and maintenance of irrigation	Joe Mynen Nathaniel Johnson Kollie Newman Wesseh Zoryou (LEAD Inc.)	None	None
1/29/2013	Access to irrigation for vegetable production	Repeat Broadcast	None	None
02/5/2013	Farming as a Business (FaaB) (planning and recordkeeping)	Nathaniel Johnson Joe Mynen	3	The callers wanted to know how FaaB works and what to do to have good records of their farming activities
02/12/2013	Market linkages	Laveto Akoi-Forkpa Rachel Mahmud Nathaniel Johnson	None	Phone line had problem
02/19/2013	Input service linkages	Nathaniel Johnson Joe Mynen	4	The callers wanted information on where to obtain loans for farming implements.
02/26/2013	Summary of week 2&3	Nathaniel Johnson Joe Mynen	3	No specific concern during the summary
03/5/2013	Vegetable production practices (general overview)	Marvelous Queejay Nathaniel Johnson	5	Expressed difficulties about protecting their plants from insects.
03/12/2013	Vegetable seed selection, Processing and preservation	Joe Mynen	5	Most of the callers wanted to know how good seeds are identified.
03/19/2013	Vegetable Seed selection, processing and preservation (repeat)	Joe Mynen	None	
03/26/2013	Site selection a. Topography/land scape b. Soil type c. H ₂ O availability	Joe Mynen	6	Lots of questions came to the discussants about site selection based on the experience of callers, especially those who have realized poor harvest due to the environment.
04/02/2013	Nursery preparation, management and transplanting	Nathaniel Johnson Joe Mynen	4	Most of the callers on the program wanted to know the best area to construct a nursery.
04/16/2013	Agro inputs/chemical handling and safety	Nathaniel Johnson	3	Farmers wanted to know the different types of agro-chemical and how they are applied on crops.
04/23/2013	Fertilization and composting	Nathaniel Johnson Joe Mynen	3	A caller wanted to know if it is possible to apply compost to tree crops such as rubber and palm. Another caller was interested to know what materials can be used to produce compost.
05/07/2013	Harvesting, handling and packaging	Nathaniel Johnson Joe Mynen	None	None
05/21/2013	Crop rotation	Nathaniel Johnson Joe Mynen	4	The callers wanted to know what crops are good for rotation. Another caller was eager to know if rice can be rotated with another crop.
05/28/2013	Vegetable preservation (The use of solar dryer)	Nathaniel Johnson and Joe Mynen	3	The callers wanted to know how the solar dryer works.
06/11/2013	Food security (seed availability)	Joe Mynen	None	Phone line had problem
06/18/2013	Food security (seed availability)	Nathaniel Johnson Marvelous Queejay	None	Phone line had problem
06/25/2013	Vegetable preservation- The use of solar dryer part II	Joe Mynen	3	The callers were interested to know how they can easily access the solar dryer. They also spoke about its durability.
07/02/2013	Crop rotation	Nathaniel Johnson	6	The callers wanted to know which crops are good for rotating. Some callers also wanted to know the advantages and disadvantages of crop rotation.
07/09/2013	General overview of vegetable production.	Nathaniel Johnson Joe Mynen	5	The callers anticipated knowing the types of vegetables, good planting practices and what time to have them planted
07/16/2013	Repeat of weeks one & two	Joe Mynen	None	None

Date	Topic	Discussant(s)	# of Callers	Callers/Farmers' Concerns/Issues Raised
07/23/2013	Farmers interview in the field - How have your farming activities improved over the past years with ACE's intervention? - What impact have they had on your children?	Farmer voices from Kpiai District	Prerecorded	Prerecorded
08/6/2013	Farming as a Business (FaaB) - Planning - Budgeting - Recordkeeping	Nathaniel Johnson & Joe Mynen	6	The callers wanted to know how FaaB works and what to do to have good records of their farming activities
08/13/2013	The value chain concept - The importance of value chain - The role of various actors in the vegetable value chain	Nathaniel Johnson and Joe Mynen	7	The callers were interested in knowing how they can be part of the value chain process. The issue of trust among vegetable value chain actors also came under discussion.
08/20/2013	Market linkages - Their significance in the value chain and the overall benefit to children's well-being	Joe Mynen	4	The issue of children benefiting their parents' farm products was very keen to almost all the callers who participated on the program. The discussant was lauded for placing emphasis on why children should benefit from the farming their parents engage in.
08/27/2013	Farmer interview in the field - How have your farming activities improved over the past years with ACE's intervention? - What impact it have they had on your children?	Farmer Voices Jorquelleh District	None	No call
09/3/2013	Inputs service linkages - What impact it has on the vegetable value chain	Nathaniel Johnson	5	Those who participated wanted to know the possibility of being linked by ACIDI/VOCA's ACE program to import service providers.
09/10/2013	Roundtable discussion with the value chain actors (inputs dealer, farmer and buyer). The cross-cutting benefits	Interview with farmers in Laworta and input service provider in Gbarnga	None	Prerecorded
09/17/2013	The formation of community-based farmers' associations through the established cluster farmers	Joe Mynen Nathaniel Johnson	6	The callers wanted to know what support ACIDI/VOCA-ACE provides individual farmers wanting to engage with such process.
09/24/2013	Farmers interview in the field - How have your farming activities improved over the past years with ACE's intervention? - What impact it have they had on your children?	Interview with vegetable farmer in Tamayta, Jorquelleh District	None	Prerecorded
10/01/2013	The impact of vegetable production on children's well-being (health, nutrition and education)	Nathaniel Johnson	5	Most of the callers were equally concerned like the studio guests regarding return benefit of vegetable production for children especially in rural communities.
10/08/2013	Agriculture and safety of children - Agrochemical handling - Child labor	Joe Mynen Nathaniel Johnson	6	Callers described their experiences regarding how some farmers handle chemicals on their farms and use children to do most of the work with no benefit.
10/15/2013	The potential for sustainability of activities after ACE	Nathaniel Johnson	4	The callers mainly participated to express appreciation to ACIDI/VOCA for its intervention in the county.
10/22/2013	Replay of farmers' voices in place of former closing program	Farmer Voices	None	No call

NB: The month of November was used to cover ACE closeout events and communicate the end of ACE; highlighting its major achievements over the project period.

**Radio Gbarnga Agriculture Radio Program
ACE Performance Monitoring Tracker**

Station: Radio Saclepea

Location: Nimba County

Date	Topic	Discussant(s)	# of Callers	Farmers' Concern/ Problem Raised
01/07/2013	Introduction of ACIDI/VOCA ACE – Radio Program	Laveto Akoi-Forkpa Marvelous Queejay	None	None
01/14/2013	ACE program implementation approaches: a) VC concept b) technical assistance c) FaaB	Thomas Kerkulah Patrick Wehyie Leona Zonen	None	None
01/21/2013	Access to irrigation for vegetable production	Thomas Kerkulah Leona Zonen Patrick Wehyie	2	The callers described difficulties in accessing irrigated system
01/28/2013	Access to irrigation for vegetable production (repeat)	Thomas Kerkulah Leona Zonen Patrick Wehyie	None	None

Date	Topic	Discussant(s)	# of Callers	Farmers' Concern/ Problem Raised
02/04/2013	FaaB (planning and recordkeeping)	Thomas Kerkulah Patrick Wehyie Thomas Marwolo (LIFE staff)	1	Callers were concerned about the methods of cassava planting
02/15/2013	Market linkages	Thomas Kerkulah Patrick Wehyie Thomas Marwolo (LIFE staff)	5	Most of the callers complained about the lack of marketing; as such the program aimed to improve farmers' understanding of marketing and market linkages
02/18/2013	Input service linkages	Thomas Kerkulah Patrick Wehyie	3	The caller wanted knowledge on fertilizer application
02/25/2013	Summary of weeks two and three	Thomas Kerkulah Patrick Wehyie Leona Zonen	3	No specific concern or problem (phone line had problem)
03/04/2013	Vegetable production practices (general overview)	Thomas Kerkulah Patrick Wehyie	None	Phone line had problem
03/11/2013	Vegetable seed selection, processing and preservation	Thomas Kerkulah Patrick Wehyie	4	Most of the callers who participated wanted detailed information about seed selection, especially how bad seeds are identified.
03/18/2013	Vegetable seed selection, processing and preservation	Repeat of week two	4	No new comment/concern
03/25/2013	Site selection a) Topography/landscape b) Soil type c) H ₂ O availability	Thomas Kerkulah Patrick Wehyie Leona Zonen	5	Vegetable growers calling on the program wanted to know when they should select their seeds and what things they should take into consideration when selecting the seeds.
04/8/2013	Farm sanitation and insects/pest management -weeding -insecticide use -soap solution, etc.	Thomas Kerkulah Patrick Wehyie	3	Two farmers wanted to know the chemical needed to kill certain insects that affect plantain growth. They also expressed interest in knowing the measurement and application procedure of insecticide on plants
04/15/2013	Agroinputs/chemical handling and safety	Thomas Kerkulah Patrick Wehyie	5	Most of the farmers calling wanted to know the time duration to harvest after applying chemical on a crop.
04/22/2013	Fertilization and composting	Thomas Kerkulah Patrick Wehyie	None	None
04/29/2013	Harvesting, handling and packaging	Thomas Kerkulah Patrick Wehyie	3	Farmers wanted to know whether all crops could be harvested with a knife. They also wanted to know how to keep pepper and bitter ball from getting spoiled following harvest.
05/06/2013	Crop rotation -its importance	Thomas Kerkulah Patrick Wehyie	4	The callers mainly wanted to know if crop rotation works well for all plants.
05/20/2013	Food security (seed availability)	Thomas Kerkulah Patrick Wehyie Madison Guambah (Lead Farmer from Fleedin)	6	The callers wanted to know how to select good seed. They also raised the issue of food insecurity in post-war communities despite many people farming each year.
05/27/2013	Food security (seed availability)	Thomas Kerkulah Patrick Wehyie Richard Duo (Lead Farmer from Kpaytuo)	5	The callers wanted to know how to select good seed. They also raised the issue of food insecurity in post-war communities despite many people farming each year.
06/03/2013	Farmer interviews in the field	Playback farmers' voices	None	None
06/10/2013	Farmer interviews in the field	Playback farmers' voices	None	None
06/27/2013	Vegetable preservation—the use of solar dryer, part II	Thomas Kerkulah Patrick Wehyie Leona Zonen	4	Most of the callers wanted to know how the solar dryer works and whose crops it preserves.
07/01/2013	Crop rotation	Thomas Kerkulah Patrick Wehyie	5	The callers wanted to know which crops are good to be rotated. Some callers also wanted to know the advantages and disadvantages of crop rotation.
07/08/2013	General overview of vegetable production	Thomas Kerkulah Patrick Wehyie	4	The callers anticipated learning the types of vegetables for good planting and what time to have them planted
07/15/2013	Repeat of weeks one and two	Thomas Kerkulah Patrick Wehyie	None	None
07/22/2013	Farmer interviews in the field - How have your farming activities improved over the past years with ACE's intervention? - What impact have they had on your children?	Farmer voices from Fleedin	Prerecorded	Pre-recorded
08/5/2013	FaaB -planning -budgeting -recordkeeping	Patrick Wehyie Leona Zonen	4	The callers wanted to know how FaaB works and what to do to have good records of their farming activities
08/12/2013	The value chain concept -The importance of value chains -The role of various actors in the vegetable value chain	Thomas Kerkulah Patrick Wehyie	5	The callers were interested in knowing how they can be part of the value chain process. The issue of trust among vegetable value chain actors was also discussed.
08/19/2013	Market linkages -Their significance in the value chain and the overall benefit to children's well-being	Leona Zonen Thomas Kerkulah	4	The issue of children benefiting from their parents' farm produce was very keen to almost all the callers who participated on the program. The discussant was lauded for placing emphases on why children should benefit from the farming their parents engage in.

Date	Topic	Discussant(s)	# of Callers	Farmers' Concern/ Problem Raised
08/26/2013	Farmer interviews in the field - How have your farming activities improved over the past years with ACE's intervention? - What impact have they had on your children?	Farmers' Voices from Kpaytuo	None	None
09/3/2013	Inputs service linkages - What impact it has on the vegetable value chain	Thomas Kerkulah Patrick Wehyie	6	Those who participated wanted to know the possibility of being linked by ACDI/VOCA's ACE program to input service providers.
09/9/2013	Roundtable discussion with value chain actors (inputs dealer, farmer and buyer). The cross-cutting benefits	Interview with farmers and Input Service providers	None	Prerecorded
09/16/2013	The formation of community-based farmers' associations through the established cluster farmers	Thomas Kerkulah Patrick Wehyie	4	The callers wanted to know what support ACDI/VOCA's ACE program provides individual farmers wanting to engage with such process.
09/23/2013	Farmer interviews in the field - How have your farming activities improved over the past years with ACE intervention? - What impact have they had on your children?	Interview with vegetable farmers Fleedin and Kpaytuo	None	Prerecorded
10/07/2013	The impact of vegetable production on children's well-being (health, nutrition and education)	Leona Zonen Thomas Kerkulah	3	Most of the callers were as concerned as the studio guests about the return benefit of vegetable production for children, especially in rural communities.
10/ 14/2013	Agriculture and safety of children - agrochemical handling - child labor	Thomas Kerkulah Patrick Wehyie	4	Callers described how some farmers handle chemicals on their farms and use children to do most of the work with no benefit.
10/ 21/2013	The potential for sustainability of activities after ACE	Thomas Kerkulah Patrick Wehyie	5	The callers mainly participated to express appreciation to ACDI/VOCA for its intervention in the county.

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FARMER'S FINANCIAL DIARY



Rice Production	MONTH 1	MONTH 2	MONTH 3	MONTH 4	MONTH 5	MONTH 6	MONTH 7
Total Harvested (kgs)							
Total kept as seeds							
Total rice available during Hunger Season							
Total additional rice bought on the market during Hunger Season							

II. Rice V. C

Land Size previous season: _____

Total Previous Harvest (Kgs): _____

FARMER'S FINANCIAL DIARY

NAME _____

AGE _____

SEX _____

NUMBER OF DEPENDENTS

MALE

FEMALE

COUNTY _____

DISTRICT _____

TOWN / VILLAGE _____

PERIOD JOINED PROJECT _____

LEAD FARMER VEGETABLE ONLY OVERLAP

RICE

ID. NO. _____

MONTH 3		MONTH 4		MONTH 5		MONTH 6		MONTH 7	
A	B	A	B	A	B	A	B	A	B

Total Production Cost										

Rice Variety: A _____

Rice Variety: B _____

Production Season: _____ To _____ 20 _____

Starting Date: _____

Description	MONTH 1		MONTH 2	
	A	B	A	B
Farm Size (Acres)				
Input Cost L\$				
Seeds				
Cutlass				
Axe				
Hoe				
Other (Specify)				
Total Input Cost				

Hired Labor

Clearing				
Planting				
Weeding				
Harvesting				
Total Hired Labor Cost				

Family Labor \$

Clearing				
Planting				
Weeding				
Fencing				
Animal Trap				
Bird Scaring				
Harvesting				
Total Family Labor Cost				

Last Season Data

I. Vegetable V. C **From** _____ **TO** _____

Total Land Size previous season: _____

Total Sales Volume previous season: _____

Total Sales Value previous season: _____

Total expenses previous season: _____

Crop Variety: A) Pepper B) Bitterballs C) High Value

Production Season: From _____ To _____

	WEEK 1			WEEK 2			WEEK 3			WEEK 4		
I. TOTAL HARVEST	A	B	C	A	B	C	A	B	C	A	B	C
(Kgs)												
Bags												
Qty. of Crops Dried (Solar)												
II. SALES												
Market Outlet 1 (Pre-Harvest Arrangement)												
Volume in (Kgs)												
Value L\$												
Payment Method												
Market Outlet 2 (Regional Market)												
Volume in (Kgs)												
Value L\$												
Total Sales L\$												
III. PROFIT & LOSS L\$ SALES - EXPENSES												

