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Effective Seed Storage in Timor-Leste (ESS) Funded by USAID, Office for Foreign Disaster Assistance - OFDA

Annual Report

October 1, 2014 – September 30, 2015



Picture 1: A SILC Meeting in Sagadati, Baucau

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Program Summary

An intervention that addresses seed system insecurity, and ultimately food insecurity, in Timor Leste is essential to mitigate post-harvest storage losses of farm-saved seed. It also helps maintain better quality seed to reduce the underlying risk factors of availability, accessibility and utilization of productive seed. This is in line with priority action four of the Hyogo Framework for Action. Since August 2011, Mercy Corps and partners through the USAID/OFDA funded Effective Seed Storage (ESS) in Timor-Leste program have successfully developed a market system for a metal-based seed storage system that is locally customized and manufactured. The program was also successfully replicated in 10 out of 13 districts in the country through an initial expansion in February 2013. Starting from February 2014, the program incorporated a member-based financial institution model called Savings and Internal Lending Communities (SILC) to expand access to credit and promote a culture of savings among poor farming households.

While the seed storage system proved to effectively improve food self-sufficiency, SILC membership provides savings-led financial services to communities that have little or no access to formal financial services and contributes to strengthening resilience among vulnerable families. Leveraging the success of the program, in April 2015, Mercy Corps, in partnership with Catholic Relief Services (CRS) and five local NGOs, expanded the improved storage system and SILC activities to further 'off-grid' communities and started promoting keyhole gardening as a diversified production system, with a special focus on vegetable production. The expansion of SILC and seed storage activities is targeting underserved communities within the existing target and neighboring districts/sub-districts. The inclusion of keyhole garden systems will not only further increase food self-sufficiency, but also serves as a nutrition sensitive agriculture component of ESS.

Performance Summary

Sector 1: Agriculture and Food Security		Objective: Increased food self-sufficiency through access to post-harvest storage system and promoting keyhole garden production system		
Beneficiaries Targeted	300,000 IDPs: 0	Overall budget (for all sectors): US\$4,522,499		
Beneficiaries Reached	263,971 IDPs: 0	Amount Spent (for all sectors): US\$2,507,503		
Geographic Area (s)	At least 10 out of 13 districts of Timor-Leste			
Sub-Sector 1: Seed System Security				
Sub-Sector 2: Improving Agricultural Production/Food Security				
<i>OFDA Indicator</i>	<i>Baseline</i>	<i>Target</i>	<i>Progress</i>	<i>Last update</i>
Projected increase in number of months of food self-sufficiency due to seed systems activities/agricultural input for beneficiary households	2.5 month ¹	>0	To be reported at the end of program ²	June 2015
Number of people benefiting from seed systems/agricultural input activities, by sex	0	300,000	263,971 ³ (47% female)	June 2015
Additional Indicators (adjusted according to Phase III proposal)				

¹ Recalculated from the baseline data during the Phase II Final Evaluation, especially to make adjustments from the number of food security months into food self-sufficiency months

² The Final Evaluation of Phase II reported that the surveyed respondents experienced an increase in number of months of food self-sufficiency by 2.1 months (84% increases from the baseline). The data for the Phase III beneficiaries will be collected during the survey at the end of program.

³ Calculated from total number of households that accessed the storage system and/or had access to promoted good practices (BCC) multiplied by the average number of household members, during previous phases.

% of farmers reported increase of knowledge and practice in seed selection, drying and storage	0	80%	To be reported at the end of program ⁴	June 2015
Number of farmers with access to improved seed storage system, by sex	0	52,200	36,453 (silos) plus 9,936 (GrainPro bags) ⁵	October 2015
Increase of Household Dietary Diversity Score (HDDS)	7 ⁶	9 ⁷	To be reported at the end of program	October 2015
Number of households with properly used keyhole garden	0	690	8	October 2015
Number of households replicating keyhole garden	0	690	0	June 2015

Sector 2: Economic Recovery and Market Systems		Objective: Increased resilience through access to credit and promoting culture of savings		
Beneficiaries Targeted	4,840 ⁸ (no IDPs)			
Beneficiaries Reached	1,382			
Geographic Area (s)	Ainaro, Manufahi, and Baucau			
Sub- Sector: Microfinance				
<i>OFDA Indicator</i>	<i>Baseline</i>	<i>Target</i>	<i>Progress (to date)</i>	<i>Last update</i>
Number of people, by sex, or MSEs newly receiving financial services due to USAID/OFDA support	0	4,840 (including also 1,000 of previous target)	1,382 members – 59%	October 2015
Percentage of financial service accounts/groups supported by USAID/OFDA that are functioning properly	0	100%	100% of reported SILC groups	October 2015
Total USD amount channeled into the program area through sub-sector activities	0	0	0	October 2015
Additional Indicators				
% of participating households that have sold assets in the last 6 months to purchase foods or other basic needs	31%	Reduced by 50% from the baseline	To be reported at the end of program	June 2015
% of participating household saving every month	2%	100%	100% of reported 1,382 SILC members	October 2015
Average amount of household income	\$114.61	Increased by 30% from the baseline	To be reported at the end of program	June 2015

Sector Summary (Activities)

This annual report marks the transition period from Phase II to Phase III of the ESS Program. Through Phase II, Mercy Corps and partners successfully expanded the program activities nation-wide, while also incorporating Savings and Internal Lending Community (SILC) into ESS. In April 2015, the program began Phase III (based on the program's Modification of Assistance Award No. 4) to expand the improved storage system (ISS) and SILC activities to further 'off-grid' communities and started promoting keyhole gardens (KHGs) as a diversified production system with a special focus on vegetable production. Figure 1 illustrates the ESS program's evolution from Phase I to Phase III. Table 1 summarizes key activities during this year for each quarter.

⁴ On average 74% of farmers were reported adopting improved techniques by the Final Evaluation of Phase II. For the farmers supported during the Phase III, the progress will be included in the Final Evaluation at the end of program.

⁵ Farmers who accessed silos and GrainPro bags likely overlapped.

⁶ Baseline HDDS is average of all survey respondents. See M&E section for more information.

⁷ Target based on upper tercile of all respondents' HDDS.

⁸ The majority of these will likely overlap Sector 1 beneficiaries.

Figure 1: ESS Program Timeline

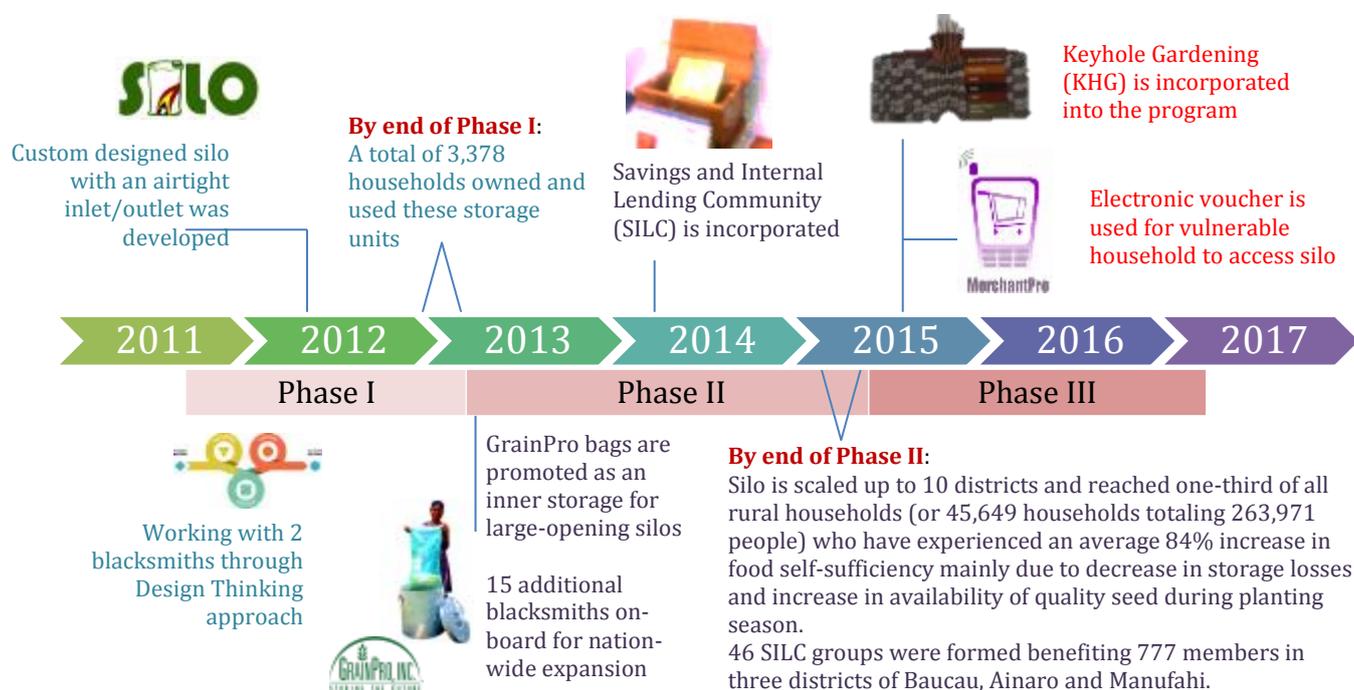


Table 1: Key Program Activities During the Year

Quarter 1	<ul style="list-style-type: none"> The program continued to deliver ISS and SILC field activities Submitted proposal to OFDA for Phase III
Quarter 2	<ul style="list-style-type: none"> Conducted Final Evaluation of Phase II by external consultant Submitted 2-month No Cost Extension of Phase II while waiting for the approval of Phase III Conducted Designing for Behavior Change (DBC) analyses for three promoted practices of seeds selection, drying and storage
Quarter 3	<ul style="list-style-type: none"> Kick started ESS Phase III Started development of electronic vouchers for ISS by contracted firm Carried out Training of Trainers (ToT) #1 for newly recruited SILC Field Agents for new target areas Facilitated Private Sector Provider (PSP) training #1 to 'graduated' SILC Field Agents Developed mobilization and training materials and delivered of ToT to field staff on keyhole gardens
Quarter 4	<ul style="list-style-type: none"> Facilitated community meetings and carried out beneficiary selection Collected Household Dietary Diversity Score (HDDS) indicator baseline data Delivered ToT #2 for newly recruited SILC Field Agents for new target areas Conducted Private Sector Provider (PSP) training #2 to 'graduated' SILC Field Agents Continued field activities for ISS, SILC and KHG

A. Improved Seed Storage (ISS) Activity

Community mobilization, BCC training, voucher distribution and supported marketing activities

During this year, silo vouchers were distributed during the first – and part of the second – quarters, or towards the end of Phase II. In addition, the team continued to support linkages between blacksmiths and retailers/kiosks – to act as points of sale for the seed silos. A total of 18 kiosks sold silos and diversified products from the blacksmiths. During the first and second quarters, Mercy Corps also commissioned the production of a video to air on national television (TVTL) – the only TV channel which airs nation-wide. The video clip demonstrated and endorsed general good practices in seed storage and promoted the improved seed storage systems produced by the blacksmiths and sold in participating kiosks (*video can be viewed on YouTube: <http://youtu.be/I9rftD7xjnA>*). The TV promotion provided general visibility for the ESS program to broader audiences throughout Timor-Leste. Mercy Corps and CRS also continued to work with local partner organizations to mobilize communities, lead the beneficiary selection process and provide Behavior Change Communication (BCC) training to target farmers. By end of Phase II, the ESS team reached 202 rural communities (sucos/villages) across 10 districts and a total of 35,703 households owned and used silos by end of Phase II. While the third quarter was mainly used to transition from Phase II to Phase III, during the last quarter of this year, an additional 265 farmers accessed silos with vouchers and 485 silos were purchased from blacksmiths at full price, bringing the total number of farmers with access to silos to 36,453 silos (24% purchased at full price).

Transitioning to electronic voucher system

Entering Phase III, the program is preparing to use an electronic voucher system. The e-voucher system is expected to ease voucher distribution and reporting by field staff, the M&E team and blacksmiths, while at the same time improving “governance” or compliance to finance and operation procedures and increasing transparency to beneficiaries. Since April 2015, Mercy Corps has been in discussion with Transversal, a pre-selected e-voucher app developer. Mercy Corps has worked with Transversal for e-vouchers in several countries, including Nepal and Haiti. The contract with Transversal for ESS was signed in June 2015 at which time the customization process was being finalized. The prototype of the app was presented by Transversal to both CRS and Mercy Corps teams (including key program, finance and operations staff) and feedback was provided accordingly.

Review of ISS post-harvest BCC flipbook (Training Guide) and conducted Barrier Analysis of key behaviors

To incorporate and document consumer feedback, as well as the results from CRS’ internal monitoring review, the program revised the BCC (behavior change communication) training facilitation guide for Phase III of the program. The new document was reviewed by CRS’ and Mercy Corps’ technical staff and feedback was incorporated from the Ministry of Agriculture and Fisheries (MAF) extension department.

The team also conducted in-depth reviews of three promoted behaviors by carrying out a Barrier Analysis⁹ as recommended by the Final Evaluation of Phase II (summary of evaluation’s recommendation is presented under the Monitoring & Evaluation (M&E) section). The three behaviors assessed were (i) seed storage, (ii) seed selection, and (iii) seed drying. This analysis was part of the Designing for Behavior Change (DBC)¹⁰ methodology and aims to help the program document learning and improve the quality of program implementation. In April, led by Mercy Corps’ Senior M&E Officer, the team conducted an internal workshop

⁹ To identify BC determinants, a barrier analysis was conducted by comparing the responses of ‘doers’ – those who practice the behavior - versus ‘non-doers’ for a certain behavior. A total of 90 respondents were interviewed for each behavior (45 doers, 45 non-doers).

¹⁰ DBC framework was utilized as an analysis tool to improve the BCC and training materials. DBC is a process to help program designers make key program decisions that will enable the designer to develop a comprehensive and effective behavior change (BC) strategy, resulting in increased adoption of positive behaviors among program participants.

with enumerators to analyze the findings. Based off the findings, the revision of the ISS flipbook/training guide was finalized prior to the start of Phase III. The table below summarizes the identified key determinants and recommended actions for program implementation.

Table 2: Identified Key Determinants and Recommended Actions for Phase III

The promoted behaviors	Key determinants	Recommended actions
<p>Seed storage: Targeted men and women in maize producing households keep the dried grain and seeds separately in clean and airtight storage units, in dry conditions and off the ground of the storage space</p>	<p>Perceived self-efficacy Proper seed storage is not a difficult practice</p> <p>Perceived access Improved seed storage system is not widely available</p> <p>Perceived positive consequence Proper storage reduces the likelihood of weevil attack</p> <p>Reminder It is difficult to remember that seeds should be separated from grains</p>	<p>To update the training guide: to simplify the key steps in storage practice and to include a message that good airtight storage minimizes weevil infestation</p> <p>Continue to work with local manufacturers to increase availability of silos and, if needed, to provide discounted vouchers for poor farmers</p> <p>Use SMS reminders during the harvest period on the need to store seeds and grain properly</p>
<p>Seed Selection: Targeted men and women in maize producing households carry out seed selection of a similar variety of maize - to be dried and stored separately from grain/food - by selecting only seeds from the middle part of large, clean cobs with no obvious physical damage and/or indication of pest activity</p>	<p>Perceived positive consequences Good seeds are key for good planting</p> <p>Perceived negative consequences Without proper seeds selection the likelihood of having inferior seeds during the next planting season is very high</p> <p>Perceived access Large cobs are not always available. No access to tarpaulin or other layer to dry seeds</p> <p>Perceived severity Food insecurity is a serious problem</p> <p>Perceived action efficacy Seed selection contributes to ensuring access to seeds for next planting season, therefore needed for food security</p>	<p>To update the training guide with the following:</p> <ul style="list-style-type: none"> - Select the biggest available cobs - Include economic benefits of investing in doing proper drying (i.e. cost/benefit analysis of the use of tarpaulin) <p>During the household (HH) visits, field officers discussed with beneficiaries the positive and negative consequences of doing or not doing seed selection</p> <p>Statement to include in the BCC material: 'food security started with seed security and seed security started with seed selection.'</p>
<p>Seed Drying: Targeted men and women in maize producing households sun-dry their harvested maize grains/seeds immediately after being harvested; under bright sunlight and on a clean surface; with the maximum depth of the maize not more than ankle bone; for at least 3 days</p>	<p>Perceived positive consequence Properly dried seeds will ensure availability of seeds during next planting season. Properly dried seed ensure good production</p> <p>Perceived access No tarpaulin or other drying bases</p> <p>Reminder It is difficult to remember that seeds should be dried properly</p> <p>Perceived risk Family members may have food security problem if no seeds are available for next planting season</p>	<p>Revisit the training guide to reinforce the following:</p> <ul style="list-style-type: none"> - Drying seeds will ensure availability of quality seeds for next planting season - Good production of maize will only be possible if high quality seeds, which are dried, are used - To include simple cost/benefit analysis of the use of tarpaulin and other alternatives <p>Work with local stores to increase availability of tarpaulin</p> <p>Use SMS reminder during the harvest period to remind them of drying practices</p> <p>Statement to include in the BCC material:</p>

	<p>Perceived action efficacy Drying seeds properly will help them to mitigate hunger</p>	<p>‘food security starts with seed security, and seed security starts with seed drying.’</p>
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Kick-off of Phase III and community mobilization to new target areas

Once the program’s Modification of Assistance Award No. 4 was signed by OFDA and Mercy Corps, the team quickly started Phase III implementation. All sub grant agreements between Mercy Corps and other NGO partners (CRS and OrganizaSaun Haburas Moris (OHM)) were also extended accordingly. In addition, CRS extended agreements with its three local NGO partners. In April 2015, a meeting was held between Mercy Corps, CRS and OHM to establish a detailed work plan, M&E plan and a mobilization guide. CRS conducted a similar workshop with its partners in Baucau. The program also recruited additional staff, especially for the inclusion of keyhole gardening activities. By the end of June, most additional key staff had been on-boarded. In the months of July and August 2015, the program team conducted district-level workshops in all ten target districts to disseminate new program activities and to agree with stakeholders on the selected target communities, which were based on the Asian Development Bank (ADB) Least Developed Sucos in each district. The workshops were also used to initiate collaboration and coordination with the district-level Ministry of Agriculture and Fisheries (MAF) and other agencies, both governmental and non-governmental. Post workshops, the field staff conducted community meetings and household visits. The community meeting was held in each selected community to promote program activities and to provide an opportunity for the community members to self-select as beneficiaries, according to the criteria set for each component of the program. The household visit was conducted at each self-selected household to confirm/finalize beneficiary selection and participation in the program activities. In total, the team reached communities in 44 new sucos. The CRS partners in Baucau and Lautem have already begun ISS post-harvest BCC training for 250 new farmers (150 male and 115 females).

B. Savings and Internal Lending Communities (SILC) Activity

812 individuals joined and participated in SILC groups as a result of Field Agent outreach

Mercy Corps and CRS continued to provide technical assistance to Field Agents to form and provide capacity building to SILC members in the target districts. During this year, a total of 812 individuals joined SILC groups across eight districts (including three previously selected districts and five new districts), bringing the total number of farmers involved in the SILC activities to 1,382 (59% female).

5 Field Agents were selected and trained to be SILC Private Service Providers (PSP)

In May 2015, the program conducted a two-day training for the SILC Private Service Provider (PSP) certification process for CRS and Mercy Corps staff members. The objectives of this training were to train the staff on the PSP methodology and prepare them for the certification exam. During the training, individual interviews and focus group discussions were conducted with SILC group members to discuss and agree on the process and methodology as per SILC Global Standards. Post training, interviews with Field Agents and Focus Groups Discussions (FGD) with SILC group members were conducted to assess performance of Field Agents and to determine if she/he would be recommended and further supported to be a SILC PSP. Based on the outcome of the interviews and FGDs, CRS and Mercy Corps selected five (out of nine) Field Agents to be promoted as PSPs. The first PSP was certified in September 2015.

21 new Field Agents recruited and trained for Phase III target areas

Whenever feasible, during the district workshops and community meetings as mentioned in the ISS Activity section, the team also promoted SILC to the community members. During the meetings, the SILC approach was presented and the plan for the program to recruit Field Agents as SILC trainers was communicated. As per experience in Timor-Leste and other countries, members of savings and lending groups are mostly



Picture 2: SILC Field Agent training participants in Maliana, August

women. Considering the local context where women trainers are better suited for women trainees, women were specifically targeted as Field Agents. During the mobilization process, ESS staff asked the local leaders to encourage women to apply as Field Agents, including stay-at-home mothers. In addition, the recruitment process did not include criteria that may be unrealistic for this target demographic (i.e. basic literacy and numeracy skills are required rather than a formal education level). By doing this, recruitment of Field Agents was done in a transparent way to attract many female candidates to apply.



Picture 2: KHG Training of Trainers for field officers involving school pupils in Dili, June 2015

An additional 21 new Field Agents were recruited for Phase III across seven districts. In August 2015, ESS conducted a five-day training for these new Field Agents and project staff in Maliana, Bobonaro. The training was focused on basic concepts of SILC, its principles, how to be a good facilitator and the mobilization process, and roles of the management committee and general assembly. Training was designed to include not just theoretical aspects but also practical learning opportunities were

provided as often as possible. In September, follow-up training on record keeping was also provided to Field Agents. Post training, each Field Agent developed their action plan for the next quarter.

Keyhole Gardens (KHG) Activity

Training of Trainers (TOT) on Keyhole Gardening techniques and Farmer Field School (FFS) approach was conducted for field staff

In June 2015, a Training of Trainers for the KHG farmer field school facilitation was conducted for Mercy Corps and partner OHM in Dili. During this training, four different KHG models were established at a public school to provide firsthand experience for staff on the promoted gardens. Two staff members from IOM (United Nations

Organization for Migration– also an OFDA grantee in Timor-Leste who introduced keyhole gardens two years ago as part of their Disaster Risk Reduction (DRR) Program) were involved as resources for the training. This activity was aired by a national TV station, TVTL, during the primetime evening news. The training for CRS and their local partners was conducted during the following week in Baucau.

After the TOT, community mobilization, including household visits to pre-identified beneficiaries (selected during community meetings as reported under ISS Activity section), were carried out. Through the end of this reporting period, eight farmers had established keyhole gardens.

Monitoring and Evaluation (M&E)

A. Final Evaluation of Phase II

From January 17 until February 24, 2015, Johan van Duijn, an independent consultant, was hired to carry out the final evaluation of ESS Phase II. The objective of the evaluation was to collect data and information and analyze it to evaluate the ESS program achievements. The evaluation also documents learning from the SILC component of the program and provides recommendations for the anticipated Phase III of the ESS program.

This evaluation had two parts: (i) a household survey of randomly selected 409 respondents in four agro-ecological zones of Timor-Leste to assess program performance against indicators; and (ii) key informant interviews (KIIs) and focus group discussions (FGDs) to assess the program against the Development Assistance Committee (DAC) evaluation criteria (Relevance, Effectiveness, Efficiency, Impact, and Sustainability). The full report of this evaluation is attached. Focus Group Discussions were completed with beneficiaries of seed storage as well as SILC interventions, with silo manufacturers, and with local NGO partners. KIIs were conducted with program staff. A desk assessment of program documents and other relevant reports was completed to complement the information gathered from the survey, FGDs and KIIs. The below table summarizes program performance against its indicators:

Table 3: Phase II Program Indicator Performance

Performance	Indicators
Achieved targets	<ul style="list-style-type: none"> - Projected increase in # of months of food self-sufficiency due to seed systems/agricultural input for beneficiary households - # of people benefiting from seed systems/agricultural input activities, by sex - Percentage of beneficiaries reporting decreased post-harvest losses for seeds - Number of farmers with access to improved seed storage system, by sex - Number of farmers with access to BCC materials/training
Partly achieved	<ul style="list-style-type: none"> - Percentage of farmers adopting improved technique(s)
Not achieved	<ul style="list-style-type: none"> - Increase in availability of quality seed during planting season

Overall, there was only one indicator that was not achieved by the program, which is “Increase in availability of quality seed during planting season.” The target for this indicator was very high, an 80% increase. The survey shows that there was an increase in availability of around 40 to 46%. The following table presents conclusions and recommendations from the final evaluator based on DAC Criteria:

Table 4: Conclusions and Recommendations of Final Evaluator Based on DAC Criteria

Conclusions	Recommendations
Relevance	
<ul style="list-style-type: none"> • Relevance of the program increased through the inclusion of SILC. • Savings groups were seen as very important by community members. They provide a safe place to put 	<ul style="list-style-type: none"> • Completion of group formation and training during ESS Phase III. • Incorporation of SILC indicators in Phase III evaluation survey.

<p>money and reduce waste on unnecessary purchases.</p> <ul style="list-style-type: none"> In several districts, vouchers already covered a significant portion of the maize-producing farmers. The use of the voucher coverage is likely to go beyond resource-poor households. 	<ul style="list-style-type: none"> Reduce number of vouchers in Phase II. Prioritize Phase III districts and communities that have a voucher coverage of less than 40%. Ensure during selection processes that priority goes to resource-poor households.
Effectiveness	
<p>The following factors contributed to achievements:</p> <ul style="list-style-type: none"> Expansion to eastern district through CRS Increased competition led to cheaper silo materials and good profit margins of \$5-7 per unit Improved beneficiary selection process with feedback mechanisms for community members. <p>The following factors hampered achieving results:</p> <ul style="list-style-type: none"> Capacity and dedication of local partners to do sufficient field work in communities Variation in capacity of blacksmiths to produce silos Limited thinking of stakeholders towards market-led development The program’s high number of beneficiaries has to some extent hampered the achievement of full adoption of the promoted techniques 	<ul style="list-style-type: none"> Consider the development of feedback mechanisms on the quality of products straight to the blacksmiths. Assess capacity of blacksmiths prior to signing agreements with them. Reduce number of voucher beneficiaries to remove expectation to get subsidized silos and freeing time for follow-up activities and monitoring of silo and technique adoption. More market support activities
Efficiency	
<ul style="list-style-type: none"> Quantitative targets for silo distribution are met with only 76.7% budget expenditure. The cost per household for the seed storage intervention is \$39.89. This amount could easily be justified by the prevention of loss of seeds, which can be equivalent to \$20 per planting season. The target number of beneficiaries for seed systems were reached, but needed the deployment of additional staff. A number of inefficiencies were observed in M&E. 	<ul style="list-style-type: none"> Ensure allocation of sufficient field staff for beneficiary mobilization and training. Design a standard monitoring system at the beginning of the program, including database Consider the use of e-vouchers and linked monitoring system Identify focal persons for communication between organizations Design feedback mechanisms/procedures on reports
Impact	
<ul style="list-style-type: none"> Blacksmiths turned into businessmen. Reduction in seed losses and increased food self-sufficiency through high adoption of quality seed storage in the form of metal silos. Farmers with the capacity to pay to purchase silos at the full price 	<ul style="list-style-type: none"> Prioritize business management training with new blacksmiths at start of Phase III. Final evaluation of ESS Phase II to sample respondents from beneficiaries since 2011 to assess continuity of improvements and durability of silos.
Sustainability	
<p>Continuing benefits after the program:</p> <ul style="list-style-type: none"> Silo production by blacksmiths. Increased food self-sufficiency. Increased seed availability. <p>Factors threatening sustainability:</p> <ul style="list-style-type: none"> Unavailability of silo materials at competitive prices. Continuing “wait and see” attitude of non-beneficiaries Full price is still considered too high by vulnerable farmers 	<ul style="list-style-type: none"> Conduct barrier analysis and redesign BCC around 3 key messages: <ul style="list-style-type: none"> Proper seed selection Proper drying Proper storage Work towards free market principles allowing price competition between blacksmiths.

B. Baseline for Phase III KHG

The baseline survey for the ESS keyhole garden component was conducted October 19-23, 2015. The data presented corresponds to the following ESS Program Indicators:

- Increase of Household Dietary Diversity Score (HDDS)
- Number of households with proper keyhole garden
- Number of households replicating keyhole garden

The Household Dietary Diversity Score (HDDS) measures the number of different food groups consumed over a given reference period. Dietary diversity is associated with a number of improved outcomes including birth weight, child anthropometric status, and improved hemoglobin concentration.¹¹

For the purpose of the ESS keyhole garden component, the average HDDS of target households in the selected districts, as well as the percentage of households that consume Vitamin A-rich foods (fruits and vegetables), will be most relevant to inform program activities and indicator targets.

Methodology

The methodology for the baseline survey was designed based on the FANTA Household Dietary Diversity Score (HDDS) for Measurement of Household Food Access. The HDDS questionnaire measures the number of pre-defined food groups consumed by each target household with a 24-hour recall period. Scores range from 1-12, calculating consumption of each of the following food groups: 1) Cereals, 2) Roots and Tubers, 3) Vegetables, 4) Fruits, 5) Meat, Poultry, Offal, 6) Eggs, 7) Fish and Seafood, 8) Pulses, Legumes, Nuts, 9) Milk and Milk Products, 10) Oil/Fats, 11) Sugar/Honey, 12) Condiments, Coffee, Tea. A total of 99.4% of respondents reported this period was a “normal” day and did not include a special occasion during which atypical foods may have been consumed. In addition to tabulating the HDDS of each respondent, the expanded questionnaire separated the Fruit and Vegetable food groups into Vitamin A-rich fruits and vegetable subgroups: i) orange roots, carrot, squash; ii) dark leafy greens, kale, spinach; iii) cabbage or other vegetables; iv) ripe papaya, mango; v) young papaya, mango, other fruit. Endline data will be collected for the same food groups, among a similar sample size, to measure change resulting from the keyhole garden intervention in each district.

A total of 341 households from six municipalities/districts were surveyed, representing 100% of the households selected during the first round of beneficiary selection (out of three rounds to be conducted). Target beneficiaries were selected through two processes: 1) during a community meeting attendants were requested to self-identify if they met selection criteria and were willing to participate in project activities; 2) a household visit was then carried out by field staff to determine if the household met the criteria and to agree on activities/contributions by both the beneficiary and project team. With a target of 1,380 households properly using a keyhole garden by the end of project, this sample size provides a 4.6% margin of error with a confidence level of 95%.¹²

Results

The average HDDS for all targeted households is 7 (0-12 scale). The lowest average HDDS was reported in Ermera District (mean of 4.9) and Manatutu (mean of 5.6). Covalima received the highest average score of 8.1. The HDDS will also be measured at the endline, among a similar sample size, to measure change resulting from the KHG intervention in each district, and overall.

Table 5: HDDS per Target District

Districts	Average of HDDS	# of Households Surveyed
Aileu	7.5	44

¹¹ Swindale, Anne, and Paula Bilinsky. 2006. Household Dietary Diversity Score (HDDS) Indicator Guide for Measurement of Household Food Access (v.2).

¹² Measured using RAOSOFT sample size calculator <http://www.raosoft.com/samplesize.html>

Ainaro	7.0	99
Covalima	8.1	77
Ermera	4.9	38
Manatuto	5.6	10
Manufahi	6.9	73
Overall	7.0	341

Looking at individual food groups, **Food Group 1** (wheat, maize, rice, etc.) had the highest consumption rate across all districts with 97.9% of target households reporting to have eaten one of these foods during the previous 24-hour period. The district with the lowest percentage of Food Group 1 consumption was Manatuto with 90%.

The lowest consumption was from **Food Group 7** (fish, shellfish) with a total of 10.9% of target households across all districts reporting consumption of this food group. Covalima had the lowest consumption rate (6.5%) and Manatuto had the highest (30%).

Food Group 9 (dairy products, cheese, milk, yogurt) scored the second lowest overall with a total 11.1% of households reporting consumption. Manatuto and Aileu districts both had 0 households report consumption of dairy, and Manufahi had the highest consumption, averaging 16.4% of respondents.

Utilization of **Vitamin A-rich foods** was surveyed in further detail as it is of greatest relevance to the keyhole garden activities. Overall, consumption of Vitamin A-rich vegetables is high with 88% of all respondents reporting to have eaten vegetables (any vegetable within sub-groups 2A, 3A, or 3B) in the previous 24-hour period. Dark, leafy green vegetables received the highest number of reports of consumption (78%), with Ermera and Manatuto reporting the least amount (47% and 50%, respectively). However, carrots, squash, and orange-fleshed roots had much lower reports of consumption with only 24% overall. The districts with the lowest percentage of target households consuming these vegetables are Aileu (2%), Ermera (38%), and Manatuto (10%). It should be noted that the high percentage of vegetable consumption may be due to the greater seasonal availability of vegetables during the survey period. As the “lean” season approaches, December – April, a diversified production of vegetables will be important to maintain a nutrient-rich diet throughout the year.

Based on these results, the program team sees an opportunity to promote more carrot, squash and orange-fleshed roots, such as sweet potato, while further reinforcing the use of leafy, green vegetables in the KHGs. The integration of carrot, squash, and orange-fleshed roots becomes even more critical during the lean season because these vegetables provide a higher caloric content in addition to Vitamin A and other important micronutrients.

The target for the Program Indicator *Increase of Household Dietary Diversity Score (HDDS)* is set at an average HDDS of 9. This target was calculated based on the upper tercile of the 341 household scores. It is important to note that the HDDS does not include scores for individual vegetable or fruit groups, but rather a summary of all vegetables and fruits consumed. Thus, it is recommended the program team monitor the consumption of leafy, green vegetables as well as carrot, squash, and orange-fleshed vegetables at the midline of the program in order to gauge consumption during the lean season and measure for change over time.

Table 6: Consumption of Vitamin A-Rich Foods

Districts	# of HH	Food Group 2A: Orange roots, carrots, squash	Food Group 3A: Dark green leafy veg, kale, spinach	Food Group 3B: Cabbage, other veg	Food Group 4A: Ripe papaya, mango	Food Group 4B: Other fruit, young papaya, mango
Aileu	44	2%	84%	20%	16%	0%

Ainara	99	20%	79%	39%	28%	9%
Covalima	77	25%	90%	21%	35%	17%
Ermera	38	8%	47%	5%	18%	18%
Manatuto	10	10%	50%	10%	20%	0%
Manufahi	73	51%	79%	59%	14%	4%
Overall	341	24%	78%	32%	24%	9%

C. Visits by USAID

USAID Timor-Leste visited ESS sites and held meeting with OFDA Regional Advisor

In December 2014, Dennis Wesner, the Director of Economic Growth of the USAID mission in Timor-Leste, visited project sites in Baucau. During this two-day visit, Mr. Wesner visited the Uaniki blacksmith and a project site. In addition, in December 2015, Harlan Hale, OFDA Regional Advisor, also visited Dili and held a discussion related to updates with both Mercy Corps and CRS.

In September 2015, Mark Henderson, the new Director of Economic Growth of the USAID mission in Timor-Leste visited Baucau. During this visit, he was able to visit all three ESS components: ISS, KHG and SILC.

OFDA Regional Advisor and Mercy Corps Regional Program Director

During the last week of June 2015, Harlan Hale from USAID/OFDA Regional Advisor visited Timor-Leste to see different sites of OFDA funded projects in the country, including ESS. Anna Chilczuk, Mercy Corps' South and East Asia Regional Program Director, joined Harlan to visit ESS sites in Manufahi District. During this visit, they met with supported blacksmiths and farmers who have been using the promoted seed storage system, as well as SILC groups. Harlan and Anna also visited other Mercy Corps project sites, including the Conservation Agriculture project (this is also an OFDA funded project, but Mercy Corps acts as a sub-grantee to the UN Food and Agriculture Organization) and inland fish aquaculture program (COMPAC-TL) funded by the Royal Norwegian Embassy.

Coordination & Collaboration

Partners' quarterly coordination meeting & others

CRS and Mercy Corps staff collaborated closely to ensure programmatic synergy. Regular quarterly meetings are conducted to discuss emerging lessons, challenges and solutions. During these meetings, the team discussed achievements to date and strategized to speed up program implementation and spending towards the end of Phase II. In addition to these regular meetings, before the end of Phase II, the following coordination meetings were held:

- A two-day workshop with all supported blacksmiths to share their business development experiences on November 24-25, 2014. During this meeting, the blacksmiths presented their production record to date and held discussions on specific issues such as suppliers and quality of materials; key diversification and new products; and shared challenges and future plans. On the second day, the group visited the Uainiki Blacksmith (Mr. Manuel Gaspar) in Baucau. He is one of the successful supported blacksmiths and they continue to hold discussions there, especially around lessons learned. Documented lessons and recommendations from the workshop included: (i) the need to behave and think like businessmen (they should not depend on the project); (ii) strengthen collaboration by proposing to form a blacksmith association; (iii) recognize product diversification as the key for sustaining business; (iv) maintain relationships with existing suppliers and, if possible, add more suppliers to ensure a reliable quality source

for materials; (v) promote their products through savings and lending groups and to possibly to work together with the groups so members can get credit to access expensive products (e.g. water or grain storage); (vi) blacksmiths also recommended that the project further assist them in developing their business skills.

- On December 7-8, 2014, all ESS implementing partners and both international and local NGOs (Mercy Corps, CRS, IMM, OHM, Caritas, KdP, and TID) participated in the final program reflection workshop in Baucau. The workshop aimed at (i) presenting project achievements and sharing updates on the Phase III proposal plan; (ii) discussing the draft of the new version of the flipbook/facilitation guide; (iii) reviewing SILC monitoring forms for Field Officers and presenting the updated data and information; (iv) documenting lessons learned and identifying key success factors for the next phase. This workshop was also a farewell for IMM as they did not join Phase III of the program. Five key learnings and recommendations included: (1) refresher training for field staff is required, especially for the rolling out of the new flipbook/facilitation guide; (2) to be more realistic with the target areas to be covered by field staff – detailed implementation plan and targeting for new areas – including criteria selection - must be agreed upon at the start of Phase III; (3) to prioritize the more vulnerable communities, not just the ones closest to the blacksmith locations; (4) agreed that the customer feedback survey was very important, if possible do it more regularly – this is to be linked with regular monitoring to supported farmers; (5) community mobilization is key for successful program implementation, and strengthening community mobilization of field staff is strongly recommended for Phase III.

Quarterly harmonization meeting with Ministry of Agriculture (MAF) and stakeholders

Mercy Corps and implementing partners are regularly participating at the district-level harmonization meetings with stakeholders. These meetings are organized by the district-level MAF, wherein each representative from various organizations and government agencies are given the opportunity to share learning and to provide relevant updates.

Savings group technical working group

CRS is now leading the Village Loan and Savings (VLSA) Group Technical Working Group, a group of agencies promoting VLSA in the country. Mercy Corps and CRS are actively participating in its monthly coordination meeting to share best practices and lessons learned, and to coordinate or collaborate on field activities. One highlighted activity during this year was a cross-learning visit of the working group members to different VLSA models, including SILC.

ESS showcased program activities

Mercy Corps and partners, including supported blacksmiths, participated in different expos in the country, including the World Food Day Expo, Food Security and Climate Change Expo, Permascout Event, as well as a USAID Expo. During these events, the ESS program did not just presenting program outreach materials (brochure, etc.), but they also showcased products produced by blacksmiths.



Picture 3: ESS team took a picture with Ms. Karen Stanton, the US Ambassador to Timor-Leste during 2015 USAID Expo in Dili

Humanitarian Country Team (HCT) for Food Security

Both Mercy Corps and CRS are members of the Humanitarian Country Team (HCT) for Timor Leste. During this reporting period, a two-day simulation exercise (SIMEX) was completed in Dili, hosted by UNOCHA in close collaboration with the Ministry of Social and

Solidarity, relevant local NGOs and INGOS, and UN agencies in Timor Leste. Mercy Corps and CRS are also actively participating in coordination meetings with other HTC members to prepare a contingency plan for the impacts of El Nino this year.

From the Field

SILC Groups

Diras Naroma SILC Group

Manuel de Costa has been a member of the SILC group Diras Naroma in Cotalala, Manufahi since May 2015. This group was originally established as farmer group in 2012, but disbanded until ESS presented an opportunity to rejoin with a savings and loan focus. Manuel grows coffee on his land, but has not made a profit selling the beans to nearby markets. Now with the SILC group, Manuel



Manuel de Costa and members of Diras Naroma SILC group. Photo by Mercy Corps

used a loan to purchase a coffee processor and now receives higher prices for the processed coffee he sells. His loan was also used to purchase additional beans from other coffee growers in the SILC group to increase their revenue and encourage them to invest and participate in the lending component of the SILC group. By doing this, Manuel and the SILC members have increased their savings with the interest from loans and have simultaneously built a cooperative of coffee producers and processors. Buyers now know their group and trust the quality and quantity of their product. As an organized SILC group, they are now a known and respected source for coffee in the community.

In one to two years, Manuel wants to purchase pigs to raise on his coffee farms. He feels this will be a good investment as the pigs can forage on his coffee farm and will in turn fertilize the soil. The savings and loans from SILC can help him achieve this.

Sen SILC Group

Outside of Same, a group of maize farmers have also organized as a SILC group under the ESS program. The savings and lending model is new to this group, but after their first year of implementation each member had accessed a loan. A few men purchased pigs and chickens with their loans then resold them for a profit; one pig can cost \$25 but has a resale value of \$30 - \$35 in larger markets. This approach was successful for many of the farmers for resale of livestock and vegetables. The location of their farms is closer to larger markets that many other farming communities have difficulty accessing. This allows this group to purchase products before the farmers make it to the markets, thus acting as traders and purchasing the goods at a lower price.

One farmer, Antonino Pereda, used his loan to open a kiosk in his community. This business has been successful and has inspired another member to work toward opening a kiosk and carpentry business in the future. For this to become a reality, he knows he must increase his savings

significantly. Fortunately, the rest of the group is also eager to begin investing and in the next cycle they have agreed to double the amount put into SILC each week.

ESS Supported Blacksmiths

Baucau

Manuel Gaspar is a blacksmith in Baucau. His family formed their blacksmith cooperative in 1942. For generations the business provided small farming tools and equipment for the community. After an initial partnership with FAO in 2001, Manuel expanded the business by producing storage silos of different sizes for grain, seed, and household food and water. In 2009, Manuel produced a corn-processing tool for Mercy Corps' supported farmer groups, and by 2013 he was trusted partner and well known in the community. He was, therefore, an ideal blacksmith to produce the seed storage silos for the ESS program. Manuel helped design the airtight silos for the program and produces both 35kg and 75kg containers.



Diversified products built by Manuel Gaspar. Photo by Mercy Corps

Having received accounting and bookkeeping training through the ESS program, Manuel is able to better manage his business and used savings to build his home, the expansive blacksmith shop, and three motorbikes for transporting his products. He has saved over \$30,000 to date. He also learned to diversify his business and now produces carts, ovens, cookstoves, and fish boxes. However, Manuel knows that in order to continue selling seed storage silos and other products to farmers, he will need to reach new customers in other communities. He plans to continue saving to purchase a truck to transport the larger products, such as silos and water tanks, and to access new markets outside of Baucau.

Betano

Arnaldo de Silva has been a blacksmith since 2004, starting his business in Betano with support from FAO to make food and water storage containers. His business is smaller than Manuel's but it has grown quickly, with seed and water storage silos being his most popular items.



Arnaldo de Silva stands next to the silos produced for ESS. Photo by Mercy Corps

Arnaldo received the promotion and cost calculation training through the ESS program and has greatly improved his business with these new skills. He works with the village leaders and shop owners to determine what equipment is most needed by the community and where it can be sold. Arnaldo creates posters with photos or illustrations of his designs with the cost listed alongside, placing them in local shops and kiosks as a marketing tool. After saving for 1.5 years, he was able to purchase a truck and can now deliver his products to his customers and can access markets in other areas. Currently, Arnaldo takes his wares to markets in Same, Simpang Tiga, Dotik, and Holarua.

The truck has provided a significant opportunity to

grow his business, but Arnaldo needs additional guidance on diversifying his products and expanding his business. He wants to switch from using manual equipment to using machinery that will improve efficiency and keep costs down. He is already planning for when ESS no longer provides vouchers for the seed silos, and knows he will need to provide other ways to continue marketing the benefits of sealed seed storage and ensuring the product is accessible (and affordable) to those who need it most.

Arnaldo differs from Manuel in that he knows his business may not continue after him. He is saving to send his three children to university where they can use their education to work in any industry they choose. Because of this, Mercy Corps and CRS must consider ways to share Arnaldo's knowledge and experience with the community, so the skills to produce the silos and demand for the improved seed storage is sustained beyond the ESS program.

Keyhole Gardening

With the keyhole garden component of ESS underway, Mercy Corps, CRS, and local partners have put initial lessons learned into action. The CRS office houses two KHGs used to test materials, planting procedures, and growing methods. Additionally, KHGs were planted in schools and public areas as demonstration sites.

So far they have learned valuable information about the level of effort for construction, availability of materials, and which plants are most productive. For instance, broccoli is harvested every three months, but for small household gardens this length of time between harvests is not an efficient use of space and resources (i.e. water). Thus, broccoli will be replaced with mustard greens, which are also rich in vitamins, iron and fiber, and can be harvested monthly. Additionally, it was observed that previous KHG projects administered by other NGOs were unsuccessful. It was reported that seedlings had a low success rate, resulting in the gardens often being abandoned. With this information, the ESS program team has prioritized incorporating seedling care into the trainings offered to beneficiaries.



Keyhole garden at CRS office in Baucau. Photo by Mercy Corps

Thus far, target community members have responded to keyhole gardening with enthusiasm. One of the most appealing benefits of the KHG is the decreased effort needed to maintain the garden. Especially for women and the elderly, having the garden closer to the home is a huge benefit, making it easier to cultivate regularly. Furthermore, re-using household water, or grey water, eliminates the need to travel far distances to obtain water for their gardens.

Though the initial reaction and implementation of the KHGs has been positive, a few challenges are being considered. The materials needed to build the KHGs can be difficult to procure in many of the project areas. Specifically buffalo manure, ash, and fertilized soil are not readily available in the large quantities required for the KHG construction. Thus far, Mercy Corps and implementing partners have made linkages to those materials, but in order to sustain KHGs these links will need to be further developed.

The application of KHGs in schools should also be analyzed. The Vice Principal at the Tasitolu Elementary School in Dili reported that the KHG planted three months ago on school property was a great success. The students enjoyed helping construct the gardens, teachers were interested in building more KHGs, and the maintenance was straightforward and more efficient by re-using water from the kitchen. Most importantly, the vegetables produced were used for the school feeding program and cut down on the cost of purchasing produce in Dili. The school wants to expand and plant additional gardens to provide all the vegetables needed to feed their 1,000 students. This would ensure students are receiving nutritious and diverse foods daily and save the school money. However, the money saved would be returned to the Ministry of Education (MoE) and not be directed back into the school. With this structure, the sustainability of the KHG is threatened as schools have little incentive to invest time, effort, and cost of materials into constructing new KHGs. The MoE does see great potential in the KHG model as it was mentioned in a site visit at the Tasitolu school; however, the program may need to encourage the MoE to design incentives in order to bring this type of intervention to scale.