**Associate Award under the Feed the Future Innovation Lab for Collaborative Research on Grain Legumes**

**AID-EDH-A-00-07-00005**

# YEAR 3 REPORT: OCTOBER 2015 – MARCH 2016

**With the collaboration of**

# 1. Introduction

## MASFRIJOL ANNUAL REPORT FY2016

### Executive Summary

This annual report of the MASFRIJOL project covers the period from October, 2015 through September 2016. MASFRIJOL has devoted significant time to the establishment of community seed depots (CSD) as well as forwarding the nutrition education agenda with very positive results. As the project starts its four year, the past six months were used wisely to set up the closing ramp. Key activities were (a) dissemination of seed of improved bean varieties to new beneficiaries and a second wave of dissemination to households that experienced crop failure in the past; (b) Strong emphasis on the establishment of CSD for local seed production; (c) the completion of the nutrition assessment data collection conducted on beneficiary families with children under 5 years of age; and (e) crosscutting education sessions and technical assistance to directly support the areas of work with strong emphasis on women participation. It has been encouraging for the implementing team to achieve most of the project indicators at 80% or more. Although some indicators have lagged to make room for priorities with CSDs, we remain confident that we will reach all of the project goals and enhance the impact of this initiative in the last months of the project.

In numbers, the accomplishments for the period October 1, 2015 to September 30, 2016, are highlighted below.

- **47 CSDs** were established and 36 already harvested production during the first planting season of 2016. These CSDs were established in an equal number of communities in the target five WHIP departments. The experience of these CSDs has been highly positive.
- **4,094 pounds of improved seed varieties** were produced and commercialized in the target communities by CSDs, with which 40.9ha can be planted, some in the second planting season and some later in 2017. The amount of seed available from CSDs is poised to increase as MASFRIJOL continues to expand on this community-based seed production model.
- **8,008 bags of seed of improved bean varieties** have been delivered to partners for distribution to the same number of new beneficiary families, representing nearly 33,000 families that have received improved bean seed since the onset of the project. With an original goal of benefitting 25,000 families, this means we surpassed this indicator by 32%.
- **352 hectares** cultivated this year with improved black bean varieties.
- **Yield per hectare surpassed from a target of 465kg/ha to 779kg/ha.**
- **7135 children under five years of age** reached through this intervention.
- **5,383 women participating** in MASFRIJOL project activities.

- **441 households** have improved bean storage capacity as a result of MASFRIJOL-introduced technologies.
- **65 technicians** from the ministries of Agriculture and Health as well as from collaborating projects in the WHIP area were trained in the fourth cross-training program (Agriculture and Nutrition) organized by MASFRIJOL and FANTA III.
- **15 producers and 8 technicians** were instructed during the second CSD model training course were seed production strategies, methods and best practices were imparted. The course is required for aspiring CSD participants.
- **2,312 beneficiaries** were trained on improved agronomic practices for bean production. With this, MASFRIJOL reached 80% of the goal of 12,000 beneficiaries trained.
- **5,383 beneficiaries** participated in at least one nutrition education/training sesion. This brings us to 100% of the project goal to reach 12,000 beneficiaries during the life of the project. The work will continue during the rest of the project as many communities have not been reached and we continue to build momentum with the participation of MSPAS health educators to reach more families.
- **721 beneficiaries participated** in bean recipe demonstration sessions teaching families to enhance their diets with more bean consumption. With this number, MASFRIJOL has reached 108% of the goal of 2,000 beneficiaries for the life of the project.

Detailed tables providing evidence of communities reached and partners involved are offered in the following sections. The project team based at the Legume Innovation Lab and in Quetzaltenango is proud to plan for FY 2017 with these results as a strong platform. In addition to this report, ad hoc reports on the CSD experience will be prepared in late February to outline the impact of this initiative which has the capacity to increase seed availability to many remote communities in the FTF area in Guatemala.

## 2. Administrative Results

Over the past year, the project has been implemented as per the LIL Management Office and the project field office in Labor Ovalle plan. The scheduled activities set for this period were completed as expected, with the exception of some changes in personnel. One of the lead technicians resigned to dedicate her time to her newborn child. The search for her replacement is under way. MASFRIJOL is also searching for a seed specialist to support seed production by the Community Seed Depots (CSDs). Because of the pressure to advance with the CSD agenda, MASFRIJOL strengthened its technical team field office thereby ensuring that the project indicators continue reaching according to programmed into the Performance Monitoring Plan (PMP). This decision involved the hiring of four new auxiliary technicians, so the team MASFRIJOL in each department is currently made by Ing. Agr. Extension (team leader) and two Technical Assistants

The MASFRIJOL field office was favored with the addition of a Peace Corps Response Volunteer (PCRV) with strong experience in nutrition education. Rachel Uffer is a dynamic individual and embodies the volunteer spirit committed to making a difference in the community, learning and absorbing the culture of our beneficiaries, and being a resourceful member of the MASFRIJOL team. Uffer left in August after a six-month volunteering period, but we have successfully acquired the services of Ms. Dorothia Vieira. Ms. Viera, a new PCRV,will be supporting MASFRIJOL for a period of 12 months offering training and experience especially in nutrition-related activities.

## 3. Supporting Increased Bean Productivity

### Focus on Community Seed Depots

During the period covered by this report (October 2015 to September 2016), almost all agricultural activities focused on the production of Quality declared seed by Community Seed Depots. Identifying farmers and training them on seed production techniques is a top priority for the project. The most important challenge is to communicate the conditions necessary to participate and to obtain a commitment from the candidate seed producers in exchange for receipt of the MASFRIJOL technology support package. During the training workshop for potential CSDs, MASFRIJOL clearly explained that one of the main conditions for participating in this effort was the availability of irrigation. A CSD seed producer must have the capacity to irrigate the bean crop being grown for seed production during the dry season. It has been long established that the dry season is the best time to produce seed because of high light intensity, increased plant vigor, and the lower potential pest and disease pressure if water is available.

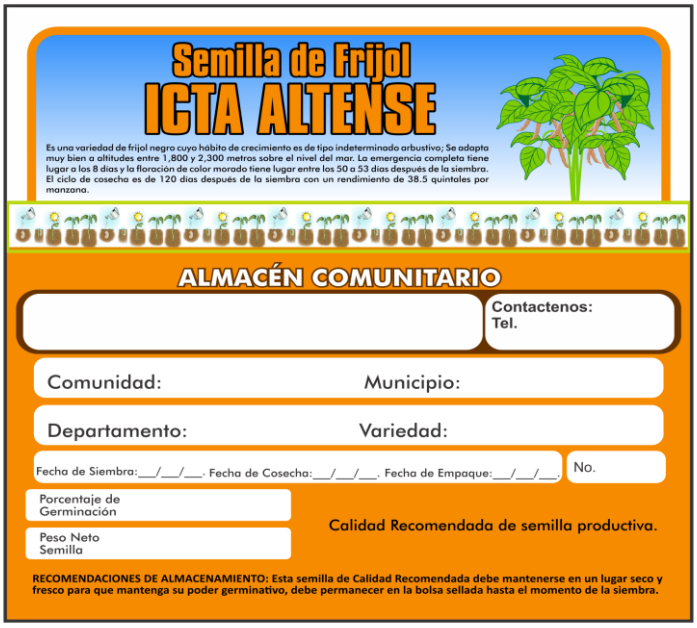
**Picture 1. CSD with sprinkler irrigation system in El Carpintero community, Chiantla, Huehuetenango.**

Access to irrigation water is a challenge for CSD owners since this is a limited resource in the highlands and there are competing demands for this resource. Those with access to irrigation frequently prefer to grow high-value crops that are sold in local markets or for export under out-grower contracts with exporters. Nevertheless, MASFRIJOL project staff reported that farmers were readily convinced of the potential profitability of growing bean seed of the improved varieties. As a result, MASFRIJOL was successful in establishing 35 CSDs with willing farmers, most of them experienced in producing grain though not in producing seed.

Interestingly, most farmers had not appreciated the potential profitability of bean seed production and sale until presented with information on projected yields, market opportunities, and the potential value added price of Quality declared seed. Fortunately, most farmers had detailed knowledge of the improved varieties that were disseminated beginning in the 2014 production cycle and had experienced remarkable yields compared to traditionally available seed. The improved varieties are ICTA Hunapu, ICTA Altense, ICTA Superchiva, and ICTA Ligero—all bush-type beans.

**Expected impact of CSDs**

**Picture 3. Sample label for Community Seed Depots promoted by MASFRIJOL.**




CSDs are intended to produce seed within a short distance of the targeted communities that succeeded in producing grain with the disseminated varieties. Farmer demand for *quality, disease-free seed with genetic purity* is a critical sustainability factor for the CSDs. If farmers are to invest in purchasing seed over grain, they need to appreciate and be assured that they will receive a yield benefit and a return on that input investment. The MASFIJOL project is providing instruction to the selected farmers who have met CSD criteria on seed production and handling practices recommended by ICTA. In addition, CSD seed producers will be required to open their fields for quality supervision and technical assistance and must be willing to host open field days for farmers in the community to observe the important agronomic traits of the improved varieties and to confirm that the fields are healthy and disease free.

Table 1, below, shows the location of the CSDs across the target departments and municipalities. From the 35 CSDs established, 23% are in San Marcos, 40% in Huehuetenango , 25% in Quiche, 6% in Quetzaltenango, and 6% in Totonicapan. Although this distribution reflects the proportion of municipalities in the WHIP departments, the numbers are also consistent with the location of the land with the highest bean production potential.

**Figure 4. Community Seed Depot of Mr. Victor Inés Samayoa with MASFRIJOL technician Miguel Guzman. Común of Rio Blanco, Cunen, Quiche.**

Each CSD is planting from one to two *cuerdas*; one *cuerda* equals 437 square meters and has the potential to yield 200 to 250 pounds of Quality declared seed. The goal for MASFRIJOL is to establish at least 75 CSDs during the life of the project. With these 35, the project has met 46% of its goal. New CSDs seed producers will be selected and trained in advance of the second season, which begins in August 2016. Reaching this goal is feasible since there has been a high degree of CSD owner satisfaction with the enterprise, which should motivate other potential farmers to become involved. Most see the supplying of seed to their community and the opportunity to develop seed markets as a viable business opportunity. Linking them to ICTA and, thus, future access to new and improved bean seed varieties with resistances to the abiotic and biotic stresses found in the highlands are strong incentives for them to continue. ICTA shares this vision and is willing to visit the farmers at least six times during the growing cycle to ensure quality seed and to provide technical consultations with the CSD owners.

MASFRIJOL understands that not every farmer may be successful in achieving the expected phytosanitary standards for both fields and harvested seed. For those potential cases in which technical implementations could be improved, MASFRIJOL will provide the technology package and assistance to the struggling CSDs for up to two seasons. MASFRIJOL understands the importance of communicating to farmers that they are expected to develop independence in their seed producing practices within one or two years. The hope is that if CSDs seed producers realize that they will only be helped for a limited time, they will take better advantage of the limited opportunity.

**Training curriculum for CSDs**

The list of new CSDs is being gathered and the next cohort of potential CSD owners will be trained during a workshop in May 2016 by ICTA and MASFRIJOL technicians, with special

participation by AGREQUIMA on the safe handling of pesticides. The workshop includes the following curriculum.

- MASFRIJOL Community Seed Depots' Implementation Model
- Small-scale Seed Production Systems
- Key Aspects of Artisanal Production of Quality Declared Bean Seed
- Bean Plant Clinic (Bean Seed Disease Diagnostic Practicum)
- Responsible Use and Handling of Pesticides
- Appropriate Use of Pesticide Application Gear
- Pesticides Allowed under the USAID Guatemala PERSUAP (Pesticide Evaluation Report and Safer Use Action Plan)
- Review of EMPR (Environmental Mitigation Plan and Report) Content and Field Monitoring Criteria

Training on seed post-harvest and important topics such as seed marketing were not part of this curriculum, but farmers are being visited by MASFRIJOL technicians with training packages covering these topics.

To date, MASFRIJOL is satisfied with the results of the CSD promotion. It is expected that the 25,000 families already reached during the 2014 and 2015 seasons will be the CSD's first target market. These beneficiaries are already familiar with the increased yield potential of the four varieties promoted by CSDs.

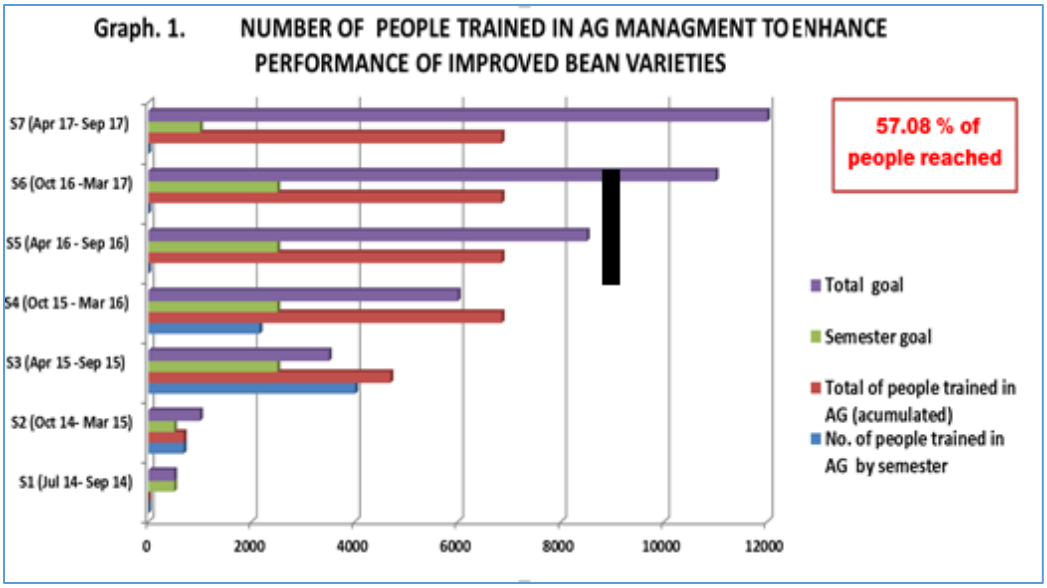
**Table 1. MASFRIJOL Established CSDs (Cycle January to June 2016)**

| No | NOMBRE | Edad | DPI | Departamento | Municipio | Comunidad | Area (Cuerdas) (437 m²) | Coordenadas Geográfica | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Latitud | Longitud |
| 1 | Francisco Aquilino Perez Mendez | 44 | 2516830951205 | San Marcos | San Miguel Ixtahuacan | El Salitre | 2 | N 15° 15' 56.5" | W 91° 40' 51.4" |
| 2 | Miguel Estanislao Bamaca | 40 | 2212763781205 | San Marcos | San Miguel Ixtahuacan | EXIAL | 2 | N 15° 12' 7.3" | W 91° 44' 11.6" |
| 3 | Carlos Camerlino Dominguez Gonzale | 35 | 2774028401405 | San Marcos | San Miguel Ixtahuacan | Tierra Blanca | 2 | N 15° 18' 55.3" | W 91° 42' 21.7" |
| 4 | Jose Bamaca Sales | 62 | 2258103951205 | San Marcos | San Miguel Ixtahuacan | Siete Platos | 1 | N 15° 15' 47.9" | W 91° 40' 11.4" |
| 5 | Ricardo Benito Gonzalez | 50 | 1815243841205 | San Marcos | San Miguel Ixtahuacan | Chisnan | 1 | N 15° 16' 28.4" | W 91° 45' 36.8" |
| 6 | Hector Modesto Bravo Lopez | 37 | 1844238991205 | San Marcos | San Miguel Ixtahuacan | Maquivil | 1 | N 15° 13' 19.1" | W 91° 43' 29.9" |
| 7 | Edgardo Anastacio Diaz Domingo | 47 | 2398479701205 | San Marcos | San Miguel Ixtahuacan | Las Escobas | 2 | N 15° 15' 13.9" | W 91° 47' 57.2" |
| 8 | Lencio Gumercindo Gonzalez Ajpop | 50 | 166996781205 | San Marcos | San Miguel Ixtahuacan | Alen | 1 | N 15° 20' 11.16" | W 91° 44' 25.3" |
| 9 | Elpidio Lopez Figueroa/ Jose Lopez Figueroa | 50/ 54 | 1706806731302/ 2384257891302 | Huehuetenango | Chiantla | Aldea El Carpintero | 2 | N 15° 22' 2.9" | W 91° 29' 55.7" |
| 10 | Jesus Ramirez | 76 | 1714922421322 | Huehuetenango | Concepcion Huista | Yichoch | 1 | N 15° 36' 45.3" | W 91° 40' 50.5" |
| 11 | Bartolo Hernandez Diaz | 26 | 2170815831322 | Huehuetenango | Concepcion Huista | Caserio San Felipe | 1 | N 15° 36' 54.0" | W 91° 45' 38.9" |
| 12 | Juan Agripino Alba Cifuentes | 54 | 2326768281302 | Huehuetenango | Chiantla | El Pino | 2 | N 15° 23' 43.31" | W 91° 27' 40.08" |
| 13 | Eulalio Veasquez Cano | 60 | 2971566831332 | Huehuetenango | Concepcion Huista | Trapichitos | 1 | N 15° 36' 54.4" | W 91° 44' 34.9" |
| 14 | Carlos Enrique Rodriguez Lucas | 50 | 1826548851324 | Huehuetenango | san Antonio Huista | Canton Reforma | 1 | N 15° 39' 5.3" | W 91° 46' 54.5" |
| 15 | Francisco Sanchez Miguel | 66 | 1715212501307 | Huehuetenango | Jacaltenango | Pebilpam | 1 | N 15° 45' 12.12" | W 91° 49' 6.1" |
| 16 | Artemio Ortiz Martinez | 45 | 1859752751315 | Huehuetenango | Todos Santos Cuchumat. | San Martin | 2 | N 15° 34' 36.11" | W 91° 39' 28.91" |
| 17 | Ernesto Martin Pablo | 41 | 1650863511307 | Huehuetenango | Jacaltenango | Chapaltlaj | 1 | N 15° 39' 35.1" | W 91° 40' 47.01" |
| 18 | Alberto Carmelino Hernandez Quiñonez | 57 | 1625479861307 | Huehuetenango | Jacaltenango | Hunta | 1 | N 15° 44' 50.48" | W 91° 49' 22.15" |
| 19 | Gildardo Fredy Herrera Jimenez | 47 | 1737508181324 | Huehuetenango | san Antonio Huista | Las Galeras | 1 | N 15° 39' 8.45" | W 91° 48' 21.58" |
| 20 | Pedro Lopez Martinez | 42 | 1866751351324 | Huehuetenango | san Antonio Huista | Nojoyá | 1 | N 15° 39' 33.5" | W 91° 49' 4.4" |
| 21 | Angel Otoniel Castillo Castillo | 54 | 219379041307 | Huehuetenango | Jacaltenango | Lupina | 1 | N 15° 44' 33.4" | W 91° 49' 35.57" |
| 22 | Benito Ramos Matías | 29 | 1978972311322 | Huehuetenango | Concepcion Huista | Yulá | 1 | N 15° 37' 15.64" | W 91° 38' 33.74" |
| 23 | Gaspar Garcia Ulan | 56 | 2251642291416 | El Quiche | Sacapulas | Chutinimit | 1 | N 15° 18' 13.8" | W 91° 5' 35.6" |
| 24 | Victor Yat Jimon | 45 | 1851675351404 | El Quiche | Zacualpa | Chixocol | 2 | N 15° 1' 15.2" | W 90° 54' 28.8" |
| 25 | Santiago Lux Garcia | 59 | 1869260301404 | El Quiche | Zacualpa | La Vega | 2 | N 15° 1' 7.5" | W 91° 51' 51.2" |
| 26 | Manuel Hernandez Garcia | 58 | 1869267581404 | El Quiche | Zacualpa | Tunajá I | 1 | N 15° 1' 58.3" | W 90° 51' 42.7" |
| 27 | Francisco Tun Riquiac | 52 | 2468571531404 | El Quiche | Zacualpa | San Antonio V Centro | 2 | N 15° 1' 58.0" | W 91° 56' 57.7" |
| 28 | Feino Morales Lopez | 50 | 1899755391415 | El Quiche | San Miguel Uspantan | Chotom | 1 | N 15° 19' 54.9" | W 90° 49' 10.3" |
| 29 | Froilan Noriega Ramirez | 54 | 1785081011415 | El Quiche | San Miguel Uspantan | Xolalbarda | 2 | N 15° 17' 10.6" | W 91° 47' 54.6" |
| 30 | Juan Lopez Chivalan | 47 | 1596458751410 | El Quiche | Santa Maria Cunen | Los Planes | 1 | N 15° 18' 57" | W 91° 2' 28.7" |
| 31 | Victor Ines Samayoa Velasquez | 65 | 2464422081410 | El Quiche | Santa Maria Cunen | Rio Blanco | 1 | N 15° 13' 52" | W 91° 0' 10.1" |
| 32 | Elena Luisa Velasquez Godinez/ Juana Bacilia Velasquez Velasquez | 44/ 42 | 1739682791202/ 1739675581202 | Quetzaltenango | San Juan Ostuncalco | Agua Blanca | 2 | N ° ' " | W ° ' " |
| 33 | Felipa Isabel Herrera Lopez de Orozco | 61 | 1917753630804 | Quetzaltenango | San Juan Ostuncalco | Las Barrancas | 2 | N 14° 36' 35.99" | W 91° 43' 48" |
| 34 | Modesta Barrera Ajcá | 36 | 1869705870805 | Totonicapan | Momostenango | S. Jose Siguila (Sical | 2 | N 15° 16' 11.99" | W 91° 26' 23.99" |
| 35 | Santos Timoteo Garcia Vargas | 54 | 1869707570805 | Totonicapan | Momostenango | Xequemeya (Panca) | 1 | N 15° 5' 59.99" | W 91° 21' 35.99" |
| | **TOTAL Cuerdas** | | | | | | 49 | | |
| | **TOTAL Hectareas** | | | | | | 2.14 ha | | |

## Progress on other productivity-enhancement areas

During this reporting period MASFRIJOL trained 2,157 people on integrated agronomic management practices for bean production in the highlands— 86% of the target beneficiaries for this period, which shows steady progress toward aggregate project goals. The cumulative number of beneficiaries trained in agronomic practices is 6,850, representing 57% of the project's goal of 12,000 farmers.

COMMENT




Even after MASFRIJOL's seed distribution efforts are decreased compared to previous years, training on agronomic management practices for successful bean production will continue. The MASFRIJOL agricultural extension model is based on repeated visits and farmer–technician communication. Since smallholder bean farmers are resource poor, they need to use a variety of scale-appropriate integrated crop management practices to build up the health and fertility of the soil, manage pests and diseases, and culture their beans in accord with the specific requirements of the variety in their agroecological context. These requirements can be complicated. One visit per household is not considered sufficient to effectively educate farmers on management options and the most effective and efficient use of available limited resources to maximize bean productivity and profitability.

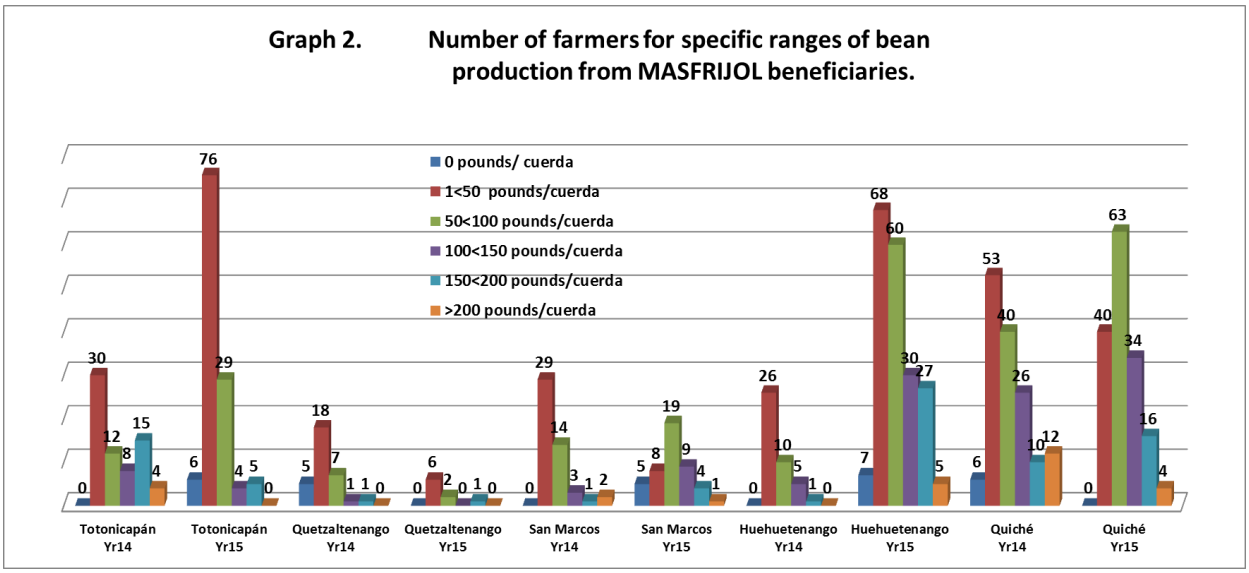
**Preparing for lower-scale seed dissemination during the coming year**

As described in the MASFRIJOL Year 3Workplan, MASFRIJOL will reach 5,000 farmers with seed of improved varieties by targeting those households that endured long drought periods in 2014 and 2015. This plan provides the best opportunity for the project to demonstrate the genetic potential of the improved varieties and the value of planting quality seed to increase yields to farmers. Save the Children, which MASFRIJOL continues to partner with under the Rural Value Chains Project led by AGEXPORT, will independently reach 5,000 households by emulating the MASFRIJOL model of enhancing productivity and the nutritional quality of diets. Under this collaboration, MASFRIJOL makes available its know-how, technologies, and extension methods to the Save the Children field team so that the model is accurately replicated. As a result, 10,000 families will be reached; about half of these will be given a second opportunity to test and again experience with the improved bean varieties. The expectation is that growing conditions during the coming rainy season will be better than in 2015 and 2014, particularly in areas of Totonicapan.

## Yield impact from access to improved seed

Many farmers reported their bean yields in 2014 and 2015, but the information gathered was unfortunately inadequate; further, the reporting families had not been randomly selected. A recent observation by the External Evaluation Team to the Feed the Future Legume Innovation Lab outlined the need to generate data that reflected the real impact of MASFRIJOL across municipalities on both yield and total bean production by households. Obtaining data on how much the project is increasing total household bean production is critical to ensuring that households have increased food and nutritional security and can potentially consume more beans in their diets. To this end, the MASFRIJOL project is planning an assessment activity for the project final year.

Given the available data, graph 2, below, present bean yield data for a sample of the farmers across the five target departments that received seed in 2014 and 2015. Please note, however, that the yield data set was limited to the harvest forms turned in by partners and probably biased and thus not indicative of farmer experience with planting quality seed of improved varieties in the respective departments. Despite these limitations, we believe that the data suggest trends in productivity that are consistent with field observations by the MASFRIJOL team.




Graph 2 shows bean yield frequencies obtained by a total of 1,200 beneficiary farmers from five departments in 2014 and 2015. Assuming an average baseline bean yield of 20–25 lbs/cuerda from milpas, the data suggest that the majority of farmers in many areas did not experience a yield increase (yields of only 1-50 lbs/cuerda). The encouraging data, however, indicate that a significant number of farmers, especially in Quiché, reported yields between 50 and 100 lbs/cuerda and even higher. These yield findings most certainly must be confirmed before impact claims can be made.

When MASFRIJOL technicians visit farmers, they regularly hear the comment that bean yields under the *milpa* system (maize interplanted with beans) are consistently low. As a consequence, even small increases in bean yield obtained through planting quality seed of the improved black bean varieties in monoculture result in relatively large percentage increases in yield. If farmers compare monoculture with milpa-produced beans, three- to five-fold increases in bean yields above 15–25 lbs. per cuerda are commonly obtained. Farmers also liked the ease of managing insect pests when growing beans in monoculture.

The fundamental question that needs to be answered is whether monoculture bean production by smallholder farmers is affecting the amount of land area dedicated by each farmer to both bean and maize production. The corollary question is, how is the planting of beans in monoculture affecting total household bean and maize production each year? Total production of these crops would be expected to determine household food security and consumption of both beans and maize as well as, possibly, household income.

Although the mean bean yields for the five departments in 2015 tended to vary, this difference is not likely to be significant.

Average across departments during 2015: 63lbs/cuerda for N 530 families

- Average for Totonicapan during 2015: 40 lbs/cuerda
- Average for Quetzaltenango during 2015: 52.2 lbs/cuerda
- Average for San Marcos during 2015: 73 lbs/cuerda
- Average for Quiche during 2015: 72 lbs/cuerda
- Average for Huehuetenango during 2015: 77 lbs/cuerda

The yield data presented in this report were obtained from WHIP partners. Table 2 summarizes the proportion of seed forms and grain harvest forms received from partners through this reporting period. An expectation of this partner relationship was that each would provide yield and other information collected from beneficiary households; unfortunately, they didn't follow through as expected. Again, MASFRIJOL is planning to randomly sample the known beneficiary farmers (from existing lists) to obtain more reliable yield data on *milpa* (traditional varieties) and monoculture (improved varieties) systems to evaluate the effectiveness of the technology.

| Table 2. Seed Forms (from seed bags) distributed during year 2015 and those recovered until March 2016. | | | | |
|---|---|---|---|---|
| Partner | Seed Bags delivered (Seed Forms) | % of total bags delivered | Forms received up to March 31, 2016 | % of total forms received |
| RVCP/Agexport (includes ADAM) | 29 | 0 | 29 | 0 |
| RVCP/Anacafe/Funcafé | 695 | 4 | 535 | 3 |
| PL-480 Save the Children | 2035 | 12 | 724 | 4 |
| PL-480 CRS/SEGAMIL/CARITAS | 1118 | 7 | 548 | 3 |
| MSPAS | 8966 | 53 | 3960 | 23 |
| MAGA | 2358 | 14 | 2115 | 13 |
| SESAN | 50 | 0 | 0 | 0 |
| PCI | 285 | 2 | 169 | 1 |
| Municipalidad de San Sebastian H. | 300 | 2 | 40 | 0 |
| Dirección MASFRIJOL (siembra de Invernade | 1 | 0 | 1 | 0 |
| Municipalidad San Miguel Ixt. S.M. | 1050 | 6 | 939 | 6 |
| Total | 16,887 | 100 | 9,060 | 54 |

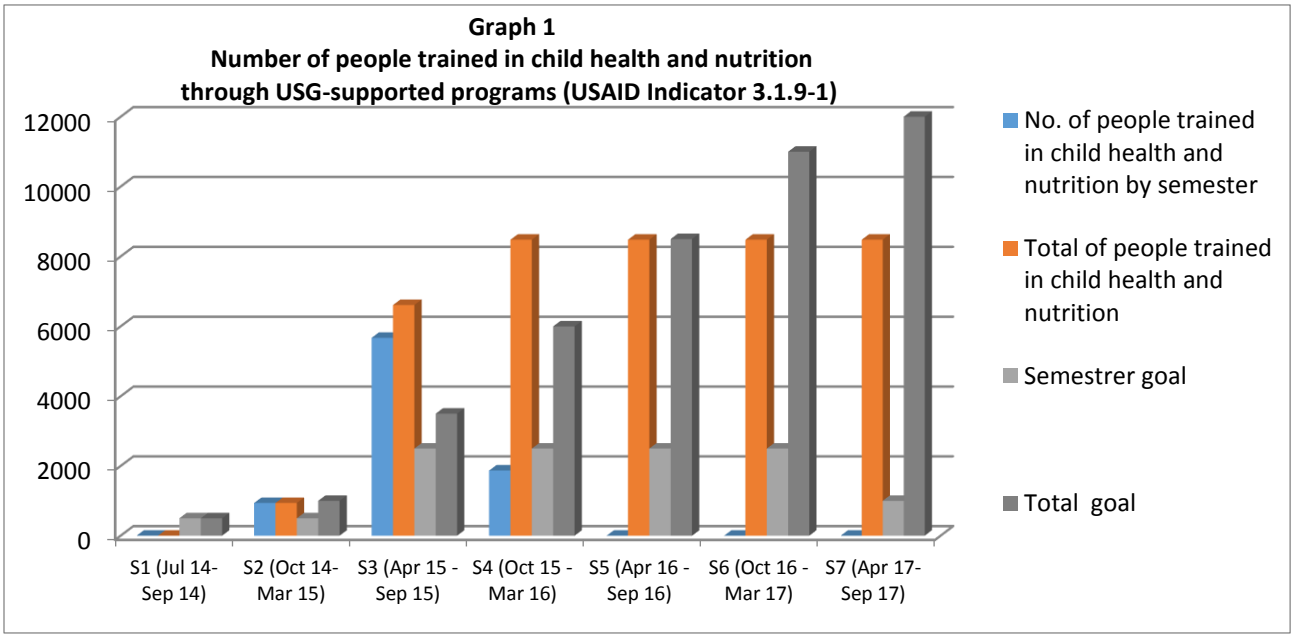
**Dissemination of GrainPro bags**

In order for gains in bean productivity to translate into increased household nutritional security and increased bean consumption, households must be able to store the harvested grain for extended periods of time. To help farmers limit grain losses due to bruchids during storage and to incentivize household storage, MASFRIJOL disseminated GrainPro bags to families that received seed of the improved varieties and produced beans. During this reporting period, 816 families have benefitted from receiving two GrainPro bags each. This number will increase significantly in the next reporting period since it will coincide with the main production season of the agricultural year from May–August. It is hoped that households will carefully handle and reuse these bags for bean storage in future years. Again, the project plans to monitor the efficacy, adoption, and continued use of GrainPro bags.

# 4. Enhancing the Nutritional Quality of Diets

**Training activities**

Over the past six months, the MASFRIJOL team has focused increasing effort on nutrition enhancement activities versus seed dissemination activities. The education sessions have been delivered and led by the MASFRIJOL technician assigned to the respective department, with the participation of different partners. The main bean consumption-related themes covered during this period include raising awareness about the causes of chronic malnutrition, complementary feeding, quality protein, the importance of a balanced diet for children in their first year of life,



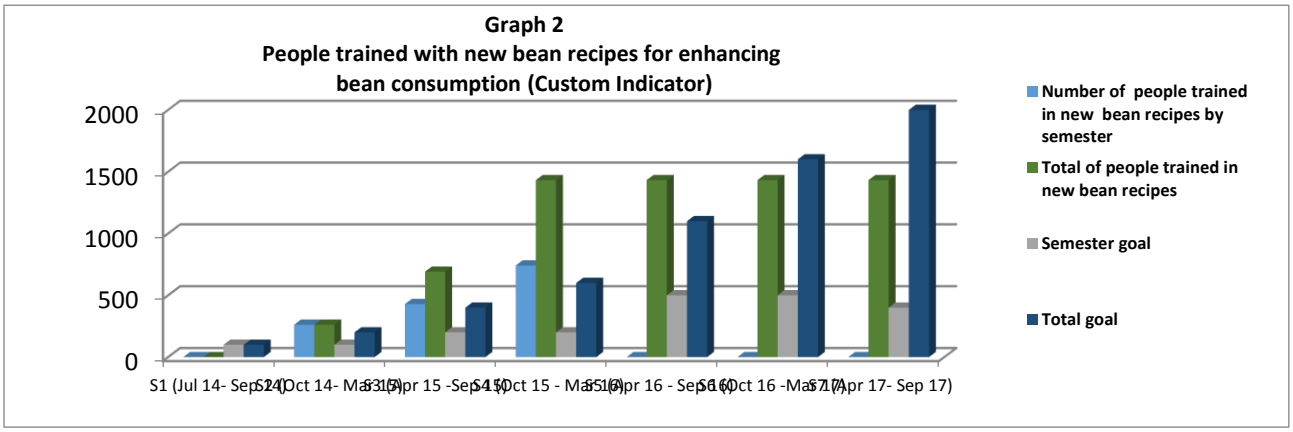

and the importance of a balanced diet for pregnant women. These themes are delivered with the help of high quality, culturally adapted materials (videos, curricular guides, etc.) that have been vetted and approved for use by USAID's observing of the MASFRIJOL Communications Plan. The nutrition education sessions consistently emphasized the nutritional and health importance of beans in the 1000-day window.

By the end of the current report period, MASFRIJOL had reached a total of 8,481 beneficiaries who had participated in at least one training session. This total indicates that the project has attained 71% of its goal of benefitting 12,000 households with nutrition education during its lifetime.

The training delivered has been well received, particularly by mothers. The concepts are simple and the meetings dynamic, especially the preparation of bean-based recipes. In these sessions, mothers learn easy recipes they can try immediately with their children, who often accompany them. The goal is to facilitate knowledge and methods for mothers to diversify the way they feed beans to the whole family, so that beans are consumed daily without losing their appeal. Mixing

other ingredients commonly available in the community with beans further increases the quality food intake, along with the protein.

Graph 2 presents a timeline of progress achieved by MASFRIJOL in providing nutrition education and training on recipes for bean-based foods to mothers of beneficiary families.




**Picture 1. Mother giving "Ceviche de Frijol" to her daughter after a recipe demonstration. Duraznales, Concepción Chiquirichapa, Quetzaltenango.**

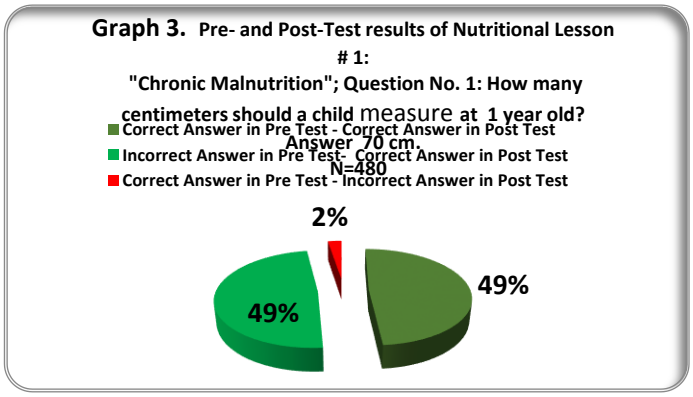
**Picture 1 Nutritional Session "Chronic Malnutrition" in the community of Ixlaj, Chajul, Quiché.**

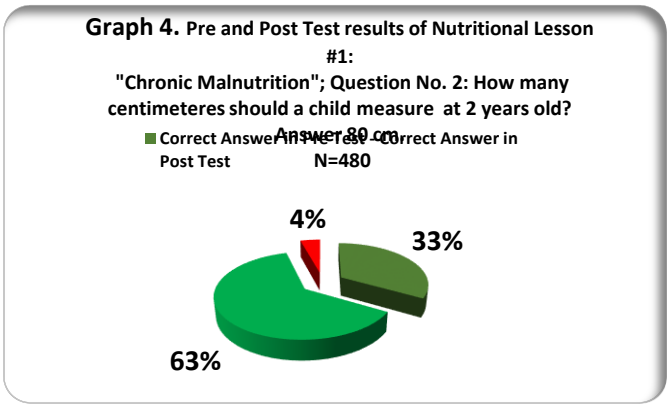
In each of the sessions delivered by MASFRIJOL, a quick pre-evaluation of existing subject knowledge is given to the attendees. The post-evaluation then determines which aspects of the training session attendees remember from the instruction. This feedback is used to improve the next session and consequently, the quality of the training curricula.

Mothers are also encouraged to indicate the most important information learned and compare their impressions and answers to the evaluation with others in the group. Such exchange is received with enthusiasm and they laugh at their misconceptions and enjoy realizing they have acquired new knowledge and skills.

One example of knowledge acquired regards correct estimation of the minimum waist and height of a well-nourished child at a certain age. This question is asked of the mothers so that they learn

to identify symptoms of chronic malnutrition in their children. Graphs 3 and 4, below, show the results of several training sessions (N=480) in which 49% of the attendees didn't know the right answer to a question on the minimum waist and height for a two-year-old child. The graphs also indicate that although some of the mothers were initially confused, their confusion had been eliminated by the post-evaluation test.




## Measuring changes in bean consumption

MASFRIJOL will be assessing possible changes in bean consumption at the household level through a randomly selected simple of 700 families with children under five years of age across the 30 municipalities in the five target departments. The data gathered from these families include information on child growth (anthropometric data), bean consumption in the household, diversity of foods in diets, and diets of women, pregnant women, and children up to two years of age.

**Picture 2. Families filling out bean consumption form. Santo Domingo, Concepción Tutuapa, San Marcos.**

The first stage of the evaluation is planned to help the MASFRIJOL team to gain a good introduction to the community and with the selected families in order to carry the following actions:

- Pre-evaluation of nutrition for the entire family
- Nutrition and feeding education based on the MASFRIJOL training curriculum for six months
- Post-evaluation of impact measured mainly in increased bean intake

The selection of communities for the evaluation of bean consumption was made at random from the list of beneficiary communities reported by MASFRIJOL technicians and collaborating partners. Participation in the survey is voluntary.

To date, data have been collected from 286 randomly select families, representing 41% of the total. The following tables present data for these 286 families and are not yet conclusive. Final results will be analyzed after the 700 families have been contacted and the training and data collection has been completed.

The following table shows the number of families reached in each target municipality for which the pre-evaluation and nutrition education activities were carried out

**Table 3. MASFRIJOL Nutrition Education Evaluation (partial results)**

| Department | Municipality | Community | No. Families reached |
|---|---|---|---|
| **QUICHÉ** | Chajul | Ixlaj | 5 |
| | Cotzal | Pamaxan | 3 |
| | Cunen | Chiul | 3 |
| | | Paraiso | 6 |
| | | San Luis | 5 |
| | | Sausucuché | 6 |
| | | Xetzac | 9 |
| | Nebaj | Batzchocolá | 6 |
| | Sacapulas | Chuitinimit | 10 |
| **TOTAL** | | | **53** |
| **SAN MARCOS** | San Miguel Ixtahuacan | Cabajchum | 7 |
| | | Chininhuitz | 6 |
| | | Chisnan | 6 |
| | | Exial | 7 |
| | | Las Escobas | 10 |

| | | | |
|---|---|---|---|
| | | Maquivil | 7 |
| | | Salitre | 6 |
| | San Rafael Pie de la cuesta | El naranjo | 9 |
| | | Nueva Libertad | 11 |
| | | Nuevo San Rafael | 10 |
| | Concepción Tutuapa | La Laguna | 10 |
| | | Sochel | 3 |
| | | Tuichuna | 10 |
| | | La Unión | 7 |
| | | Santo Domingo | 7 |
| **TOTAL** | | | **116** |
| **QUETZALTENANGO** | Concepción Chiquirichapa | Barrios San Marcos | 2 |
| | | Duraznales | 5 |
| | | Excomucha | 1 |
| | | Telena | 6 |
| | | Tuipox | 6 |
| | San Juan Ostuncalco | Lagunas Cuaches | 6 |
| | | Las victorias | 2 |
| | | Los Alonzos | 10 |
| | | Monrrovia | 5 |
| **TOTAL** | | | **43** |
| **TOTONICAPAN** | Santa Lucia la Reforma | Pabaquit | 8 |
| | | San Luis Sibila | 9 |
| | Momostenango | Racana | 11 |
| | | Rachoquel | 10 |
| | | San Vicente Buenabaj | 8 |
| | | Tierra Colorada | 7 |
| **TOTAL** | | | **53** |
| **HUEHUETENANGO** | Concepción Huista | Petatán | 5 |
| | | Centro (Unión, Mendez, Pozo) | 7 |
| | | Cabic | 4 |
| | | Yulá | 5 |
| **TOTAL** | | | **21** |

The pool of 286 families contains 307 children five years of age or younger; of these, 53% of the children are female and 47% male. Even though these numbers represent only 41% of the total sample size, preliminary analysis of the data collected to date suggests that approximately 65% of the children five years of age and younger are exhibiting symptoms of undernutrition, based on USAID's metric for child stunting ("Indicator 3.1.9-11 for Prevalence of stunted children under five years of age"). Of these, approximately **38%** show moderate delay in growth while **28%** shows a severe delay in growth.

It is important to mention that the proportion of children under five years with chronic malnutrition (65%) is significantly above the national mean of **37.6%** based on the Fourth National Census (November 2015, published by the Government of Guatemala). This difference is explained by the fact that MASFRIJOL is only measuring children in the Western Highlands of Guatemala, an area known for a high incidence of child stunting.

Table 4 shows the detailed data for this indicator (USAID 3.1.9-11) reported for each of the MASFRIJOL target municipalities/departments.

**Table 4. Indicator USAID 3.1.9-11 "Prevalence of stunted children under five years of age"**

| Department | # Children measured | % HAZ Normal | Chronic Malnutrition | | |
|---|---|---|---|---|---|
| | | | % HAZ <-2 | % HAZ < -3 | % Total Chronic Malnutrition |
| **Quetzaltenango** | 67 | 26.87 | 41.79 | 31.34 | 73.13 |
| **Totonicapán** | 56 | 35.71 | 25.00 | 39.29 | 64.29 |
| **San Marcos** | 124 | 35.48 | 42.74 | 21.78 | 64.52 |
| **Huehuetenango** | 23 | 47.83 | 13.04 | 39.13 | 52.17 |
| **Quiché** | 37 | 35.13 | 48.65 | 16.22 | 64.87 |

**HAZ = Height for Age Z score**

Anthropometric data was also analyzed for the subjects reached to date. The data fulfills USAID indicator "3.1.9-12 Prevalence of wasted children under five years," where it was found that **93.8%** of the children show a current, normal nutritional status; however, the remaining **3.2%**

fall under acute malnutrition status (2.28% with acute, moderate malnutrition and 0.98 with severe, acute malnutrition).

In addition, it is important to note that **2.93%** of the children were found to be overweight. Table 5 below presents the details of these data per department.

**Table 5. 3.1.9-12 Prevalence of wasted children under five years of age**

| Department | # Children measured | % WHZ Overweight | % WHZ Normal | Acute Malnutrition | | |
|---|---|---|---|---|---|---|
| | | | | % WHZ <-2 | % WHZ < -3 | % Total Acute Malnutrition |
| **Quetzaltenango** | 67 | 1.49 | 98.51 | 0 | 0 | 0 |
| **Totonicapán** | 56 | 1.79 | 89.29 | 5.35 | 3.57 | 8.92 |
| **San Marcos** | 124 | 3.22 | 94.37 | 2.41 | 0 | 2.41 |
| **Huehuetenango** | 23 | 8.70 | 86.96 | 0 | 4.34 | 4.34 |
| **Quiché** | 37 | 2.70 | 94.60 | 2.70 | 0 | 2.70 |

**WHZ = Weight for height Z score**

Since this is only the preliminary data, it was not yet possible to assess changes in diets, especially possible increases in bean consumption, by households that are the primary focus of this agriculture for nutrition Feed the Future project, MASFRIJOL.

## 5. Success Story

See recommended format attached.