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SOMALIA PROGRAM SUPPORT SERVICES

FINAL PERFORMANCE EVALUATION OF THE PARTNERSHIP FOR ECONOMIC GROWTH ACTIVITY IN THE SOUTHWEST STATE OF SOMALIA

August 2016

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COVER PHOTO: Livestock market, Mogadishu. Photo credits Evaluation Team

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ACRONYMS

ABIC	Agribusiness Incubation Center
DAI	Development Alternative Inc.
DAP	Di-ammonium Phosphate
DFID	Department for International Development (United Kingdom)
FAO	Food and Agriculture Organization of the United Nations
FGD	Focus Group Discussion
FGS	Federal Government of Somalia
GDP	Gross Domestic Product
KEA	Kenya and East Africa
IP	Implementing Partner
KII	Key Informant Interview
MOA	Ministry of Agriculture
MLFR	Ministry of Livestock, Forestry and Range
MT	Metric Tons
NGO	Non-governmental Organization
PEG	Partnerships for Economic Growth
SATG	Somali Agriculture Technical Group
SOW	Statement of Work
SPS	Sanitary and Phytosanitary Standards
SPSS	Somalia Program Support Services
SRS	Simple Random Sampling
STTA	Short-term Technical Assistance
SWSS	Southwest State of Somalia
TA	Technical Assistance
TOR	Terms of Reference
USAID	United States Agency for International Development
WFP	World Food Programme

EXECUTIVE SUMMARY

INTRODUCTION

Background: This document presents the findings, conclusions and recommendations from the final performance evaluation of the crop and livestock sub-activities of the Partnership for Economic Growth (PEG) project. The goal of PEG was to contribute to increasing stability through inclusive economic growth by increasing food availability for consumers while also bolstering farmers' incomes; and, to create employment in the crop and livestock value chains in the Southwest State of Somalia (SWSS) through increased productivity. A secondary goal of this final performance evaluation is to capture lessons learned from conducting crop and livestock focused economic growth activities that can be used by USAID/Somalia for future economic growth programming in SWSS.

The crop and livestock sub-activities that are the focus of this final evaluation were implemented from March 2014 to December 2015 in SWSS by the USAID Implementing Partner (IP) Development Alternatives Incorporated (DAI) and their sub-contractor Somali Agriculture Technical Group (SATG).

Methodology: Data for this evaluation were collected through a survey of beneficiaries at the household level, as well as qualitative data collected through Focus Group Discussions (FGD) and Key Informant Interviews (KII). Because of data quality issues in the first round of data collection related to production units of measure and plot size, IBTCI commissioned a second round of data collection to rectify those issues.

KEY FINDINGS AND RECOMMENDATIONS

To what extent has PEG been able to meet its targets for sub-activities based in South Central Somalia?

- PEG met most Input Targets: PEG delivered the targeted levels of training and micro-grants for agriculture and exceeded targets related to fodder production micro-grants for seeds, cuttings, and tractors. For livestock, PEG exceeded technical assistance (TA), training targets, and veterinary provision services input targets, but was unable to attain the target of benefiting one milk processing company.
- Agriculture and Livestock Outcomes were mixed: PEG achieved the target range for maize yields, resulting in an average yield increase of 29 percent compared to production prior to PEG. Livestock sub-activity results for cattle, i.e., mortality and morbidity, showed

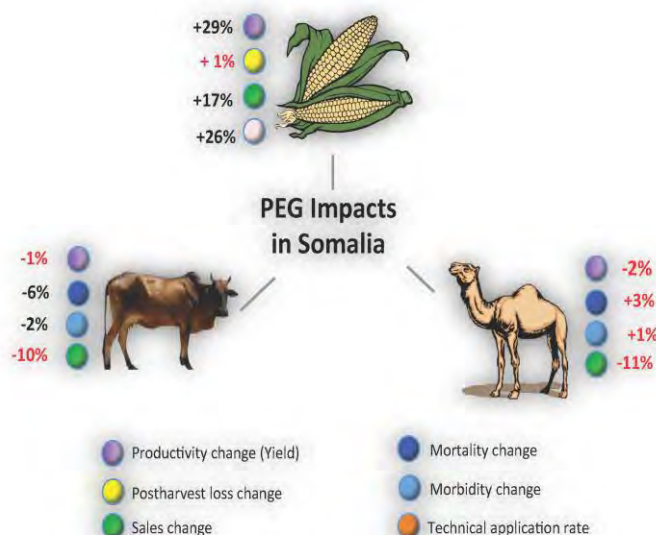


Figure 1: Percentage Change in Key Indicators "Before PEG" and "With PEG"

modest upward trends, though milk production trended downward. All indicators for camels trended downward. The short-term nature of the pilot-type activity prevented clear conclusions about livestock and camel outcomes.

- Household-level Outcomes were Mainly Positive: PEG had positive effects on household income for most crop farmers, and on household food self-sufficiency. PEG contributed to a modest increase in hired labor on crop farms. Adult members of crop households are now working less, probably because PEG's methods are more effective. The increase in the average number of household girls employed on the farm was relatively small, but highlights the potential negative impact of projects that aim to increase agricultural productivity.
- PEG Regulatory and Policy Support was Ineffective: PEG's draft legislation was not deemed to be of use by the Government of Somalia (GoS) because there was insufficient consultation to reflect changed government priorities.

Recommendations and Lessons Learned

- Carefully Consider Indicators and Time Frames during Project Design: The choice of which agricultural interventions will be supported, such as how many value chains and what parts of it, needs to take into consideration the myriad of variables related to local conditions and the objectives of the activity to determine useful indicators and realistic time frames. The project period was too short for some PEG targets such as increasing milk production.
- Build Data Collection into Ongoing Monitoring on Production Changes and Inputs, and Contextual Factors: Disaggregate by gender and age and conduct verifications, beginning with the baseline. Such data will inform USAID/Somalia management decisions during critical implementation phases. Also, these data can contribute to more robust evaluations later and minimize the data anomalies pertaining to plot sizes and crop yields, and recall bias encountered in this PEG final performance evaluation.
- Analyze Gender Impacts of Increased Agricultural Productivity during the Design Phase: During the design phase, planners should undertake a gender analysis of probable labor impacts of improved agricultural practices including identifying unanticipated consequences like additional labor burdens for girls, as was the case in PEG. Mitigation might include training on labor-saving gender-specific techniques.
- Limit Regulatory Support to Providing Technical Expertise when Requested (leave drafting to government). Projects like PEG may be able to support the national responsibility for drafting laws and regulations by financing personnel who would be embedded in the Ministry.

Was the implementation model used by PEG, namely implementation of sub-activities through a local partner, appropriate for south central Somalia? What were the strengths and challenges?

- Drought, weeds, and pests suppress Somali farmers' maize production, but their problems start with degraded, nutrient-starved soils, and limited access to nitrogen fertilizer and improved maize seed. Involvement of the local IP, SATG, with experience in the areas of intervention, allowed for time-saving efficiencies in the selection of suitable crop varieties, and in commencing demonstration plots with an effective package of inputs such as improved seeds, urea, diammonium phosphate (DAP), and insecticide, that had a significant positive effect on maize yield.
- The cascade model coordinated by SATG was an effective method to transmit the knowledge of new agricultural practices at the top two levels of the cascade, evidenced by similarly improved maize yields for lead and contact farmers. The cascade model also mitigated implementation challenges caused by the insecure environment.
- The transfer of knowledge to female farmers was most effective when it was woman-to-woman.

Recommendations and Lessons Learned

- Develop Local Partnerships and Expertise. Identify appropriately qualified local partners in order to leverage their expertise, local knowledge, and to overcome security challenges. For example, Banadir University should be part of a similar future project, to ensure long-term sustainability. There is also a need to use more local Somali experts to achieve cost effectiveness rather than rely on expatriate staff in project implementation. This also helps mitigate security challenges.
- Monitor and Evaluate Cascade Effectiveness along with Inputs to Better Assess Results. Future projects should identify and sample contact farmers further down the knowledge transfer cascade (i.e., second-degree contact farmers) to verify training numbers reported by primary contact farmers, and to assess the effectiveness of the knowledge transfer process (i.e., whether information is being transmitted accurately), and the relationship of access to other necessary inputs.
- Address the Availability of inputs in the Cascade Model. The knowledge transfer multiplier tends to peter off the further removed from the agricultural extension agent and lead farmer. Also, knowledge transfer and agricultural inputs go hand-in-hand. Therefore, to achieve the productive benefits of the improved practices, successive levels of contact farmers need to be provided access to those inputs in order to achieve the same productivity levels.
- Nurture Female Role Models. Support efforts to recruit and train more female extension agents. Projects like PEG should seek to identify and develop female lead farmers who can be more effective than men in mentoring other female farmers.

How successful has PEG been in ensuring that the benefits of its interventions continue beyond the life of the activity?

- Beneficiaries overwhelmingly report knowledge and the application of new practices and their intention to use them, but cite potential technical and financial constraints. Capacity to pay is a limiting factor for the sustainable adoption of PEG practices without continued subsidies for agro-inputs like urea, DAP, pesticides, and tractor rental.
- Because SATG is continuing the operation of an Agribusiness Incubation Center (ABIC) in Afgoi and two sub-stations in Awdeghle and Balad, SATG is an ongoing resource to farmers and the GoS, especially for high-quality maize seed.
- The World Food Programme's (WFP) purchases are a strong market motivator for maize producer farming households to continue PEG practices and produce high quality maize grain.

Recommendations and Lessons Learned

- Create Financing Mechanisms for Farmers. Cognizant of the financial constraints faced by small-scale farmers, development interventions that seek to introduce improved agricultural practices involving agro-inputs and contracted mechanization services should include a viable financial and technical route to the sustainable adoption of the improved interventions, and ensure that women have equal access.
- Promote Private Enterprises and Public Private Partnerships. In order to help ensure the sustainability of the PEG model and replace donor support, linkages should be strengthened between farmers and private sector input suppliers. By strengthening the ability of suppliers to play an active role in demonstrating to farmers the benefits of using improved seed and other agro-inputs, the input suppliers would themselves benefit from the increased demand for their products.
- Use a "Help Build the Value Chain" Strategy. Developing the agro-input supply chain is a complex and time consuming undertaking. In situations such as Somalia where the input supply end of the value chain is not well developed, and where farmer cooperatives are weak or non-existent, an initial transitional strategy to consider would be to work with select lead farmers to enable them to assume the role of an input supplier in their respective districts. This may serve as an interim solution while the agro-input supply chain is strengthened.

- Support Farming Cooperatives. Looking forward, there is a need to support the creation of farming cooperatives, to leverage the ability of farmers to participate in and benefit from agricultural marketing farther up the value chain(s) and to provide focal points for TA provision, strengthen farm management, and provide increased access to financing.

To what extent did women benefit directly from PEG's interventions?

- PEG surpassed the participation rate target of 15 percent women beneficiaries by achieving over 30 percent.
- Women and men benefitted equally from PEG in terms of yield. When women have equal access to project inputs and TA, they perform equally to men.
- Women expressed the intention to continue application of PEG practices more often than men, indicating that women might adapt to innovation at higher rates than men.
- Cultural and time factors were the most important constraints on women's participation.

Recommendations and Lessons Learned

- Set Higher Targets for Women's Participation. In projects like PEG, women's participation can be increased if there are more women available to train and mentor other women. Therefore, similar projects should aim to recruit, train, and deploy female extension agents, to match female extension agents with female lead farmers, and to facilitate learning transfer between female lead farmers and female contact farmers.
- Anticipate and Overcome Women's Access Constraints. For example, future projects should be designed to promote inclusive finance mechanisms beyond conventional microcredit to intensify outreach and provide financial services to women. Inclusive financial mechanisms might include: credit through private sector agricultural businesses; collateralization of physical assets; collateralization of "forward delivery" contracts; and innovative savings and insurance instruments.
- Consider Women's Cultural Constraints in Project Design and Implementation. For example, scheduling training events for women at times that do not conflict with their other responsibilities and thereby encourage a higher rate of participation.

I. INTRODUCTION

This document presents the findings and recommendations from the final performance evaluation of the crop and livestock sub-activities of the Partnership for Economic Growth (PEG) project. The crop and livestock sub-activities that are the focus of this evaluation were implemented from March 2014 to December 2015 in the Southwest State of Somalia (SWSS) by the United States Agency for International Development (USAID) implementing partner (IP) Development Alternatives Incorporated (DAI) and their sub-contractor Somali Agriculture Technical Group (SATG).

I.1. PEG GOAL AND EVALUATION PURPOSE

The goal of PEG was to contribute to increasing stability through inclusive economic growth by increasing food availability for consumers while also bolstering farmers' incomes; creating employment in the crop and livestock value chains in the Southwest State of Somalia (SWSS) through increased productivity; implementing targeted interventions that foster good governance and economic recovery and that reduce the appeal of extremism. Accordingly, the purpose of this final performance evaluation is to gather data to fully respond to each of the evaluation questions while capturing lessons learned from conducting crop and livestock focused economic growth activities that can be used by USAID/Somalia for future economic growth programming in SWSS.

The audience for this final performance evaluation is the USAID/Kenya and East Africa (KEA)/Somalia Office, DAI, and other USAID IPs working in the economic growth sector.

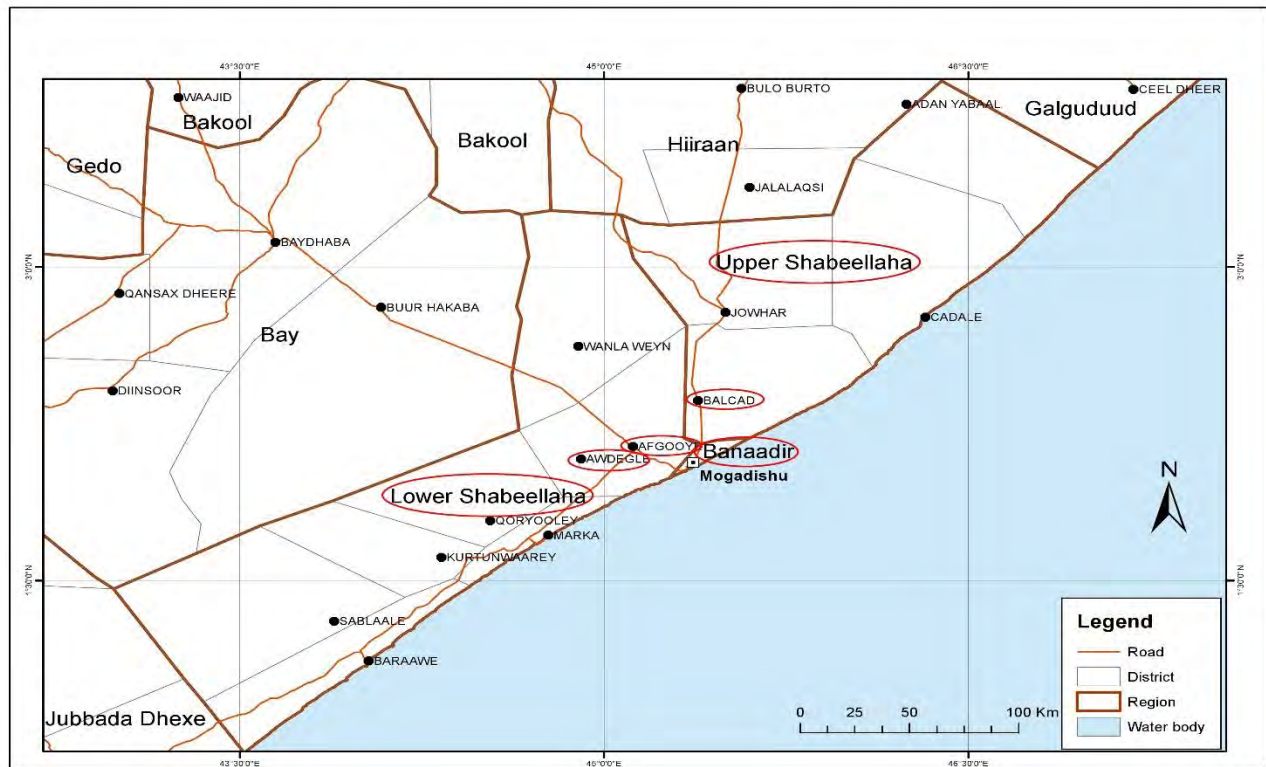
I.2. BACKGROUND

In April 2011, USAID launched a \$20.9 million PEG activity in Somaliland and Puntland with the purpose of helping local authorities and private sector investment groups improve the investment environment, generate employment and improve livelihoods. In August 2013, USAID granted a two-year cost extension to pilot crop and livestock sub-activities in SWSS.¹

In 2014, IBTCI conducted the PEG mid-term evaluation. As PEG started its work in SWSS in late 2013, the mid-term evaluation focused only on PEG's interventions in Somaliland and Puntland. Given that only a year had lapsed since the mid-term evaluation focused on Somaliland and Puntland and that there are many lessons to learn from nascent development activities in SWSS, USAID specified that the final performance evaluation should focus exclusively on PEG's interventions in SWSS (See Figure 2), which started in March 2014 and ran for 18 months.

¹ Activity documents specified South Central Somalia

Figure 2: Location of PEG Interventions in SWSS



Development Problem

Agriculture: In South Central Somalia, crop farming is an important economic activity providing employment and a food source to millions of people, particularly in the Shabelle and Juba Valleys as well as the inter-riverine regions of Bay and Bakool. Historically, food production and processing, especially around the Shabelle Valley and Banadir Region, have been important industries. Maize is the main crop in the Shabelle Valley. Twenty-three years of civil unrest has led to the destruction of agriculture infrastructure, markets, agriculture institutions, and human capacity. Therefore, working to improve crop production is an important initial undertaking, which promises to improve incomes for crop value chain actors, while creating jobs and providing additional food availability.

There are numerous constraints that prevent South Central Somalia farmers from increasing production to meet domestic requirements and expand to possible export market. These constraints include, but are not limited to: Instability and limited extension services; human capacity and labor costs; limited marketing options; infrastructure and post-harvest handling; pest control; seed availability; a weak enabling policy and regulatory environment; lack of donor/non-governmental organization (NGO) support; and the lack of agricultural finance and credit mechanisms.

Livestock: Livestock is the largest economic sector in Somalia. Livestock production accounts for over 40 percent of the gross domestic product (GDP).² Livestock exports include cattle, camels, sheep, and

² Partnership for Economic Growth (Partnership)-Extension, Livestock Sub-Activity Scope of Work: South Central Somalia, p. 1.

goats (shoats). With increased investment, smart regulation, compliance with international sanitary and phytosanitary standards (SPS), sector coordination, and improved branding/marketing, there are significant opportunities to capitalize on the growth of the Somali livestock sector for export to the Middle East and other potential markets in addition to meeting growing local demand.

Over the last two decades, insecurity and milk transportation difficulties disrupted the previously existing raw milk trade, which started in the 1970s. This trade supplied daily milk to urban consumers. The primary constraints that prevent the South Central Somalia livestock sector from increasing milk production to meet domestic requirements and to expand potential export markets include: animal health; animal feed constraints; and dairy value chain related constraints.

Despite these constraints, the demand for fresh camel milk continues to be strong, but the supply remains low around the main urban areas of South Central Somalia. Camel milk is considered to have medicinal values and consumers believe it does not carry diseases. Factors that limit camel milk production and marketing are similar to those of cow's milk, e.g., low productivity of the camels due to insufficient or non-nutritious fodder, poor milk handling and transportation, and a local knowledge base on improved livestock and milk production practices.

PEG Sub-Activity Objectives

Agriculture Sub-Activity: PEG aimed to increase food availability and farmer incomes by providing training, demonstration exercises, and extension support to encourage farmers to adopt improved agricultural practices. This sub-activity was to also provide a sustainable supply of improved seeds through support to seed/seedling production technologies.

Livestock Sub-Activity: The objectives were to improve productivity in the dairy sector, improve livelihoods, create employment, support women in business, and supply better quality milk to consumers. Under this sub-activity, PEG aimed to work with the cow and camel milk value chains in the Shabelle Region and in Mogadishu including: milk producers and sellers; milk collectors and traders; dairy farms and milk processors; and dairy input suppliers. To achieve this objective, PEG's strategy was to use a "Demonstrate > Provide In-kind and/or Financial Support > Transfer Technology" approach.

Local partner SATG's role was to test and demonstrate new crop and livestock practices to SWSS, including the introduction of already tested high-yield crop varieties, and to provide ongoing technical assistance (TA) to beneficiaries to enable and encourage the application of crop and livestock best practices. To support these efforts, SATG established an Agribusiness Incubation Center (ABIC) in Afgoi. The ABIC serves as a training center and demonstration plot for various agricultural technologies and crops. Maize production is a primary focus of SATG. To demonstrate maize production best practices, SATG provided TA through a cascade approach in which extension agents trained lead farmers who in turn provided training to contact farmers. The cascade approach mainly was focused on training milk producers in milk hygiene practices and fodder production. The rest of the interventions including vegetable, oil seeds, and legumes production, were conducted as a small-scale pilot.

Development Hypothesis

The PEG development hypothesis posited that, through its sub-activities, PEG would contribute to increasing stability through inclusive economic growth by increasing food availability for consumers while also bolstering farmers' incomes; and creating employment in the crop and livestock value chains in SWSS through increased productivity, resulting from targeted micro-grants and technical support to riverine farmers in the Lower and Middle Shabelle Regions.

1.3. EVALUATION QUESTIONS

This final performance evaluation sought to answer the following five questions:

- 1) To what extent has PEG been able to meet its targets for sub-activities based in South Central Somalia?
- 2) Was the implementation model used by PEG, namely implementation of sub-activities through a local partner, appropriate for South Central Somalia? What were strengths and challenges?
- 3) How successful has PEG been in ensuring that the benefits of its interventions continue beyond the life of the activity?
- 4) To what extent did women benefit directly from PEG's interventions?
- 5) What are some changes in activity implementation and/or strategy that could have allowed PEG to make a greater impact among its beneficiaries?

2. EVALUATION METHODS & LIMITATIONS

2.1 METHODOLOGY

IBTCI utilized a mixed-methods approach to data collection and analysis involving quantitative data collected through a survey of beneficiaries, as well as qualitative data collected through Focus Group Discussions (FGD) and Key Informant Interviews (KII). During the course of this evaluation, two distinct quantitative surveys were undertaken: an initial survey in 2015 and a second in March/April 2016 to resolve data quality issues encountered during the first survey.

The first survey encountered the following challenges:

- Security issues during the fieldwork included districts and villages targeted for implementation and, thus, included in the sampling strategy that were controlled by Al-Shabaab. To mitigate this, respondents from inaccessible villages with Awddehle District were mobilized to Afgoi town to be interviewed.
- The survey questionnaire was too lengthy and overambitious, seeking standard (plot-size, irrigation status, yields) information throughout four seasons per each type of crop.
- Contacting PEG beneficiaries proved challenging due to the fact that one mobile phone often has multiple users who share it (making it difficult to contact the PEG beneficiary) and mobile phones were often switched off.
- Data anomalies pertaining to plot sizes and crop yields were not observed until the data analysis stage since no logical control mechanism was built into the data collection tool.
- The units of measure used in the survey were not the units of measure used locally, which contributed to data errors.

To resolve these issues, IBTCI undertook a second survey of 521 beneficiaries selected through systematic random sampling stratified by the four districts (Afgoi, Awddehle, Balad, and Banadir), by beneficiary category (lead crop farmer, contact crop farmer and livestock farmer), and gender (See Table 1). Of the 521 beneficiaries included in the sample, 194 were female (34 percent) and 327 were male (66 percent). The sample frame was developed based on the lists of lead farmers (286), contact farmers (1,600) and livestock farmers (212) provided by DAI. Data were collected in March-April 2016 and covered four agricultural seasons: Gu 2013, Deyr 2013/14, Deyr 2014/15, and Gu 2015.³

³ “Gu” (April-June) and “Deyr” (October-December) are rainy seasons.

To improve the accuracy of the information collected related to PEG's livestock interventions, local units of measure were used⁴ and more detailed data were collected regarding the milking process and outputs as well as animal morbidity, mortality and birth rates. The gender section of the second survey was also expanded to provide greater detail on the impacts that PEG had on female beneficiaries. Additional questions regarding labor were added to the survey to make it possible to calculate the average amount of household and non-household labor that was used before PEG and with PEG. Also, data controls were incorporated into the survey so that improbable entries (e.g., higher yields than SATG indicated was possible/expected), and mathematically impossible entries (e.g., irrigated area higher than arable land or farm size) would generate an error message or warning. (See Annex 9: Factsheet on Data Collection and Quality Lessons Learned).

Table 1: Quantitative Survey Final Sample of Crop and Livestock Farmers Interviewed

Sub Activity	District	Face-to-Face				Telephone				Total
		Gender of Household Head				Gender of Household Head				
		Female		Male		Female		Male		
		Count	%	Count	%	Count	%	Count	%	
Crops	Afgoi	22	25%	32	25%	75	71%	130	65%	259
	Awdehgle	1	1%	0	0%	25	24%	65	32%	91
	Balad	18	20%	31	25%	4	4%	3	1%	56
Livestock	Banadir	48	54%	63	50%	1	1%	3	1%	115
	TOTAL	89		126		105		201		521

Findings from the desk review of SATG's Agriculture and Livestock Milestone Reports were triangulated with information gleaned from KIIs, FGDs and quantitative data collected through the household level survey.

2.2 EVALUATION LIMITATIONS

The short period of the project limited the ability to evaluate interventions like livestock veterinary services, where due to the length of the cattle lifecycle, there was insufficient time to evaluate results like increased milk production due to reduced morbidity.

This evaluation did not survey second-degree contact farmers, so it is not possible to evaluate the effectiveness of the knowledge transfer process from first-degree contact farmers to second-degree contact farmers.

The methodology does not provide statistically valid conclusions at the district level; however, district comparisons still provide valuable findings. Findings can only be generalized for PEG-targeted farming households; not for the overall population of the three regions.

For the second quantitative survey, security challenges limited the ability to conduct face-to-face interviews using mobile devices in Awdehgle District. To address this, IBTCI designed an alternative questionnaire for telephone interviews.

⁴ In the revised (second) survey, more appropriate units of measure were used for maize. Rather than asking for the farmer to indicate the amount harvested in kilograms, the farmers were asked how many sacks of corn were harvested and which color sack they used (there were 2 common sacks used for harvesting, one that weighed 100 kgs. when full and another that weighed 75 kgs). Also, the questionnaire asked farmers how much dry maize they harvested (the original survey did not distinguish between moist and dry).

3. FINDINGS, CONCLUSIONS & RECOMMENDATIONS

The evaluation findings are organized in five categories that directly address the referenced evaluation questions: (1) Did PEG meet its sub-activity targets in South Central Somalia?; (2) Was the PEG implementation model of working through a local partner, using the cascade knowledge transfer method, appropriate?; (3) Are PEG's intervention benefits continuing after the activity?; (4) Did women benefit directly from PEG?; and (5) What changes in implementation and/or strategy could have allowed for greater impacts. Within each sub-section below, the findings, conclusions, recommendations and lessons learned for each question comprise the response.

3.1. DID PEG MEET ITS SUB-ACTIVITY TARGETS?

Overview of PEG Overall Performance against the Sub-Activity Targets

A summary of PEG's sub-activity achievements are presented in table two below.

Table 2: Comparison of SATG Targets and Actual Achievements

Description of Sub-activity	Achievements by the End of PEG
Organize on-site demonstrations and testing of improved crop production practices and variety trials	SATG developed one demo site per each district, in total three sites (Target - one demo site per each district – total 3)
Provide agricultural inputs and TA to farmers engaged in demonstration and adoption of 12 improved agriculture practices	TA and varying agro-inputs have been provided to beneficiaries to assist with adoption, in: 1) Maize production 2) Vegetable production 3) Legumes production 4) Fodder crops 5) Oil crops 6) Irrigation Water Management 7) Soil Fertility Management 8) Water Conservation 9) Crop protection and pesticide use 10) Post-harvest handling 11) Marketing of Surplus 12) Farm Management and Record-Keeping
Regulatory, Policy and Institutional Capacity Building	Draft Phytosanitary regulations by SATG submitted to the Ministry of Agriculture (MOA); Draft Livestock Act submitted to the Ministry of Livestock, Forest and Range (MLFR). Dairy Act developed by SATG in consultation with the Minister of Livestock, Forestry and Range Based on KII interviews with current and former Ministers, neither Ministry intends to use these draft regulatory documents
Provide in kind micro-grants (cold box, cooling system, container) and TA to improve milk production and marketing	▪ 212 Milk producers trained in milk hygiene practices (Target: 200) ▪ 24 Milk traders trained in milk hygiene practices (Target: 6)

	▪ 500 milk containers distributed to milk producers ▪ The target of benefiting one milk processing company was not reached
Provide in-kind micro-grants (seed, cuttings, tractor hours) and TA for fodder production	▪ 20 Commercial fodder producers supported (Target: 1) ▪ Nine Commercial feed processors/producers supported with seeds and training (Target: 1);
Provide support in animal health and vet services	▪ Two agro-vets mobilized (Target: 1) ▪ Training on disease prevention provided

Source: Desk Review of SATG Agriculture and Livestock Milestone Reports, stakeholder workshop reports, and cross verification through KIs and FGDs.

SATG tested all five crops in demonstration fields, but only three (maize, tomato and fodder) were further fully rolled out to the farmers' fields. The grain legumes and sesame were not rolled out because, as SATG explained, the pilot period of implementation was too short and there was curtailed accessibility to the farmers due to insecurity.

Overall Perceptions of PEG Beneficiaries

Maize farmers were asked their perception of the quantity and the quality of the training that they received during PEG. Lead farmers were asked about the training they received from extension agents, while contact farmers were asked about the training they received from lead farmers. In order to summarize the findings for the sample population as a whole, the following scoring methodology was used: Very adequate = 100%; Somewhat adequate = 75%; Somewhat inadequate = 50%; Very inadequate = 25%. The unweighted average score was calculated by multiplying the percentage response by the corresponding assigned value.

Overall, lead farmers rated the adequacy of training frequency and quality of training slightly higher than did contact farmers. Female lead farmers rated the adequacy of the frequency and quality slightly lower than male lead farmers (See Annex 4, Figure 1). Female contact farmers were equally content as male contact farmers with the frequency of training received from lead farmers. The female contact farmers were slightly more satisfied with the quality of training received from lead farmers (See Annex 4 Figure 2). A possible explanation for this may be that only six percent of female lead farmers received training from female extension agents, while 35 percent of female contact farmers received training from a female lead farmer. Annex four, figures one through three provide charts that score farmer perceptions of training quantity and quality.

Variations between districts were also detected. Lead farmers in Awdeghle District had a lower opinion of the quantity and quality of training they received from extension agents than farmers in either Afgoi District or Balad District (See Annex 4, Figures 3a and 3b). The explanation for this may be that the relatively insecure environment in Awdeghle District limited the ability of extension workers who went there, as well as the ability of lead farmers from Awdeghle to participate in field days organized outside of the district. In comparison, the contact farmers in Awdeghle District rated the quantity and quality of training received from lead farmers highly. This highlights one of the benefits of the cascade model; that is, in places where access by

"The organization brought us something good, the maize that used to go bad before is now perfect. We thank them."

"This new system of farming is the best one and the most desirable one compared to the former - we noticed even in the first time of its introduction. We say thanks to Allah."

Female contact farmer, Balad

extension agents is limited due to security concerns, locally-based lead farmers are well positioned to provide training and disseminate knowledge of new agricultural practices to contact farmers in their district.

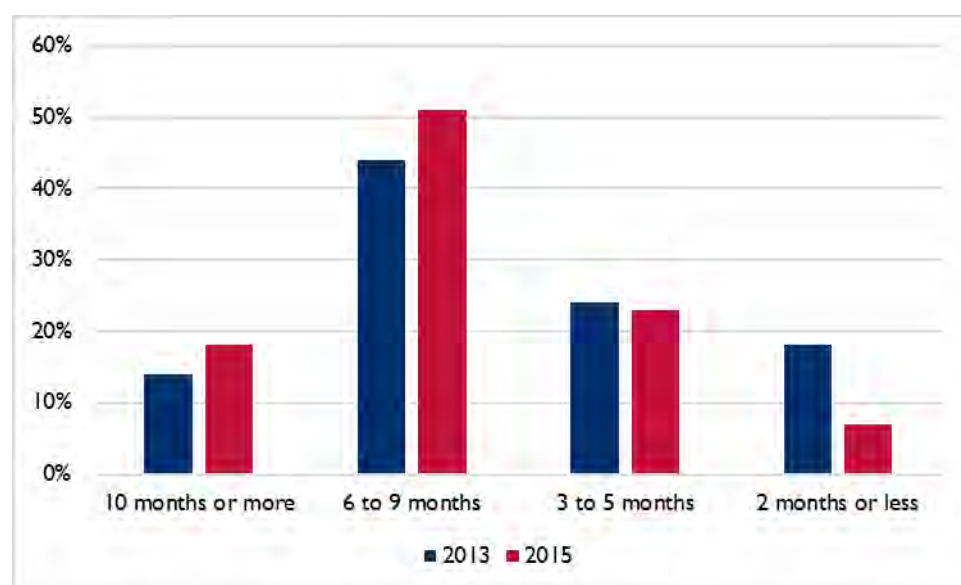
The FGD qualitative findings corroborate these quantitative findings. In general, both male and female maize farmers were positive in terms of their perception of PEG. Each spoke about the support they received from PEG for maize production. One female lead farmer said that she received good training and instruction from PEG and explained that “Initially we didn’t know how to apply agro-inputs on the farm but we are [now] confident that we can do it for ourselves.” A male contact farmer from Balad District said that, “After we were trained, we saw the difference in our product. We harvested more produce this time around compared to before. We are very happy about it.” Another male contact farmer from Balad added, “SATG has shown us a new method of farming, which is better than our former system of farming and we thank them. Our old method of farming is totally different than what we have learned now.”

In terms of PEG’s effect on household finances, 67 percent of maize farmers considered that PEG had a great or medium effect, compared to 45 percent of livestock farmers (See Annex 4, Figure 4). Similarly, 66 percent of crop farmers said that PEG had a great or medium effect on household nutrition, compared to 43 percent of livestock farmers (See Annex 4, Figure 5).

Effects of PEG on Household Food Self-Sufficiency and Employment

Food Self-Sufficiency: To ascertain whether the food self-sufficiency of beneficiary households had changed, survey respondents were asked how many months their household was self-sufficient in food during the calendar years 2013 (before PEG) and 2015 (with/after PEG). As shown in figure three below, there was an increase in the percentage of households reporting food self-sufficiency for six to nine months when comparing 2013 and 2015. In 2013, whereas 44 percent of households were food self-sufficient for six to nine months, in 2015 the figure rose to 51 percent. Annex four, figure six also presents data regarding household food self-sufficiency disaggregated by district.

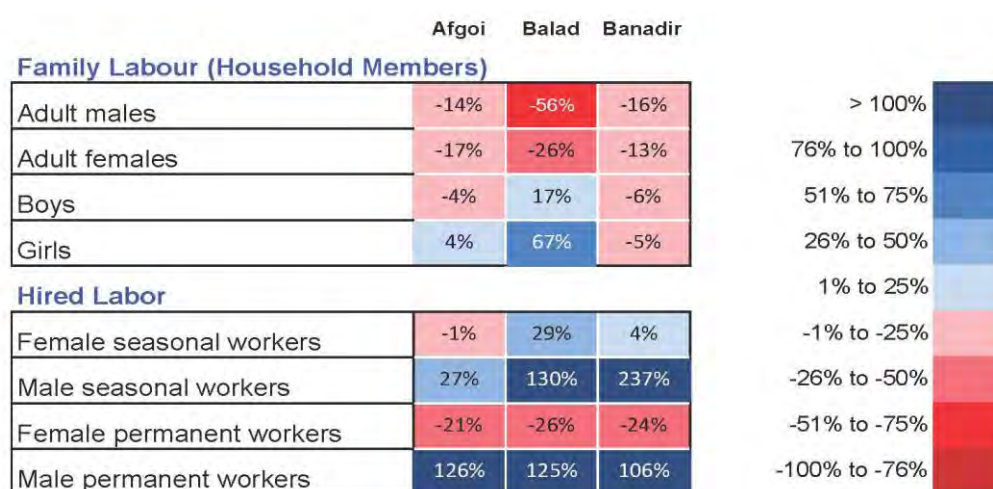
Figure 3: Household Food Self-Sufficiency



Employment Impact: Through the evaluation survey, IBTCI collected data on the amount of family and hired labor used by maize farmers in 2013 (before PEG) and in 2015 (with/after PEG). For each labor category, farmers were asked how many individuals worked on their farm in each respective year. Figure four summarizes the findings in the form of a heat map showing that percentage change in labor use per farm, disaggregated by labor category and district.

With regard to household labor, the average number of adult male and adult female household members who worked on the farms was lower in 2015 in all three districts compared to 2013. Increases in household labor were reported in Balad District in the case of boys, and in Afgoi and Balad Districts in the case of girls. This may be due to the fact maize yields increased by 64 percent between Gu 2013 and Gu 2015, compared to 17 percent in Afgoi and 18 percent in Awdeghle. With regard to hired labor, the largest increase was reported in male permanent workers in all three districts, and in male seasonal workers in Balad and Banadir.

Figure 4: Average Percentage Change in On-Farm Labor from 2013 to 2015



The decline in household labor of adult males and females and boys was likely the result of increased mechanization (tractors for land preparation) and smaller areas of cultivation, made possible by the higher productivity per hectare of PEG practices for maize production. The increase in labor of household girls, most notable in Balad, was likely a result of increased maize yields, requiring more labor for harvest and post-harvest. Household boys are responsible for contributing to heavy work including canal digging, building construction and any other heavy operations. The mechanization processes of PEG alleviated the need for that type of manual labor input. The tasks undertaken by girls, including the harvest and postharvest handling of maize, did not benefit from labor-saving mechanization. Increased maize yields therefore resulted in increased work for girls.

It is important to point out that the calculation of the percentage change is based on a low denominator. The average number of individuals working on the farm in any one category is relatively low, so even a small increase in terms of average number of individuals working would show as a

Table 3: Change in the Average Number of Individuals Working per Farm

	Afgoi	Balad	Banadir
Household labor	- 0.53	- 2.58	- 0.34
Seasonal workers	+ 0.33	+ 2.22	+ 1.37
Permanent workers	+ 0.47	+ 0.44	+ 0.19

relatively high percentage change. For example, in the case of the girl household members in Balad, in 2013 an average of 0.33 household girls worked on the farm. In 2015, an average of 0.56 household girls worked on the farm. Similarly, the increase in the absolute number of workers is small. The average number of male permanent workers employed in 2015 ranges from 0.7 in Banadir to 1.3 in Afgoi; compared to 0.3 and 0.6, respectively, in 2013. Table 3 presents a summary of the change in the numbers working per farm. Note that the survey did not determine the employment duration or level of effort of household members.

Agriculture

As described above, SATG tested all five crops in demonstration fields, but only maize, tomato and fodder, were fully rolled out to the farmers' fields. SATG explained that the pilot period of implementation was too short and there were farmer accessibility issues due to insecurity that limited where they could work.

Maize Yields: This section presents the findings from the evaluation survey pertaining to maize yields and agricultural inputs and practices; the major agricultural crop promoted by PEG. Farmers were asked about the area planted and the amount harvested over the course of four seasons: in Gu 2013 and Deyr 2013/2014 (before PEG) and in Deyr 2014/2015 and Gu 2015 (with PEG). The data were used to calculate and compare the before PEG and with PEG yields. Local units of land size and harvesting containers with known average weight capacity were used in an attempt to improve data accuracy as much as is possible based on the farmers' memory recall. It should be noted that none of the respondents maintain farm records on the quantity of harvested maize, and fewer than 60 percent maintain records on the area of maize grown.

Average maize yield estimates derived from the survey responses are presented in annex four, figure eight. On average, in the three districts, maize yields in 2015 (with PEG) were 29 percent more than before PEG. Annex four, figure seven presents the change in yields disaggregated by district. In Afgoi, average maize yields increased from 3,060 kg/ha in Gu 2013 to 3,580 kg/ha in Gu 2015; in Awdeghle average yields increased from 3,127 kg/ha to 3,677 kg/ha; and from 1,970 kg/ha to 3,228 kg/ha in Balad. This represented an increase of 17 percent in Afgoi, 18 percent in Awdeghle, and 64 percent in Balad.

Table 4 below presents a summary of the maize yield estimates from the evaluation survey. PEG achieved maize yield targets that were set between 3,000 – 4,000 kg/ha.

Table 4: Summary of Maize Yields from the PEG Evaluation Survey		Afgoi	Awdeghle	Balad
	Gu 2013	3,060	3,127	1,970
	Gu 2015	3,580	3,677	3,228
	Variance	+17%	+18%	+64%

Figure 5: Average Maize Yields by Type of Farmer

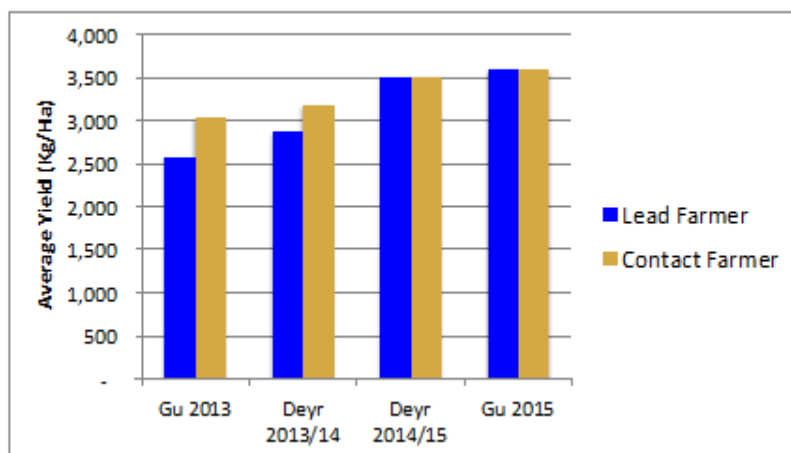


Figure five shows the average change in yields over time for Afgoi, Awdeghle and Balad combined (See Annex 4 for separate figures for each district). When considering these data compared alongside the change in the use of the three agricultural inputs: the amount of DAP they applied before planting, the amount of urea they applied after planting, and whether they used insecticides. There appears to be a strong correlation between input use and yields. It indicates that maize yields were significantly

correlated to the application of the PEG-promoted inputs.

In Gu 2015 there was a decline in the percentage of farmers who applied urea, yet in Afgoi and Awdeghle Districts maize yields were higher (See Annex 4 for findings presented by district). The explanation for this may be that the application of urea in the preceding seasons had increased the nitrogen levels sufficiently to maintain yields for an additional season, despite a decline in its use. In both districts, use of DAP remained relatively constant with respect to the previous season, but in Balad, a large decline in the percentage of farmers using DAP and urea coincided with a decline in yields as compared to the previous season.

To confirm whether the increased yields were indeed statistically correlated to the increased use of these agro-inputs, a linear mixed methods regression analysis was conducted with maize yield in each of the four seasons set as the dependent variables, with the PEG inputs as the independent variables. In addition to the agro-input variables, regression models tested the effect on yields of gender, education level and total farm size (See Annex 5). Gender and number of years of education were not found to have a significant effect on yields. Total farm size was found to have a significant negative impact, providing evidence that small-scale farmers obtained significantly higher yields, relative to large-scale farmers.

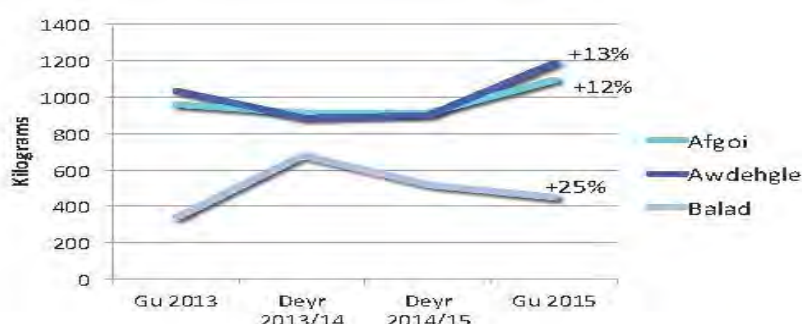
Farmers were asked about the amount of DAP and urea that they applied, and this information was used to calculate the amount of the inputs that were applied in terms of kilograms per hectare. Based on this information, it was estimated that in Gu 2015 only 10 percent of maize farmers applied the inputs in the recommended amount of around 200 kg/ha of DAP and 11 percent of farmers applied the recommended amount of 100kg/ha of urea. Only eight percent applied both DAP and urea in the recommended amounts.

Post-harvest Loss: Farmers were asked about the amount of the crops lost after harvest. Annex 4 Figure 9 shows that in the case of maize, there was decline in post-harvest loss during PEG in Deyr 2014/15, but the percentage of loss increased once again in Gu 2015 to very near the level of Gu 2013. Although the evaluation survey did not ask farmers to specify the cause, insect damage is the most prevalent cause

of post-harvest loss in Somalia, after loss incurred during harvesting and field drying⁵. Studies have found that insect damage to maize was only light at harvest and could be lowered by improving storage techniques, thus permitting conservation of considerable local reserves⁶.

Sales: As shown in figure five below, average sales of maize per farmer in Gu 2015 increased in all three districts relative to Gu 2013.

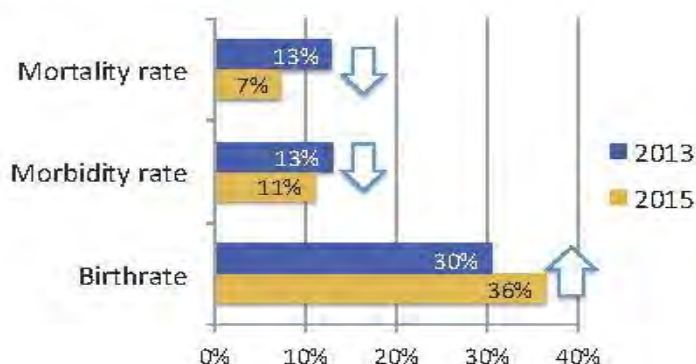
Figure 6: Average Volume of Maize Sales per Farmer



Livestock (Cattle and Camels)

Birth, Morbidity and Mortality Rates: Between 2013 and 2015, the mortality and morbidity rates for cattle declined and the birthrate increased (See Figure 7). This positive result is consistent with the expected impacts of the vaccination and animal health interventions of PEG. In contrast, in the case of camels, the mortality rate remained unchanged while the morbidity rate increased and the birthrate declined (See Figure 8 on the next page). Further investigation would be required to determine the cause of this decline.

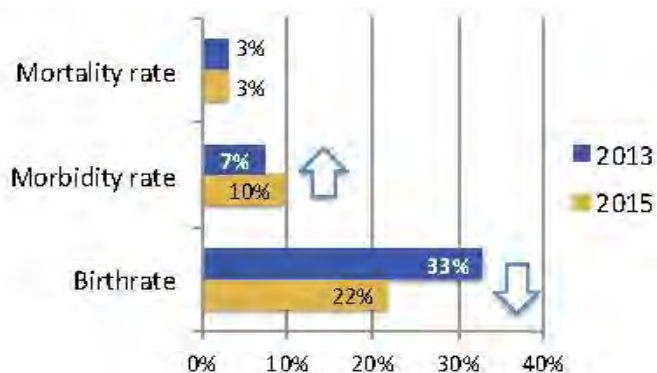
Figure 7: Cattle Birth, Morbidity and Mortality Rates



⁵ See African Postharvest Losses Information System (APHLIS) Estimated Postharvest Losses for Maize in Somalia 2003-2015 at the website: http://www.aphlis.net/?form=losses_estimates&co_id=42&prov_id=549&c_id=324&year=2007 (accessed June 24, 2016)

⁶ Abukar, M. M.; Burgio, G.; Tremblay, E. "Evaluation of post-harvest losses caused by insects to maize in three districts of southern Somalia". Bollettino del Laboratorio di Entomologia Agraria "Filippo Silvestri" 1986 43 51-58. See also African Postharvest Losses Information System (APHLIS) Estimated Postharvest Losses for Maize in Somalia 2003-2015 at the website: http://www.aphlis.net/?form=losses_estimates&co_id=42&prov_id=549&c_id=324&year=2007 (accessed June 24, 2016)

Figure 8: Camel Birth, Morbidity and Mortality Rates



Milk Production, Yields and Sales: In the case of cattle, average daily milk production, average daily milk sales and daily yields per lactating cow all declined between 2013 and 2015. In the case of camels, average daily milk production and yields remain constant between the two years, while average daily milk sales in 2015 were 43 percent lower than in 2013. Further investigation would be required to determine the cause of this decline. SATG notes, however, that the livestock sub-sector requires a long-term implementation period due to the animal's life cycle and the complexities of the dairy value chain. It is, however, possible to conduct vaccination campaigns in the short-term, and these may result in short-term impacts on morbidity and mortality. Developing feed and fodder, improving milk hygiene, strengthening milk traders, and improving the overall quality and value chain require a long-term approach.

Annex four, Figure 10 presents a comparison of year-round average milk production, sales and yields estimates for cattle for 2013 and 2015 while Figure 11 presents the findings for camels. The graphs present the simple average for Gu, Jilal and Deyr in each year.⁷ A separate comparison of findings for each season may be found in Annex 4, Figures 12–14. The graphs show the average daily milk production, average daily milk sales and average daily yield per lactating cow, for individual livestock farmers.

Policy Support to the Ministries of Agriculture and Livestock

SATG provided assistance to the Ministry of Agriculture (MOA) to draft phytosanitary regulations and to the Ministry of Livestock, Forest and Range (MLFR) for the drafting of a Dairy Act. The overall key finding from KIIs with the current and former ministers of both institutions was that neither MOA nor MLFR intends to make use of the draft documents submitted by SATG (they were in English, while the official languages of Somalia are Somali and Arabic). SATG was the initiator of the activity to develop a draft phytosanitary regulation. The MOA had a different priority, which was to develop a policy on quality control to meet quality requirements and promote export/imports. Although the MOA was engaged in drafting and reviewing the Terms of Reference (TOR) for hiring short-term technical assistance (STTA) to draft the phytosanitary regulation, the MOA did not take ownership of the process.

Regarding the Dairy Act, the MLFR developed a National Veterinary Code on its own without assistance from PEG. The draft Dairy Act submitted by PEG was not used. At the time of the evaluation, both

⁷ In reality, Deyr spans two calendar years. The average for 2013 includes Deyr 2013/14 and the average for 2015 includes Deyr 2015/16.

ministries were dissatisfied with the level of coordination of PEG activities as a whole. They recommended that to avoid wasting resources and time, the drafting of policies and regulation should come from and be driven by the primary ministry stakeholders rather than by donor IPs.

Conclusions: Did PEG meet its sub-activity targets?

- PEG met most Input Targets. PEG delivered the targeted levels of training and micro-grants for agriculture and exceeded targets related to fodder production related micro-grants for seeds, cuttings and tractors. For livestock, PEG exceeded TA, training targets, and veterinary services input targets, but was unable to accomplish the target of benefiting one milk processing company.
- Agriculture and Livestock Outcomes were Mixed. The target range for maize yields was achieved, resulting in an average increase of 29 percent increase in yields compared to before PEG. Livestock sub-activity results for cattle (mortality and morbidity) showed modest upward trends, though milk production trended downward. Indicators for camels also trended downward. The short-term nature of the pilot-type activity prevented clear conclusions about livestock and camels outcomes.
- Outcomes for Households were Mainly Positive: PEG had positive effects on household finances for most crop farmers, and on household food self-sufficiency. PEG contributed to a modest increase in hired labor on crop farms. Adult members of crop households are working less, likely because PEG's methods are more effective. The increase in the average number of household girls employed on the farm was relatively small, but highlights potential negative impact of projects that aim to increase agricultural productivity.
- Policy Support (drafting) by PEG was Ineffective: PEG's draft legislation was not deemed to be of use by the GoS because there was insufficient consultation to reflect changed government priorities.

3.2. WAS THE IMPLEMENTATION MODEL USED BY PEG APPROPRIATE FOR SOUTH CENTRAL SOMALIA?

This section presents the findings from the evaluation of the appropriateness of the PEG implementation model, through the local partner SATG. SATG used a cascade model whereby SATG provided training to agricultural extension agents who provided training to lead farmers who, in turn, trained contact farmers. The contact farmers who received training from lead farmers were first-degree contacts, in the sense that they received information on PEG agricultural practices directly from the lead farmers. The first-degree contact farmers, in turn, provided training in PEG practices to farmers who were second-degree contacts in the sense that they received the information one step removed from the lead farmer and two-steps removed from the extension agent. Both the lead farmers and the first-degree contact farmers received the same agricultural inputs (maize seeds, urea and DAP) through PEG. The second-degree contact farmers did not receive any agricultural inputs through PEG.

For this final performance evaluation, the cascade model was analyzed in terms of the number of farmers reached and the effectiveness of the knowledge transfer process, as measured by the percentage of farmers who were applying the new agricultural practices introduced and promoted by PEG at the time of the survey.

On average, male and female lead farmers provided training to around 11 farmers each (Table 5). On average, first-degree male contact farmers provided training to between three and four second-degree contact farmers.⁸ First-degree female contact farmers each provided training to around two second-degree farmers, on average. The small difference between genders in the number of farmers reached is likely due to a combination of factors related to cultural norms (it is more culturally acceptable for men

⁸ It should be noted that it is possible that these numbers contain double counting of farmers who received training from more than one farmer (e.g. a contact farmer who received training from more than one lead farmer).

to provide training to both men and women, while it is more culturally acceptable for women to provide training to women) as well as time-availability (women have additional household responsibilities, limiting the time they have available for providing training).

In addition to providing training to contact farmers, lead farmers also provided peer training to other lead farmers as well. Fifty-five percent of female lead farmers indicated that they received “most of their PEG training” from other lead farmers, and in 75 percent of cases, the “other lead farmers” were female (See Table 6: $41\% \div 55\% = 75\%$).

These findings reflect the effectiveness of the cascade model as a knowledge sharing mechanism, but also the diminishing multiplier effect the further down the cascade one goes. Male and female lead farmers provided training to over 10 first-degree contact farmers each, as was expected of them. First-degree contact farmers provided peer-to-peer training to second-degree contact farmers, reflecting a vibrant aspect of the cascade model. The cascade model is dynamic as a mechanism to share knowledge from lead farmer to contact farmers and is a fairly strong mechanism for contact farmers to reinforce knowledge among themselves. The third level of the cascade, however, shows that the knowledge transfer multiplier tends to diminish the further removed the knowledge transfer recipient is from the lead farmer who received training from an agricultural extension agent.

Table 5: Average Number of Farmers Trained by Lead and Contact Farmers in Maize Production Practices

Type of Farmers who Received Training	Lead Farmers who Provided Training		Contact Farmers who Provided Training	
	Male	Female	Male	Female
Contact farmers	11.2	10.5	3.5	2
Other farmers	0.2	1.3	1.7	1

Table 6: Primary Provider of Training to Lead Farmers

“Who did you (the household head) receive most of your PEG training from?”

Person who provided most PEG training	Survey Respondent	
	Female Lead Farmer	Male Lead Farmer
Male extension worker	34%	56%
Female extension worker	10%	1%
Male lead farmer	14%	40%
Female lead farmer	41%	2%

It is worth noting that the same selection criteria were used for both lead and first-degree contact farmers. Both types of farmers received the same agro-inputs. Perhaps the reason for the contact farmer reaching out to fewer farmers was because s/he could not offer agro-inputs, and their training commitment was less formal than that of lead farmers.

“The farmers in the community were divided into two groups: those that benefited from the PEG and other who did not benefit. The ones who did not benefit were coming to the trained farmers to learn from them, so that they may also apply the new practices tomorrow.”

Female contact farmer, Balad

The before PEG maize yields of contact farmers were higher than those of lead farmers: by 17 percent in Gu 2013 and by 11 percent higher in Deyr. In Deyr 2014/15 and Gu 2015, however, the with PEG yields of both types of farmers were almost identical. The average yields of lead farmers increased by almost 1,000 kg/ha while the average yields of contact farmers increased by about 500 kg/ha.

The fact that both types of farmers obtained the same yields after benefiting from PEG provides evidence of the effectiveness of the cascade model. Those who received the knowledge transfer from lead farmers achieved the same end-of-project yield as those who received the knowledge transfer directly from extension agents. It is noted that the lead farmers, starting from a lower average yield,

achieved a much higher percentage increase compared to contact farmers. Between Gu 2013 and Gu 2015, the average yields increased by 39 percent for lead farmers versus 18 percent for contact farmers. One explanation for the fact that both groups ended the project with similar yields of around 3,500 kg/ha despite the fact that contact farmers started from a higher yield starting point, may be that the obtained yield is approaching the water-limited yield potential for maize in the intervention areas.

The FGD qualitative findings indicate that the cascade model used to transmit information from lead farmer to contact farmer, and from PEG farmers to non-PEG farmers, was an effective approach. The consensus of all FGD participants on this point was that both lead and contact crop farmers felt confident in their ability to share their knowledge of new techniques and practices with their neighbors, and that they have already shared and plan to continue to share this knowledge learned from PEG. Non-PEG neighboring farmers, for their part, have expressed interest in learning PEG techniques for maize after seeing the positive results of PEG beneficiaries.

“I started teaching others the new techniques of farming. They appreciated the new practices. I helped planting on three farms using the experience I got from the training.”

Female lead farmer, Afgoi

Although the cascade model was not specifically directed at livestock farmers, they too indicated that they shared the techniques they have learned with other livestock farmers. As one male livestock farmer from Afgoi said, “We have confidence ...I have gained a lot. I also share the information with my neighbors... how to milk animals.”

“Our neighbors are very much interested [in the new practices] because they have seen us benefiting from the program as we harvested very good products.”

Female contact farmer, Balad

“Few people benefited from the program but the information has reached many people who are now willing to join it and benefit from it in the next cycle. Those who have participated in the program want to get more and those who did not participate want to be in such a program.”

Male contact farmer, Balad

Conclusions: Was the PEG implementation model appropriate?

- Drought, weeds, and pests suppress Somali maize farmers’ maize production, but their problems start with degraded, nutrient-starved soils and their limited access to nitrogen fertilizer and improved maize seed. Involvement of the local implementing partner SATG with its past experience in the intervention areas allowed for time-saving efficiencies in the selection of suitable crop

varieties, and commencing demonstration plots using an effective package of agricultural inputs (seeds, urea, DAP, and insecticide) that had a significant effect on increases in maize yield.

- The SATG-coordinated cascade model was an effective method to transmit knowledge of new agricultural practices at the top two levels of the cascade, evidenced by similarly improved maize yields for lead and contact farmers. The cascade model also mitigated implementation challenges caused by the insecure environment.
- The transfer of knowledge to female farmers was most effective when it was woman-to-woman.

3.3. ARE PEG BENEFITS CONTINUING?

This section presents the findings related to the evaluation question: “How successful has PEG been in ensuring that the benefits of its interventions continue beyond the life of the activity.” A good metric of the sustainability of PEG interventions is the extent to which the new agricultural practices promoted by PEG are currently being applied by farmers, and the extent to which farmers intend to apply the practices in future.

Figure nine presents the findings regarding current practices and future intentions, disaggregated into four components. These include agronomic practices, fertilizers and pesticides, water management and soil conservation, and post-harvest marketing and farm management.

The four heat charts comprising figure nine are divided into two sides. The left side shows the percentage of farmers who currently (i.e., at the time that the evaluation survey was conducted) apply PEG practices. The right side shows the percentage of farmers who indicated that they intend to apply PEG practices in future.

The figures show that maize production agronomic practices are applied by 88 percent of females and 89 percent of males (shaded medium blue). Vegetable production agronomic practices are applied by 70 percent of females (shaded light blue). All of the other practices are applied by 65 percent or less of male and female farmers. Eighty-five percent or more of male and female farmers indicated that they intend to apply all of the PEG practices in future. With regard to the maize production agronomic practices, all of the female farmers and almost all male farmers who are currently applying the practices indicated that they intend to continue applying the practices in future.

With the exception of maize production practices, there is a large difference in general between the current practice and future intentions to apply practices. Farmers were asked what benefits they saw from applying the PEG practices. Figure nine presents the findings for crops farmers and dairy farmers. Male and female farmers responded that they considered PEG methods to be more productive than traditional methods. The second most frequent benefit cited by male and female farmers was that PEG methods will allow them to earn more income. Between 16 percent and 20 percent of farmers indicated that they will continue to use PEG methods because they are less labor intensive.

Farmers who are not currently applying a given practice, but who indicated that they intend to do so in future, are likely motivated by these same reasons. As to why they are not currently applying the practice, the reasons may be gleaned from the responses given by farmers who are currently applying a given practice and who indicated that they do not intend to continue applying it in future (See Figure 9 on the next page). The reasons most commonly cited by both crop farmers and dairy farmers, male and female alike, were: (1) they lacked the technical ability to continue without further support; and (2) that without further financial support they would lack the means to continue to purchase the required inputs.

Thus, farmers who are not currently applying a practice, but who indicate that they intend to do so in future, are likely limited by either financial or technical constraints. Whether they are, in fact, able to act on their intention on their own, or would require the support of a project similar to PEG would need to be verified through future study.

Figure 9: Crop Farmers' Current Application of Practices and Future Intentions

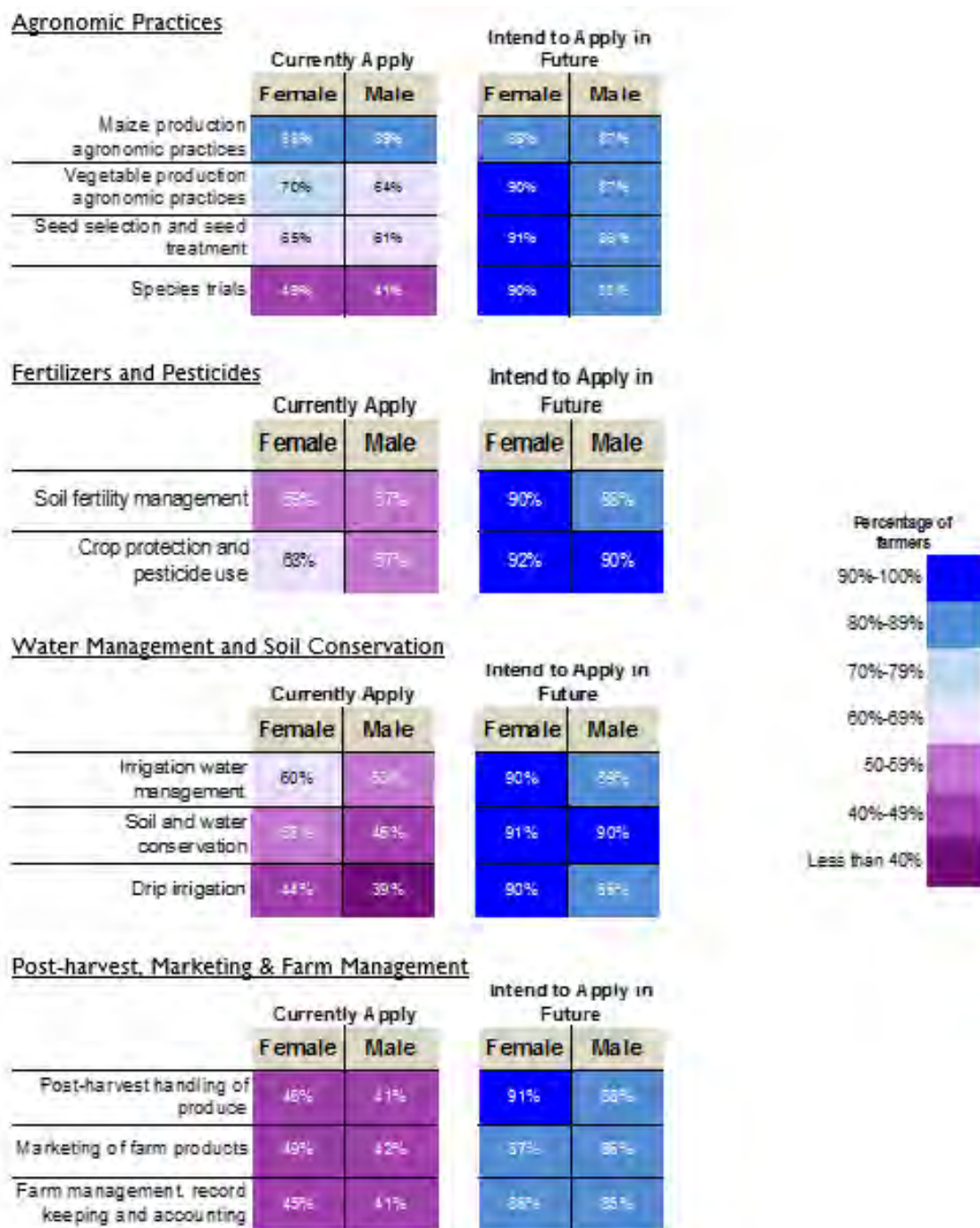
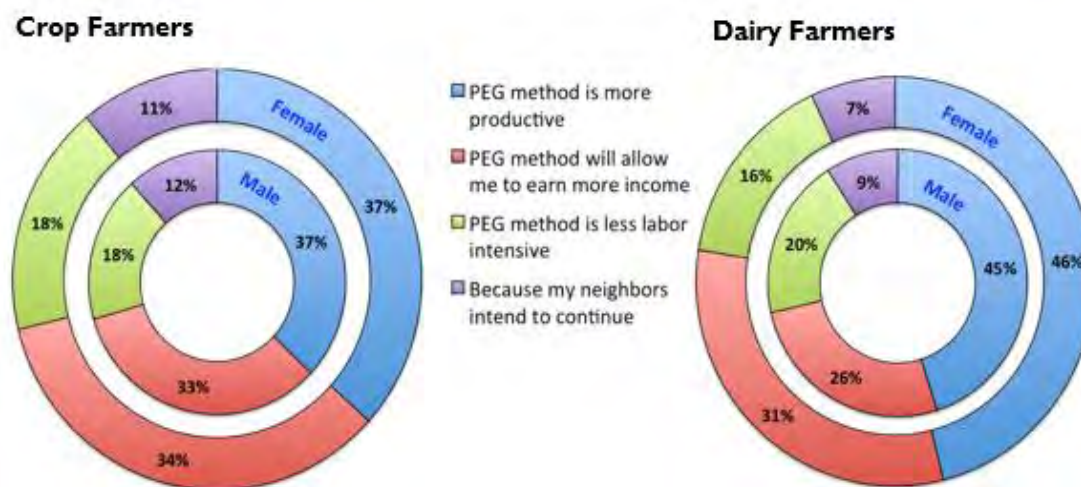


Figure 10: Reasons why Farmers Intend to Continue Using PEG Practices



One of the PEG practices used for maize farmers was tractor ploughing the land. When asked whether farmers will leave the new PEG methods and go back to traditional methods, one lead crop farmer from Afgoi noted that, “People were not able to use tractors to cultivate their farms so the program brought a lot of things like use of tractors and fertilizers for nutrients. It is possible [that farmers will return to traditional methods] if they do not get subsidies or support and they are not able to buy treatments and hire tractors.”

Yet when asked whether PEG supported the right practices and approach for their community, FGD participants answered affirmatively. For example, one male FGD participant from Balad said, “Yes, the tilling of the land using tractors, distributing of seeds and chemicals for the aim of increasing the production was the right approach for our community.”

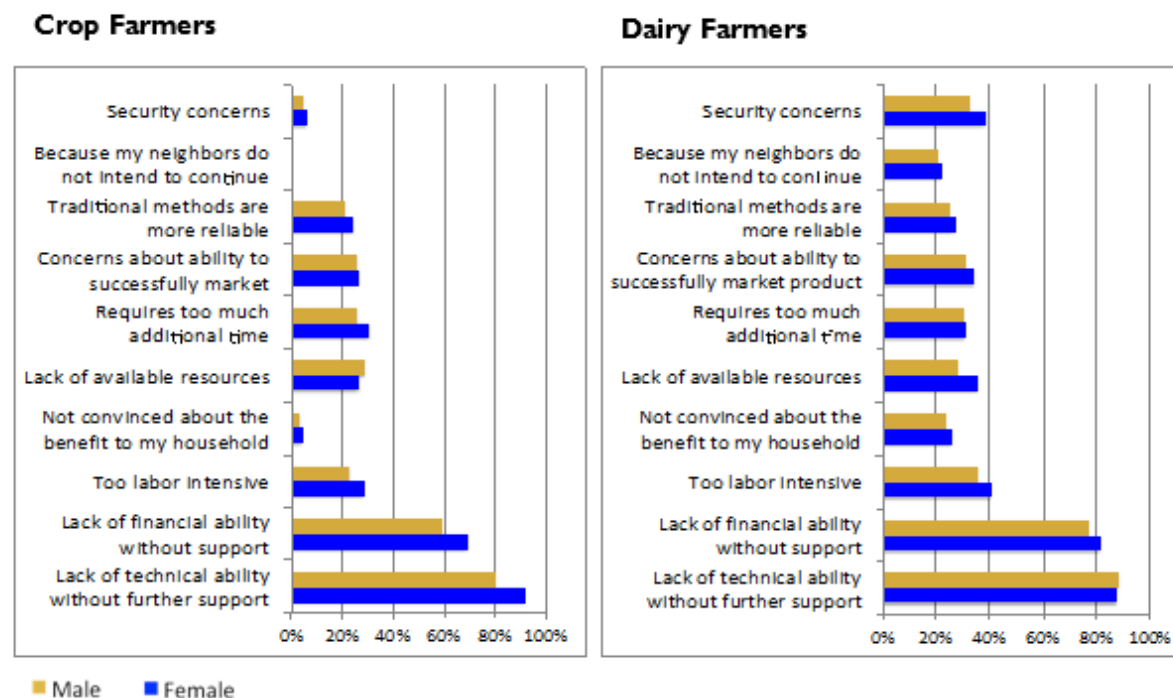
Crop farmers said that they benefitted from PEG, but that they will be challenged to continue the more expensive practices on their own. A male contact farmer from Balad District said that, “The farm needs to be ploughed and also we need petrol for the pump during irrigation. We are not able pay for these.”

“The organization (SATG) has shown us the quality of this program on a small parcel of land. That is good, but we have larger areas of land that we need to try these new practices on, and that requires financial and material support. Unless the organization supports us in every step, we won’t be able to [expand].”

Male contact farmer, Balad

SATG is continuing operation of an ABIC in Afgoi, two sub-stations created in Awdeghle and Balad, and continues to support farmers interested and/or involved in high quality maize seed production activities. PEG activities are consistent with SATG’s objective of building sustainable agriculture in Somalia. Another SATG objective is to facilitate online discussions, and document the results and outcomes of its work, while expanding its network of interested practitioners and professionals.

Figure 11: Reasons Why Farmers DO NOT Intend to Continue Using PEG Practices



Along with willingness to apply the PEG practices in future, it should be noted that a sustainable supply of high-quality agro-inputs is a precondition for the continuity of those practices. Access to high quality maize seed and other agro-inputs depends on the existence of a strong input supply chain to make those inputs available.

Market-driven Support for Farmers: One of the factors that will help to ensure that benefits to farmers continue is that fact that there is demand for high-quality grain that PEG farmers now produce. The WFP, for example, supported maize producers in the Lower Shebelle Region by purchasing high-quality maize grain from farming households in Afgoi and Awdeghle Districts. These purchases were in support of WFP's aims to address basic food needs, strengthen coping mechanisms, and support local efforts to achieve food security for vulnerable Somalis so they can cope more effectively with hardships. In Deyr 2014-15, approximately 1,500 farming households sold up to 100 metric tons (MT) of dry maize grain to WFP. In the following Gu 2015 season, WFP purchased approximately 1,000 MT of maize grain and in Deyr 2015-16 WFP purchased approximately 2,000 MT. It is worth noting that the total dry maize grain production in Deyr 2015-16 exceeded 3,000 MT. Farmers sold approximately 66 percent of the maize produced to the WFP. Continuing market demand is a strong precondition of stable production.⁹

Conclusions: Are PEG benefits continuing?

- Beneficiaries overwhelmingly report knowledge and application of new practices and the intention to use them, but cite technical and financial constraints. Capacity to pay was also cited as a limiting

⁹ Interview with FAO Liaison Office in Somalia.

factor for the sustainable adoption of PEG practices without continued subsidies for agro-inputs like urea, DAP, pesticides, and tractor rental.

- Because SATG is continuing operation of an ABIC in Afgoi and two sub-stations in Awdeghle and Balad, they are an ongoing resource to farmers and the GoS, especially for high-quality maize seed.
- WFP's purchases are a strong market motivator for maize producer farming households to continue PEG practices and produce high-quality maize grain.

3.4. DID WOMEN BENEFIT DIRECTLY FROM PEG?

This section presents the findings regarding the extent to which women benefited directly from PEG's interventions. Women participated in the activities that were funded by PEG and, in particular, the Somali Women Agricultural Society participated in PEG activities.

PEG showed that when women have equal access to project inputs and TA, they perform equal to men. Over 30 percent of PEG beneficiaries were women, surpassing the target participation rate of 15 percent. Women benefited directly from PEG in various ways and to varying degrees through participation in demonstrations and trainings (female farmers who were the household head achieved similar yields and displayed similar productivity gains as male farmers); by obtaining increased income through agricultural employment due to PEG; and by increased time savings because PEG methods were more efficient. Women benefited too by achieving greater participation in decisions about agricultural production on the farm, including decisions about what seeds and crops to grow, the area of land that is planted, how to spend farm income and whether, and how the product will be sold.

Women farmers who participated in PEG displayed a willingness to pass on their knowledge to other farmers, albeit at a slightly lower rate than men. For cultural reasons, female farmers prefer to receive training from other women, as evidenced by the high percentage (41 percent) of female lead farmers who indicated that their primary source of training on PEG was from other female lead farmers.

Table 7 shows the extent to which women benefitted directly in five ways. Women in Afgoi appear to have benefited to the greatest extent, relative to the women in Balad and Banadir. Eighty-eight percent or more of Afgoi respondents indicated that women in their households had benefitted through participation in PEG demonstrations and training and learning about PEG agricultural practices. Eighty-eight percent of respondents also indicated that women have more income from agricultural employment due to PEG as well as more time available due to PEG's efficient methods. Ninety-four percent of respondents in Afgoi said that women now participate more in decisions about agricultural production on the farm.

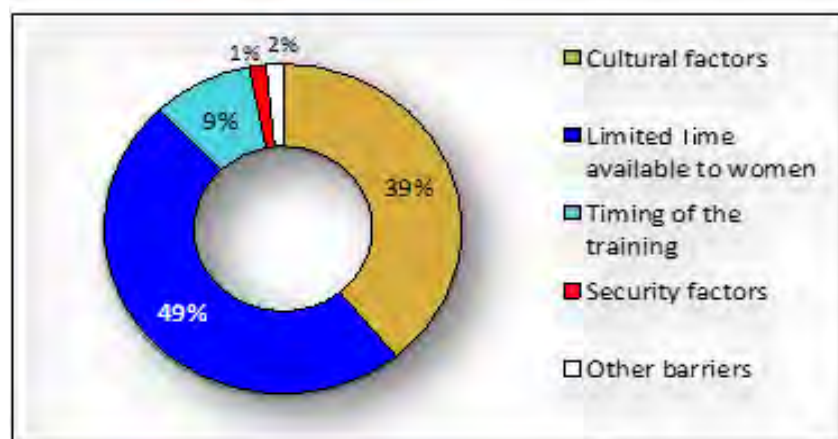
The benefits to women in Banadir appear to be more muted, relative to Afgoi. Comparing Balad to Afgoi, 85 percent of Balad's respondents indicated that women in their household learned about PEG agricultural practices (although women participated themselves directly in PEG training in only 58 percent of households in Balad). It is worth noting that Banadir District – where 85 percent of beneficiaries were female – was chosen by PEG to promote milk hygiene and storage best practices through the provision of training, coolers and jugs to improve the hygiene and quality of milk for sale.

For the other types of impacts, the findings indicate that women benefitted from PEG in between 33 and 58 percent of all households.

Table 7: Impacts of PEG on Women

Percentage of households in which women:	Afgoi	Balad	Banadir		
Participated in PEG demonstrations and training	91%	58%	46%	81% to 100%	
Learned about PEG agricultural practices	94%	85%	50%	61% to 80%	
Have more income from agricultural employment due to PEG	88%	44%	33%	41% to 60%	
Have more time available because PEG methods save time	88%	48%	42%	21% to 40%	
Participate more in decisions about agricultural production on farm	94%	34%	44%	1% to 20%	

Figure 12: Why Women Do Not Participate in More Agricultural Projects like PEG



Survey respondents were asked their opinion of why women do not participate to a greater extent in agricultural projects like PEG. The most common response given was that women have limited amount of time, due to their other household responsibilities (See Figure 12). Cultural factors was the second-most frequent response.¹⁰ The third most often cited response was the timing of the training. Security and other factors made up three percent of the responses.

Male head of households were asked whether the role of women had changed, compared to before PEG, when it came to making decisions on their farm. In the case of crop farmers, the largest net change reported was in the area of land that is planted (52 percent of households). When it comes to deciding what type of seeds to purchase and what crops to grow, around 50 percent of farmers said that the role of their wife had increased, while around 20 percent of crop farmers indicated that their wife participates less compared to before PEG. The explanation for reduced participation of women may be that, as men gained more knowledge relative to their wives about what kinds of seeds to use, then the men may well take a greater role in such decision-making. As a consequence, the net gain was only around 27 percent. In the case of cattle farmers there was a net increase of 54 percent and 58 percent, respectively, in the participation of women in decision-making regarding treatment of cattle and when to buy and sell cattle.

With regard to the participation of women in decisions about how to spend farm income and whether and how to sell farm products, over 50 percent crop and cattle farmers said that their wife now participated to a greater extent, but 15 percent of respondents indicated that their wife now participates less, resulting in a net increase in participation of 40 percent and 35 percent respectively. Figures 15 and 16 in annex four provides a breakdown of the types of decisions and the degree of change.

¹⁰ Cultural factors referred to tradition views on the role that women should play on the farm, in the household, and in society in general.

Survey respondents said that several factors determine who participates in decision-making on the farm, and whether or not the woman participates (See Annex 4, Figure 16). In order of importance, the factors mentioned were: the level of education and the amount of agricultural experience of the individuals, the amount of time available to women, as well as traditional views about gender roles on the farm.

“Women benefitted from learning about improved hygiene for milk and we have received jugs that are better than the plastic containers in terms of hygiene.” (Female livestock farmer, Benadir). Other female livestock farmers also mentioned that they benefited by learning how to use veterinary drugs and proper treatment of cattle to improve animal health.

Access to agricultural inputs is key to the adoption of improved agricultural practices and achieving the benefits. Eighty-one percent of female farmers and 77 percent of male farmers indicated that lack of access to financing would constrain their ability to purchase the agricultural inputs that would enable them to continue to apply PEG practices. Women farmers tend to face disproportionately greater obstacles than men in accessing financial services because they have less access to land than men and, therefore, have a harder time getting access to finance. The principal constraints to greater female farmer participation in projects like PEG include cultural factors (i.e. cultural views of the role of women), limited time available to women and the timing of training events.

Conclusion: Did Women Benefit Directly from PEG?

- PEG surpassed the participation rate target of 15 percent women beneficiaries by achieving over 30 percent.
- Women and men benefitted equally from PEG in terms of yield. When women have equal access to project inputs and TA, they perform equally to men.
- Women intended to continue application of PEG practices more than men, indicating that women might adapt to innovation at higher rates than men.
- Cultural and time factors were the most important constraints on women’s participation.

3.5. WHAT CHANGES IN IMPLEMENTATION AND/OR STRATEGY COULD HAVE ALLOWED PEG TO MAKE A GREATER IMPACT AMONG BENEFICIARIES?

This section presents recommendations and lessons learned corresponding to each of the four previous categories of findings and conclusions.

Question 1: To what extent has PEG been able to meet its targets for sub-activities based in South Central Somalia?

Recommendations and Lessons Learned

- Carefully Consider Indicators and Time Frames during Project Design: The choice of which agricultural interventions will be supported, such as how many value chains and what parts of it, needs to take into consideration the myriad of variables related to local conditions and the objectives of the activity to determine useful indicators and realistic time frames. The project period was too short for some PEG targets such as increasing milk production.
- Build Data Collection into Ongoing Monitoring on Production Changes and Inputs, and Contextual Factors: Disaggregate by gender and age and conduct verifications, beginning with the baseline. Such data will inform USAID/Somalia management decisions during critical implementation phases. Also, these data can contribute to more robust evaluations later and minimize the data anomalies

pertaining to plot sizes and crop yields, and recall bias encountered in this PEG final performance evaluation.

- Analyze Gender Impacts of Increased Agricultural Productivity during the Design Phase: During the design phase, planners should undertake a gender analysis of probable labor impacts of improved agricultural practices including identifying unanticipated consequences like additional labor burdens for girls, as was the case in PEG. Mitigation might include training on labor-saving gender-specific techniques.
- Limit Regulatory Support to Providing Technical Expertise when Requested (leave drafting to government). Projects like PEG may be able to support the national responsibility for drafting laws and regulations by financing personnel who would be embedded in the Ministry.

Question 2: Was the implementation model used by PEG, namely implementation of sub-activities through a local partner, and the cascade mode of knowledge transfer to farmers, appropriate for South Central Somalia? What were the strengths and challenges?

Recommendations and Lessons Learned

- Develop Local Partnerships and Expertise. Identify appropriately qualified local partners in order to leverage their expertise, local knowledge, and to overcome security challenges. For example, Banadir University should be part of a similar future project, to ensure long-term sustainability. There is also a need to use more local Somali experts to achieve cost effectiveness rather than rely on expatriate staff in project implementation. This also helps mitigate security challenges.
- Monitor and Evaluate Cascade Effectiveness along with Inputs to Better Assess Results. Future projects should identify and sample contact farmers further down the knowledge transfer cascade (i.e., second-degree contact farmers) to verify training numbers reported by primary contact farmers, and to assess the effectiveness of the knowledge transfer process (i.e., whether information is being transmitted accurately), and the relationship of access to other necessary inputs.
- Address the Availability of inputs in the Cascade Model. The knowledge transfer multiplier tends to peter off the further removed from the agricultural extension agent and lead farmer. Also, knowledge transfer and agricultural inputs go hand-in-hand. Therefore, to achieve the productive benefits of the improved practices, successive levels of contact farmers need to be provided access to those inputs in order to achieve the same productivity levels.
- Nurture Female Role Models. Support efforts to recruit and train more female extension agents. Projects like PEG should seek to identify and develop female lead farmers who can be more effective than men in mentoring other female farmers.

Question 3: How successful has PEG been in ensuring that the benefits of its interventions continue beyond the life of this activity?

Recommendations and Lessons Learned

- Create Financing Mechanisms for Farmers. Cognizant of the financial constraints faced by small-scale farmers, development interventions that seek to introduce improved agricultural practices involving agro-inputs and contracted mechanization services should include a viable financial and technical route to the sustainable adoption of the improved interventions, and ensure that women have equal access.
- Promote Private Enterprises and Public Private Partnerships. In order to help ensure the sustainability of the PEG model and replace donor support, linkages should be strengthened between farmers and private sector input suppliers. By strengthening the ability of suppliers to play an active role in demonstrating to farmers the benefits of using improved seed and other agro-inputs, the input suppliers would themselves benefit from the increased demand for their products.

- Use a “Help Build the Value Chain” Strategy. Developing the agro-input supply chain is a complex and time consuming undertaking. In situations such as Somalia where the input supply end of the value chain is not well developed, and where farmer cooperatives are weak or non-existent, an initial transitional strategy to consider would be to work with select lead farmers to enable them to assume the role of an input supplier in their respective districts. This may serve as an interim solution while the agro-input supply chain is strengthened.
- Support Farming Cooperatives. Looking forward, there is a need to support the creation of farming cooperatives, to leverage the ability of farmers to participate in and benefit from agricultural marketing farther up the value chain(s) and to provide focal points for TA provision, strengthen farm management, and provide increased access to financing.

Question 4: To what extent did women benefit directly from PEG’s interventions?

Recommendations and Lessons Learned

- Set Higher Targets for Women’s Participation. In projects like PEG, women’s participation can be increased if there are more women available to train and mentor other women. Therefore, similar projects should aim to recruit, train, and deploy female extension agents, to match female extension agents with female lead farmers, and to facilitate learning transfer between female lead farmers and female contact farmers.
- Anticipate and Overcome Women’s Access Constraints. For example, future projects should be designed to promote inclusive finance mechanisms beyond conventional microcredit to intensify outreach and provide financial services to women. Inclusive financial mechanisms might include: credit through private sector agricultural businesses; collateralization of physical assets; collateralization of “forward delivery” contracts; and innovative savings and insurance instruments.
- Consider Women’s Cultural Constraints in Project Design and Implementation. For example, scheduling training events for women at times that do not conflict with their other responsibilities and thereby encourage a higher rate of participation.

ANNEX I: EVALUATION STATEMENT OF WORK

STATEMENT OF WORK

C.1 Purpose of final performance evaluation

The purpose of this final performance evaluation is to learn lessons about conducting agriculture and livestock focused economic growth activities in South Central Somalia that can be used by USAID in future economic growth programming.

C.2 Audience and Intended Use

The audience for this study is the USAID/Kenya and East Africa (KEA)/Somalia Office, DAI, and other USAID partners working in the economic growth sector. The findings can be used by government policy makers in the Ministry of Agriculture, Ministry of Livestock, and other key related Ministries in Somalia. They may also be used by agricultural educational institutions, NGOs, farmer associations, agribusiness enterprises, and researchers, amongst others.

C.3 Key Evaluation Questions and Final Performance Evaluation Objectives

C.3.1 Key Evaluation Questions

SPSS will design and implement surveys, Key Informant Interviews (KII) and Focus Group Discussions (FGD) to collect data to address evaluation questions defined by the SOO, with the purpose of collecting information to address the five key evaluation questions:

1. To what extent has PEG been able to meet its targets for sub-activities based in South Central Somalia?
2. Was the implementation model used by PEG, namely implementation of sub-activities through a local partner, appropriate for South Central Somalia? What were the strengths and challenges?
3. How successful has PEG been in ensuring that the benefits of its interventions continue beyond the life of the activity?
4. To what extent did women benefit directly from PEG's interventions?
5. What are some changes in activity implementation and/or strategy that could have allowed PEG to make a greater impact among its beneficiaries?

C.4 Methodology

SPSS will use a mixed methods approach including document review, quantitative surveys, FGDs, and in-depth key informant interviews (KIIs). This combination of methods will enable SPSS to obtain the data necessary to answer the five key questions and their corresponding sub-questions (please see the Baseline Study Matrix in Annex A).

C.4.1 Document review

The final performance evaluation team will review documents/reports that provide essential background information on PEG. The document review will allow the final performance evaluation team to better understand the activity objectives and implementation approaches. It will also help design the data collection tools (questionnaires, FGD guides and KII guides).

The documents for review will include:

- PEG Extension - Agriculture Sub-Activity Scope of Work: South Central Somalia and Somaliland

- PEG - Extension Livestock Sub-Activity Scope of Work: South Central Somalia
- PEG Monitoring and Evaluation Plan/ Performance Management Plan Phase II Revised October 2014;
- PEG Annual Workplan, September 1, 2014 – August 31, 2015
- Mid-Term Performance Evaluation of PEG, September 2014
- All PEG Quarterly reports submitted to date
- All site visit reports conducted for PEG sites
- The DAI Baseline Study
- Recommendations relevant to PEG in the 2014 USAID/Somalia Gender Assessment (pages 36-42)

The Final Evaluation team, in collaboration with PEG, will also obtain information from DAI and SATG to design sampling frames and draw the sample. This part of the preparation phase will require efficient and effective communication between the final performance evaluation team, the SPSS sub-contractor (data collection firm) and the PEG team.

C.4.2 Field surveys

The Final Performance Evaluation will involve undertaking field surveys in South Central Somalia to determine the opinion of direct beneficiaries regarding various aspects related to program performance and collect data about production yields, behavior changes, and related household changes. Separate surveys will be undertaken of the following target beneficiary groups:

Lead livestock and agricultural farmers: The PEG ‘cascade’ model entails the transfer of livestock and agricultural technologies and practices from the Research and Agribusiness Incubation Center, via technical mentoring provided by the Ministry of Agriculture (MOA) and Ministry of Livestock (MOL) extension workers, to lead farmers selected by PEG under specific criteria. The lead farmers receive the technologies and training in improved practices and subsequently act as demonstration transfer points to surrounding farmers in their communities, known as “contact farmers.”

Contact livestock and agricultural farmers: The farmers who are introduced to new technologies and improved practices via contact with a lead farmer and with the support of technical mentoring by SATG.

Women Direct Beneficiaries: A sub-group of the lead and contact livestock and agricultural farmers. The target for women farmers set by PEG was for 25 percent of all direct beneficiary farmers (i.e. lead + contact farmers). In order to answer Key Evaluation Question 4 (To what extent did women benefit directly from PEG’s interventions?) with the required level of statistical significance, it will be necessary to treat women direct beneficiaries as a distinct sampling frame; that is, as a separate population for study.

Some of the questions will be common to each of the target groups mentioned above, however each of the target groups will have some distinct/unique questions that only apply to them.

C.4.3 Calculation of Sample Size for Each Field Survey

The evaluation team will design and implement two quantitative surveys to assess outcomes amongst the two groups of direct beneficiaries: livestock farmers and agricultural farmers. Women beneficiaries will be treated as a separate sample frame to ensure that the responses are statistically significant at the 90 percent level of confidence, plus or minus five percent margin of error. Female livestock and agricultural farmers will be asked the same questions as their male counterparts for the livestock and agricultural surveys, so that their information can be disaggregated and compared. In addition, however, female direct beneficiaries may be asked a set of sub-questions specific to Key Question 4 if

found appropriate during the design of instruments.

Both quantitative surveys will be designed to provide statistically valid conclusions and findings that can be generalized for the entire target population. Both surveys will provide for a 90 percent level of confidence with +/-5 percent margin of error.

Table I shows the life-of-project (LOP) total achieved number of lead farmers and contact farmers and the sample size required to obtain a 90 percent level of confidence, plus or minus 5 percent margin of error.

A random, statistically significant sample size will be selected using the formula for calculating the sample size for proportions, since all but one of the quantitative sub-questions corresponding to Question I are proportional in nature. For example, in order to calculate the number of farmers and others who have applied new technologies or management practices as a result of USG assistance (Sub-question I.2), we will need to calculate the proportion of lead and contact farmers sampled who have applied new technologies or management practices, and then apply that proportion to the universe in order to estimate the total number of farmers who have applied them.

Table I: Life of Project Achieve Number of Lead and Contact Farmers

District	Total Lead Farmers	Total Contact Farmers
Afgoi	205	1,559
Awdehgle	190	613
Balad	100	638
Total	495	2,810
Required overall sample size	174	244
Proportion of female beneficiaries	27 percent	23 percent
Required sample of female beneficiaries	47	56
Required sample of male beneficiaries	137	188

Furthermore, even for the sole sub-question (Sub-question I.1 about the change in productivity) that asks about the mean, the formula for calculating the sample size for proportions is the recommended choice, since the variance in productivity -- that would be required to use the formula for calculating a mean -- is unknown. In this instance, the use of the level of maximum variability (P=0.5) in the calculation of the sample size for the proportion will produce a more conservative sample size (i.e., a larger one) than would be calculated by the sample size of the mean, which means that the response will be of equal or greater statistical significance than if the formula for calculating the sample size for means were used.

With a small sample frame -- such as is the case for the PEG Final Performance Evaluation -- the formula used to calculate the sample size is:

$$n = \frac{n_0}{1 + \frac{(n_0 - 1)}{N}}$$

where n is the required sample size and N is the population size;

and where:

$$n_0 = \frac{Z^2 pq}{e^2}$$

where n_0 is sample size for large populations. Z is the desired level of confidence, determined from statistical tables known as “Z Tables”, which show the area under the normal curve. A confidence level of 90 percent corresponds to a Z value of 1.64. The variable p is the estimated proportion of an attribute that is present in the population, and q is equal to $1 - p$. The value for Z is found in statistical tables that contain the area under the normal curve.

In instances where the value of p is unknown (as is the case for the PEG final performance evaluation), a value of 0.5 is used, as this provides a conservative estimate of required sample size (i.e. larger sample size than may be strictly necessary to achieve the desired level of confidence). This means that q , calculated as $1 - p$, is equal to 0.5 as well.

To calculate the sample size for lead farmers, we first calculate n_0 as follows:

$$n_0 = \frac{Z^2 pq}{e^2} = \frac{1.64^2 \times 0.5 \times 0.5}{.05^2} = 267$$

Next we calculate n as follows:

$$n = \frac{n_0}{1 + \frac{(n_0 - 1)}{N}} = \frac{267}{1 + \frac{(267 - 1)}{495}} = 174$$

Similarly, to calculate the sample size for contact farmers, we first calculate n_0 as follows:

$$n_0 = \frac{Z^2 pq}{e^2} = \frac{1.64^2 \times 0.5 \times 0.5}{.05^2} = 267$$

Next we calculate n as follows:

$$n = \frac{n_0}{1 + \frac{(n_0 - 1)}{N}} = \frac{267}{1 + \frac{(267 - 1)}{2,810}} = 244$$

The sample for the two target groups will be selected via the Simple Random Sampling (SRS) method by organizing the names of the direct beneficiaries into four lists: male livestock beneficiaries; female livestock beneficiaries; male agriculture beneficiaries; female agriculture beneficiaries, arranged alphabetically and assigned an ordinal number from 1 to N , where N is the number of direct beneficiaries in each beneficiary group. For each group, a random number, r , between 1 and n will be generated using the RANDBETWEEN function in Microsoft Excel. The random number thus generated will be used as the starting point for selecting the sample. The next name on the beneficiary list to be selected for the sample will be the name corresponding to number $r + N/n$, where n is equal to the required sample size for the respective group. The remaining names for the sample will be drawn in a

similar fashion until the desired sample size has been attained.

C.4.4 FOCUS GROUPS AND KEY INFORMANT INTERVIEWS

A total of sixteen Focus Group Discussions will be conducted with representatives of the following stakeholder groups:

1. Livestock sector beneficiaries including:

Focus Group Participants	Number of Focus Groups
Male lead farmers	1
Male contact farmers	2
Female lead farmers	1
Female contact farmers	2
Private sector representatives of milk producers/sellers; milk collectors/traders; dairy farms and milk processors; dairy input suppliers and agro-vets	1
Extension workers, Ministry of Livestock (MOA) regional staff, Academic/Research Institutions, including the Agribusiness Incubation Center (ABIC)	1
TOTAL	8 focus groups

2. Agricultural sector beneficiaries including:

Focus Group Participants	Number of Focus Groups
Male Lead farmers	1
Male contact farmers	2
Women lead farmers	1
Women contact farmers	2
Farm input centers/agro-dealers; traders/vendors;	1
Extension workers, Ministry of Agriculture (MOA) regional staff; Academic/Research Institutions including the Agribusiness Incubation Center (ABIC)	1
TOTAL	8 focus groups

The objectives of the FGDs and the KIIs will be to supplement the information collected through the farmer surveys and to answer Key Questions 2, 3 and 4. The SPSS team believes that, to ensure a representative number of participants in each of the FGDs, flexibility in the data collection plan will be required.

The selection of FGD participants and KII informants will be made by the Final Performance Evaluation team in consultation with DAI and SATG.

The final performance evaluation team will develop semi-structured question guides for FGDs and KIIs. This will ensure the information required to answer the key questions and their respective sub-questions is addressed and will enable the team to follow-up should areas of further inquiry emerge during interviews. The length of FGDs is estimated to be around two hours.

For the four heterogeneous FGDs (private sector and extension/Ministry/academic), follow-up one-on-one interviews will be conducted to discuss sensitive issues that cannot be fully explored in such a diverse group, or if more talkative participants end up dominating conversations in the FGDs so that all participant views cannot be fully heard.

To conduct in-depth interviews with key informants, the evaluation team will develop KII guides. To facilitate data processing, one unified guide will be developed for all KIIs, with skip pattern logic so that each key informant is only asked the relevant questions. The length of each key informant interviews is estimated to be around 1 hour.

IBTCI is aware that the data collection period will be in the middle of the agricultural harvest period in the target regions. Therefore, IBTCI will carefully coordinate with PEG and its partners to ensure that 1) enumerator visits will be scheduled well in advance with beneficiaries to ensure optimal times for both parties; and 2) interviews will be scheduled for times that will not prevent beneficiaries from harvesting/selling their crops, thereby negatively impacting their incomes.

C.4.5 Sustainability

The understanding of sustainability in the PEG context embraces the concept of “...ensuring that the benefits of its intervention continue beyond the life of the activity,” which is Key Question 3. As explained by the PEG COR, and assumed by the PEG development hypothesis, for there to be perpetuity of benefits - farmers need to have continued access to inputs, capacity (personally or linkages to a third party) to access/implement problem solving technologies to reduce production risks (identified in the project), and linkages/capacity to sell into enduring (and hopefully growing) markets. Perpetuity of benefits will also depend on a foundation of private and public sector as partners/buyers/service providers within the value chains.”

The findings from the document review and KIIs will be used to develop a framework and tool for the perpetuity of benefits components of the respective sector value chains. When components are functioning, sustainability ensues. Stakeholders’ can provide assessments of strengths/weaknesses in the two respective value chain components, or a SWOT analysis, in the target geographic context.

The Perpetuity of Benefits framework and tool will be utilized in FGDs and KIIs to ascertain:

1. What elements of PEG do the beneficiaries feel will apply long after the project has closed?
2. What evidence is there to show increased food availability and farmer incomes at household levels?
3. What are the effects of PEG interventions on employment creation in the agriculture and livestock value chains?
4. What are the effects of PEG interventions on the quantity and quality of production in the two respective value chains?
5. What are the effects of PEG interventions on the introduction and acceptance of innovations into the two respective value chains?
6. What are the effects of PEG interventions on the efficiency of the two respective value chains?
7. After the end of the project, do beneficiaries anticipate that their neighbors and other community members will adopt some of the technologies and opportunities promoted by PEG?
8. How successful was PEG at establishing sustainable partnerships/networking/linkages, taking into account the impacts on the following stakeholders?
 - a. Educational Institutions
 - b. Local farm input suppliers and other agribusiness enterprises
 - c. Ministry of Agriculture
 - d. Ministry of Livestock
 - e. Local Institutions and NGOs and farmer associations

9. How sustainable is the Research and Agribusiness Incubation Center (RAIC) business model?

Sustainability will thus be assessed through KIIs and FGDs with the relevant stakeholders listed in section C.4.4 above. The detailed results will be presented in an annex to the report. A summary of findings will be presented in the main body of the text.

C.4.6 Quality Assurance Considerations

The team will use both **Mobile Data Collection** (MDC) and the traditional **paper-and-pencil** (PAPI) interview method. MDC will be utilized to gather data from farmer surveys, and PAPI will be utilized for KIIs. As SPSS is familiar with the challenges associated with both, the evaluators, in close coordination with the sub-contractor, will develop concise data management and quality assurance (QA) guidelines for the survey, FGDs and KIIs at the study inception to ensure full rigor. We will put in place a system of quality control, complementing and enforcing the existing quality control measures used by our sub-contractor. A real-time data quality functionality as well as real-time back end verification capabilities will be available on the MDC platform during the field surveys data collection period. The MDC platform offers flexibility for iterative data analysis for this evaluation, and for subsequent evaluations under SPSS, as well as providing the same functionalities to the rolling program of monitoring and verification activities conducted by SPSS.

The Final Performance Evaluation Team will develop appropriate data collection tools and will design manuals for interviewers and supervisors reflective of the specific fieldwork requirements and roles in the evaluation as well as survey protocols to be used during data collection. SPSS will review and provide technical backstopping and oversight during the development of the data collection tools. The data survey collection tools will be scripted onto the MDC platform, tested and refined before they are deployed in the field.

KIIs and FGDs will be divided between the three experts and the subcontractor. The female, Somali-speaking expert will participate in the FGDs for women specifically, as well as other interviews.

All data collection teams interviewing women will have at least one female enumerator on the team, unless specific security concerns are documented that prevent this.

All direct and sub-contracted staff will sign a Conflict of Interest statement before being hired that validates they have not previously worked for DAI or SATG.

As part of QA procedures, the data collection team sub-contracted to undertake field surveys will hold a debriefing at the end of each day spent in the field, to discuss notes, check data quality (i.e. randomly select and listen to some of the recordings against the written notes) and assure that instruments are fully complete. Using the real-time back-end verification capabilities, IBTCI will check the data collected by the Sub-contracted company for data collection.

The team will submit written weekly status reports. There will be weekly teleconferences between the field team and the Nairobi project director. In the case of challenges in the field, there will be intermediate updates. During the two week period that the two Key Personnel will return home, the Somali expert will remain in Somalia and Nairobi, both to participate in interviews and to monitor data, in order to provide immediate feedback to the survey subcontractor if necessary.

C.4.7 Ethical Considerations

For all KIIs and FGDs, SPSS will implement a policy of informed consent and all interviews will be carried out on a voluntary basis. Interviewees will be given the option not to respond to questions or to decline the interview, if at any time they believe a response would contain sensitive information. Information

provided from interviews and discussions will not be linked to any specific person in the final report and will be kept confidential. Only general identifying information (geographic area, region, organization, clan, sex, and age if reported voluntarily) will be utilized. Any information that could be directly linked to an individual will not be used. Only members of the final performance evaluation team will have access to the transcripts and raw data. Raw data with identifying information redacted will be provided to USAID at the end of the final performance evaluation study. Prior to the start of the final performance evaluation study, the final performance evaluation team members (including transcribers) will sign a certificate of confidentiality. The final report will be a synthesis of the team's analysis drawn from interviews from numerous respondents. Quotes provided to highlight particular issues will not be attributed to any individual by name.¹¹

C.4.8 Data Management, Processing, and Analysis

Prior to processing the data, the performance evaluation team will daily review collected data to ensure all findings are properly recorded and documented. After completion of each FGD session, each member of the final performance evaluation team will review the transcripts from individual transcribers. Next, they will meet to discuss and review the transcriptions. If unanticipated information is uncovered, team members will design appropriate probing questions for the KIIs. Additional information collected through this approach will help the final performance evaluation team in the final analysis during triangulation of data (findings).

Data will be disaggregated, as appropriate, by district, gender, stakeholder category and by agricultural subsector (livestock/agriculture). The team will report to USAID the participants in all of the FGDs and KIIs, disaggregated by gender, age group, sub-sector and district. The final performance evaluation team will assess both quantitative and qualitative data and findings and conclusions will be drawn from a comparative analysis.

The final performance evaluation team will analyze data collected using a process in which quantitative and qualitative data analysis strategies are connected to determine and understand key findings. Once the analysis is completed for each method, the final performance evaluation team will determine how the analysis and findings of each method can inform and strengthen the other.

The final performance evaluation team will utilize different types of triangulation to validate findings, analyses, and conclusions including: a) data triangulation, using a *variety* of data sources;¹² b) investigator triangulation involving the use of *different evaluators* who bring diverse perspectives and cultural and analytical skills, all having experience in agriculture programs; and c) methodological triangulation, in which the final performance evaluation team will use *thematic analysis* for qualitative information. For the thematic analysis, the final performance evaluation team tentatively plans to utilize Atlasti.

The final performance evaluation team will review PEG performance management information submitted to date by DAI. In addition, the team will review all relevant national agricultural policies and guidelines for triangulation purposes. Detailed synthesis and analysis will support the key findings and conclusions from the final performance evaluation study. Content, comparative, and analytical analysis techniques of the qualitative data from KIIs and FGDs, and expert consultations are some of the analytic methods that will be used. The team will also use statistics to present data on graphs and in tables. The final performance evaluation team will follow USAID's information quality standards stipulated in ADS 578. Data will be disaggregated where appropriate.

C.4.9 Methodological Strengths and Limitations

¹¹ IBTCI: Ethical Policy Guidelines.

¹² Analysis of background documents; FGDs, KIIs and quantitative surveys.

USAID's Evaluation Policy states that any methodological strengths and limitations are to be communicated explicitly in SOWs. Some examples of methodological strengths and limitations include:

C.4.9.1 Strengths:

1. The sampling design provides 90 percent confidence level and a +/-5 percent margin of error, providing reliable data for decision-making purposes.
2. SPSS is mindful of the political polarization in Somalia, and will discuss and coordinate with USAID/Somalia and DAI Somalia and SATG about selection of respondents and other issues that may arise. While bias can never be entirely eliminated from an assessment, there are a number of checks that the final performance evaluation team will conduct to mitigate and minimize bias. The KIs will be implemented using interview guides rather than a detailed questionnaire that might "force" respondents to provide answers to questions about aspects of the activity for which they may have inadequate knowledge.
3. Interviewer bias will be mitigated by convening daily team debriefs, rolling data analysis and presentation of transcripts within a reasonable timeframe of each qualitative data collection.
4. MDC: the adoption of MDC platform will result into increased speed and efficiency of data collection, increased accuracy and data quality, faster access to data, and better accountability on the part of the data collectors.

C.4.9.2 Limitations:

1. **Document Review:** Beneficiary records may have data quality issues that make it challenging to determine the precise number of direct beneficiaries.
2. **KII:** Senior government agency representatives may change over time. There will be careful selection of key informants for in-depth interviews to avoid bias. When only a few people are involved in the activity, it may be difficult to demonstrate the validity of the findings. Findings could be susceptible to interviewer bias. Mitigation measures will include using semi-structured interviews and structured processes for interview note taking, and named forms. Also, each interviewer selections decision will be justified and documented
3. **FGD:** Mobilizing FGD participants may be challenging due to security issues.
4. **Respondents' Contact Information:** If the contact information (phone number) for direct beneficiary farmers is inaccurate, there will be challenges in organizing the livestock and agricultural livestock farmers.
5. **Migration:** Some beneficiaries may have left their homes
6. **Harvest time:** Data collection must be coordinated around harvest time, which may cause scheduling delays.
7. **IP Key Informants:** Because the activity comes to a close on October 31, 2015, some KI staff may be leaving for other opportunities during the time projected to interview them.

C.10 FINAL PERFORMANCE EVALUATION STUDY REPORT FORMAT

The final performance evaluation report will have no more than 25 pages, excluding annexes. The report format will use Microsoft products and 11-point font will be used throughout, with 1" page margins. Four bound hard copies shall be submitted, and an electronic copy in Microsoft Word. In addition, all data collected by the evaluation team will be provided to USAID electronically in an easily readable format. If the report contains any potentially sensitive information, a second version report excluding this information will be submitted (also electronically, in English) for dissemination among stakeholders and on the DEC.

SPSS is responsible for ensuring that the final performance evaluation study report includes all criteria listed in Appendix I of USAID's Evaluation Policy:

1. **Executive Summary** - concisely state the most salient findings and recommendations (2.5 pages);
2. **Acronyms** (1 page);
3. **Table of Contents** (2 pages);
4. **Introduction** - purpose, audience, and synopsis of task order (1 page);
5. **Background** - brief overview of development problem, purpose and objective of the final performance evaluation study and key research questions (2 pages);
6. **Methodology** - describe final performance evaluation study methodology, including constraints and gaps (1 page);
7. **Final performance evaluation Findings and Conclusions** - for each evaluation question with conclusions (18 pages);
8. **Issues** - provide a list of key technical and/or administrative, if any (1 page);
9. **Annexes** - that document the research methodology, schedules and tables will be succinct, pertinent and readable. These will include references to bibliographical documentation, meetings, key informant interviews, and focus group discussions.

C.10.1 QUALITY EVALUATION REPORT

SPSS will review USAID's requirements and expectations on the draft and final reports as detailed on the "Checklist for Assessing Evaluation Reports." USAID will subject the structure and content of the report to the parameters outlined on the checklist and will use this as a basis for accepting and/or rejecting the reports.

C.10.2 THREATS TO VALIDITY

SPSS will manage the final performance evaluation team and guard against any possible threats to validity of final performance evaluation findings drawn from the qualitative methods. Any conclusion drawn from the qualitative data sources will be supported by a well-grounded body of evidence that is triangulated and confirmed. SPSS will brief the final performance evaluation team on the parameters outlined on the USAID's "Checklist for Reducing Threats to Validity for Qualitative Methods".

C.10.3 DETAILED WORK PLAN

The final performance evaluation study will be carried out over 15 weeks and will have three distinct phases – preparation, data collection, and analysis and reporting.

Preparation Phase – Weeks 1 to 3

Week 1 will be take place primarily from the home bases of the final performance evaluation team. During this period, there will be an initial Skype conference between the SPSS team in Nairobi, the IBTCI home office in Vienna VA, the final performance evaluation team and the subcontractor. The team will discuss roles and responsibilities for the final performance evaluation study.

The final performance evaluation team will also conduct a thorough desk review of PEG activity documentation, including PEG data sets, and all initial sampling information. Based on this information, the team leader will revise the work plan and draft tools for the study. These will include a checklist for observation, guides for FGDs and KIs, assessment tools, grade-level knowledge in secondary school assessments, literacy, numeracy, and life skills questionnaires etc.

The team leader will deploy to Kenya at the beginning of week two. Within two days, the team will hold an initial meeting with the PEG COR, DAI, USAID/EA/Somalia M&E Specialist, and other relevant USAID personnel. This introductory meeting will clarify roles and responsibilities, logistical issues, and timelines. Within five days of this meeting, the team will produce a draft work plan, which will provide a projected

timeline and describe in detail the final data collection methods (including draft interview questions and data collection tools) to be used.

During week 2, the team will also meet with the sub-contractor to discuss revisions of work plan, formation of sampling frames (data gaps, if any), and preparation of initial tools. The team will also discuss a pilot-testing plan for the quantitative survey. With the subcontractor, the team will begin recruiting respondents, designing data entry software and developing a logistical plan for deployment to Somalia.

Working in the appropriate rural and urban regions of south central Somalia, the sub-contractor will pilot-test the quantitative survey to determine the appropriateness of the questions and the clarity of the Somali translation. Based on feedback on these initial tools, the team will revise the work plan, and the tools as needed.

Over the course of the two weeks in Nairobi (weeks 1 and 2), the final performance evaluation team will work with USAID and PEG to finalize the work plan, the tools and the sampling frame for the final performance evaluation. They will also train the management of the survey team in use of the evaluation protocols. Before departing for Somalia, the team will meet with USAID and PEG to refine and finalize the work plan and tools.

At the beginning of week 3, the team will deploy to Somalia. The Team Leader and the Agriculture Sector Specialist will deploy to Mogadishu, accompanied by a Somali-speaking facilitator. During the first week in the field, they will meet with representatives of the contracted data collection firm to brief them on procedures and determine the data collection schedule.

Data Collection Phase – Weeks 4 to 7

At the end of week 4, the evaluation team leader and the Ag specialist will return to Nairobi after ensuring that intensive quantitative and qualitative data collection by the subcontractor is going forward as planned. The evaluation specialist will remain behind with the subcontractor for the entire period of data collection. Before departing Mogadishu, the team will work with the subcontractor to brief and train field staff and make sure procedures for data cleaning, data processing, and initial statistical analysis are in place. They will also work with the subcontractor to recruit FGD respondents. The subcontractor will conduct FGDs with selected target groups. Before they leave Mogadishu, the final performance evaluation team will sit in on a few random FGDs and review notes, transcriptions, and create the categories necessary to conceptualize FGD findings for further verification.

The team leader and the Ag Specialist will return home during from week 5 through 6. During this period, the data collection will be conducted by the sub-contracted firm supervised by the Evaluation Specialist.

During week 7, the team will return to Mogadishu, where it will work finalize its work with the sub-contracted firm. The team will gather qualitative data through a final set of interviews with relevant stakeholders. They will also hold an out-brief meeting with the Ministry of Agriculture, the Ministry of Livestock and PEG.

Analysis and Report Preparation – Weeks 8 to 10

At the beginning of week 8, the team will redeploy to Nairobi. During weeks 9 and 10, they will prepare tables, charts, and graphs for quantitative data analysis, while drafting narrative sections of the final performance evaluation report.

No later than 12 days after completion of fieldwork, the team will make a presentation of preliminary

findings and conclusions of the final performance evaluation to USAID and key stakeholders. In preparation for this presentation, the team will prepare a detailed written outline and PowerPoint on preliminary findings and conclusions. The presentation will synthesize qualitative and quantitative findings, triangulate data to verify the findings, elaborate conclusions based on verified findings, and make preliminary recommendations for follow up surveys.

Report Finalization – Weeks 11 to 15

The team will return to their respective homes at the beginning of week 11 – the same week in which they submit the first draft of the final performance evaluation report. The final report will be submitted during week 15.

ANNEX 2: FINAL PERFORMANCE EVALUATION MATRIX

KEY QUESTION 1: To what extent has PEG been able to meet its targets for sub-activities based in South Central Somalia?							
SUB-QUESTION	TYPE OF EVIDENCE	DATA COLLECTION			SAMPLING OR SELECTION APPROACH	DATA METHOD	ANALYSIS
		SOURCE	TOOL	METHOD			
1. What is the percent change in average volume/yield of agricultural products/commodities supported through USG activities (Kg / hectare) IR2.1	Analytical, including economic modeling	• Final Evaluation Survey of Lead Farmers • Survey of Contact Farmers	Structured questionnaire	Survey of Farmers	Stratified, Systematic Random	Comparison of final survey results with the baseline data and targets reported in PEG PMEP, as well as results reported in Quarterly Reports.	
2. What is the number of farmers and others who have applied new technologies or Management practices as a result of USG assistance (IR2.2), disaggregated by value chain (livestock, agriculture) and gender.	Analytical, including economic modeling	• Final Evaluation Survey of Lead Farmers • Survey of Contact Farmers	Structured questionnaire	Survey of Farmers	Stratified, Systematic Random	Comparison of final survey results with the baseline data and targets reported in PEG PMEP, as well as results reported in Quarterly Reports.	
3. What is the number of males and females who have received USG-supported short-term agricultural sector productivity or food security training (AI 3.1), disaggregated by value chain (livestock, agriculture) and gender.	Analytical, including economic modeling	• PEG beneficiary sign-in sheets; • Afgoi, Aw-Dhegle & Balad Center training records	Not applicable	Desk review	Entire universe of training event sign-in sheets and beneficiary records	Review all PEG beneficiary sign-in sheets for training events; Review all Extension Center training records. Create Excel spreadsheet of beneficiaries and sort alphabetically to detect double-counting. Comparison of findings with targets reported in PEG PMEP, as well as results reported in Quarterly Reports.	

KEY QUESTION I: To what extent has PEG been able to meet its targets for sub-activities based in South Central Somalia?						
SUB-QUESTION	TYPE OF EVIDENCE	DATA COLLECTION			SAMPLING OR SELECTION APPROACH	DATA METHOD OR ANALYSIS
		SOURCE	TOOL	METHOD		
4. What number of persons have received new or better employment (including better self-employment) as a result of direct or indirect participation in USG-funded workforce development projects (AI 3.2), disaggregated by value chain (livestock, agriculture) and gender.	Analytical, including economic modeling	- Final Evaluation Survey of Lead Farmers - Survey of Contact Farmers	Structured questionnaire	Survey of Farmers	Stratified, Systematic Random	Comparison of final survey results with the baseline data and targets reported in PEG PMEP, as well as results reported in Quarterly Reports.
5. What is the number of food security private enterprises, producer organizations, water users associations, women's groups, trade and business associations, and community-based organizations (CBOs) that received USG assistance (AI3.3), disaggregated by value chain (livestock, agriculture) and gender.	Descriptive	PEG documents (MOUs, agreements, event sign-in sheets) indicating the name of entity that received USG and the type and date of the USG assistance.	Not applicable	Desk review	Entire universe of MOUs, agreements and event sign-in sheets documenting the receipt of USG assistance.	Review all source documents to identify number of beneficiary entities. Comparison of findings with targets set in PEG PMEP, as well as results reported in Quarterly Reports.
6. What is the number of technologies or management practices in development phases of research, field testing or made available for transfer or development as a result of USG assistance, disaggregated by value chain (livestock, agriculture) and gender?	Descriptive	PEG documents to identify policies, regulations and procedures supported by project; Key informant interviews (KIs) to confirm status.	Semi-structured KI interview guides	Desk review Key informant interviews	Entire universe of relevant PEG documents describing USG assistance provided. Key informants selected in consultation with PEG.	Comparison of findings from desk review and KIs with the targets established in the PEG PMEP, as well as results reported in Quarterly Reports.

KEY QUESTION 1: To what extent has PEG been able to meet its targets for sub-activities based in South Central Somalia?

SUB-QUESTION	TYPE OF EVIDENCE	DATA COLLECTION			SAMPLING OR SELECTION APPROACH	DATA METHOD	ANALYSIS
		SOURCE	TOOL	METHOD			
7. What is the number of investment deals initiated or completed by project end, through the contribution of the USG assistance, disaggregated by value chain (livestock, agriculture)?	Descriptive	PEG documents to identify policies, regulations and procedures supported by project; Key informant interviews (KIs) to confirm status.	Semi-structured KI interview guides	Desk review Key informant interviews	Entire universe of relevant PEG documents describing USG assistance provided. Key informants selected in consultation with PEG.	Comparison of findings from desk review and KIs with the targets established in the PEG PMEP, as well as results reported in Quarterly Reports.	
8. What was the proportion of female participants in PEG activities designed to increase access to productive economic resources (assets, credit, income or employment), disaggregated by value chain (livestock, agriculture)?	Analytical	• PEG beneficiary sign-in sheets; • Afgoi, Aw-Dhegle & Balad Center training records	Not applicable	Desk review	Entire universe of relevant PEG and Center training events	Review all PEG beneficiary sign-in sheets for training events; Review all Extension Center training records. Create Excel spreadsheet of beneficiaries and sort alphabetically to detect double-counting.	
9. In what ways and to what extent did participants directly benefit from PEG interventions in terms of: - Employment opportunities - Income -Household Asset accumulation -Access to Health and Education services -Food security.	Analytic and descriptive, including economic modeling	• PEG documents • Final Evaluation Survey of Farmers • Focus Group Discussions with producer groups, trade and business associations	N/A Structured questionnaire Semi-structured Focus Group Discussion Guide	• Desk review • Survey of Farmers Focus Group Discussions	• NA • Stratified, Systematic Random • Purposive	• Analysis of PEG documentation, • Analysis of survey results using SPSS to quantify average benefits • Analysis of FG results to qualify benefits	

KEY QUESTION 1: To what extent has PEG been able to meet its targets for sub-activities based in South Central Somalia?							
SUB-QUESTION	TYPE OF EVIDENCE	DATA COLLECTION			SAMPLING OR SELECTION APPROACH	DATA METHOD	ANALYSIS
		SOURCE	TOOL	METHOD			
I0. What was the proportion of female participants in PEG activities designed to increase access to productive economic resources (asses, credit, income or employment), disaggregated by value chain (livestock, agriculture)?	Descriptive	• PEG beneficiary sign-in sheets; • Afgoi, Aw-Dhegle & Balad Center training records	Not applicable	Desk review	Entire universe of relevant PEG and Center training events	Review all PEG beneficiary sign-in sheets for training events; Review all Extension Center training records. Create Excel spreadsheet of beneficiaries and sort alphabetically to detect counting.	
I1. What is the number of Policies, Regulations, and Administrative Procedures in development, passed, or being implemented as a result of USG assistance, disaggregated by value chain (livestock, agriculture)?	Descriptive	PEG documents to identify policies, regulations and procedures supported by project; Key informant interviews (KIIs) to confirm status.	Semi-structured KII interview forms	Desk review Key informant interviews	Entire universe of relevant PEG documents describing USG assistance provided. Key informants selected in consultation with PEG.	Comparison of findings from desk review and KIIs with the targets established in the PEG PMEP, as well as results reported in Quarterly Reports.	

KEY QUESTION 2: Was the implementation model used by PEG, namely implementation of sub-activities through a local partner, appropriate for South Central Somalia? What were the strengths and challenges?							
SUB-QUESTION	TYPE OF EVIDENCE	DATA COLLECTION			SAMPLING OR SELECTION APPROACH	DATA METHOD	ANALYSIS
		SOURCE	TOOL	METHOD			
1. How effective was the local partner at achieving targets for the two value chains (livestock and agriculture)?	Analytical	Findings from Question 1, above	N/A	Desk review	N/A	Review of findings from Question 1 to calculate the overall level of effectiveness, calculated as the simple (non-weighted) average percentage achievement for all relevant PEG indicators.	

KEY QUESTION 2: Was the implementation model used by PEG, namely implementation of sub-activities through a local partner, appropriate for South Central Somalia? What were the strengths and challenges?						
SUB-QUESTION	TYPE OF EVIDENCE	DATA COLLECTION			SAMPLING OR SELECTION APPROACH	DATA METHOD ANALYSIS
		SOURCE	TOOL	METHOD		
2. How adequate were the management systems put in place by PEG in terms of: • Strategic and Operational Planning • Monitoring and Evaluation • Human resource management • Financial administration • Reporting	Descriptive	• PEG Quarterly and Annual Reports • Key informant interviews with USAID, DAI, SATG, relevant ministries	• Key Informant Interview Guide	• Desk review • Key Informant Interviews	• NA • Purposive	The findings from the desk review and KIs will provide input for the qualitative analysis of the adequacy of the established management systems The management capacity assessment tool will be used to develop a qualitative measure of the adequacy of management systems.

KEY QUESTION 2: Was the implementation model used by PEG, namely implementation of sub-activities through a local partner, appropriate for South Central Somalia? What were the strengths and challenges?						
SUB-QUESTION	TYPE OF EVIDENCE	DATA COLLECTION SOURCE	TOOL	METHOD	SAMPLING OR SELECTION APPROACH	DATA METHOD ANALYSIS
3. How adequate was the relationship with direct beneficiaries in terms of stakeholder engagement (communication, coordination, participation, ownership and/or buy-in) and responsiveness to stakeholder input and feedback?	Descriptive	Focus group discussions with: • Livestock Beneficiaries: -Milk producers/sellers; -Milk collectors/traders; -Dairy farms and milk processors; -Dairy input suppliers and agro-vets • Agricultural beneficiaries: - Farmers associations -Beneficiaries not members of associations - NGOs, CBOs Key informant interviews with: • DAI • SATG • Representatives of Ministry of Agriculture and Ministry of Livestock	Focus group discussion guides Key informant interview guides	Focus group discussions Key informant interviews	Purposive	• The findings of FGDs and KIIs will be analyzed to determine the quality (adequacy) of the various elements of stakeholder engagement. • Based on stakeholder feedback, a qualitative ranking score for each element of stakeholder engagement will be assigned.

KEY QUESTION 2: Was the implementation model used by PEG, namely implementation of sub-activities through a local partner, appropriate for South Central Somalia? What were the strengths and challenges?							
SUB-QUESTION	TYPE OF EVIDENCE	DATA COLLECTION			SAMPLING OR SELECTION APPROACH	DATA METHOD	ANALYSIS
		SOURCE	TOOL	METHOD			
4. How adequate was the relationship with other stakeholders whose participation was important for effective and efficient implementation as well as the sustainability of PEG interventions?	Descriptive	Focus group discussions with managers and extension staff from Ministry of Agriculture and Ministry of Livestock, and private sector value chain stakeholders. Key informant interviews with: • DAI • SATG • Representatives of Ministry of Agriculture and Ministry of Livestock • Private sector value chain stakeholders	Focus group discussion guides Key informant interview guides	Focus group discussions Key informant interviews	Purposive	• The findings of FGDs and KIIs will be analyzed to determine the quality.	
What were the strengths or advantages of implementing sub-activities through a local partner?	Analytical and Descriptive	Findings from Questions 1 to 4, above.	Focus group discussion guides Key informant interview guides	Focus group discussions Key informant interviews	Purposive	The findings of FGDs and KIIs: desk review of findings from Questions 1 to 4.	
What implementation challenges did the local partner encounter and how were these challenges addressed?	Descriptive	Findings from Questions 1 to 4, above.	Focus group discussion guides Key informant interview guides	Focus group discussions Key informant interviews	Purposive	The findings of FGDs and KIIs: desk review of findings from Questions 1 to 4.	

KEY QUESTION 3: How successful has PEG been in ensuring that the benefits of its intervention continue beyond the life of the activity?							
SUB-QUESTION	TYPE OF EVIDENCE	DATA COLLECTION			SAMPLING OR SELECTION APPROACH	DATA METHOD	ANALYSIS
		SOURCE	TOOL	METHOD			
1. What are the factors that were required to ensure that the beneficiaries will receive a perpetuity of benefits?	Descriptive	• PEG documents • KIIs with: • DAI • Representatives of Ministry of Agriculture and Ministry of Livestock • Supply chain private sector stakeholders	NA KII guide FGD Guide Perpetuity of Benefits tool	• Desk review • Key informant interviews	• NA • Purposive	The findings from the document review and KIIs will be used to develop a framework for the perpetuity of benefits that comprise sustainability, with stakeholders' assessments of strengths/weaknesses in the chain, or a SWOT analysis.	
2. How adequate and effective was PEG at developing a strategy and implementing an operational plan that would ensure the sustainability of PEG benefits?	Descriptive	• PEG documents • KIIs with: • DAI • Representatives of Ministry of Agriculture and Ministry of Livestock • FGDs with agro enterprises, livestock farmers, and agricultural farmers	• NA • KII guide • Focus Group Discussion Guides	• Desk review • Key informant interviews • Focus Group Discussions	• NA • Purposive	Use the Perpetuity of Benefits framework to match against the strategy and outcomes of the PEG operational plan, for both the present and possible future scenarios	

KEY QUESTION 3: How successful has PEG been in ensuring that the benefits of its intervention continue beyond the life of the activity?							
SUB-QUESTION	TYPE OF EVIDENCE	DATA COLLECTION			SAMPLING OR SELECTION APPROACH	DATA METHOD	ANALYSIS
		SOURCE	TOOL	METHOD			
3. How successful was PEG at establishing sustainable partnership/networking/linkages, taking into account the impacts on the following stakeholders? -Educational institutions -Local farm input suppliers and other agribusiness enterprises -Ministry of Agriculture - Ministry of Livestock -Local institutions and NGOs and farmer associations.	Descriptive	• PEG documents • KIs with relevant stakeholders from partner education institutions, local farm input suppliers and other agribusiness enterprises • -Ministry of Agriculture • - Ministry of Livestock • - Local institutions and NGOs and farmer associations.	• NA • Semi-structured KI guide • Focus Group Discussion Guides • Perpetuity of Benefits tool	• Desk review • Key informant interviews • Focus group discussions	• NA • Purposive • Purposive	The Perpetuity of Benefits tool will be used in the desk review, KIs and FGs to assess changes and outcomes from partnerships/networking/linkages, and impacts on specified stakeholders. The analysis will include an assessment of the ways in which the partnerships/networking/linkages have positively or negatively impacted the direct and indirect stakeholders and the extent to which there have been impacts beyond the direct participants.	

KEY QUESTION 3: How successful has PEG been in ensuring that the benefits of its intervention continue beyond the life of the activity?

SUB-QUESTION	TYPE OF EVIDENCE	DATA COLLECTION			SAMPLING OR SELECTION APPROACH	DATA METHOD	ANALYSIS
		SOURCE	TOOL	METHOD			
4. How sustainable is the business model for the Research and Agribusiness Incubation Center (RSIC)?	Descriptive and analytical	• ABIC documents • KII with ABIC Manager • Willingness-to-pay (WTP) questions from the Survey of Lead Farmers and the Survey of Contact Farmers	• NA • Semi-structured KII guide • Question	• NA • Key informant interviews • Structured questionnaire • Quantification of qualitative data	• NA • Purposive • Stratified, Systematic Random • NA	Financial sustainability analysis of the ABIC, including analysis of take-up of Center services by target clients and beneficiary willingness to pay. The WTP survey will be carried out on a small sample (30 respondents).	
5. How sustainable is the Cascade Model by which Incubation Centers transfer new agricultural and livestock technologies and practices to lead farmers, who in turn are the contact points for dissemination of new agricultural and livestock practices to contact farmers?	Descriptive and analytical, Including economic modeling	• KIIs with ABIC Manager and Ministry of Agriculture • Survey of lead farmers • Survey of contact farmers • Focus group discussions with managers and extension staff from Ministry of Agriculture and Ministry of Livestock	• NA • Semi-structured KII guide • WTP questionnaire	• NA • Key informant interviews • Structured questionnaire • Conversion of qualitative data into qualitative scale	• NA • Purposive • Purposive	Findings from the KIIs, Surveys and Focus Groups will be used to determine the application rate by contact farmers, the effectiveness of the relationship between lead farmers and contact farmers, and the willingness and capacity of lead farmers to continue the relationship with contact farmers after project completion.	

KEY QUESTION 4: To what extent did women benefit directly from PEG's interventions?							
SUB-QUESTION	TYPE OF EVIDENCE	DATA COLLECTION			SAMPLING OR SELECTION APPROACH	DATA METHOD	ANALYSIS
		SOURCE	TOOL	METHOD			
1. How adequate was the PEG gender strategy for benefiting women?	Analytic and descriptive	• PEG documents • Final Evaluation Survey of Farmers (section related to adequacy of gender strategy). • Focus Group Discussions with Women Beneficiaries	• NA • Structured questionnaire • Focus Group Discussion Guide	• Desk review • Survey of Farmers • Focus Group Discussions	NA	Analysis of PEG documentation, taking into account USAID Gender Equality and Female Empowerment Policy and recommendations from the USAID/Somalia 2014 Gender Assessment.	
2. In what ways and to what extent did women directly benefit from PEG interventions in terms of: - Employment opportunities - Income - Time efficiency - Women's empowerment - Household well-being (Education, Health access, household-level food security)	Analytic and descriptive, including economic modeling	• PEG documents • Final Evaluation Survey of Farmers (section related to adequacy of gender strategy). • Focus Group Discussions with women's groups, trade and business associations	• NA • Structured questionnaire • Semi-structured Focus Group Discussion Guide	• Desk review • Survey of Farmers • Focus Group Discussions	• NA • Stratified, Systematic Random • Purposive	• Analysis of PEG documentation, taking into account USAID Gender Equality and Female Empowerment Policy and recommendations from the USAID/Somalia 2014 Gender Assessment. • Analysis of survey results using SPSS to quantify average benefits • Analysis of FGD results to qualify benefits	
3.If there were any differing impacts on female, compared to male direct beneficiaries as a result of PEG interventions, what was the nature and extent of those impacts (positive, negative, neutral)?	Analytic and descriptive	• PEG documents • Final Evaluation Survey of Farmers (section related to adequacy of gender strategy). • Focus Group Discussions with women's groups, trade and business associations	• NA • Structured questionnaire • Semi-structured Focus Group Discussion Guide	• Desk review • Survey of Farmers • Focus Group Discussions	• NA • Stratified, Systematic Random • Purposive	• Analysis of survey results using SPSS to quantify average negative impacts, if any. • Analysis of FGD results to qualify negative impacts, if any.	

Note: The survey of farmers will have proportional representation of women beneficiaries. Twenty-seven percent of Lead Farmer respondents will be female, while twenty-three percent of Contact Farmer respondents will be female, in keeping with the overall proportion of beneficiaries calculated from the Participant Lists available during preparation of this Technical Proposal.

KEY QUESTION 5: What are some changes in activity implementation and/or strategy that could have allowed PEG to make a greater impact among its beneficiaries?

SUB-QUESTION	TYPE OF EVIDENCE	DATA COLLECTION			SAMPLING OR SELECTION APPROACH	DATA METHOD	ANALYSIS
		SOURCE	TOOL	METHOD			
- What changes in delivery system could have allowed PEG to have greater impact on: - Agricultural productivity and quality; - Livestock productivity and quality; - Employment opportunities; - Farm family income; - Women	Descriptive	• Focus Group Discussions • Key Informant Interviews	• Focus Group Discussion Guides • Key informant interviews	Focus group discussions	Purposive	The findings of the focus group discussions and key informant interviews will be organized in a structured manner to allow for the quantification of qualitative data.	
- What changes in technical approach could have allowed PEG to have greater impact on: - Agricultural productivity and quality; - Livestock productivity and quality; - Employment opportunities; - Farm family income; - Women	Descriptive	• Focus Group Discussions • Key Informant Interviews	• Focus Group Discussion Guides • Key informant interviews	Focus group discussions	Purposive	The findings of the focus group discussions and key informant interviews will be organized in a structured manner to allow for the quantification of qualitative data.	

ANNEX 3: DETAILED METHODOLOGY AND ANALYSIS

QUANTITATIVE SURVEY

Quantitative surveys were carried out in four districts in Lower and Middle Shebelle and Banadir regions (see Table 7 below) for the lead and contact farmers in the two sub-activities with a total sample size of 481 farmers. The quantitative survey was designed to provide statistically valid conclusions and findings that can be generalized for the entire target population. The survey provides for a 90 percent level of confidence with +/-5 percent margin of error. A random, statistically significant sample size was selected using the formula for calculating the sample size for proportions, since all but one of the quantitative sub-questions corresponding to Question 1 are proportional in nature. For example, in order to calculate the number of farmers and others who have applied new technologies or management practices as a result of USG assistance (Sub-question 1.2), SPSS needed to calculate the proportion of lead and contact farmers sampled who have applied new technologies or management practices, and then apply that proportion to the universe in order to estimate the total number of farmers who have applied them. Table 1 shows the life-of-project (LOP) total achieved number of lead farmers and contact farmers and the sample size required to obtain a 90 percent level of confidence, plus or minus 5 percent.

Table 7: Life of Project Achieved Number of Lead and Contact Farmers

District	Agriculture Farmers		Livestock Farmers
	Total Lead Farmers	Total Contact Farmers	Total Contact Farmers
Afgoi	75	1,559	106
Awdehgle	75	613	-
Balad	50	638	-
Benadir/Mogadishu	-	-	106
Total	200	2,810	212
Required overall sample size	115	245	119
Female beneficiaries as a proportion of total beneficiaries	29 percent	24 percent	33 percent
Required sample of female beneficiaries	33	59	39
Required sample of male beneficiaries	82	186	80

Furthermore, even for the sole sub-question (Sub-question 1.1 about the change in productivity) that asks about the mean, the formula for calculating the sample size for proportions is the recommended choice, since the variance in productivity -- that would be required to use the formula for calculating a mean -- is unknown. In this instance, the use of the level of maximum variability ($P=0.5$) in the calculation of the sample size for the proportion will produce a more conservative sample size (i.e., a larger one) than would be calculated by the sample size of the mean, which means that the response will be of equal or greater statistical significance than if the formula for calculating the sample size for means were used.

With a small sample frame, such as is the case for the PEG Final Performance Evaluation -- the formula used to calculate the sample size is:

$$n = \frac{n_0}{1 + \frac{(n_0 - 1)}{N}}$$

where n is the required sample size and N is the population size;

and where:

$$n_0 = \frac{Z^2 pq}{e^2}$$

where n_0 is sample size for large populations. Z is the desired level of confidence, determined from statistical tables known as “Z Tables”, which show the area under the normal curve. A confidence level of 90 percent corresponds to a Z value of 1.64. The variable p is the estimated proportion of an attribute that is present in the population, and q is equal to 1 - p.

In instances where the value of p is unknown (as is the case for the PEG final performance evaluation), a value of 0.5 is used, as this provides a conservative estimate of required sample size (i.e. a larger sample size than may be strictly necessary to achieve the desired level of confidence). This means that q, calculated as 1 - p, is equal to 0.5 as well.

To calculate the sample size for lead agriculture farmers, we first calculate n_0 as follows:

$$n_0 = \frac{Z^2 pq}{e^2} = \frac{1.64^2 \times 0.5 \times 0.5}{0.05^2} = 269$$

Next we calculate n as follows:

$$n = \frac{n_0}{1 + \frac{(n_0 - 1)}{N}} = \frac{269}{1 + \frac{(269 - 1)}{200}} = 115$$

Similarly, to calculate the sample size for contact agriculture farmers, we first calculate n_0 as follows:

$$n_0 = \frac{Z^2 pq}{e^2} = \frac{1.64^2 \times 0.5 \times 0.5}{0.05^2} = 269$$

Next we calculate n as follows:

$$n = \frac{n_0}{1 + \frac{(n_0 - 1)}{N}} = \frac{269}{1 + \frac{(269 - 1)}{2810}} = 245$$

To calculate the sample size for contact livestock farmers, we first calculate n_0 as follows:

$$n_0 = \frac{Z^2 pq}{e^2} = \frac{1.64^2 \times 0.5 \times 0.5}{0.05^2} = 269$$

Next we calculate n as follows:

$$n = \frac{n_0}{1 + \frac{(n_0 - 1)}{N}} = \frac{269}{1 + \frac{(269 - 1)}{212}} = 119$$

The sample for the two target groups was selected via the Simple Random Sampling (SRS) method by organizing the names of the direct beneficiaries into four lists: male livestock beneficiaries; female

livestock beneficiaries; male agriculture beneficiaries; and female agriculture beneficiaries, arranged alphabetically and assigned an ordinal number from 1 to N, where N is the number of direct beneficiaries in each beneficiary group. For each group, a random number, r, between 1 and n will be generated using the RANDBETWEEN function in Microsoft Excel. The random number thus generated was used as the starting point for selecting the sample. The next name on the beneficiary list to be selected for the sample was the name corresponding to number $r + N/n$, where n is equal to the required sample size for the respective group. The remaining names for the sample were drawn in a similar fashion until the desired sample size was attained. The final sample attained for the study is given in the table below:

Table 8: Final Achieved Number of Lead and Contact Farmers

Sample	Agriculture Farmers		Livestock Farmers
	Total Lead Farmers	Total Contact Farmers	Total Contact Farmers
Achieved overall sample size	131	229	121
Female headed households as a proportion of total sample size	12 percent	12 percent	27 percent
Achieved female headed households	16	28	33
Achieved male headed households	115	201	88

The overall sample for agriculture farmers achieved was 360 households. However, the distribution by lead and contact farmers and also by gender was not achieved. This discrepancy in the gender distribution is mainly as a result of the definition used. During the study, we discovered that being a female beneficiary does not mean that the household is female headed. Although the registered PEG beneficiary may be female, the household head is not necessarily female. The failure to achieve the desired sample of agriculture contact farmers was caused by the failure to locate the sampled farmers during data collection and also the enumerators' failure to access some locations due to fighting between Al-Shabaab and African Union peace keepers.

DATA ANALYSIS

The ET team followed USAID's information quality standards stipulated in ADS 578. Qualitative and quantitative data were analyzed as follows:

Qualitative Data

Qualitative data played an integral part in the PEG Evaluation since the evaluation was a combination of the management oriented systems model and the qualitative model. After data collection, the team coded the qualitative data. The coding process was done using the NVIVO¹³ software. Coding is a method to organize and group similarly themed or frequently occurring data (called Nodes in NVIVO) into categories or 'families' because they share some characteristic (See Annex 8). They are arranged under several categories, which included some more detailed sub-categories. For example, data coded as "Program impact" were categorized under the major heading 'Impact', which in turn had several more refined sub-categories called 'Positive' and 'Negative'. The team looked for patterns that corresponded to one of these: similarity, difference, frequency, sequence, and/or correspondence. After that, the

¹³ NViVo is a Qualitative Data Analysis software available online for download from QSR International.

major categories were compared with each other and consolidated in various ways that progressed towards the themes. The coding went hand-in-hand with the write-up of findings. Between this going back and forth, the team also winnowed the data, focusing on some of the data and disregarding other parts of it. The goal is to aggregate data into small numbers, and using a computer is an easy way to quickly locate passages. Themes that emerged from the categories serve as the major findings of the study, as well as the complex connections between themes that were also formed. Generalizations about the patterns were analyzed. Lastly the team presented the results through both text and visuals like tables and figures to make it easier to read.

Quantitative Data

Data from the quantitative survey was captured in SPSS and STATA. All data analysis was done using SPSS and Excel. The data analysis included generating descriptive status, cross-tabulation and correlations to test for associations of key outcomes with demographic and socio-economic characteristics of farmers. The analysis was also disaggregated by gender, district and main farming activities, and differences in outcomes were also tested to see if they were significant. Binary logistic regression analysis was also carried out to establish the key determinants of adoption for the most commonly adopted technology (Maize production and milk hygiene).

Data Triangulation

Once the analysis was done, data was triangulated by comparing data through cross verification from both qualitative results and quantitative results. The data were also compared with desk review documents as well as additional literature review materials, specifically on economic growth approaches in fragile states.

ANNEX 4: FINDINGS - ADDITIONAL GRAPHS AND TABLES

Figure 1: Perception of Lead Farmers Regarding Quantity and Quality of Training (Entire sample)

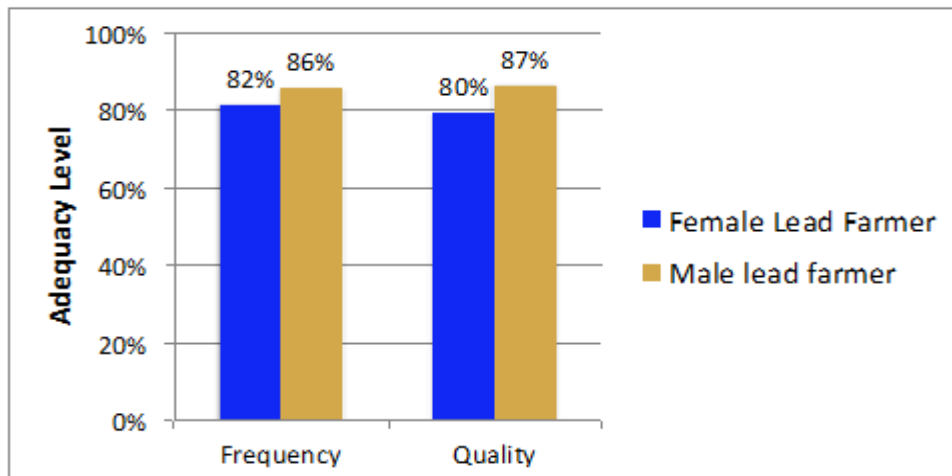


Figure 2: Perception of Contact Farmers Regarding Quantity and Quality of Training (Entire sample)

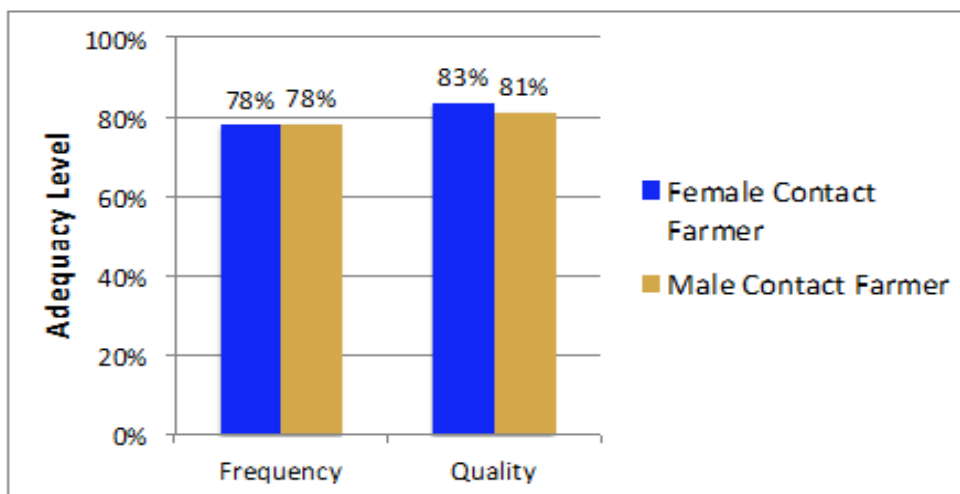


Figure 3: Perceptions Regarding Quantity and Quality of PEG Training



Figure 4: Perceptions Regarding PEG's Effect on Household Finances

To what extent did PEG help to improve the financial situation in your household?

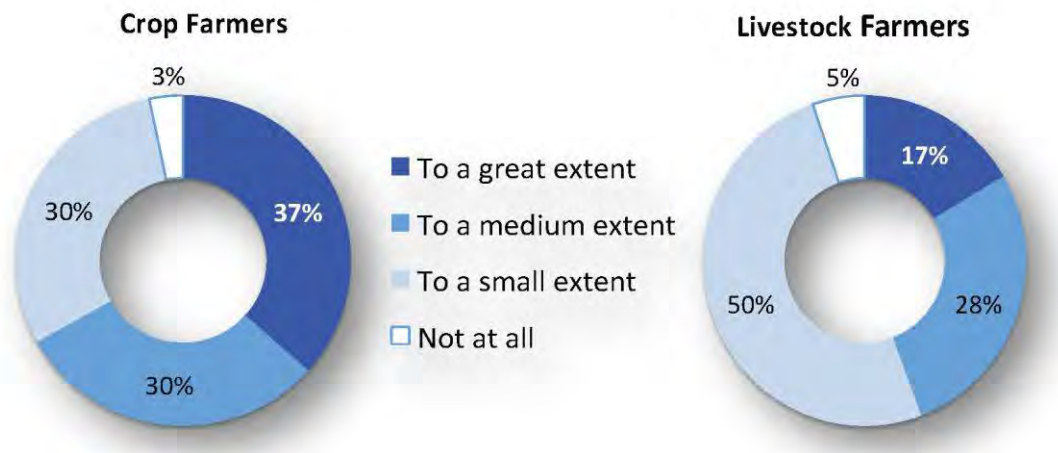


Figure 5: Perceptions Regarding PEG's Effect on Household Nutrition

To what extent did PEG help to improve the nutritional situation in your household?

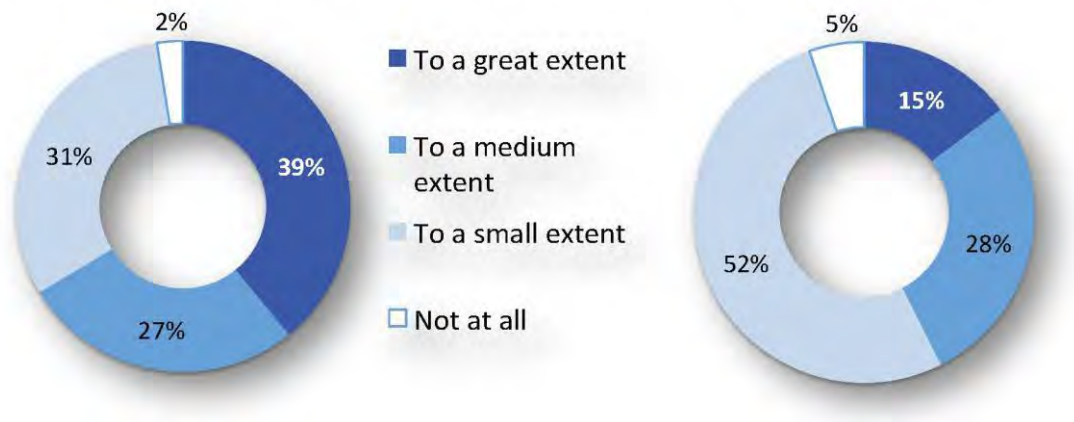
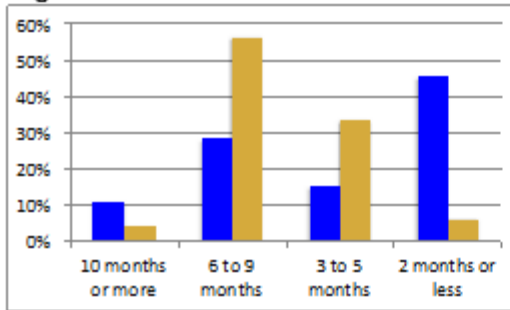
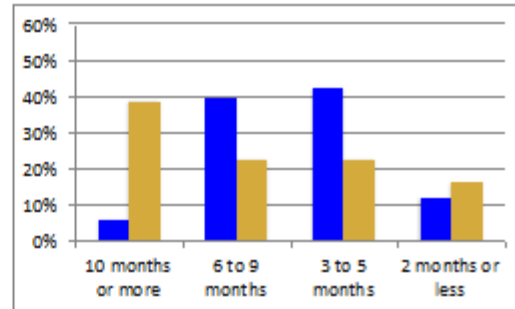


Figure 6: Household Food Self-Sufficiency by District

Afgoi



Balad



Banadir

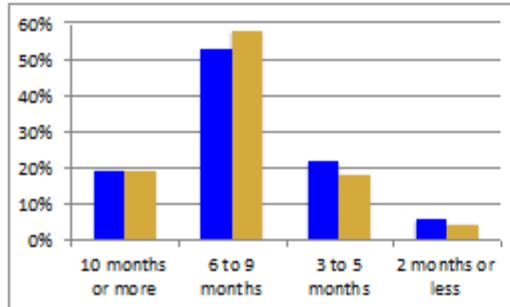


Figure 7: Maize Input Use and Yields by District

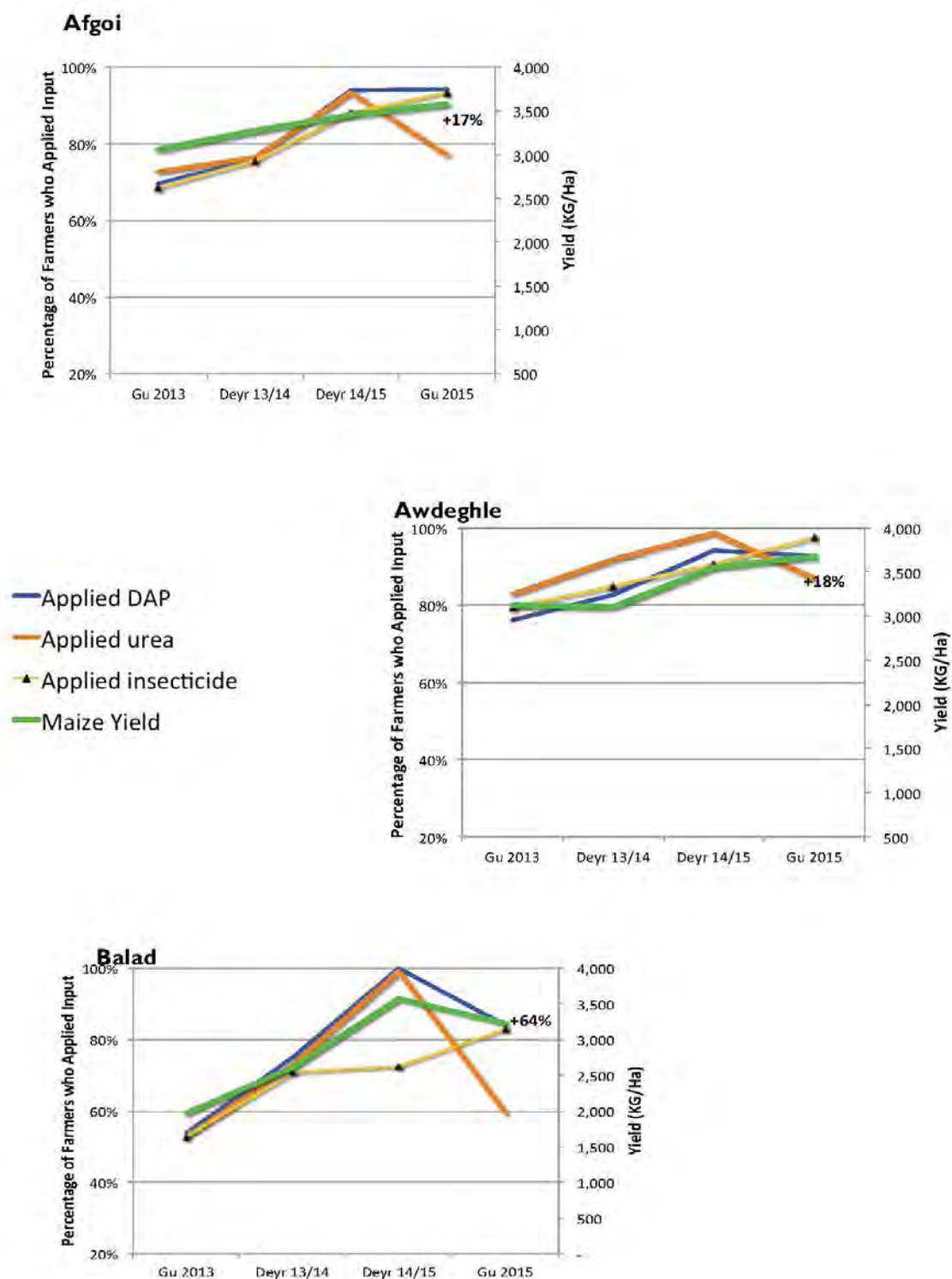


Figure 8: Maize Input Use and Yields

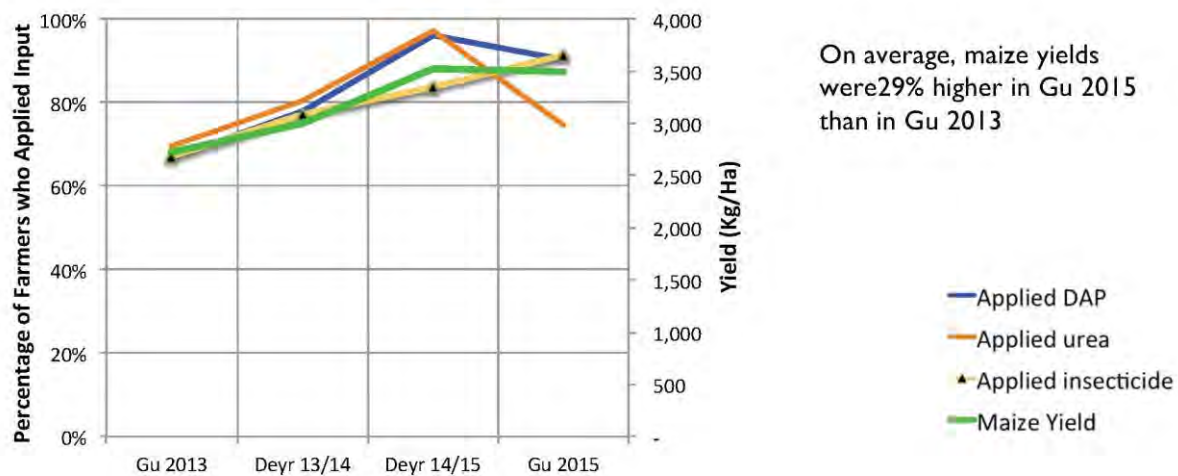


Figure 9: Post Harvest Loss of Maize

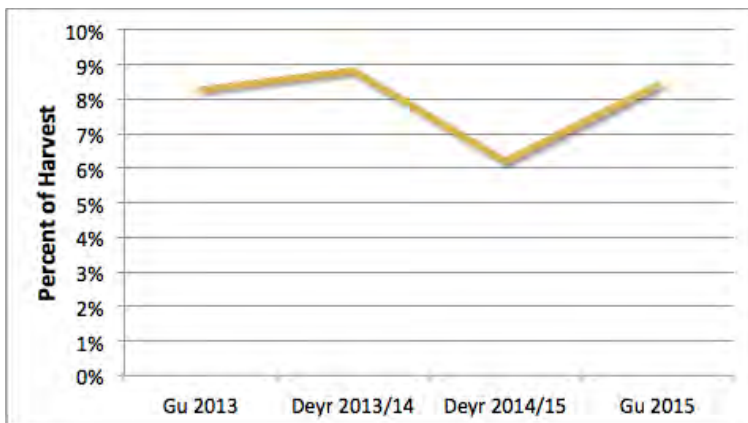


Figure 10: Average Cattle Milk Production, Sales and Yields

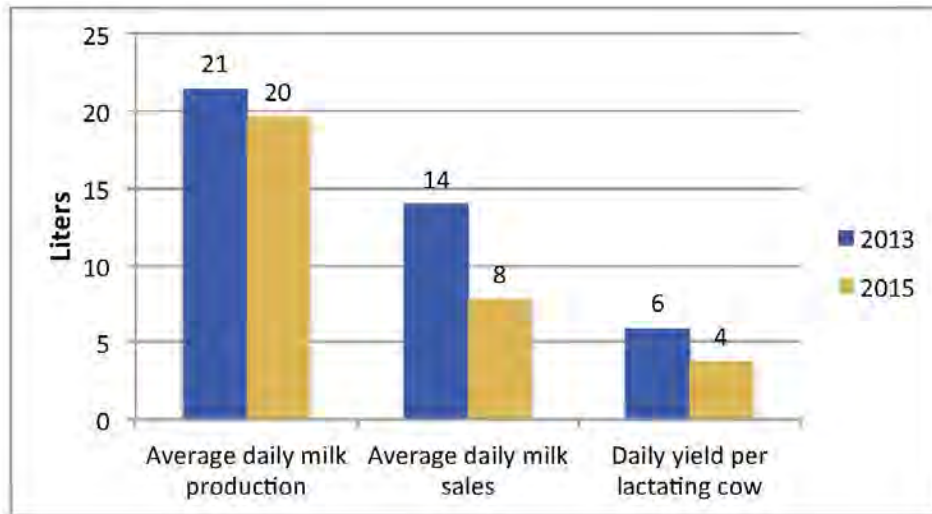


Figure 11: Average Camel Milk Production, Sales and Yields

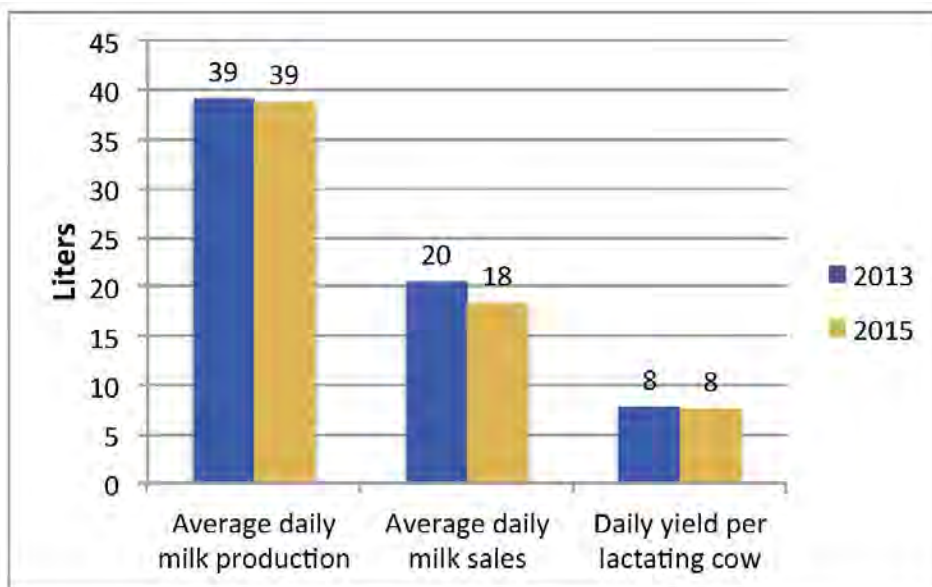


Figure 12: Cattle Milk Production, Sales and Yields in Gu

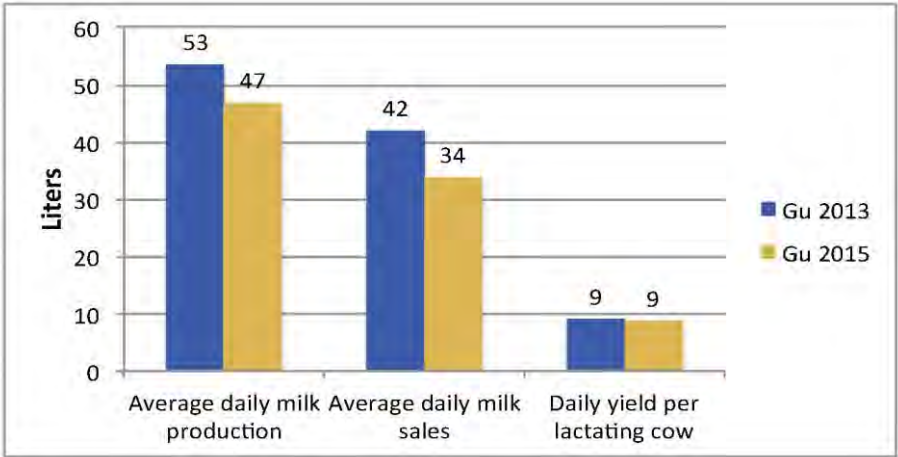


Figure 13: Cattle Milk Production, Sales and Yield in Jilal

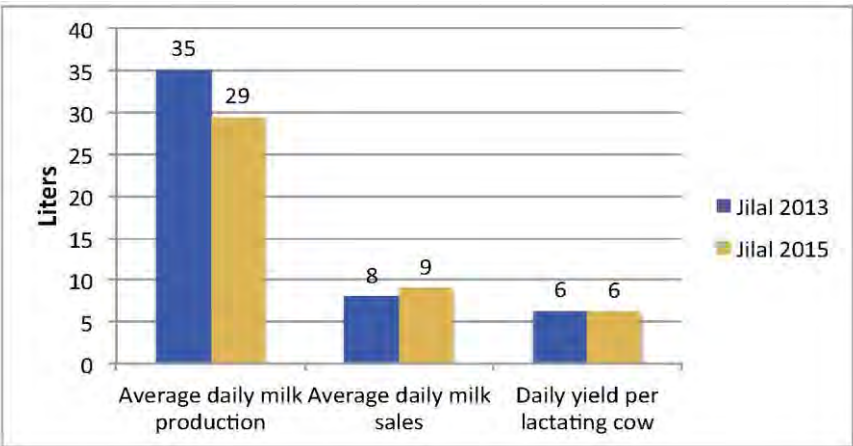


Figure 14: Cattle Milk Production, Sales and Yield in Deyr

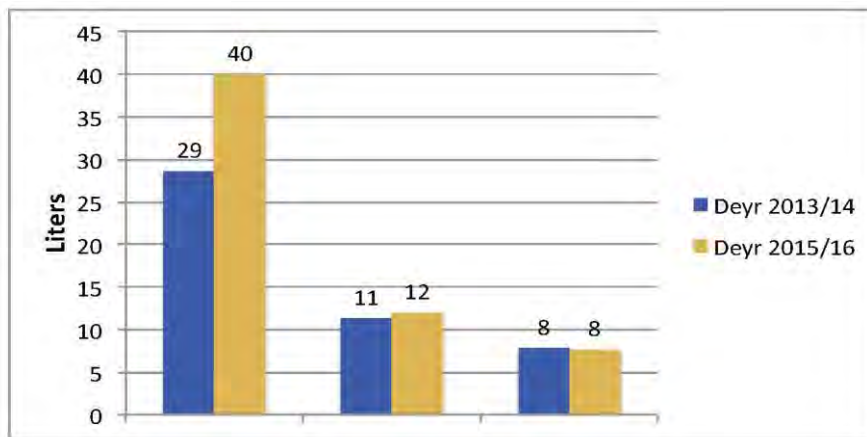


Figure 15: Change in the Participation of Women in Decision-Making

Change in the participation of women in decision-making about:

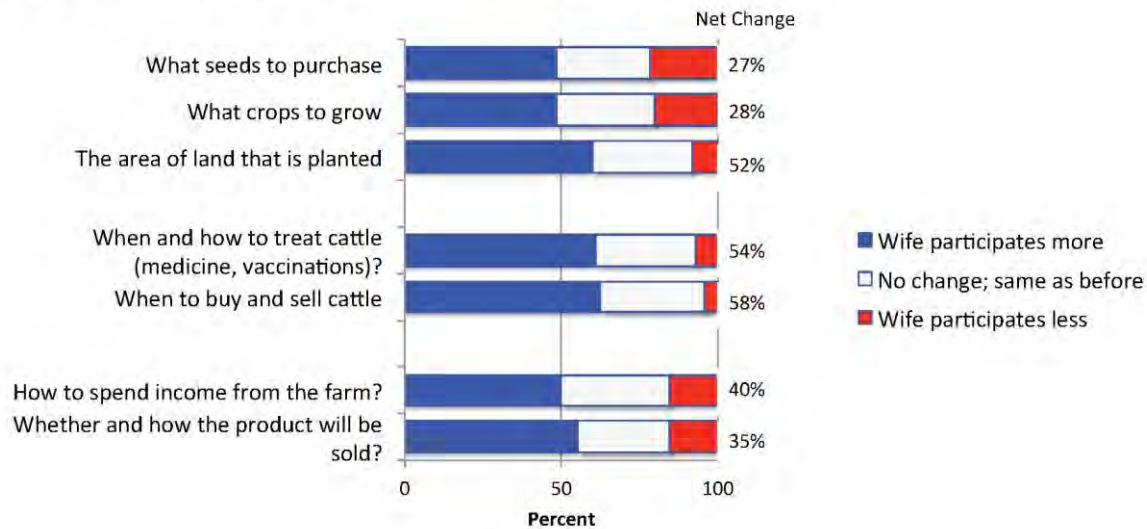
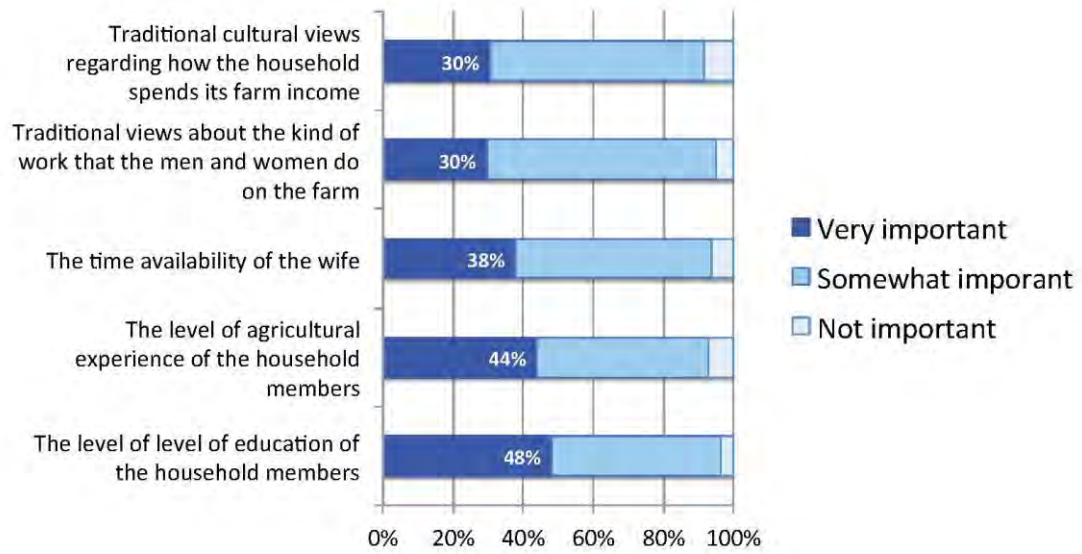


Figure 16: Factors affecting who participates in decision-making on the farm



ANNEX 5: MAIZE REGRESSION ANALYSIS

Table 1: Stratified Regression Analysis of Maize Yield (Stratification is by Season)

* indicates significance at 5%

	Estimate	Std. Error	t value	Pr(> t)	
Gu 2013					
(Intercept)	622.13	299.17	2.08	0.04	*
Beneficiary Type					
Lead Farmer	69.60	138.07	0.50	0.61	
Contact Farmer#					
Irrigation Status					
Irrigated Farms	609.87	236.44	2.58	0.01	*
Non - Irrigated Farms#					
Gender of Respondent					
Female	-78.77	131.23	-0.60	0.55	
Male#					
DAP	7.00	6.58	1.06	0.29	
Urea	-9.70	9.25	-1.05	0.30	
Applied Insecticides					
Yes	1822.87	183.63	9.93	0.00	*
No#					
District					
Afgoi	263.43	189.38	1.39	0.17	
Awdeghle	237.27	223.08	1.06	0.29	
Balad#					
Deyr 2013/14					
(Intercept)	371.10	359.52	1.03	0.30	
Beneficiary Type					
Lead Farmer	174.84	145.23	1.20	0.23	
Contact Farmer#					
Irrigation Status					
Irrigated Farms	619.15	282.43	2.19	0.03	*
Non - Irrigated Farms#					
Gender of Respondent					
Female	-57.82	136.75	-0.42	0.67	
Male#					
DAP	8.39	4.79	1.75	0.08	
Urea	-7.47	7.46	-1.00	0.32	
Applied Insecticides					

	Estimate	Std. Error	t value	Pr(> t)	
Yes	2015.32	225.50	8.94	0.00	*
No#					
District					
Afgoi	293.79	209.84	1.40	0.16	
Awdeghle	76.98	244.41	0.31	0.75	
Balad#					
Deyr 2013/14					
(Intercept)	1910.90	548.24	3.49	0.00	*
Beneficiary Type					
Lead Farmer	-20.78	132.33	-0.16	0.88	
Contact Farmer#					
Irrigation Status					
Irrigated Farms	609.67	424.54	1.44	0.15	
Non - Irrigated Farms#					
Gender of Respondent					
Female	-61.40	126.85	-0.48	0.63	
Male#					
DAP	-6.92	3.50	-1.98	0.05	
Urea	16.53	5.64	2.93	0.00	*
Applied Insecticides					
Yes	1061.88	312.90	3.39	0.00	*
No#					
District					
Afgoi	-272.60	185.24	-1.47	0.14	
Awdeghle	-14.88	219.73	-0.07	0.95	
Balad#					
Gu 2015					
(Intercept)	2113.34	451.36	4.68	0.00	*
Beneficiary Type					
Lead Farmer	-68.72	135.08	-0.51	0.61	
Contact Farmer#					
Irrigation Status					
Irrigated Farms	591.57	327.79	1.80	0.07	
Non - Irrigated Farms#					
Gender of Respondent					
Female	40.49	130.55	0.31	0.76	
Male#					
DAP	-7.41	3.13	-2.37	0.02	*
Urea	22.66	5.09	4.45	0.00	*
Applied Insecticides					

	Estimate	Std. Error	t value	Pr(> t)	*
Yes	680.80	324.34	2.10	0.04	
No#					
District					
Afgoi	24.00	193.84	0.12	0.90	
Awdeghle	-12.14	231.36	-0.05	0.96	
Balad#					

Table 2: Linear Mixed Effects Model

* indicates significance at 5%

	Estimate	Std Error	p value	*
(Intercept)	1204.41	185.16	0.00	
Season				
Gu 2013#				
Deyr 2013/14	34.40	64.67	0.60	
Deyr 2014/15	292.53	66.64	0.00	*
Gu 2015	418.70	67.21	0.00	*
Beneficiary Type				
Lead Farmer	0.13	104.70	1.00	
Contact Farmer#				
District				
Afgoi	-55.54	173.83	0.75	
Awdeghle	-20.48	123.50	0.87	
Balad#				
Gender of Respondent				
Female	7.60	102.49	0.94	
Male#				
Irrigation Status				
Irrigated Plots	399.08	146.28	0.01	*
Non - Irrigated Plots#				
DAP	5.02	2.00	0.01	*
urea	17.81	3.24	0.00	*
Insecticide Use				
Yes	1454.15	109.85	0.00	*
No#				

Table 3

Regression Analysis of Maize Yields Deyr 2013/2014

Independent variables: Amount of DAP (kg/ha), Urea (kg/ha), Female

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2396.767	103.648		23.124	.000
	DAP_Maize_Deyr_2013_14	6.850	1.523	.293	4.499	.000
	Urea_Maize_Deyr_2013_14	6.615	1.673	.257	3.954	.000
	Female	62.183	138.154	.021	.450	.653

a. Dependent Variable: Maize_Deyr_2013_14_Yield

Table 4

Regression Analysis of Maize Yields Deyr 2013/2014

Independent variables: Amount of DAP (kg/ha), Urea (kg/ha)

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2420.464	89.174		27.143	.000
	DAP_Maize_Deyr_2013_14	6.797	1.516	.291	4.483	.000
	Urea_Maize_Deyr_2013_14	6.654	1.669	.259	3.988	.000

a. Dependent Variable: Maize_Deyr_2013_14_Yield

Table 5

Regression Analysis of Maize Yields Deyr 2013/2014

Independent variables: Amount of DAP (kg/ha), Urea (kg/ha), Whether Insecticide was applied (yes/no)

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1150.609	161.852		7.109	.000
	DAP_Maize_Deyr_2013_14	5.051	1.375	.216	3.672	.000
	Urea_Maize_Deyr_2013_14	4.598	1.516	.179	3.034	.003
	C_30. Did you apply insecticide on the maize in Deyr 2013/2014?	1677.133	185.755	.407	9.029	.000

a. Dependent Variable: Maize_Deyr_2013_14_Yield

Table 6

Regression Analysis of Maize Yields Deyr 2013/2014

Independent variables: Amount of DAP (kg/ha), Urea (kg/ha), whether insecticide was applied (yes/no), farm size

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1334.583	180.910		7.377	.000
	DAP_Maize_Deyr_2013_14	4.962	1.368	.212	3.627	.000
	Urea_Maize_Deyr_2013_14	4.987	1.517	.194	3.288	.001
	C_30. Did you apply insecticide on the maize in Deyr 2013/2014?	1583.278	189.426	.385	8.358	.000
	F_1. What is the total size of your farm (the land that you own)?	-6.777	3.046	-.096	-2.225	.027

a. Dependent Variable: Maize_Deyr_2013_14_Yield

Table 7

Regression Analysis of Maize Yields Deyr 2013/2014

Independent variables: Amount of DAP (kg/ha), Urea (kg/ha), whether insecticide was applied (yes/no), farm size, district

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1551.196	207.519		7.475	.000
	DAP_Maize_Deyr_2013_14	5.703	1.406	.244	4.056	.000
	Urea_Maize_Deyr_2013_14	4.387	1.536	.171	2.856	.005
	C_30. Did you apply insecticide on the maize in Deyr 2013/2014?	1622.916	189.415	.394	8.568	.000
	F_1. What is the total size of your farm (the land that you own)?	-6.091	3.048	-.087	-1.998	.046
	District	-179.982	85.810	-.092	-2.097	.037

a. Dependent Variable: Maize_Deyr_2013_14_Yield

Table 8

Regression Analysis of Maize Yields Deyr 2013/2014

Independent variables: Amount of DAP (kg/ha), Urea (kg/ha), whether insecticide was applied (yes/no), farm size, education level

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		

1	(Constant)	1149.403	212.448		5.410	.000
	DAP_Maize_Deyr_2013_14	4.496	1.393	.192	3.227	.001
	Urea_Maize_Deyr_2013_14	5.479	1.542	.213	3.553	.000
	C_30. Did you apply insecticide on the maize in Deyr 2013/2014?	1539.563	190.784	.374	8.070	.000
	F_1. What is the total size of your farm (the land that you own)?	-8.383	3.190	-.119	-2.628	.009
	H_9. Education level of household head (select highest level of completed education only)	187.639	113.624	.074	1.651	.100

a. Dependent Variable: Maize_Deyr_2013_14_Yield

ANNEX 6: DATA COLLECTION INSTRUMENTS

QUESTIONNAIRE OF FACE-TO-FACE INTERVIEW (F2F)

SECTION	VARIABLE NAME	LABEL	CODING AND FILTER LOGIC			
General (G)	G_1	Interviewer Unique ID	ALL SCREENED IN			
		Numeric	Unique ID to be assigned by Survey Firm			
Household (H)	H_1	Household Head Unique ID	ALL SCREENED IN			
		Numeric	Unique ID to be assigned by survey firm. ID will include District prefix			
Household (H)	H_2	Name of Household Head	ALL SCREENED IN			
		Text	Automatically filled in based on input for H_1			
ft	H_9	Gender of Household Head	ALL SCREENED IN			
		Single Response				
		Female	1			
		Male	2			
Household (H)	H_3	Phone number of respondent	ALL SCREENED IN			
		Numeric	Automatically filled in based on input for H_1.			
Household (H)	H_4	District	ALL SCREENED IN			
		Single Response	Automatically filled in based on input for H_1			
		Afgoi	1			
		Awdehgle	2			
		Balad	3			
		Banadir	4			
Household (H)	H_5.1	Village (Afgoi)	FILTER IF	H_4	EQUALS	1
		Single Response	Automatically filled in based on input for H_1			
		Anoole	1			
		Marerey	2			
		Mordiile	3			
		Sabiid	4			
		Balbaley Shuk	5			
		Buuxow	6			
		Jumbulul	7			
		Daynile /Dhiiqaaley	8			
		Geeryoon /Afgoi	9			
		Jabad-Geel/Ceelasha	10			
		Carbiska/Afgoi	11			
		Ceelasha	12			
		Rimi-Gacameed	13			
		Dhalanrogga	14			
		Lafale	15			
		Shimbiroole	16			
		Jasiira	17			
		Harweyn	18			
		Shukurow	19			

SECTION	VARIABLE NAME	LABEL	CODING AND FILTER LOGIC			
		Galwar				20
		Balgure				21
		Sagalad				22
		Kuraale				23
		Balow				24
		Aw-haliim				25
		Buriweyne				26
		Banadir University				27
		Barwaqo				28
		Beder				29
		Al-Nacim				30
		Aran				31
		Xafiska Dallada				32
Household (H)	H_5.2	Select village (Awdegle)	FILTER IF	H_4	EQUALS	2
		Single Response	Automatically filled in based on input for H_I			
		Mubaraak				33
		D/salam				34
		J/Awdehgle				35
		Gumeysidid				36
		Aybuutey				37
		Jowhar				38
		Malabler				39
Household (H)	H_5.3	Select village (Balad)	FILTER IF	H_4	EQUALS	3
		Mashruuca				40
		Walamoy				41
		Hawa-Tako				42
		Isgoys				43
		Gololey				44
		Kurshaale				45
		Bakhdaad				46
Household (H)	H_5.3	Select village (Banadir)	FILTER IF	H_4	EQUALS	4
		Mashruuca				40
		Walamoy				41
		Hawa-Tako				42
		Isgoys				43
		Gololey				44
		Kurshaale				45
		Bakhdaad				46
Household (H)	H_6	Type of Beneficiary	ALL SCREENED IN			
		Single Response	Automatically filled in based on input for H_I.			
		Lead Farmer (Crops)				1
		Contact Farmer (Crops)				2
		Livestock Farmer (Dairy, Camels)				3
		To be read aloud to Household Head: Hello, we are from a research company called DARS and we are currently conducting a survey to evaluate the Partnership for Economic Growth (PEG)				

SECTION	VARIABLE NAME	LABEL	CODING AND FILTER LOGIC
		project, which is implemented in Somalia by DAI/SATG. We would like to know how the PEG project helped your household, so that future projects can be better designed. For this purpose, we are interviewing randomly selected households, and your name and information you give me will not be shared with anyone else. The interview will take about 60 minutes to complete. You may skip any question that you are not comfortable answering, and you can stop the interview any time.	
Household (H)	H_7	May I start now?	
		Single Response	ALL SCREENED IN
		Yes	1
		No	0
		If H_5=0, thank the Household Head for their time. Pick one of the reserve households and continue to administer another interview.	
Start of Questionnaire			
	NOTE	This section asks some questions about your household	
Household (H)	H_8	Marital status of the household head	ALL SCREENED IN
		Single Response	
		Single	1
		Married	2
		Divorced	3
		Widowed/widower	4
Household (H)	H_9	Education level of household head (select highest level of completed education only)	ALL SCREENED IN
		Single Response	
		None	0
		Primary	1
		Secondary	2
		University	3
Household (H)	H_10	How many males under 18 years old live in your household?	ALL SCREENED IN
		Numeric	
Household (H)	H_11	How many females under 18 years old live in your household?	ALL SCREENED IN
		Numeric	
Household (H)	H_12	How many males 18 to 65 years old live in your household?	ALL SCREENED IN
		Numeric	

SECTION	VARIABLE NAME	LABEL	CODING AND FILTER LOGIC			
Household (H)	H_13	How many females 18 to 65 years old live in your household? Numeric	ALL SCREENED IN			
Household (H)	H_14	How many males over 65 years old live in your household? Numeric	ALL SCREENED IN			
Household (H)	H_15	How many females over 65 years old live in your household? Numeric	ALL SCREENED IN			
Household (H)	H_16	What is the main farming activity for household food consumption? Single response Food crops Cattle raising Camel raising Mixed cattle and camel raising Fodder	ALL SCREENED IN			
				1		
				2		
				3		
				4		
				5		
Household (H)	H_17	What is the main farming activity for household income? Single response Food crops Cattle raising Camel raising Mixed cattle and camel raising Fodder	ALL SCREENED IN			
				1		
				2		
				3		
				4		
				5		
NOTE		This section asks some questions about your farm				
Farm (F)	F_1	What is the total size of your farm (the land that you own)? Numeric	ALL SCREENED IN			
Farm (F)	F_2	What is the unit of measurement? Single Jibaal Darab Hectare	ALL SCREENED IN			
				1		
				2		
				3		
Farm (F)	F_3	On the land that you own, how many different plots of land do you farm on? Please use the same unit of measurement. Numeric	FILTER IF	H_6	EQUALS	1 or 2
Farm (F)	F_4	What is the size of the largest plot? Please use the same unit of measurement.	FILTER IF	H_6	EQUALS	1 or 2

SECTION	VARIABLE NAME	LABEL	CODING AND FILTER LOGIC			
		Numeric				
Farm (F)	F_5	Would you agree to let me measure this plot after we complete this survey?	FILTER IF	H_6	EQUALS	1 or 2
		Single				
		Yes	1			
		No	0			
		Numeric				
		Numeric				
Farm (F)	F_8	How much of your own land is irrigated?	ALL SCREENED IN			
		Numeric				
Farm (F)	F_9	How much land did you rent or borrow in 2015?	ALL SCREENED IN			
		Numeric				
Farm (F)	F_10	Was the land you rented or borrowed irrigated?	FILTER IF	F_9	GREATER THAN	0
		Single				
		Yes	1			
		No	0			
	NOTE	This section asks about your participation in PEG activities.				
Participation (P)	P_1	Did you receive PEG support in Gu season 2014?	ALL SCREENED IN			
		Single				
		Yes	1			
		No	0			
Participation (P)	P_2	Did you receive PEG support in Deyr season 2014/2015?	ALL SCREENED IN			
		Single				
		Yes	1			
		No	0			
Participation (P)	P_3	Did you receive PEG support in Gu season 2015?	ALL SCREENED IN			
		Single				
		Yes	1			
		No	0			
Participation (P)	P_4	Who in the household received training directly from PEG either from an extension worker or lead farmer?	ALL SCREENED IN			
		Multiple				
		Male head of household	1			
		Female head of household	2			
		Wife (who is not head of household)	3			
		Other adult male in household	4			
		Other adult female in household	5			

SECTION	VARIABLE NAME	LABEL	CODING AND FILTER LOGIC			
		None of the above	6			
Participation (P)	P_5	Who did you (the household head) receive most of your PEG training from?	ALL SCREENED IN			
		Single				
		Male extension worker	1			
		Female extension worker	2			
		Male lead farmer	3			
		Female lead farmer	4			
Participation (P)	P_6	How do you assess the adequacy of the frequency of visits/meetings/trainings conducted by PEG extension workers?	FILTER IF	H_6	EQUALS	1
		Single				
		Very insufficient	1			
		Somewhat insufficient	2			
		Somewhat sufficient	3			
		Very sufficient	4			
Participation (P)	P_7	How do you assess the quality of training that you received from PEG extension workers?	FILTER IF	H_6	EQUALS	1
		Single				
		Very low quality	1			
		Low quality	2			
		Medium quality	3			
		High quality	4			
		Very high quality	5			
Participation (P)	P_8	How do you assess the adequacy of the frequency of visits, meetings, and trainings conducted by the Lead Farmer?	FILTER IF	H_6	EQUALS	2
		Single				
		Very inadequate	1			
		Somewhat inadequate	2			
		Somewhat adequate	3			
		Very adequate	4			
Participation (P)	P_9	How do you assess the quality of training that you received from the Lead Farmer?	FILTER IF	H_6	EQUALS	2
		Single				
		Very inadequate	1			
		Somewhat inadequate	2			
		Somewhat adequate	3			
		Very adequate	4			
Participation (P)	P_10	What type of support did you receive from PEG?	FILTER IF	H_6	EQUALS	3

SECTION	VARIABLE NAME	LABEL	CODING AND FILTER LOGIC			
		Multiple Vaccination of cattle Vaccination of camels Vaccination of goats Received a cooling box for milk Received milk cans	1 2 3 4 5			
Participation (P)	P_11	In your opinion, to what extent did PEG help to improve the financial situation of your household?	ALL SCREENED IN			
		Single To a great extent To a medium extent To a small extent Not at all	1 2 3 4			
Participation (P)	P_12	In your opinion, to what extent did PEG help to improve the nutritional situation of your household?	ALL SCREENED IN			
		Single To a great extent To a medium extent To a small extent Not at all	1 2 3 4			
NOTE		The following questions are about Gu 2013				
Crops (C)	C_1	How much maize did you plant in Gu 2013? (Area of land)	FILTER IF	H_6	EQUALS	1 OR 2
		Numeric				
Crops (C)	C_2	What is the unit of measurement for the area of maize planted?	FILTER IF	C_1	GREATER THAN	0
		Single Jibaal Darab Hectare	1 2 3			
Crops (C)	C_3	Was the maize irrigated?	FILTER IF	C_1	GREATER THAN	0
		Single response Yes No	1 0			
Crops (C)	C_4	How many sacks of maize cobs did you harvest in Gu 2013?	FILTER IF	C_1	GREATER THAN	0
		Numeric				
Crops (C)	C_5	What is the unit of measure for the quantity of maize harvested?	FILTER IF	C_1	GREATER THAN	0
		Green sack (around 75 kg) Dark sack (around 85 kg/sack)	1 2			

SECTION	VARIABLE NAME	LABEL	CODING AND FILTER LOGIC			
Crops (C)	C_6	How many sacks of dry maize grain cobs did you obtain in Gu 2013? Numeric	FILTER IF	C_1	GREATER THAN	0
Crops (C)	C_7	How many sacks of dry maize grain cobs did you lose after harvesting in Gu 2013? Numeric	FILTER IF	C_6	GREATER THAN	0
Crops (C)	C_8	How many sacks of dry maize grain cobs did you sell in Gu 2013? Numeric	FILTER IF	C_6	GREATER THAN	0
Crops (C)	C_9	How many kilograms of DAP did you apply prior to planting on the maize in Gu 2013? Numeric	FILTER IF	C_1	GREATER THAN	0
Crops (C)	C_10	How many kilograms of urea did you apply on the maize after planting in Gu 2013? Numeric	FILTER IF	C_1	GREATER THAN	0
Crops (C)	C_11	Did you apply insecticide on the maize in Gu 2013? Single Yes No	FILTER IF	C_1	GREATER THAN	0
Crops (C)	C_12	How many small plots (quarter jibaal) of tomato did you plant in Gu 2013? Numeric	FILTER IF	H_6	EQUALS	1 OR 2
Crops (C)	C_13	Was the tomato irrigated in Gu 2013? Single Yes No	FILTER IF	C_12	GREATER THAN	0
Crops (C)	C_14	How many jerry cans of tomato did you harvest in Gu 2013? Numeric	FILTER IF	C_12	GREATER THAN	0
Crops (C)	C_15	How many jerry cans of the harvested tomato did you lose after harvesting in Gu 2013? Numeric	FILTER IF	C_14	GREATER THAN	0
Crops (C)	C_16	How many jerry cans of tomato did you sell in Gu 2013? Numeric	FILTER IF	C_14	GREATER THAN	0
Crops (C)	C_17	How many kilograms of	FILTER IF	C_12	GREATER	0

SECTION	VARIABLE NAME	LABEL	CODING AND FILTER LOGIC			
		DAP did you apply prior to planting the tomato in Gu 2013?			THAN	
		Numeric				
Crops (C)	C_18	How many kilograms of urea did you apply on the tomato after planting in Gu 2013?	FILTER IF	C_12	GREATER THAN	0
		Numeric				
Crops (C)	C_19	Did you apply insecticide on the tomato in Gu 2013?	FILTER IF	C_12	GREATER THAN	0
		Single				
		Yes	1			
		No	0			
NOTE		The following questions are about Deyr 2013/2014				
Crops (C)	C_20	How much maize did you plant in Deyr 2013/2014? (Area of land)	FILTER IF	H_6	EQUALS	1 OR 2
		Numeric				
Crops (C)	C_21	What is the unit of measurement for the area of maize planted?	FILTER IF	C_20	GREATER THAN	0
		Single				
		Jibaal	1			
		Darab	2			
		Hectare	3			
Crops (C)	C_22	Was the maize irrigated?	FILTER IF	C_20	GREATER THAN	0
		Single response				
		Yes	1			
		No	0			
Crops (C)	C_23	How many sacks of maize cobs did you harvest in Deyr 2013/2014?	FILTER IF	C_20	GREATER THAN	0
		Numeric				
Crops (C)	C_24	What is the unit of measure for the quantity of maize harvested?	FILTER IF	C_20	GREATER THAN	0
		Green sack (around 75 kg)	1			
		Dark sack (around 85 kg/sack)	2			
Crops (C)	C_25	How many sacks of dry maize grain cobs did you obtain in Deyr 2013/2014?	FILTER IF	C_20	GREATER THAN	0
		Numeric				
Crops (C)	C_26	How many sacks of dry maize grain cobs did you lose after harvesting in Deyr 2013/2014?	FILTER IF	C_25	GREATER THAN	0
		Numeric				
Crops (C)	C_27	How many sacks of dry	FILTER IF	C_25	GREATER	0

SECTION	VARIABLE NAME	LABEL	CODING AND FILTER LOGIC			
		maize grain cobs did you sell in Deyr 2013/2014?			THAN	
		Numeric				
Crops (C)	C_28	How many kilograms of DAP did you apply on the maize prior to planting in Deyr 2013/2014?	FILTER IF	C_20	GREATER THAN	0
		Numeric				
Crops (C)	C_29	How many kilograms of urea did you apply on the maize after planting in Deyr 2013/2014?	FILTER IF	C_20	GREATER THAN	0
		Numeric				
Crops (C)	C_30	Did you apply insecticide on the maize in Deyr 2013/2014?	FILTER IF	C_20	GREATER THAN	0
		Single				
		Yes	I			
		No	0			
Crops (C)	C_31	How many small plots (quarter jibaal) of tomato did you plant in Deyr 2013/2014? (Land area)	FILTER IF	H_6	EQUALS	I OR 2
		Numeric				
Crops (C)	C_32	Was the tomato irrigated in Deyr 2013/2014?	FILTER IF	C_31	GREATER THAN	0
		Single				
		Yes	I			
		No	0			
Crops (C)	C_33	How many jerry cans of tomato did you harvest in Deyr 2013/2014?	FILTER IF	C_31	GREATER THAN	0
		Numeric				
Crops (C)	C_34	How many jerry cans of harvested tomato did you lose after harvesting in Deyr 2013/2014?	FILTER IF	C_33	GREATER THAN	0
		Numeric				
Crops (C)	C_35	How many jerry cans of tomato did you sell in Deyr 2013/2014?	FILTER IF	C_33	GREATER THAN	0
		Numeric				
Crops (C)	C_36	How many kilograms of DAP did you apply prior to planting on the tomato in Deyr 2013/2014?	FILTER IF	C_31	GREATER THAN	0
		Numeric				
Crops (C)	C_37	How many kilograms of urea did you apply on the tomato after planting in Deyr 2013/2014?	FILTER IF	C_31	GREATER THAN	0

SECTION	VARIABLE NAME	LABEL	CODING AND FILTER LOGIC			
		Numeric				
Crops (C)	C_38	Did you apply insecticide on the tomato in Deyr 2013/2014?	FILTER IF	C_31	GREATER THAN	0
		Single				
		Yes	1			
		No	0			
NOTE: The following questions are about Deyr 2014/2015						
Crops (C)	C_39	How much maize did you plant in Deyr 2014/2015? (Area of land)	FILTER IF	H_6	EQUALS	1 OR 2
		Numeric				
Crops (C)	C_40	What is the unit of measurement for the area of maize planted?	FILTER IF	C_39	GREATER THAN	0
		Single				
		Jibaal	1			
		Darab	2			
		Hectare	3			
Crops (C)	C_41	Was the maize irrigated?	FILTER IF	C_39	GREATER THAN	0
		Single response				
		Yes	1			
		No	0			
Crops (C)	C_42	How many sacks of maize cobs did you harvest in Deyr 2014/2015?	FILTER IF	C_39	GREATER THAN	0
		Numeric				
Crops (C)	C_43	What is the unit of measure for the quantity of maize harvested?	FILTER IF	C_42	GREATER THAN	0
		Green sack (around 75 kg)	1			
		Dark sack (around 85 kg/sack)	2			
Crops (C)	C_44	How many sacks of dry maize grain cobs did you lose after harvesting in Deyr 2014/2015?	FILTER IF	C_42	GREATER THAN	0
		Numeric				
	C_44 b	How many sacks of dry maize grain cobs did you obtain in deyr 2014/2015?		C_42	GREATER THAN	0
Crops (C)	C_45	How many sacks of dry maize grain cobs did you sell in Deyr 2014/2015?	FILTER IF	C_42	GREATER THAN	0
		Numeric				
Crops (C)	C_46	How many kilograms of DAP did you apply prior to planting on the maize in Deyr 2014/2015?	FILTER IF	C_39	GREATER THAN	0
		Numeric				

SECTION	VARIABLE NAME	LABEL	CODING AND FILTER LOGIC			
Crops (C)	C_47	How many kilograms of urea did you apply on the maize after planting in Deyr 2014/2015?	FILTER IF	C_39	GREATER THAN	0
		Numeric				
Crops (C)	C_48	Did you apply insecticide on the maize in Deyr 2014/2015?	FILTER IF	C_39	GREATER THAN	0
		Single				
		Yes	1			
		No	0			
Crops (C)	C_49	How many small plots (quarter jibbaal) of tomato did you plant in Deyr 2014/2015?	FILTER IF	H_6	EQUALS	1 OR 2
		Numeric				
Crops (C)	C_50	Was the tomato irrigated in Deyr 2014/2015?	FILTER IF	C_49	GREATER THAN	0
		Single				
		Yes	1			
		No	0			
Crops (C)	C_51	How many jerry cans of tomato did you harvest in Deyr 2014/2015?	FILTER IF	C_49	GREATER THAN	0
		Numeric				
Crops (C)	C_52	How many jerry cans of harvested tomato did you lose after harvesting in Deyr 2014/2015?	FILTER IF	C_49	GREATER THAN	0
		Numeric				
Crops (C)	C_53	How many jerry cans of tomato did you sell in Deyr 2014/2015?	FILTER IF	C_51	GREATER THAN	0
		Numeric				
Crops (C)	C_54	How many kilograms of DAP did you apply prior to planting on the tomato in Deyr 2014/2015?	FILTER IF	C_49	GREATER THAN	0
		Numeric				
Crops (C)	C_55	How many kilograms of urea did you apply on the tomato after planting in Deyr 2014/2015?	FILTER IF	C_49	GREATER THAN	0
		Numeric				
Crops (C)	C_56	Did you apply insecticide on the tomato in Deyr 2014/2015?	FILTER IF	C_49	GREATER THAN	0
		Single				
		Yes	1			
		No	0			

SECTION	VARIABLE NAME	LABEL	CODING AND FILTER LOGIC			
NOTE: The following questions are about Gu 2015						
Crops (C)	C_57	How much maize did you plant in Gu 2015? (Area of land)	FILTER IF	H_6	EQUALS	1 OR 2
		Numeric				
Crops (C)	C_58	What is the unit of measurement for the area of maize planted?	FILTER IF	C_57	GREATER THAN	0
		Single				
		Jibaal	1			
		Darab	2			
		Hectare	3			
Crops (C)	C_59	Was the maize irrigated?	FILTER IF	C_57	GREATER THAN	0
		Single response				
		Yes	1			
		No	0			
Crops (C)	C_60	How many sacks of maize cobs did you harvest in Gu 2015?	FILTER IF	C_57	GREATER THAN	0
		Numeric				
Crops (C)	C_61	What is the unit of measure for the quantity of maize harvested?	FILTER IF	C_60	GREATER THAN	0
		Green sack (around 75 kg)	1			
		Dark sack (around 85 kg/sack)	2			
Crops (C)	C_62	How many sacks of dry maize grain cobs did you lose after harvesting in Gu 2015?	FILTER IF	C_60	GREATER THAN	0
		Numeric				
Crops (C)	C_63	How many sacks of dry maize grain cobs did you sell in Gu 2015?	FILTER IF	C_60	GREATER THAN	0
		Numeric				
Crops (C)	C_63	How many kilograms of DAP did you apply prior to planting on the maize in Gu 2015?	FILTER IF	C_57	GREATER THAN	0
		Numeric				
Crops (C)	C_64	How many kilograms of urea did you apply on the maize after planting in Gu 2015?	FILTER IF	C_57	GREATER THAN	0
		Numeric				
Crops (C)	C_65	Did you apply insecticide on the maize in Gu 2015?	FILTER IF	C_57	GREATER THAN	0
		Single				
		Yes	1			
		No	0			

SECTION	VARIABLE NAME	LABEL	CODING AND FILTER LOGIC			
Crops (C)	C_66	How many small plots (quarter jibaal) of tomato did you plant in Deyr in Gu 2015?	FILTER IF	H_6	EQUALS	I OR 2
		Numeric				
Crops (C)	C_67	What was the unit of measurement for the area of tomato planted?	FILTER IF	C_66	GREATER THAN	0
		Single				
		Jibaal	1			
		Darab	2			
		Hectare	3			
Crops (C)	C_68	Was the tomato irrigated in Gu 2015?	FILTER IF	C_66	GREATER THAN	0
		Single				
		Yes	1			
		No	0			
Crops (C)	C_69	How many jerry cans of tomato did you harvest in Gu 2015?	FILTER IF	C_66	GREATER THAN	0
		Numeric				
Crops (C)	C_70	How many jerry cans of harvested tomato did you lose after harvesting in Gu 2015?	FILTER IF	C_69	GREATER THAN	0
		Numeric				
Crops (C)	C_71	How many jerry cans of tomato did you sell in Gu 2015?	FILTER IF	C_69	GREATER THAN	0
		Numeric				
Crops (C)	C_72	How many kilograms of DAP did you apply prior to planting on the tomato in Gu 2015?	FILTER IF	C_66	GREATER THAN	0
		Numeric				
Crops (C)	C_73	How many kilograms of urea did you apply on the tomato after planting in Gu 2015?	FILTER IF	C_66	GREATER THAN	0
		Numeric				
Crops (C)	C_74	Did you apply insecticide on the tomato in Gu 2015?	FILTER IF	C_66	GREATER THAN	0
		Single				
		Yes	1			
		No	0			
NOTE: The next two questions are about farm records						
Crops (C)	C_75	In Gu 2013 and Deyr 2013/2014 which of the following types of farm records did you keep?	FILTER IF	H_6	EQUALS	I OR 2
		Multiple				

SECTION	VARIABLE NAME	LABEL	CODING AND FILTER LOGIC			
		Area of crops grown	1			
		Quantity of crops harvested	2			
		Quantity of crops sold	3			
		Value of crops sold	4			
		None of the above	5			
Crops (C)	C_76	In Gu 2015 and Deyr 2015/2016 which of the following types of farm records did you keep?	FILTER IF	H_6	EQUALS	1 OR 2
		Multiple				
		Area of crops grown	1			
		Quantity of crops harvested	2			
		Quantity of crops sold	3			
		Value of crops sold	4			
		None of the above	5			
NOTE: This section is about livestock for milk production in 2013						
Livestock (L)	L_1	In 2013 did you have any dairy cattle?	FILTER IF	H_6	EQUALS	3
		Single				
		Yes	1			
		No	0			
Livestock (L)	L_2	In 2013 did you have any camels for milk production?	FILTER IF	H_6	EQUALS	3
		Single				
		Yes	1			
		No	0			
NOTE: This section is about dairy cattle in 2013						
Livestock (L)	L_3	How many cattle did you have at the beginning of 2013?	FILTER IF	L_1	EQUALS	1
		Numeric				
Livestock (L)	L_4	How many calves were born in 2013?	FILTER IF	L_1	EQUALS	1
		Numeric				
Livestock (L)	L_5	How many cattle became sick in 2013?	FILTER IF	L_1	EQUALS	1
		Numeric				
Livestock (L)	L_6	How many cattle died in 2013?	FILTER IF	L_1	EQUALS	1
		Numeric				
Livestock (L)	L_7	How many cattle did you have at the end of 2013?	FILTER IF	L_1	EQUALS	1
		Numeric				
Livestock (L)	L_8	How many head of cattle produced milk in Gu 2013?	FILTER IF	L_1	EQUALS	1
		Numeric				
Livestock (L)	L_9	How many times per day did you milk in Gu 2013?	FILTER IF	L_8	GREATER THAN	0
		Numeric				

SECTION	VARIABLE NAME	LABEL	CODING AND FILTER LOGIC			
Livestock (L)	L_10	During the first milking, how many cans of milk did you get each day in total (Gu 2013)?	FILTER IF	L_8	GREATER THAN	0
		Numeric				
Livestock (L)	L_11	What size can did you use for milking in Gu 2013?	FILTER IF	L_8	GREATER THAN	0
		750 milliliter can	1			
		1 liter can	2			
Livestock (L)	L_12	During the second milking, how many cans of milk did you get each day in total (Gu 2013)?	FILTER IF	L_9	EQUALS	2
		Numeric				
Livestock (L)	L_13	During Gu 2013, how many cans of milk did you sell each day?	FILTER IF	L_8	GREATER THAN	0
		Numeric				
Livestock (L)	L_14	How many head of cattle produced milk in Jilal season in 2013?	FILTER IF	L_1	EQUALS	1
		Numeric				
Livestock (L)	L_15	How many times per day did you milk in Jilal season in 2013?	FILTER IF	L_14	GREATER THAN	0
		Numeric				
Livestock (L)	L_16	During the first milking, how many cans of milk did you get in total (Jilal 2013)?	FILTER IF	L_14	GREATER THAN	0
		Numeric				
Livestock (L)	L_17	What size can did you use for milking in Jilal 2013?	FILTER IF	L_14	GREATER THAN	0
		750 milliliter can	1			
		1 liter can	2			
Livestock (L)	L_18	During the second milking, how many cans of milk did you get in total (Jilal 2013)?	FILTER IF	L_14	EQUALS	2
		Numeric				
Livestock (L)	L_19	During Jilal 2013, how many cans of milk did you sell each day?	FILTER IF	L_14	EQUALS	2
		Numeric				
Livestock (L)	L_20	How many head of cattle produced milk in Deyr 2013/2014?	FILTER IF	L_1	EQUALS	1
		Numeric				
Livestock (L)	L_21	How many times per day did you milk in Deyr 2013/2014?	FILTER IF	L_20	GREATER THAN	0
		Numeric				

SECTION	VARIABLE NAME	LABEL	CODING AND FILTER LOGIC			
Livestock (L)	L_22	During the first milking, how many cans of milk did you get in total (Deyr 2013/2014)?	FILTER IF	L_20	GREATER THAN	0
		Numeric				
Livestock (L)	L_23	What size can did you use for milking in Deyr 2013/2014?	FILTER IF	L_20	GREATER THAN	0
		750 milliliter can	1			
		1 liter can	2			
Livestock (L)	L_24	During the second milking, how many cans of milk did you get in total (Deyr 2013/2014)?	FILTER IF	L_21	EQUALS	2
		Numeric				
Livestock (L)	L_25	During Deyr 2013/2104, how many cans of milk did you sell each day?	FILTER IF	L_20	EQUALS	2
		Numeric				
NOTE: This section is about camels for milk production in 2013						
Livestock (L)	L_26	How many camels did you have at the beginning of 2013?	FILTER IF	L_2	EQUALS	1
		Numeric				
Livestock (L)	L_27	How many calves were born in 2013?	FILTER IF	L_2	EQUALS	1
		Numeric				
Livestock (L)	L_28	How many camels became sick in 2013?	FILTER IF	L_2	EQUALS	1
		Numeric				
Livestock (L)	L_29	How many camels died in 2013?	FILTER IF	L_2	EQUALS	1
		Numeric				
Livestock (L)	L_30	How many camels did you have at the end of 2013?	FILTER IF	L_2	EQUALS	1
		Numeric				
Livestock (L)	L_31	How many camels produced milk in Gu 2013?	FILTER IF	L_2	EQUALS	1
		Numeric				
Livestock (L)	L_32	How many times per day did you milk in Gu 2013?	FILTER IF	L_31	GREATER THAN	0
		Numeric				
Livestock (L)	L_33	During the first milking, how many cans of milk did you get each day in total (Gu 2013)?	FILTER IF	L_31	GREATER THAN	0
		Numeric				
Livestock (L)	L_34	What size can did you use for milking in Gu 2013?	FILTER IF	L_31	GREATER THAN	0
		750 milliliter can	1			
		1 liter can	2			

SECTION	VARIABLE NAME	LABEL	CODING AND FILTER LOGIC			
Livestock (L)	L_35	During the second milking, how many cans of milk did you get each day in total (Gu 2013)?	FILTER IF	L_32	EQUALS	2
		Numeric				
Livestock (L)	L_36	During Gu 2013, how many cans of milk did you sell each day?	FILTER IF	L_31	GREATER THAN	0
		Numeric				
Livestock (L)	L_37	How many camels produced milk in Jilal season in 2013?	FILTER IF	L_2	EQUALS	1
		Numeric				
Livestock (L)	L_38	How many times per day did you milk in Jilal season in 2013?	FILTER IF	L_37	GREATER THAN	0
		Numeric				
Livestock (L)	L_39	During the first milking, how many cans of milk did you get in total (Jilal 2013)?	FILTER IF	L_37	GREATER THAN	0
		Numeric				
Livestock (L)	L_40	What size can did you use for milking in Jilal 2013?	FILTER IF	L_37	GREATER THAN	0
		750 milliliter can	1			
		1 liter can	2			
Livestock (L)	L_41	During the second milking how many cans of milk did you get in total (Jilal 2013)?	FILTER IF	L_38	EQUALS	2
		Numeric				
Livestock (L)	L_42	During Jilal 2013, how many cans of milk did you sell each day?	FILTER IF	L_37	GREATER THAN	0
		Numeric				
Livestock (L)	L_43	How many camels produced milk in Deyr in 2013/2014?	FILTER IF	L_2	EQUALS	1
		Numeric				
Livestock (L)	L_44	How many times per day did you milk in Deyr 2013/2014?	FILTER IF	L_43	GREATER THAN	0
		Numeric				
Livestock (L)	L_45	During the first milking, how many cans of milk did you get in total (Deyr 2013/2014)?	FILTER IF	L_43	GREATER THAN	0
		Numeric				
Livestock (L)	L_46	What size can did you use for milking in Deyr 2013/2014?	FILTER IF	L_43	GREATER THAN	0
		750 milliliter can	1			
		1 liter can	2			

SECTION	VARIABLE NAME	LABEL	CODING AND FILTER LOGIC			
Livestock (L)	L_47	During the second milking, how many cans of milk did you get in total (Deyr 2013/2014)?	FILTER IF	L_44	EQUALS	2
		Numeric				
Livestock (L)	L_48	During Deyr 2013/2014, how many cans of milk did you sell each day?	FILTER IF	L_43	GREATER THAN	0
		Numeric				
NOTE: This section is about livestock for milk production in 2015						
Livestock (L)	L_49	In 2015 did you have any dairy cattle?	FILTER IF	H_6	EQUALS	3
		Single				
		Yes	1			
		No	0			
Livestock (L)	L_50	In 2015 did you have any camels for milk production?	FILTER IF	H_6	EQUALS	3
		Single				
		Yes	1			
		No	0			
Livestock (L)	L_51	How many cattle did you have at the beginning of 2015?	FILTER IF	L_49	EQUALS	1
		Numeric				
Livestock (L)	L_52	How many calves were born in 2015?	FILTER IF	L_49	EQUALS	1
		Numeric				
Livestock (L)	L_53	How many cattle became sick in 2015?	FILTER IF	L_49	EQUALS	1
		Numeric				
Livestock (L)	L_54	How many cattle died in 2015?	FILTER IF	L_49	EQUALS	1
		Numeric				
Livestock (L)	L_55	How many cattle did you have at the end of 2015?	FILTER IF	L_49	EQUALS	1
		Numeric				
Livestock (L)	L_56	How many head of cattle produced milk in Gu 2015?	FILTER IF	L_49	EQUALS	1
		Numeric				
Livestock (L)	L_57	How many times per day did you milk in Gu 2015?	FILTER IF	L_56	GREATER THAN	0
		Numeric				
Livestock (L)	L_58	During the first milking how many cans of milk did you get each day in total (Gu 2015)?	FILTER IF	L_56	GREATER THAN	0
		Numeric				
Livestock (L)	L_59	What size can did you use for milking in Gu 2015?	FILTER IF	L_56	GREATER THAN	0
		750 milliliter can	1			
		1 liter can	2			

SECTION	VARIABLE NAME	LABEL	CODING AND FILTER LOGIC			
Livestock (L)	L_60	During the second milking how many cans of milk did you get each day in total (Gu 2015)?	FILTER IF	L_57	EQUALS	2
		Numeric				
Livestock (L)	L_61	During Gu 2015, how many cans of milk did you sell each day?	FILTER IF	L_56	GREATER THAN	0
		Numeric				
Livestock (L)	L_62	How many head of cattle produced milk in Jilal season in 2015?	FILTER IF	L_49	EQUALS	1
		Numeric				
Livestock (L)	L_63	How many times per day did you milk in Jilal season in 2015?	FILTER IF	L_62	GREATER THAN	0
		Numeric				
Livestock (L)	L_64	During the first milking how many cans of milk did you get in total (Jilal 2015)?	FILTER IF	L_62	GREATER THAN	0
		Numeric				
Livestock (L)	L_65	What size can did you use for milking in Jilal 2015?	FILTER IF	L_62	GREATER THAN	0
		750 milliliter can	1			
		1 liter can	2			
Livestock (L)	L_66	During the second milking how many cans of milk did you get in total (Jilal 2015)?	FILTER IF	L_63	EQUALS	2
		Numeric				
Livestock (L)	L_67	During Jilal 2015, how many cans of milk did you sell each day?	FILTER IF	L_62	GREATER THAN	0
		Numeric				
Livestock (L)	L_68	How many head of cattle produced milk in Deyr in 2015/2016?	FILTER IF	L_49	EQUALS	1
		Numeric				
Livestock (L)	L_69	How many times per day did you milk in Deyr 2015/2016?	FILTER IF	L_68	GREATER THAN	0
		Numeric				
Livestock (L)	L_70	During the first milking how many cans of milk did you get in total (Deyr 2015/2016)?	FILTER IF	L_68	GREATER THAN	0
		Numeric				
Livestock (L)	L_71	What size can did you use for milking in Deyr 2015/2016?	FILTER IF	L_68	GREATER THAN	0
		750 milliliter can	1			
		1 liter can	2			

SECTION	VARIABLE NAME	LABEL	CODING AND FILTER LOGIC			
Livestock (L)	L_72	During the second milking how many cans of milk did you get in total (Deyr 2015/2016)?	FILTER IF	L_69	EQUALS	2
		Numeric				
Livestock (L)	L_73	During Deyr 2015/2014, how many cans of milk did you sell each day?	FILTER IF	L_68	GREATER THAN	0
		Numeric				
NOTE: This section is about camels for milk production in 2015						
Livestock (L)	L_74	How many camels did you have at the beginning of 2015?	FILTER IF	L_50	EQUALS	1
		Numeric				
Livestock (L)	L_75	How many calves were born in 2015?	FILTER IF	L_50	EQUALS	1
		Numeric				
Livestock (L)	L_76	How many camels became sick in 2015?	FILTER IF	L_50	EQUALS	1
		Numeric				
Livestock (L)	L_77	How many camels died in 2015?	FILTER IF	L_50	EQUALS	1
		Numeric				
Livestock (L)	L_78	How many camels did you have at the end of 2015?	FILTER IF	L_50	EQUALS	1
		Numeric				
Livestock (L)	L_79	How many camels produced milk in Gu 2015?	FILTER IF	L_50	EQUALS	1
		Numeric				
Livestock (L)	L_80	How many times per day did you milk in Gu 2015?	FILTER IF	L_79	GREATER THAN	0
		Numeric				
Livestock (L)	L_81	During the first milking how many cans of milk did you get each day in total (Gu 2015)?	FILTER IF	L_79	GREATER THAN	0
		Numeric				
Livestock (L)	L_82	What size can did you use for milking in Gu 2015?	FILTER IF	L_79	GREATER THAN	0
		750 milliliter can	1			
		1 liter can	2			
Livestock (L)	L_83	During the second milking, how many cans of milk did you get each day in total (Gu 2015)?	FILTER IF	L_80	EQUALS	2
		Numeric				
Livestock (L)	L_84	During Gu 2015, how many cans of milk did you sell each day?	FILTER IF	L_79	GREATER THAN	0
		Numeric				

SECTION	VARIABLE NAME	LABEL	CODING AND FILTER LOGIC			
Livestock (L)	L_85	How many camels produced milk in Jilal season in 2015? Numeric	FILTER IF	L_50	EQUALS	1
Livestock (L)	L_86	How many times per day did you milk in Jilal season in 2015? Numeric	FILTER IF	L_85	GREATER THAN	0
Livestock (L)	L_87	During the first milking how many cans of milk did you get in total (Jilal 2015)? Numeric	FILTER IF	L_85	GREATER THAN	0
Livestock (L)	L_88	What size can did you use for milking in Jilal 2015? 750 milliliter can 1 liter can	FILTER IF	L_85	GREATER THAN	0
Livestock (L)	L_89	During the second milking how many cans of milk did you get in total (Jilal 2015)? Numeric	FILTER IF	L_86	EQUALS	2
Livestock (L)	L_90	During Jilal 2015, how many cans of milk did you sell each day? Numeric	FILTER IF	L_85	GREATER THAN	0
Livestock (L)	L_91	How many camels produced milk in Deyr in 2015/2016? Numeric	FILTER IF	L_50	EQUALS	1
Livestock (L)	L_92	How many times per day did you milk in Deyr 2015/2016? Numeric	FILTER IF	L_91	GREATER THAN	0
Livestock (L)	L_93	During the first milking, how many cans of milk did you get in total (Deyr 2015/2016)? Numeric	FILTER IF	L_91	GREATER THAN	0
Livestock (L)	L_94	What size can did you use for milking in Deyr 2015/2016? 750 milliliter can 1 liter can	FILTER IF	L_91	GREATER THAN	0
Livestock (L)	L_95	During the second milking how many cans of milk did you get in total (Deyr 2015/2016)? Numeric	FILTER IF	L_92	EQUALS	2
Livestock (L)	L_96	During Deyr 2015/2016, how many cans of milk did you sell each day? Numeric	FILTER IF	L_91	GREATER THAN	0

SECTION	VARIABLE NAME	LABEL	CODING AND FILTER LOGIC			
	NOTE	The next two questions are about Livestock farm records				
Livestock (L)	L_97	In 2013, which of the following types of farm records did you keep?	FILTER IF	H_6	EQUALS	3
		Multiple Number of animals Volume of milk produced Volume of milk sold Value of milk sold				
Livestock (L)	L_98	Which of the following types of farm records did you keep in 2015?	FILTER IF	H_6	EQUALS	3
		Multiple Number of animals Volume of milk produced Volume of milk sold Value of milk sold				
	NOTE	This section is about the sustainability of PEG interventions				
Sustainability (S)	S_I	Which of the following agricultural practices promoted by PEG are you currently applying on your farm?	FILTER IF	H_6	EQUALS	I OR 2
		Multiple				
		Maize production agronomic practices (from land preparation, planting to harvest)	1			
		Applied vegetable production agronomic practices (from land preparation, planting, to harvest)	2			
		Seed selection and seed treatment	3			
		Soil fertility management, including phosphorus, nitrogen, and compost making	4			
		Crop protection and pesticide use	5			
		Irrigation water management	6			
		Soil and water conservation	7			
		Drip irrigation	8			
		Species trials (hybrids, early maturing varieties, fodder species)	9			
		Post-harvest handling of produce	10			
		Marketing of farm products	11			

SECTION	VARIABLE NAME	LABEL	CODING AND FILTER LOGIC			
		Farm management, record keeping and accounting	12			
Sustainability (S)	S_2	Which of the following agricultural practices promoted by PEG are you currently applying on your farm?	FILTER IF	H_6	EQUALS	3
		Multiple				
		Milk hygiene	1			
		Fodder production/hay making	2			
		Animal feeding and good feeding practices of dairy animals	3			
		Marketing of farm products	4			
		Farm management, record keeping and accounting	5			
Sustainability (S)	S_3	Do you intend to apply maize production agronomic practices (from land preparation, planting, to harvest) on your farm in the future?	FILTER IF	H_6	EQUALS	1 OR 2
		Single				
		Very unlikely	1			
		Somewhat unlikely	2			
		Somewhat likely	3			
		Extremely likely	4			
Sustainability (S)	S_4	Do you intend to apply vegetable production agronomic practices (from land preparation, planting, to harvest) on your farm in the future?	FILTER IF	H_6	EQUALS	1 OR 2
		Single				
		Very unlikely	1			
		Somewhat unlikely	2			
		Somewhat likely	3			
		Extremely likely	4			
Sustainability (S)	S_5	Do you intend to apply seed selection and seed treatment practices on your farm in the future?	FILTER IF	H_6	EQUALS	1 OR 2
		Single				
		Very unlikely	1			
		Somewhat unlikely	2			
		Somewhat likely	3			
		Extremely likely	4			
Sustainability (S)	S_6	Do you intend to apply soil fertility management including phosphorus, nitrogen, and compost making on your farm in the	FILTER IF	H_6	EQUALS	1 OR 2

SECTION	VARIABLE NAME	LABEL	CODING AND FILTER LOGIC			
		future?				
		Single				
		Very unlikely	1			
		Somewhat unlikely	2			
		Somewhat likely	3			
		Extremely likely	4			
Sustainability (S)	S_7	Do you intend to apply crop protection and pesticide use on your farm in the future?	FILTER IF	H_6	EQUALS	I OR 2
		Single				
		Very unlikely	1			
		Somewhat unlikely	2			
		Somewhat likely	3			
		Extremely likely	4			
Sustainability (S)	S_8	Do you intend to apply irrigation water management practices on your farm in the future?	FILTER IF	H_6	EQUALS	I OR 2
		Single				
		Very unlikely	1			
		Somewhat unlikely	2			
		Somewhat likely	3			
		Extremely likely	4			
Sustainability (S)	S_9	Do you intend to apply soil and water conservation practices on your farm in the future?	FILTER IF	H_6	EQUALS	I OR 2
		Single				
		Very unlikely	1			
		Somewhat unlikely	2			
		Somewhat likely	3			
		Extremely likely	4			
Sustainability (S)	S_10	Do you intend to apply drip irrigation on your farm in the future?	FILTER IF	H_6	EQUALS	I OR 2
		Single				
		Very unlikely	1			
		Somewhat unlikely	2			
		Somewhat likely	3			
		Extremely likely	4			
Sustainability (S)	S_11	Do you intend to apply species trials (hybrids, early maturing varieties, fodder species) on your farm in the future?	FILTER IF	H_6	EQUALS	I OR 2
		Single				
		Very unlikely	1			
		Somewhat unlikely	2			
		Somewhat likely	3			

SECTION	VARIABLE NAME	LABEL	CODING AND FILTER LOGIC			
		Extremely likely	4			
Sustainability (S)	S_12	Do you intend to apply post-harvest handling of produce practices on your farm in the future?	FILTER IF	H_6	EQUALS	1 OR 2
		Single				
		Very unlikely	1			
		Somewhat unlikely	2			
		Somewhat likely	3			
		Extremely likely	4			
Sustainability (S)	S_13	Do you intend to apply milk hygiene practices on your farm in the future?	FILTER IF	H_6	EQUALS	3
		Single				
		Very unlikely	1			
		Somewhat unlikely	2			
		Somewhat likely	3			
		Extremely likely	4			
Sustainability (S)	S_14	Do you intend to apply fodder production and hay making practices on your farm in the future?	FILTER IF	H_6	EQUALS	3
		Single				
		Very unlikely	1			
		Somewhat unlikely	2			
		Somewhat likely	3			
		Extremely likely	4			
Sustainability (S)	S_15	Do you intend to apply animal feeding and good feeding practices of dairy animals on your farm in the future?	FILTER IF	H_6	EQUALS	3
		Single				
		Very unlikely	1			
		Somewhat unlikely	2			
		Somewhat likely	3			
		Extremely likely	4			
Sustainability (S)	S_16	Do you intend to apply marketing of farm products on your farm in the future?	ALL SCREENED IN			
		Single				
		Very unlikely	1			
		Somewhat unlikely	2			
		Somewhat likely	3			
		Extremely likely	4			
Sustainability (S)	S_17	Do you intend to apply farm management, record keeping and accounting on your farm in the future?	ALL SCREENED IN			
		Single				
		Very unlikely	1			

SECTION	VARIABLE NAME	LABEL	CODING AND FILTER LOGIC			
		Somewhat unlikely	2			
		Somewhat likely	3			
		Extremely likely	4			
Sustainability (S)	S_18	Why do you intend to continue using those practices?	FILTER IF AT LEAST ONE OF THE RESPONSES TO S_3 to S_17		EQUALS	3 OR 4
		Multiple				
		PEG method is more productive	1			
		PEG method will allow me to earn more income	2			
		PEG method is less labor intensive	3			
		Because my neighbors intend to continue	4			
		Other	5			
Sustainability (S)	S_19	Why do you not intend to continue using those practices?	FILTER IF AT LEAST ONE OF THE RESPONSES TO S_3 to S_17		EQUALS	1 OR 2
		Multiple				
		Lack of technical ability without further support	1			
		Lack of financial ability without support	2			
		Too labor intensive	3			
		Not convinced about the benefit to my household	4			
		Lack of available resources	5			
		Concerns about ability to successfully market product	6			
		Requires too much additional time	7			
		Traditional methods are more reliable	8			
		Security concerns	9			
		Because my neighbors do not intend to continue	10			
		Other	11			
Sustainability (S)	S_20	How many contact farmers have you yourself trained in total on practices that you learned through PEG?	FILTER IF	H_6	EQUALS	1
		Numeric				
Sustainability (S)	S_21	How many other farmers have you yourself trained in total on practices that you learned through PEG?	FILTER IF	H_6	EQUALS	2
		Numeric				

SECTION	VARIABLE NAME	LABEL	CODING AND FILTER LOGIC			
Sustainability (S)	S_22	How likely are you to share and train other farmers on the new technologies and practices you learned from PEG after PEG has stopped supporting you?	ALL SCREENED IN			
		Single				
		Extremely unlikely	1			
		Somewhat unlikely	2			
		Somewhat likely	3			
		Extremely likely	4			
Sustainability (S)	S_23	(For Crop Farmers) Which specific training topics have you offered training on to the farmers you have trained?	FILTER IF	H_6	EQUALS	1 OR 2
		Multiple				
		Technical training on maize production	1			
		Phosphorus use	2			
		Nitrogen use	3			
		Irrigation water management and malaria vector reduction	4			
		Soil and water conservation	5			
		Hay making	6			
Sustainability (S)	S_23	(For livestock farmers) Which specific training topics have you offered training on to the farmers you have trained?	FILTER IF	H_6	EQUALS	3
		Multiple				
		Milk hygiene training	1			
		Hay making	2			
		Awareness on animal health and nutrition	3			
		Livestock feeding practices	4			
		Good feeding practices of dairy animals	5			
Sustainability (S)	S_24	Have you yourself developed linkages with agro-dealers or input suppliers as a result of PEG?	ALL SCREENED IN			
		Single				
		Yes	1			
		No	0			
Sustainability (S)	S_25	Do you think that the lead farmer who shared farming knowledge during PEG will continue to share farming knowledge with you in the	FILTER IF	H_6	EQUALS	2

SECTION	VARIABLE NAME	LABEL	CODING AND FILTER LOGIC
		future?	
		Single	
		Extremely unlikely	1
		Unlikely	2
		Likely	3
		Extremely likely	4
Sustainability (S)	S_26	Given the current security and economic situation, how encouraged or discouraged are you to learn new techniques and practices?	ALL SCREENED IN
		Single response	
		Strongly encouraged	1
		Somewhat encouraged	2
		Somewhat discouraged	3
		Strongly discouraged	4
Sustainability (S)	S_27	Given the current security and economic situation, how encouraged or discouraged are you to buy more inputs than before, or new kinds of inputs?	ALL SCREENED IN
		Single response	
		Strongly encouraged	1
		Somewhat encouraged	2
		Somewhat discouraged	3
		Strongly discouraged	4
Sustainability (S)	S_28	Given the current security and economic situation, how encouraged or discouraged are you to buy new equipment or invest in new technologies or infrastructure, like irrigation?	ALL SCREENED IN
		Single response	
		Strongly encouraged	1
		Somewhat encouraged	2
		Somewhat discouraged	3
		Strongly discouraged	4
Sustainability (S)	S_29	Given the current security and economic situation, how encouraged or discouraged are you to plant more land than you did before?	ALL SCREENED IN
		Single response	
		Strongly encouraged	1

SECTION	VARIABLE NAME	LABEL	CODING AND FILTER LOGIC
		Somewhat encouraged	2
		Somewhat discouraged	3
		Strongly discouraged	4
Sustainability (S)	S_30	Given the current security and economic situation, how encouraged or discouraged are you to plant new crops that you haven't planted before?	ALL SCREENED IN
		Single response	
		Strongly encouraged	1
		Somewhat encouraged	2
		Somewhat discouraged	3
		Strongly discouraged	4
Sustainability (S)	S_31	Compared to the security and economic situation that existed before PEG, would you say that now you are more or less likely to learn new techniques and practices?	ALL SCREENED IN
		Single response	
		Much more likely	1
		Somewhat more likely	2
		Neither more nor less likely	3
		Somewhat less likely	4
		Much less likely	5
Sustainability (S)	S_32	Compared to the security and economic situation that existed before PEG, would you say that now you are more or less likely to buy more inputs than before, or new kinds of inputs?	ALL SCREENED IN
		Single response	
		Much more likely	1
		Somewhat more likely	2
		Neither more nor less likely	3
		Somewhat less likely	4
		Much less likely	5
Sustainability (S)	S_33	Compared to the security and economic situation that existed before PEG, would you say that now you are more or less likely to buy new equipment or invest in new technologies or infrastructure, like irrigation?	ALL SCREENED IN
		Single response	
		Much more likely	1

SECTION	VARIABLE NAME	LABEL	CODING AND FILTER LOGIC
		Somewhat more likely	2
		Neither more nor less likely	3
		Somewhat less likely	4
		Much less likely	5
Sustainability (S)	S_34	Compared to the security and economic situation that existed before PEG, would you say that now you are more or less likely to plant more land than you did before?	ALL SCREENED IN
		Single response	
		Much more likely	1
		Somewhat more likely	2
		Neither more nor less likely	3
		Somewhat less likely	4
		Much less likely	5
Sustainability (S)	S_35	Compared to the security and economic situation that existed before PEG, would you say that now you are more or less likely to plant new crops that you haven't planted before?	ALL SCREENED IN
		Single response	
		Much more likely	1
		Somewhat more likely	2
		Neither more nor less likely	3
		Somewhat less likely	4
		Much less likely	5
NOTE		The next series of questions are related to household food security.	
Food Security (FS)	FS_1	In the calendar year 2013, how many months was your household self-sufficient with food from your own harvest?	
		Single response	
		10 months or more	1
		6 to 9 months	2
		3 to 5 months	3
		2 months or less	4
		Don't know	99
Food Security (FS)	FS_2	In the calendar year 2015, how many months was your household self-sufficient with food from your own harvest?	
		Single response	
		10 months or more	1

SECTION	VARIABLE NAME	LABEL	CODING AND FILTER LOGIC
		6 to 9 months	2
		3 to 5 months	3
		2 months or less	4
		Don't know	99
NOTE: This section asks about farm labor (employment)			
Employment (E)	E_1	How many adult males from your household worked on your farm in 2013?	ALL SCREENED IN
		Numeric	
Employment (E)	E_2	How many adult females from your household worked on your farm in 2013?	ALL SCREENED IN
		Numeric	
Employment (E)	E_3	How many boys from your household worked on your farm in 2013?	ALL SCREENED IN
		Numeric	
Employment (E)	E_4	How many girls from your household worked on your farm in 2013?	ALL SCREENED IN
		Numeric	
Employment (E)	E_5	How many seasonal/temporary female laborers worked on your farm in 2013?	ALL SCREENED IN
		Numeric	
Employment (E)	E_6	How many seasonal/temporary male laborers worked on your farm in 2013?	ALL SCREENED IN
		Numeric	
Employment (E)	E_7	How many permanent female laborers worked on your farm in 2013?	ALL SCREENED IN
		Numeric	
Employment (E)	E_8	How many permanent male laborers worked on your farm in 2013?	ALL SCREENED IN
		Numeric	
Employment (E)	E_9	How many adult males from your household worked on your farm in 2015?	ALL SCREENED IN
		Numeric	
Employment (E)	E_10	How many adult females from your household worked on your farm in 2015?	ALL SCREENED IN
		Numeric	

SECTION	VARIABLE NAME	LABEL	CODING AND FILTER LOGIC
Employment (E)	E_11	How many boys from your household worked on your farm in 2015? Numeric	ALL SCREENED IN
Employment (E)	E_12	How many girls from your household worked on your farm in 2015? Numeric	ALL SCREENED IN
Employment (E)	E_13	How many seasonal/temporary female laborers worked on your farm in 2015? Numeric	ALL SCREENED IN
Employment (E)	E_14	How many seasonal/temporary male laborers worked on your farm in 2015? Numeric	ALL SCREENED IN
Employment (E)	E_15	How many permanent female laborers worked on your farm in 2015? Numeric	ALL SCREENED IN
Employment (E)	E_16	How many permanent male laborers worked on your farm in 2015? Numeric	ALL SCREENED IN
NOTE: The next two questions are about perception or views of the respondent related to the security situation and economic conditions			
Views (V)	V_1	In the last year, would you say that security in your community has improved, become worse, or has there been no change? Single No change Improved Become worse No opinion No response	ALL SCREENED IN 0 1 2 3 4
Views (V)	V_2	In the last year, would you say that economic conditions in your community have improved, become worse, or has there been no change? Single No change Improved Become worse No response No opinion	ALL SCREENED IN 0 1 2 3 4

SECTION	VARIABLE NAME	LABEL	CODING AND FILTER LOGIC
NOTE: The next series of questions ask about women's benefits from PEG interventions.			
Women (W)	W_1	Did any women in your household participate in demonstrations and training by an extension agent on a demonstration farm?	ALL SCREENED IN
		Single response	
		Yes	1
		No	0
		Don't Know	3
Women (W)	W_2	Did any women in your household learn about the agricultural practices promoted by PEG?	ALL SCREENED IN
		Single response	
		Yes	1
		No	0
		Don't Know	3
Women (W)	W_3	Did any women in your household receive increased income from agricultural employment as a result of PEG?	ALL SCREENED IN
		Single response	
		Yes	1
		No	0
		Don't Know	3
Women (W)	W_4	Do any women in your household have more time available because PEG production methods saved time/were more efficient?	ALL SCREENED IN
		Single response	
		Yes	1
		No	0
		Don't Know	3
Women (W)	W_5	Do any women in your household participate more in making decisions about agricultural production on the farm than they did before you participated in PEG?	ALL SCREENED IN
		Single response	
		Yes	1
		No	0
Women (W)	W_6	In your opinion, which of the following factors explain why women do not	ALL SCREENED IN

SECTION	VARIABLE NAME	LABEL	CODING AND FILTER LOGIC			
		participate more in agricultural projects like PEG?				
		Multiple				
		Cultural factors	1			
		Limited time available to women	2			
		Timing of the training	3			
		Security factors	4			
		Other barriers	5			
Women (W)	W_6.1	If other, please specify.	FILTER IF	W_6	EQUALS	5
		Text				
		Questions W_7 to W__20 ask about who makes decisions regarding production on the farm. (NOTE TO INTERVIEWER: If the interview is with a male head of household, this question should be answered joined if possible.)				
Women (W)	W_7	Please indicate who answers this question.	ALL SCREENED IN			
		Single				
		Male head of household only	1			
		Female head of household only	2			
		Male head of household and wife or main female	3			
Women (W)	W_8	Compared to before PEG (2013), does your wife participate to a greater or lesser extent in decision-making about the area of land that is planted?	FILTER IF	H_6	EQUALS	1 OR 2
		Single				
		No change, same as before	0			
		Wife/main female participates more	1			
		Wife/main female participates less	2			
Women (W)	W_9	Compared to before PEG (2013), does your wife participate to a greater or lesser extent in decision-making about what crops to grow?	FILTER IF	H_6	EQUALS	1 OR 2
		Single				
		No change, same as before	0			
		Wife/main female participates more	1			
		Wife/main female participates less	2			
Women (W)	W_10	Compared to before PEG (2013), does your wife participate to a greater or	FILTER IF	H_6	EQUALS	1 OR 2

SECTION	VARIABLE NAME	LABEL	CODING AND FILTER LOGIC			
		lesser extent in decision-making about what seeds to purchase?				
		Single				
		No change, same as before	0			
		Wife/main female participates more	1			
		Wife/main female participates less	2			
Women (W)	W_11	Compared to before PEG (2013), does your wife participate to a greater or lesser extent in decision-making about when to buy and sell cattle?	FILTER IF	H_6	EQUALS	3
		Single				
		No change, same as before	0			
		Wife/main female participates more	1			
		Wife/main female participates less	2			
Women (W)	W_12	Compared to before PEG (2013), does your wife participate to a greater or lesser extent in decision-making about when and how to treat cattle (medicine, vaccinations)?	FILTER IF	H_6	EQUALS	3
		Single				
		No change, same as before	0			
		Wife/main female participates more	1			
		Wife/main female participates less	2			
Women (W)	W_13	Compared to before PEG (2013), does your wife participate to a greater or lesser extent in decision-making about whether and how the product will be sold?	ALL SCREENED IN			
		Single				
		No change, same as before	0			
		Wife/main female participates more	1			
		Wife/main female participates less	2			
Women (W)	W_14	Compared to before PEG (2013), does your wife participate to a greater or lesser extent in decision-making about how to spend	ALL SCREENED IN			

SECTION	VARIABLE NAME	LABEL	CODING AND FILTER LOGIC
		income from the farm?	
		Single	
		No change, same as before	0
		Wife/main female participates more	1
		Wife/main female participates less	2
Women (W)	W_15	In your opinion, how important are traditional views about the kind of work that the men and women do on the farm in deciding who does what on the farm and who participates in decision making?	ALL SCREENED IN
		Single	
		Very important	1
		Somewhat important	2
		Not important	3
		No response	4
		No opinion	5
Women (W)	W_16	In your opinion, how important are traditional cultural views regarding how the household spends its farm income in making decisions on the farm?	ALL SCREENED IN
		Single	
		Very important	1
		Somewhat important	2
		Not important	3
		No response	4
		No opinion	5
Women (W)	W_17	In your opinion, how important are traditional views about the kind of work that the men and women do on the farm in making decisions on the farm?	ALL SCREENED IN
		Single	
		Very important	1
		Somewhat important	2
		Not important	3
		No response	4
		No opinion	5
Women (W)	W_18	In your opinion, how important is the level of agricultural experience of	ALL SCREENED IN

SECTION	VARIABLE NAME	LABEL	CODING AND FILTER LOGIC
		the household members when deciding who makes decisions on the farm?	
		Single	
		Very important	1
		Somewhat important	2
		Not important	3
		No response	4
		No opinion	5
Women (W)	W_19	In your opinion, how important is the level of education of the household members when deciding who makes decisions on the farm?	ALL SCREENED IN
		Single	
		Very important	1
		Somewhat important	2
		Not important	3
		No response	4
		No opinion	5
Women (W)	W_20	In your opinion, how important is the time availability of the wife when deciding whether the woman participates in making decisions on the farm?	ALL SCREENED IN
		Single	
		Very important	1
		Somewhat important	2
		Not important	3
		No response	4
		No opinion	5

Was the land size actually measured?

Yes

No

Record land size (Numeric)

QUESTIONNAIRE OF TELEPHONE INTERVIEW (TI)

SECTION	VARIABLE NAME	LABEL	CODING AND FILTER LOGIC			
General (G)	G_1	Interviewer Unique ID	ALL SCREENED IN			
		Numeric	Unique ID to be assigned by Survey Firm			
Household (H)	H_1	Household Head Unique ID	ALL SCREENED IN			
		Numeric	Unique ID to be assigned by survey firm. ID will include District prefix			
Household (H)	H_2	Name of Household Head	ALL SCREENED IN			
		Text	Automatically filled in based on input for H_1			
Household (H)	H_9	Gender of Household Head	ALL SCREENED IN			
		Single Response				
		Female	1			
		Male	2			
Household (H)	H_3	Phone number of respondent	ALL SCREENED IN			
		Numeric	Automatically filled in based on input for H_1.			
Household (H)	H_4	District	ALL SCREENED IN			
		Single Response	Automatically filled in based on input for H_1			
		Afgoi	1			
		Awdehgle	2			
		Balad	3			
		Banadir	4			
Household (H)	H_5.1	Village (Afgoi)	FILTER IF	H_4	EQUALS	1
		Single Response	Automatically filled in based on input for H_1			
		Anoole	1			
		Marerey	2			
		Mordiile	3			
		Sabiid	4			
		Balbaley Shuk	5			
		Buuxow	6			
		Jumbulul	7			
		Daynile /Dhiiqaaley	8			
		Geeryoon /Afgoi	9			
		Jabad-Geel/Ceelasha	10			
		Carbiska/Afgoi	11			
		Ceelasha	12			
		Rimi-Gacameed	13			
		Dhalanrogga	14			
		Lafale	15			
		Shimbiroole	16			
		Jasiira	17			
		Harweyn	18			
		Shukurow	19			
		Galwar	20			
		Balgure	21			

SECTION	VARIABLE NAME	LABEL	CODING AND FILTER LOGIC			
		Sagalad	22			
		Kuraale	23			
		Balow	24			
		Aw-haliim	25			
		Buriweyne	26			
		Banadir University	27			
		Barwaqo	28			
		Beder	29			
		Al-Nacim	30			
		Aran	31			
		Xafiska Dallada	32			
Household (H)	H_5.2	Select village (Awdegle)	FILTER IF	H_4	EQUALS	2
		Single Response	Automatically filled in based on input for H_1			
		Mubaraak	33			
		D/salam	34			
		J/Awdehgle	35			
		Gumeysidid	36			
		Aybuutey	37			
		Jowhar	38			
		Malabler	39			
Household (H)	H_5.3	Select village (Balad)	FILTER IF	H_4	EQUALS	3
		Mashruuca	40			
		Walamoy	41			
		Hawa-Tako	42			
		Isgoys	43			
		Gololey	44			
		Kurshaale	45			
		Bakhdaad	46			
Household (H)	H_5.3	Select village (Banadir)	FILTER IF	H_4	EQUALS	4
		Rimi-Gacameed	1			
		Banadir University	2			
		Carbiska	3			
		Ceelasha	4			
		Daynile/Dhiiqaaley	5			
		Dhalanrogga	6			
		Barwaqo	7			
		Beder	8			
		Al-Nacim	9			
		Geeryoon	10			
		Harweyn	11			
		Jabad-Geel/Ceelasha	12			
		Jasiira	13			
		Lafale	14			
		Shimbiroole	15			
		Xafiska Dallada	16			
		Aran	17			
Household (H)	H_6	Type of Beneficiary	ALL SCREENED IN			
		Single Response	Automatically filled in based			

SECTION	VARIABLE NAME	LABEL	CODING AND FILTER LOGIC
			on input for H_1.
		Lead Farmer (Crops)	1
		Contact Farmer (Crops)	2
		Livestock Farmer (Dairy, Camels)	3
		<u>To be read aloud to Household Head:</u> Hello, we are from a research company called DARS and we are currently conducting a survey to evaluate the Partnership for Economic Growth (PEG) project, which is implemented in Somalia by DAI/SATG. We would like to know how the PEG project helped your household, so that future projects can be better designed. For this purpose, we are interviewing randomly selected households, and your name and information you give me will not be shared with anyone else. The interview will take about 60 minutes to complete. You may skip any question that you are not comfortable answering, and you can stop the interview any time.	
Household (H)	H_7	May I start now?	
		Single Response	ALL SCREENED IN
		Yes	1
		No	0
		If H_5=0, thank the Household Head for their time. Pick one of the reserve households and continue to administer another interview.	
Start of Questionnaire			
	NOTE	This section asks some questions about your household	
Household (H)	H_8	Marital status of the household head	ALL SCREENED IN
		Single Response	
		Single	1
		Married	2
		Divorced	3
		Widowed/widower	4
Household (H)	H_9	Education level of household head (select highest level of completed education only)	ALL SCREENED IN
		Single Response	
		None	0
		Primary	1
		Secondary	2
		University	3
Household (H)	H_10	How many males under 18 years old live in your household?	ALL SCREENED IN
		Numeric	

SECTION	VARIABLE NAME	LABEL	CODING AND FILTER LOGIC
Household (H)	H_11	How many females under 18 years old live in your household? Numeric	ALL SCREENED IN
Household (H)	H_12	How many males 18 to 65 years old live in your household? Numeric	ALL SCREENED IN
Household (H)	H_13	How many females 18 to 65 years old live in your household? Numeric	ALL SCREENED IN
Household (H)	H_14	How many males over 65 years old live in your household? Numeric	ALL SCREENED IN
Household (H)	H_15	How many females over 65 years old live in your household? Numeric	ALL SCREENED IN
Household (H)	H_16	What is the main farming activity for household food consumption? Single response Food crops Cattle raising Camel raising Mixed cattle and camel raising Fodder	ALL SCREENED IN 1 2 3 4 5
Household (H)	H_17	What is the main farming activity for household income? Single response Food crops Cattle raising Camel raising Mixed cattle and camel raising Fodder	ALL SCREENED IN 1 2 3 4 5
NOTE		This section asks some questions about your farm	
Farm (F)	F_1	What is the total size of your farm (the land that you own)? Numeric	ALL SCREENED IN
Farm (F)	F_2	What is the unit of measurement? Single Jibaal Darab Hectare	ALL SCREENED IN 1 2 3

SECTION	VARIABLE NAME	LABEL	CODING AND FILTER LOGIC			
Farm (F)	F_3	On the land that you own, how many different plots of land do you farm on? Please use the same unit of measurement.	FILTER IF	H_6	EQUALS	1 or 2
		Numeric				
Farm (F)	F_4	What is the size of the largest plot? Please use the same unit of measurement.	FILTER IF	H_6	EQUALS	1 or 2
		Numeric				
Farm (F)	F_5	Would you agree to let me measure this plot after we complete this survey?	FILTER IF	H_6	EQUALS	1 or 2
		Single				
		Yes	1			
		No	0			
		Numeric				
	F_7	How much of your own land is suitable for grazing? Please use the same unit of measurement				
		Numeric				
Farm (F)	F_8	How much of your own land is irrigated?	ALL SCREENED IN			
		Numeric				
Farm (F)	F_9	How much land did you rent or borrow in 2015?	ALL SCREENED IN			
		Numeric				
Farm (F)	F_10	Was the land you rented or borrowed irrigated?	FILTER IF	F_9	GREATER THAN	0
		Single				
		Yes	1			
		No	0			
	NOTE	This section asks about your participation in PEG activities.				
Participation (P)	P_1	Did you receive PEG support in Gu season 2014?	ALL SCREENED IN			
		Single				
		Yes	1			
		No	0			
Participation (P)	P_2	Did you receive PEG support in Deyr season 2014/2015?	ALL SCREENED IN			
		Single				
		Yes	1			
		No	0			
Participation (P)	P_3	Did you receive PEG support in Gu season 2015?	ALL SCREENED IN			
		Single				
		Yes	1			

SECTION	VARIABLE NAME	LABEL	CODING AND FILTER LOGIC			
		No	0			
Participation (P)	P_4	Who in the household received training directly from PEG either from an extension worker or lead farmer?	ALL SCREENED IN			
		Multiple				
		Male head of household	1			
		Female head of household	2			
		Wife (who is not head of household)	3			
		Other adult male in household	4			
		Other adult female in household	5			
		None of the above	6			
Participation (P)	P_5	Who did you (the household head) receive most of your PEG training from?	ALL SCREENED IN			
		Single				
		Male extension worker	1			
		Female extension worker	2			
		Male lead farmer	3			
		Female lead farmer	4			
Participation (P)	P_6	How do you assess the adequacy of the frequency of visits/meetings/trainings conducted by PEG extension workers?	FILTER IF	H_6	EQUALS	1
		Single				
		Very insufficient	1			
		Somewhat insufficient	2			
		Somewhat sufficient	3			
		Very sufficient	4			
Participation (P)	P_7	How do you assess the quality of training that you received from PEG extension workers?	FILTER IF	H_6	EQUALS	1
		Single				
		Very low quality	1			
		Low quality	2			
		Medium Quality	3			
		High quality	4			
		Very high quality	5			
Participation (P)	P_8	How do you assess the adequacy of the frequency of visits, meetings, and trainings conducted by the Lead Farmer?	FILTER IF	H_6	EQUALS	2
		Single				
		Very inadequate	1			
		Somewhat inadequate	2			

SECTION	VARIABLE NAME	LABEL	CODING AND FILTER LOGIC			
		Somewhat adequate	3			
		Very adequate	4			
Participation (P)	P_9	How do you assess the quality of training that you received from the Lead Farmer?	FILTER IF	H_6	EQUALS	2
		Single				
		Very inadequate	1			
		Somewhat inadequate	2			
		Somewhat adequate	3			
		Very adequate	4			
Participation (P)	P_10	What type of support did you receive from PEG?	FILTER IF	H_6	EQUALS	3
		Multiple				
		Vaccination of cattle	1			
		Vaccination of camels	2			
		Vaccination of goats	3			
		Received a cooling box for milk	4			
		Received milk cans	5			
Participation (P)	P_11	In your opinion, to what extent did PEG help to improve the financial situation of your household?	ALL SCREENED IN			
		Single				
		To a great extent	1			
		To a medium extent	2			
		To a small extent	3			
		Not at all	4			
Participation (P)	P_12	In your opinion, to what extent did PEG help to improve the nutritional situation of your household?	ALL SCREENED IN			
		Single				
		To a great extent	1			
		To a medium extent	2			
		To a small extent	3			
		Not at all	4			
NOTE		The following questions are about Gu 2013				
Crops (C)	C_1	How much maize did you plant in Gu 2013? (Area of land)	FILTER IF	H_6	EQUALS	1 OR 2
		Numeric				
Crops (C)	C_2	What is the unit of measurement for the area of maize planted?	FILTER IF	C_1	GREATER THAN	0
		Single				
		Jibaal	1			
		Darab	2			
		Hectare	3			

SECTION	VARIABLE NAME	LABEL	CODING AND FILTER LOGIC			
Crops (C)	C_3	Was the maize irrigated?	FILTER IF	C_I	GREATER THAN	0
		Single response				
		Yes	1			
		No	0			
Crops (C)	C_4	How many sacks of maize cobs did you harvest in Gu 2013?	FILTER IF	C_I	GREATER THAN	0
		Numeric				
Crops (C)	C_5	What is the unit of measure for the quantity of maize harvested?	FILTER IF	C_I	GREATER THAN	0
		Green sack (around 75 kg)	1			
		Dark sack (around 85 kg/sack)	2			
Crops (C)	C_6	How many sacks of dry maize grain cobs did you obtain in Gu 2013?	FILTER IF	C_I	GREATER THAN	0
		Numeric				
Crops (C)	C_7	How many sacks of dry maize grain cobs did you lose after harvesting in Gu 2013?	FILTER IF	C_6	GREATER THAN	0
		Numeric				
Crops (C)	C_8	How many sacks of dry maize grain cobs did you sell in Gu 2013?	FILTER IF	C_6	GREATER THAN	0
		Numeric				
Crops (C)	C_9	How many kilograms of DAP did you apply prior to planting on the maize in Gu 2013?	FILTER IF	C_I	GREATER THAN	0
		Numeric				
Crops (C)	C_10	How many kilograms of urea did you apply on the maize after planting in Gu 2013?	FILTER IF	C_I	GREATER THAN	0
		Numeric				
Crops (C)	C_11	Did you apply insecticide on the maize in Gu 2013?	FILTER IF	C_I	GREATER THAN	0
		Single				
		Yes	1			
		No	0			
Crops (C)	C_12	How many small plots (quarter jibaa) of tomato did you plant in Gu 2013?	FILTER IF	H_6	EQUALS	1 OR 2
		Numeric				
Crops (C)	C_13	Was the tomato irrigated in Gu 2013?	FILTER IF	C_12	GREATER THAN	0
		Single				
		Yes	1			
		No	0			

SECTION	VARIABLE NAME	LABEL	CODING AND FILTER LOGIC			
Crops (C)	C_14	How many jerry cans of tomato did you harvest in Gu 2013? Numeric	FILTER IF	C_12	GREATER THAN	0
Crops (C)	C_15	How many jerry cans of the harvested tomato did you lose after harvesting in Gu 2013? Numeric	FILTER IF	C_14	GREATER THAN	0
Crops (C)	C_16	How many jerry cans of tomato did you sell in Gu 2013? Numeric	FILTER IF	C_14	GREATER THAN	0
Crops (C)	C_17	How many kilograms of DAP did you apply prior to planting on the tomato in Gu 2013? Numeric	FILTER IF	C_12	GREATER THAN	0
Crops (C)	C_18	How many kilograms of urea did you apply on the tomato after planting in Gu 2013? Numeric	FILTER IF	C_12	GREATER THAN	0
Crops (C)	C_19	Did you apply insecticide on the tomato in Gu 2013? Single Yes No	FILTER IF 1 0	C_12	GREATER THAN	0
NOTE		The following questions are about Deyr 2013/2014				
Crops (C)	C_20	How much maize did you plant in Deyr 2013/2014? (Area of land) Numeric	FILTER IF	H_6	EQUALS	1 OR 2
Crops (C)	C_21	What is the unit of measurement for the area of maize planted? Single Jibaal Darab Hectare	FILTER IF 1 2 3	C_20	GREATER THAN	0
Crops (C)	C_22	Was the maize irrigated? Single response Yes No	FILTER IF 1 0	C_20	GREATER THAN	0
Crops (C)	C_23	How many sacks of maize cobs did you harvest in Deyr 2013/2014? Numeric	FILTER IF	C_20	GREATER THAN	0
Crops (C)	C_24	What is the unit of measure	FILTER IF	C_20	GREATER	0

SECTION	VARIABLE NAME	LABEL	CODING AND FILTER LOGIC			
		for the quantity of maize harvested?			THAN	
		Green sack (around 75 kg)	1			
		Dark sack (around 85 kg/sack)	2			
Crops (C)	C_25	How many sacks of dry maize grain cobs did you obtain in Deyr 2013/2014?	FILTER IF	C_20	GREATER THAN	0
		Numeric				
Crops (C)	C_26	How many sacks of dry maize grain cobs did you lose after harvesting in Deyr 2013/2014?	FILTER IF	C_25	GREATER THAN	0
		Numeric				
Crops (C)	C_27	How many sacks of dry maize grain cobs did you sell in Deyr 2013/2014?	FILTER IF	C_25	GREATER THAN	0
		Numeric				
Crops (C)	C_28	How many kilograms of DAP did you apply prior to planting on the maize in Deyr 2013/2014?	FILTER IF	C_20	GREATER THAN	0
		Numeric				
Crops (C)	C_29	How many kilograms of urea did you apply on the maize after planting in Deyr 2013/2014?	FILTER IF	C_20	GREATER THAN	0
		Numeric				
Crops (C)	C_30	Did you apply insecticide on the maize in Deyr 2013/2014?	FILTER IF	C_20	GREATER THAN	0
		Single				
		Yes	1			
		No	0			
Crops (C)	C_31	How many small plots (quarter jibaal) of tomato did you plant in Deyr 2013/2014? (Land area)	FILTER IF	H_6	EQUALS	1 OR 2
		Numeric				
Crops (C)	C_32	Was the tomato irrigated in Deyr 2013/2014?	FILTER IF	C_31	GREATER THAN	0
		Single				
		Yes	1			
		No	0			
Crops (C)	C_33	How many jerry cans of tomato did you harvest in Deyr 2013/2014?	FILTER IF	C_31	GREATER THAN	0
		Numeric				
Crops (C)	C_34	How many jerry cans of harvested tomato did you lose after harvesting in Deyr 2013/2014?	FILTER IF	C_33	GREATER THAN	0

SECTION	VARIABLE NAME	LABEL	CODING AND FILTER LOGIC			
		Numeric				
Crops (C)	C_35	How many jerry cans of tomato did you sell in Deyr 2013/2014?	FILTER IF	C_33	GREATER THAN	0
		Numeric				
Crops (C)	C_36	How many kilograms of DAP did you apply prior to planting on the tomato in Deyr 2013/2014?	FILTER IF	C_31	GREATER THAN	0
		Numeric				
Crops (C)	C_37	How many kilograms of urea did you apply on the tomato after planting in Deyr 2013/2014?	FILTER IF	C_31	GREATER THAN	0
		Numeric				
Crops (C)	C_38	Did you apply insecticide on the tomato in Deyr 2013/2014?	FILTER IF	C_31	GREATER THAN	0
		Single				
		Yes	1			
		No	0			
NOTE: The following questions are about Deyr 2014/2015						
Crops (C)	C_39	How much maize did you plant in Deyr 2014/2015? (Area of land)	FILTER IF	H_6	EQUALS	1 OR 2
		Numeric				
Crops (C)	C_40	What is the unit of measurement for the area of maize planted?	FILTER IF	C_39	GREATER THAN	0
		Single				
		Jibaal	1			
		Darab	2			
		Hectare	3			
Crops (C)	C_41	Was the maize irrigated?	FILTER IF	C_39	GREATER THAN	0
		Single response				
		Yes	1			
		No	0			
Crops (C)	C_42	How many sacks of maize cobs did you harvest in Deyr 2014/2015?	FILTER IF	C_39	GREATER THAN	0
		Numeric				
Crops (C)	C_43	What is the unit of measure for the quantity of maize harvested?	FILTER IF	C_42	GREATER THAN	0
		Green sack (around 75 kg)	1			
		Dark sack (around 85 kg/sack)	2			
Crops (C)	C_44	How many sacks of dry maize grain cobs did you lose after harvesting in Deyr 2014/2015?	FILTER IF	C_42	GREATER THAN	0

SECTION	VARIABLE NAME	LABEL	CODING AND FILTER LOGIC			
		Numeric				
Crops (C)	C_45	How many sacks of dry maize grain cobs did you sell in Deyr 2014/2015?	FILTER IF	C_42	GREATER THAN	0
		Numeric				
Crops (C)	C_46	How many kilograms of DAP did you apply prior to planting on the maize in Deyr 2014/2015?	FILTER IF	C_39	GREATER THAN	0
		Numeric				
Crops (C)	C_47	How many kilograms of urea did you apply on the maize after planting in Deyr 2014/2015?	FILTER IF	C_39	GREATER THAN	0
		Numeric				
Crops (C)	C_48	Did you apply insecticide on the maize in Deyr 2014/2015?	FILTER IF	C_39	GREATER THAN	0
		Single				
		Yes	1			
		No	0			
Crops (C)	C_49	How many small plots (quarter jibaal) of tomato did you plant in Deyr 2014/2015?	FILTER IF	H_6	EQUALS	1 OR 2
		Numeric				
Crops (C)	C_50	Was the tomato irrigated in Deyr 2014/2015?	FILTER IF	C_49	GREATER THAN	0
		Single				
		Yes	1			
		No	0			
Crops (C)	C_51	How many jerry cans of tomato did you harvest in Deyr 2014/2015?	FILTER IF	C_49	GREATER THAN	0
		Numeric				
Crops (C)	C_52	How many jerry cans of harvested tomato did you lose after harvesting in Deyr 2014/2015?	FILTER IF	C_51	GREATER THAN	0
		Numeric				
Crops (C)	C_53	How many jerry cans of tomato did you sell in Deyr 2014/2015?	FILTER IF	C_51	GREATER THAN	0
		Numeric				
Crops (C)	C_54	How many kilograms of DAP did you apply prior to planting on the tomato in Deyr 2014/2015?	FILTER IF	C_49	GREATER THAN	0
		Numeric				
Crops (C)	C_55	How many kilograms of urea did you apply on the	FILTER IF	C_49	GREATER THAN	0

SECTION	VARIABLE NAME	LABEL	CODING AND FILTER LOGIC			
		tomato after planting in Deyr 2014/2015?				
		Numeric				
Crops (C)	C_56	Did you apply insecticide on the tomato in Deyr 2014/2015?	FILTER IF	C_49	GREATER THAN	0
		Single				
		Yes	1			
		No	0			
NOTE: The following questions are about Gu 2015						
Crops (C)	C_57	How much maize did you plant in Gu 2015? (Area of land)	FILTER IF	H_6	EQUALS	1 OR 2
		Numeric				
Crops (C)	C_58	What is the unit of measurement for the area of maize planted?	FILTER IF	C_57	GREATER THAN	0
		Single				
		Jibaal	1			
		Darab	2			
		Hectare	3			
Crops (C)	C_59	Was the maize irrigated?	FILTER IF	C_57	GREATER THAN	0
		Single response				
		Yes	1			
		No	0			
Crops (C)	C_60	How many sacks of maize cobs did you harvest in Gu 2015?	FILTER IF	C_57	GREATER THAN	0
		Numeric				
Crops (C)	C_61	What is the unit of measure for the quantity of maize harvested?	FILTER IF	C_60	GREATER THAN	0
		Green sack (around 75 kg)	1			
		Dark sack (around 85 kg/sack)	2			
Crops (C)	C_62	How many sacks of dry maize grain cobs did you lose after harvesting in Gu 2015?	FILTER IF	C_60	GREATER THAN	0
		Numeric				
Crops (C)	C_63	How many sacks of dry maize grain cobs did you sell in Gu 2015?	FILTER IF	C_60	GREATER THAN	0
		Numeric				
Crops (C)	C_63	How many kilograms of DAP did you apply prior to planting on the maize in Gu 2015?	FILTER IF	C_57	GREATER THAN	0
		Numeric				

SECTION	VARIABLE NAME	LABEL	CODING AND FILTER LOGIC			
Crops (C)	C_64	How many kilograms of urea did you apply on the maize after planting in Gu 2015?	FILTER IF	C_57	GREATER THAN	0
		Numeric				
Crops (C)	C_65	Did you apply insecticide on the maize in Gu 2015?	FILTER IF	C_57	GREATER THAN	0
		Single				
		Yes	1			
		No	0			
Crops (C)	C_66	How many small plots (quarter jibaa) of tomato did you plant in Deyr in Gu 2015?	FILTER IF	H_6	EQUALS	1 OR 2
		Numeric				
Crops (C)	C_67	What was the unit of measurement for the area of tomato planted?	FILTER IF	C_66	GREATER THAN	0
		Single				
		Jibaa	1			
		Darab	2			
		Hectare	3			
Crops (C)	C_68	Was the tomato irrigated in Gu 2015?	FILTER IF	C_66	GREATER THAN	0
		Single				
		Yes	1			
		No	0			
Crops (C)	C_69	How many jerry cans of tomato did you harvest in Gu 2015?	FILTER IF	C_66	GREATER THAN	0
		Numeric				
Crops (C)	C_70	How many jerry cans of harvested tomato did you lose after harvesting in Gu 2015?	FILTER IF	C_69	GREATER THAN	0
		Numeric				
Crops (C)	C_71	How many jerry cans of tomato did you sell in Gu 2015?	FILTER IF	C_69	GREATER THAN	0
		Numeric				
Crops (C)	C_72	How many kilograms of DAP did you apply prior to planting on the tomato in Gu 2015?	FILTER IF	C_66	GREATER THAN	0
		Numeric				
Crops (C)	C_73	How many kilograms of urea did you apply on the tomato after planting in Gu 2015?	FILTER IF	C_66	GREATER THAN	0
		Numeric				
Crops (C)	C_74	Did you apply insecticide on	FILTER IF	C_66	GREATER	0

SECTION	VARIABLE NAME	LABEL	CODING AND FILTER LOGIC			
		the tomato in Gu 2015?			THAN	
		Single				
		Yes	1			
		No	0			
NOTE: The next two questions are about farm records						
Crops (C)	C_75	In Gu 2013 and Deyr 2013/2014 which of the following types of farm records did you keep?	FILTER IF	H_6	EQUALS	1 OR 2
		Multiple				
		Area of crops grown	1			
		Quantity of crops harvested	2			
		Quantity of crops sold	3			
		Value of crops sold	4			
Crops (C)	C_76	In Gu 2015 and Deyr 2015/2016 which of the following types of farm records did you keep?	FILTER IF	H_6	EQUALS	1 OR 2
		Multiple				
		Area of crops grown	1			
		Quantity of crops harvested	2			
		Quantity of crops sold	3			
		Value of crops sold	4			
NOTE: This section is about livestock for milk production in 2013						
Livestock (L)	L_1	In 2013 did you have any dairy cattle?	FILTER IF	H_6	EQUALS	3
		Single				
		Yes	1			
		No	0			
Livestock (L)	L_2	In 2013 did you have any camels for milk production?	FILTER IF	H_6	EQUALS	3
		Single				
		Yes	1			
		No	0			
NOTE: This section is about dairy cattle in 2013						
Livestock (L)	L_3	How many cattle did you have at the beginning of 2013?	FILTER IF	L_1	EQUALS	1
		Numeric				
Livestock (L)	L_4	How many calves were born in 2013?	FILTER IF	L_1	EQUALS	1
		Numeric				
Livestock (L)	L_5	How many cattle became sick in 2013?	FILTER IF	L_1	EQUALS	1
		Numeric				
Livestock (L)	L_6	How many cattle died in 2013?	FILTER IF	L_1	EQUALS	1
		Numeric				
Livestock (L)	L_7	How many cattle did you	FILTER IF	L_1	EQUALS	1

SECTION	VARIABLE NAME	LABEL	CODING AND FILTER LOGIC			
		have at the end of 2013?				
		Numeric				
Livestock (L)	L_8	How many head of cattle produced milk in Gu 2013?	FILTER IF	L_1	EQUALS	1
		Numeric				
Livestock (L)	L_9	How many times per day did you milk in Gu 2013?	FILTER IF	L_8	GREATER THAN	0
		Numeric				
Livestock (L)	L_10	During the first milking how many cans of milk did you get each day in total (Gu 2013)?	FILTER IF	L_8	GREATER THAN	0
		Numeric				
Livestock (L)	L_11	What size can did you use for milking in Gu 2013?	FILTER IF	L_8	GREATER THAN	0
		750 milliliter can	1			
		1 liter can	2			
Livestock (L)	L_12	During the second milking how many cans of milk did you get each day in total (Gu 2013)?	FILTER IF	L_9	EQUALS	2
		Numeric				
Livestock (L)	L_13	During Gu 2013, how many cans of milk did you sell each day?	FILTER IF	L_8	GREATER THAN	0
		Numeric				
Livestock (L)	L_14	How many head of cattle produced milk in Jilal season in 2013?	FILTER IF	L_1	EQUALS	1
		Numeric				
Livestock (L)	L_15	How many times per day did you milk in Jilal season in 2013?	FILTER IF	L_14	GREATER THAN	0
		Numeric				
Livestock (L)	L_16	During the first milking how many cans of milk did you get in total (Jilal 2013)?	FILTER IF	L_14	GREATER THAN	0
		Numeric				
Livestock (L)	L_17	What size can did you use for milking in Jilal 2013?	FILTER IF	L_14	GREATER THAN	0
		750 milliliter can	1			
		1 liter can	2			
Livestock (L)	L_18	During the second milking how many cans of milk did you get in total (Jilal 2013)?	FILTER IF	L_15	EQUALS	2
		Numeric				
Livestock (L)	L_19	During Jilal 2013, how many cans of milk did you sell each day?	FILTER IF	L_14	GREATER THAN	0
		Numeric				

SECTION	VARIABLE NAME	LABEL	CODING AND FILTER LOGIC			
Livestock (L)	L_20	How many head of cattle produced milk in Deyr in 2013/2014? Numeric	FILTER IF	L_1	EQUALS	1
Livestock (L)	L_21	How many times per day did you milk in Deyr 2013/2014? Numeric	FILTER IF	L_20	GREATER THAN	0
Livestock (L)	L_22	During the first milking how many cans of milk did you get in total (Deyr 2013/2014)? Numeric	FILTER IF	L_20	GREATER THAN	0
Livestock (L)	L_23	What size can did you use for milking in Deyr 2013/2014? 750 milliliter can 1 liter can	FILTER IF	L_20	GREATER THAN	0
			1			
			2			
Livestock (L)	L_24	During the second milking how many cans of milk did you get in total (Deyr 2013/2014)? Numeric	FILTER IF	L_21	EQUALS	2
Livestock (L)	L_25	During Deyr 2013/2104, how many cans of milk did you sell each day? Numeric	FILTER IF	L_20	GREATER THAN	0
NOTE: This section is about camels for milk production in 2013						
Livestock (L)	L_26	How many camels did you have at the beginning of 2013? Numeric	FILTER IF	L_2	EQUALS	1
Livestock (L)	L_27	How many calves were born in 2013? Numeric	FILTER IF	L_2	EQUALS	1
Livestock (L)	L_28	How many camels became sick in 2013? Numeric	FILTER IF	L_2	EQUALS	1
Livestock (L)	L_29	How many camels died in 2013? Numeric	FILTER IF	L_2	EQUALS	1
Livestock (L)	L_30	How many camels did you have at the end of 2013? Numeric	FILTER IF	L_2	EQUALS	1
Livestock (L)	L_31	How many camels produced milk in Gu 2013? Numeric	FILTER IF	L_2	EQUALS	1
Livestock (L)	L_32	How many times per day did you milk in Gu 2013? Numeric	FILTER IF	L_31	GREATER THAN	0

SECTION	VARIABLE NAME	LABEL	CODING AND FILTER LOGIC			
Livestock (L)	L_33	During the first milking how many cans of milk did you get each day in total (Gu 2013)?	FILTER IF	L_31	GREATER THAN	0
		Numeric				
Livestock (L)	L_34	What size can did you use for milking in Gu 2013?	FILTER IF	L_31	GREATER THAN	0
		750 milliliter can	1			
		1 liter can	2			
Livestock (L)	L_35	During the second milking how many cans of milk did you get each day in total (Gu 2013)?	FILTER IF	L_32	EQUALS	2
		Numeric				
Livestock (L)	L_36	During Gu 2013, how many cans of milk did you sell each day?	FILTER IF	L_31	GREATER THAN	0
		Numeric				
Livestock (L)	L_37	How many camels produced milk in Jilal season in 2013?	FILTER IF	L_2	EQUALS	1
		Numeric				
Livestock (L)	L_38	How many times per day did you milk in Jilal season in 2013?	FILTER IF	L_37	GREATER THAN	0
		Numeric				
Livestock (L)	L_39	During the first milking how many cans of milk did you get in total (Jilal 2013)?	FILTER IF	L_37	GREATER THAN	0
		Numeric				
Livestock (L)	L_40	What size can did you use for milking in Jilal 2013?	FILTER IF	L_37	GREATER THAN	0
		750 milliliter can	1			
		1 liter can	2			
Livestock (L)	L_41	During the second milking how many cans of milk did you get in total (Jilal 2013)?	FILTER IF	L_38	EQUALS	2
		Numeric				
Livestock (L)	L_42	During Jilal 2013, how many cans of milk did you sell each day?	FILTER IF	L_37	GREATER THAN	0
		Numeric				
Livestock (L)	L_43	How many camels produced milk in Deyr in 2013/2014?	FILTER IF	L_2	EQUALS	1
		Numeric				
Livestock (L)	L_44	How many times per day did you milk in Deyr 2013/2014?	FILTER IF	L_43	GREATER THAN	0
		Numeric				

SECTION	VARIABLE NAME	LABEL	CODING AND FILTER LOGIC			
Livestock (L)	L_45	During the first milking how many cans of milk did you get in total (Deyr 2013/2014)?	FILTER IF	L_43	GREATER THAN	0
		Numeric				
Livestock (L)	L_46	What size can did you use for milking in Deyr 2013/2014?	FILTER IF	L_43	GREATER THAN	0
		750 milliliter can	1			
		1 liter can	2			
Livestock (L)	L_47	During the second milking how many cans of milk did you get in total (Deyr 2013/2014)?	FILTER IF	L_44	EQUALS	2
		Numeric				
Livestock (L)	L_48	During Deyr 2013/2014, how many cans of milk did you sell each day?	FILTER IF	L_43	GREATER THAN	0
		Numeric				
NOTE: This section is about livestock for milk production in 2015						
Livestock (L)	L_49	In 2015 did you have any dairy cattle?	FILTER IF	H_6	EQUALS	3
		Single				
		Yes	1			
		No	0			
Livestock (L)	L_50	In 2015 did you have any camels for milk production?	FILTER IF	H_6	EQUALS	3
		Single				
		Yes	1			
		No	0			
Livestock (L)	L_51	How many cattle did you have at the beginning of 2015?	FILTER IF	L_49	EQUALS	1
		Numeric				
Livestock (L)	L_52	How many calves were born in 2015?	FILTER IF	L_49	EQUALS	1
		Numeric				
Livestock (L)	L_53	How many cattle became sick in 2015?	FILTER IF	L_49	EQUALS	1
		Numeric				
Livestock (L)	L_54	How many cattle died in 2015?	FILTER IF	L_49	EQUALS	1
		Numeric				
Livestock (L)	L_55	How many cattle did you have at the end of 2015?	FILTER IF	L_49	EQUALS	1
		Numeric				
Livestock (L)	L_56	How many head of cattle produced milk in Gu 2015?	FILTER IF	L_49	EQUALS	1
		Numeric				
Livestock (L)	L_57	How many times per day did you milk in Gu 2015?	FILTER IF	L_56	GREATER THAN	0

SECTION	VARIABLE NAME	LABEL	CODING AND FILTER LOGIC			
		Numeric				
Livestock (L)	L_58	During the first milking how many cans of milk did you get each day in total (Gu 2015)?	FILTER IF	L_56	GREATER THAN	0
		Numeric				
Livestock (L)	L_59	What size can did you use for milking in Gu 2015?	FILTER IF	L_56	GREATER THAN	0
		750 milliliter can	1			
		1 liter can	2			
Livestock (L)	L_60	During the second milking how many cans of milk did you get each day in total (Gu 2015)?	FILTER IF	L_57	EQUALS	2
		Numeric				
Livestock (L)	L_61	During Gu 2015, how many cans of milk did you sell each day?	FILTER IF	L_56	GREATER THAN	0
		Numeric				
Livestock (L)	L_62	How many head of cattle produced milk in Jilal season in 2015?	FILTER IF	L_49	EQUALS	1
		Numeric				
Livestock (L)	L_63	How many times per day did you milk in Jilal season in 2015?	FILTER IF	L_62	GREATER THAN	0
		Numeric				
Livestock (L)	L_64	During the first milking how many cans of milk did you get in total (Jilal 2015)?	FILTER IF	L_62	GREATER THAN	0
		Numeric				
Livestock (L)	L_65	What size can did you use for milking in Jilal 2015?	FILTER IF	L_62	GREATER THAN	0
		750 milliliter can	1			
		1 liter can	2			
Livestock (L)	L_66	During the second milking how many cans of milk did you get in total (Jilal 2015)?	FILTER IF	L_63	EQUALS	2
		Numeric				
Livestock (L)	L_67	During Jilal 2015, how many cans of milk did you sell each day?	FILTER IF	L_62	GREATER THAN	0
		Numeric				
Livestock (L)	L_68	How many head of cattle produced milk in Deyr in 2015/2016?	FILTER IF	L_49	EQUALS	1
		Numeric				
Livestock (L)	L_69	How many times per day did you milk in Deyr 2015/2016?	FILTER IF	L_68	GREATER THAN	0
		Numeric				

SECTION	VARIABLE NAME	LABEL	CODING AND FILTER LOGIC			
Livestock (L)	L_70	During the first milking how many cans of milk did you get in total (Deyr 2015/2016)?	FILTER IF	L_68	GREATER THAN	0
		Numeric				
Livestock (L)	L_71	What size can did you use for milking in Deyr 2015/2016?	FILTER IF	L_68	GREATER THAN	0
		750 milliliter can	1			
		1 liter can	2			
Livestock (L)	L_72	During the second milking how many cans of milk did you get in total (Deyr 2015/2016)?	FILTER IF	L_69	EQUALS	2
		Numeric				
Livestock (L)	L_73	During Deyr 2015/2104, how many cans of milk did you sell each day?	FILTER IF	L_68	GREATER THAN	0
		Numeric				
NOTE: This section is about camels for milk production in 2015						
Livestock (L)	L_74	How many camels did you have at the beginning of 2015?	FILTER IF	L_50	EQUALS	1
		Numeric				
Livestock (L)	L_75	How many calves were born in 2015?	FILTER IF	L_50	EQUALS	1
		Numeric				
Livestock (L)	L_76	How many camels became sick in 2015?	FILTER IF	L_50	EQUALS	1
		Numeric				
Livestock (L)	L_77	How many camels died in 2015?	FILTER IF	L_50	EQUALS	1
		Numeric				
Livestock (L)	L_78	How many camels did you have at the end of 2015?	FILTER IF	L_50	EQUALS	1
		Numeric				
Livestock (L)	L_79	How many camels produced milk in Gu 2015?	FILTER IF	L_50	EQUALS	1
		Numeric				
Livestock (L)	L_80	How many times per day did you milk in Gu 2015?	FILTER IF	L_79	GREATER THAN	0
		Numeric				
Livestock (L)	L_81	During the first milking how many cans of milk did you get each day in total (Gu 2015)?	FILTER IF	L_79	GREATER THAN	0
		Numeric				
Livestock (L)	L_82	What size can did you use for milking in Gu 2015?	FILTER IF	L_79	GREATER THAN	0
		750 milliliter can	1			
		1 liter can	2			

SECTION	VARIABLE NAME	LABEL	CODING AND FILTER LOGIC			
Livestock (L)	L_83	During the second milking how many cans of milk did you get each day in total (Gu 2015)?	FILTER IF	L_80	EQUALS	2
		Numeric				
Livestock (L)	L_84	During Gu 2015, how many cans of milk did you sell each day?	FILTER IF	L_79	GREATER THAN	0
		Numeric				
Livestock (L)	L_85	How many camels produced milk in Jilal season in 2015?	FILTER IF	L_50	EQUALS	1
		Numeric				
Livestock (L)	L_86	How many times per day did you milk in Jilal season in 2015?	FILTER IF	L_85	GREATER THAN	0
		Numeric				
Livestock (L)	L_87	During the first milking how many cans of milk did you get in total (Jilal 2015)?	FILTER IF	L_85	GREATER THAN	0
		Numeric				
Livestock (L)	L_88	What size can did you use for milking in Jilal 2015?	FILTER IF	L_85	GREATER THAN	0
		750 milliliter can	1			
		1 liter can	2			
Livestock (L)	L_89	During the second milking how many cans of milk did you get in total (Jilal 2015)?	FILTER IF	L_86	EQUALS	2
		Numeric				
Livestock (L)	L_90	During Jilal 2015, how many cans of milk did you sell each day?	FILTER IF	L_85	GREATER THAN	0
		Numeric				
Livestock (L)	L_91	How many camels produced milk in Deyr in 2015/2016?	FILTER IF	L_50	EQUALS	1
		Numeric				
Livestock (L)	L_92	How many times per day did you milk in Deyr 2015/2016?	FILTER IF	L_91	GREATER THAN	0
		Numeric				
Livestock (L)	L_93	During the first milking how many cans of milk did you get in total (Deyr 2015/2016)?	FILTER IF	L_91	GREATER THAN	0
		Numeric				
Livestock (L)	L_94	What size can did you use for milking in Deyr 2015/2016?	FILTER IF	L_91	GREATER THAN	0
		750 milliliter can	1			
		1 liter can	2			

SECTION	VARIABLE NAME	LABEL	CODING AND FILTER LOGIC			
Livestock (L)	L_95	During the second milking how many cans of milk did you get in total (Deyr 2015/2016)?	FILTER IF	L_92	EQUALS	2
		Numeric				
Livestock (L)	L_96	During Deyr 2015/2016, how many cans of milk did you sell each day?	FILTER IF	L_91	GREATER THAN	0
		Numeric				
	NOTE	The next two questions are about livestock farm records				
Livestock (L)	L_97	In 2013, which of the following types of farm records did you keep?	FILTER IF	H_6	EQUALS	3
		Multiple Number of animals Volume of milk produced Volume of milk sold Value of milk sold				
Livestock (L)	L_98	Which of the following types of farm records did you keep in 2015?	FILTER IF	H_6	EQUALS	3
		Multiple Number of animals Volume of milk produced Volume of milk sold Value of milk sold				
	NOTE	This section is about the sustainability of PEG interventions				
Sustainability (S)	S_I	Which of the following agricultural practices promoted by PEG are you currently applying on your farm?	FILTER IF	H_6	EQUALS	I OR 2
		Multiple Maize production agronomic practices (from land preparation, planting to harvest)	1			
		Applied vegetable production agronomic practices (from land preparation, planting, to harvest)	2			
		Seed selection and seed treatment	3			
		Soil fertility management, including phosphorus, nitrogen, and compost making	4			
		Crop protection and pesticide use	5			

SECTION	VARIABLE NAME	LABEL	CODING AND FILTER LOGIC			
		Irrigation water management	6			
		Soil and water conservation	7			
		Drip irrigation	8			
		Species trials (hybrids, early maturing varieties, fodder species)	9			
		Post-harvest handling of produce	10			
		Marketing of farm products	11			
		Farm management, record keeping and accounting	12			
Sustainability (S)	S_2	Which of the following agricultural practices promoted by PEG are you currently applying on your farm?	FILTER IF	H_6	EQUALS	3
		Multiple				
		Milk hygiene	1			
		Fodder production/hay making	2			
		Animal feeding and good feeding practices of dairy animals	3			
		Marketing of farm products	4			
		Farm management, record keeping and accounting	5			
Sustainability (S)	S_3	Do you intend to apply maize production agronomic practices (from land preparation, planting, to harvest) on your farm in the future?	FILTER IF	H_6	EQUALS	I OR 2
		Single				
		Very unlikely	1			
		Somewhat unlikely	2			
		Somewhat likely	3			
		Extremely likely	4			
Sustainability (S)	S_4	Do you intend to apply vegetable production agronomic practices (from land preparation, planting, to harvest) on your farm in the future?	FILTER IF	H_6	EQUALS	I OR 2
		Single				
		Very unlikely	1			
		Somewhat unlikely	2			
		Somewhat likely	3			
		Extremely likely	4			
Sustainability (S)	S_5	Do you intend to apply seed selection and seed treatment practices on your farm in the future?	FILTER IF	H_6	EQUALS	I OR 2
		Single				

SECTION	VARIABLE NAME	LABEL	CODING AND FILTER LOGIC			
		Very unlikely Somewhat unlikely Somewhat likely Extremely likely	1 2 3 4			
Sustainability (S)	S_6	Do you intend to apply soil fertility management including phosphorus, nitrogen, and compost making on your farm in the future?	FILTER IF	H_6	EQUALS	I OR 2
		Single Very unlikely Somewhat unlikely Somewhat likely Extremely likely	1 2 3 4			
Sustainability (S)	S_7	Do you intend to apply crop protection and pesticide use on your farm in the future?	FILTER IF	H_6	EQUALS	I OR 2
		Single Very unlikely Somewhat unlikely Somewhat likely Extremely likely	1 2 3 4			
Sustainability (S)	S_8	Do you intent to apply irrigation water management practices on your farm in the future?	FILTER IF	H_6	EQUALS	I OR 2
		Single Very unlikely Somewhat unlikely Somewhat likely Extremely likely	1 2 3 4			
Sustainability (S)	S_9	Do you intend to apply soil and water conservation practices on your farm in the future?	FILTER IF	H_6	EQUALS	I OR 2
		Single Very unlikely Somewhat unlikely Somewhat likely Extremely likely	1 2 3 4			
Sustainability (S)	S_10	Do you intend to apply drip irrigation on your farm in the future?	FILTER IF	H_6	EQUALS	I OR 2
		Single Very unlikely Somewhat unlikely Somewhat likely Extremely likely	1 2 3 4			

SECTION	VARIABLE NAME	LABEL	CODING AND FILTER LOGIC			
Sustainability (S)	S_I1	Do you intend to apply species trials (hybrids, early maturing varieties, fodder species) on your farm in the future?	FILTER IF	H_6	EQUALS	I OR 2
		Single				
		Very unlikely	1			
		Somewhat unlikely	2			
		Somewhat likely	3			
		Extremely likely	4			
Sustainability (S)	S_I2	Do you intend to apply post-harvest handling of produce practices on your farm in the future?	FILTER IF	H_6	EQUALS	I OR 2
		Single				
		Very unlikely	1			
		Somewhat unlikely	2			
		Somewhat likely	3			
		Extremely likely	4			
Sustainability (S)	S_I3	Do you intend to apply milk hygiene practices on your farm in the future?	FILTER IF	H_6	EQUALS	3
		Single				
		Very unlikely	1			
		Somewhat unlikely	2			
		Somewhat likely	3			
		Extremely likely	4			
Sustainability (S)	S_I4	Do you intend to apply fodder production and hay making practices on your farm in the future?	FILTER IF	H_6	EQUALS	3
		Single				
		Very unlikely	1			
		Somewhat unlikely	2			
		Somewhat likely	3			
		Extremely likely	4			
Sustainability (S)	S_I5	Do you intend to apply animal feeding and good feeding practices of dairy animals on your farm in the future?	FILTER IF	H_6	EQUALS	3
		Single				
		Very unlikely	1			
		Somewhat unlikely	2			
		Somewhat likely	3			
		Extremely likely	4			
Sustainability (S)	S_I6	Do you intend to apply marketing of farm products on your farm in the future?	ALL SCREENED IN			
		Single				
		Very unlikely	1			

SECTION	VARIABLE NAME	LABEL	CODING AND FILTER LOGIC			
		Somewhat unlikely	2			
		Somewhat likely	3			
		Extremely likely	4			
Sustainability (S)	S_17	Do you intend to apply farm management, record keeping and accounting on your farm in the future?	ALL SCREENED IN			
		Single				
		Very unlikely	1			
		Somewhat unlikely	2			
		Somewhat likely	3			
		Extremely likely	4			
Sustainability (S)	S_18	Why do you intend to continue using those practices?	FILTER IF AT LEAST ONE OF THE RESPONSES TO S_3 to S_17		EQUALS	3 OR 4
		Multiple				
		PEG method is more productive	1			
		PEG method will allow me to earn more income	2			
		PEG method is less labor intensive	3			
		Because my neighbors intend to continue	4			
		Other	5			
Sustainability (S)	S_19	Why do you not intend to continue using those practices?	FILTER IF AT LEAST ONE OF THE RESPONSES TO S_3 to S_17		EQUALS	1 OR 2
		Multiple				
		Lack of technical ability without further support	1			
		Lack of financial ability without support	2			
		Too labor intensive	3			
		Not convinced about the benefit to my household	4			
		Lack of available resources	5			
		Concerns about ability to successfully market product	6			
		Requires too much additional time	7			
		Traditional methods are more reliable	8			
		Security concerns	9			
		Because my neighbors do not intend to continue	10			
		Other	11			
Sustainability (S)	S_20	How many contact farmers have you yourself trained in total on practices that you	FILTER IF	H_6	EQUALS	1

SECTION	VARIABLE NAME	LABEL	CODING AND FILTER LOGIC			
		learned through PEG?				
		Numeric				
Sustainability (S)	S_21	How many other farmers have you yourself trained in total on practices that you learned through PEG?	FILTER IF	H_6	EQUALS	2
		Numeric				
Sustainability (S)	S_22	How likely are you to share and train other farmers on the new technologies and practices you learned from PEG after PEG has stopped supporting you?	ALL SCREENED IN			
		Single				
		Extremely unlikely	1			
		Somewhat unlikely	2			
		Somewhat likely	3			
		Extremely likely	4			
Sustainability (S)	S_23	(For Crop Farmers) Which specific training topics have you offered training on to the farmers you have trained?	FILTER IF	H_6	EQUALS	1 OR 2
		Multiple				
		Technical training on maize production	1			
		Phosphorus use	2			
		Nitrogen use	3			
		Irrigation water management and malaria vector reduction	4			
		Soil and water conservation	5			
		Hay making	6			
Sustainability (S)	S_23	(For livestock farmers) Which specific training topics have you offered training on to the farmers you have trained?	FILTER IF	H_6	EQUALS	3
		Multiple				
		Milk hygiene training	1			
		Hay making	2			
		Awareness on animal health and nutrition	3			
		Livestock feeding practices	4			
		Good feeding practices of dairy animals	5			
		None	6			
Sustainability (S)	S_24	Have you yourself developed linkages with agro-dealers or input	ALL SCREENED IN			

SECTION	VARIABLE NAME	LABEL	CODING AND FILTER LOGIC			
		suppliers as a result of PEG?				
		Single				
		Yes	1			
		No	0			
Sustainability (S)	S_25	Do you think that the lead farmer who shared farming knowledge during PEG will continue to share farming knowledge with you in the future?	FILTER IF	H_6	EQUALS	2
		Single				
		Extremely unlikely	1			
		Unlikely	2			
		Likely	3			
		Extremely likely	4			
Sustainability (S)	S_26	Given the current security and economic situation, how encouraged or discouraged are you to learn new techniques and practices?	ALL SCREENED IN			
		Single response				
		Strongly encouraged	1			
		Somewhat encouraged	2			
		Somewhat discouraged	3			
		Strongly discouraged	4			
Sustainability (S)	S_27	Given the current security and economic situation, how encouraged or discouraged are you to buy more inputs than before, or new kinds of inputs?	ALL SCREENED IN			
		Single response				
		Strongly encouraged	1			
		Somewhat encouraged	2			
		Somewhat discouraged	3			
		Strongly discouraged	4			
Sustainability (S)	S_28	Given the current security and economic situation, how encouraged or discouraged are you to buy new equipment or invest in new technologies or infrastructure, like irrigation?	ALL SCREENED IN			
		Single response				
		Strongly encouraged	1			
		Somewhat encouraged	2			
		Somewhat discouraged	3			
		Strongly discouraged	4			

SECTION	VARIABLE NAME	LABEL	CODING AND FILTER LOGIC
Sustainability (S)	S_29	Given the current security and economic situation, how encouraged or discouraged are you to plant more land than you did before?	ALL SCREENED IN
		Single response	
		Strongly encouraged	1
		Somewhat encouraged	2
		Somewhat discouraged	3
		Strongly discouraged	4
Sustainability (S)	S_30	Given the current security and economic situation, how encouraged or discouraged are you to plant new crops that you haven't planted before?	ALL SCREENED IN
		Single response	
		Strongly encouraged	1
		Somewhat encouraged	2
		Somewhat discouraged	3
		Strongly discouraged	4
Sustainability (S)	S_31	Compared to the security and economic situation that existed before PEG, would you say that now you are more or less likely to learn new techniques and practices?	ALL SCREENED IN
		Single response	
		Much more likely	1
		Somewhat more likely	2
		Neither more nor less likely	3
		Somewhat less likely	4
		Much less likely	5
Sustainability (S)	S_32	Compared to the security and economic situation that existed before PEG, would you say that now you are more or less likely to buy more inputs than before, or new kinds of inputs?	ALL SCREENED IN
		Single response	
		Much more likely	1
		Somewhat more likely	2
		Neither more nor less likely	3
		Somewhat less likely	4
		Much less likely	5

SECTION	VARIABLE NAME	LABEL	CODING AND FILTER LOGIC
Sustainability (S)	S_33	Compared to the security and economic situation that existed before PEG, would you say that now you are more or less likely to buy new equipment or invest in new technologies or infrastructure, like irrigation?	ALL SCREENED IN
		Single response	
		Much more likely	1
		Somewhat more likely	2
		Neither more nor less likely	3
		Somewhat less likely	4
		Much less likely	5
Sustainability (S)	S_34	Compared to the security and economic situation that existed before PEG, would you say that now you are more or less likely to plant more land than you did before?	ALL SCREENED IN
		Single response	
		Much more likely	1
		Somewhat more likely	2
		Neither more nor less likely	3
		Somewhat less likely	4
		Much less likely	5
Sustainability (S)	S_35	Compared to the security and economic situation that existed before PEG, would you say that now you are more or less likely to plant new crops that you haven't planted before?	ALL SCREENED IN
		Single response	
		Much more likely	1
		Somewhat more likely	2
		Neither more nor less likely	3
		Somewhat less likely	4
		Much less likely	5

FOCUS GROUP DISCUSSION GUIDE FOR AGRICULTURAL & LIVESTOCK BENEFICIARIES

Date/Location:	
FGD Number:	

Group Type and composition.	Please Indicate if it's Lead Farmers or Contact Farmers for Agriculture sector or it's Livestock Farmers (All livestock farmers are contact farmers). Number of Men or Women present.
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Background

We are from HACOF and we are part of a team conducting the final performance evaluation of the Partnership for Economic Growth (PEG) program implemented by SATG. The aim of the evaluation is to understand how the activities of the program have helped to improve agriculture/livestock farming practices at both the household and community levels. As part of today's discussions we will also be asking you about suggestions to further improve the effectiveness of this program and future economic growth programs.

As recipients of the program we hope that you will participate fully in sharing your experience and how you have benefited from the program in an open and honest manner. We assure you that we will not share your individual names with anyone and nothing will come back to you as individuals. You will only be identified as a group. The discussion will last no more than two hours; we kindly request that everyone participate freely. We thank you very much for your willingness to participate in the evaluation.

The discussions are guided by the 5 themes listed below. Use the probing questions within the thematic area to elicit your answer

PEG Implementation Model¹⁴

- We would like to ask you some questions about how the PEG/SATG project worked in your community. First, can you describe how the project reached farmers in your community? [explain in brief if necessary].
- How did you first learn about PEG/SATG? How did PEG/SATG first start sharing knowledge with farmers in your community?
 - Did you get clear guidance from PEG on sharing information and training? Were you comfortable with sharing what you learned?
 - Did you think that your neighbors or other farmers would be interested in learning some of the things you learned from PEG?
 - Did you think this was a good way for the project to share new information in your community? What did you like about it? What didn't work very well?
- What were some other things PEG/SATG did to support farmers in your community?
 - Were they useful? Did the project support the right technologies and approaches for your community?
 - What were some good approaches they supported? What were some technologies and approaches they supported that weren't right for your community?
- Did PEG/SATG reach lots of different kinds of people in your community?
 - Did it reach women? Did it reach youth? Did it reach all parts of your community the same?
 - Who didn't it reach very well? What might the project have done to reach more people?

Adoption of new technology/Knowledge and practices

- We would like to ask you about the things that might make people change what they are doing on their farms. I would like you to name some of the things (both good and bad) that can happen in your community that might cause people to change the things they are doing on their farms. [Specifically probe on:]

¹⁴ Moderators please refer to the PEG Activity and Sub Activity note and details on the cascade model that is given to you for specific probing questions.

- Have you seen farmers doing new things in your community? What kinds of new things have you seen?
 - Have you seen any changes in your community because of changes people are making on their farms? Have you seen positive results from farmers trying new things? Have you seen negative consequences?
 - What are some things that make it easier for farmers to try new things on their farms?
- Have you seen farmers in your community doing anything differently on their farms because of PEG?
 - Have these changes been helpful for farmers? For the community?
 - Have these changes caused any challenges in your community?

Contributions to Stability

- *We would like to talk with you now about the impact that PEG has had on your community itself.*
- Are there any PEG activities that you think have brought people together in your community?
 - What kinds of activities have helped to bring people together in your community?
 - Do you think that the effects of these activities will last after the project ends? What are some ways people in your community might keep building relationships after the project end?
- Are there any ways in which PEG activities have contributed to disagreements in your community?
 - Did PEG do anything to help address the disagreements or sources of conflict? What are some things that a project like PEG can do to help the community find solutions to disagreements?

Perpetuity of Benefits

- *We've discussed some of the changes that you have seen in your community since the PEG project began. Now we want to ask you if you about the things that you expect to see in the next few years.*
- Thinking of the things that you or your neighbors are doing differently since PEG started, are there any things you think more and more people will start to do in the future?
 - Why do you think more people will continue to adopt this change? Do you think this will be good for your community?
 - Are there things you've seen that you think you might start to do in the future? How do you think you will benefit?
 - Are there any changes you hope more people in your community will make, or new things you hope more people will do? Are there any things you are planning to do to promote these changes in your communities, with your neighbors, or with other farmers?
- Are there any things the project did that you think will not last in your community?
 - Are there things you think will go back to how they were before, now that the project is ending?
 - What effect do you think this will have on you or other farmers in your community? Will this change any of the things you do on your farm in the future?

Notes/Observations

(List unique and additional observations (including special cases/stories) that came out of the discussion that can help PEG team better understand what worked and what did not work and the reasons and how it can be addressed in the future?)

FOCUS GROUP DISCUSSION GUIDE FOR EXTENSION STAFF

Date/Location:	
FGD Number:	
Group Type and Composition	

Background

We are from HACOF and we are part of a team conducting the final performance evaluation of the Partnership for Economic Growth (PEG) program implemented by SATG. The aim of the evaluation is to understand how the activities of the program have helped to improve agriculture/livestock farming practices at both the household and community levels. As part of today's discussions we will also be asking you about suggestions to further improve the effectiveness of this program and future economic growth programs.

As recipients and stakeholders of the program we hope that you will participate fully in sharing your experience and how you and the farmers you serve have benefited from the program in an open and honest manner. We assure you that we will not share your individual names with anyone and nothing will come back to you as individuals. You will only be identified as a group. The discussion will last no more than two hours; we kindly request that everyone participate freely. We thank you very much for your willingness to participate in the evaluation.

The discussions are guided by the 5 themes listed below use the probing questions within the thematic area to elicit your answer.

PEG Implementation Model¹⁵

- Discuss on the merits of the Implementation Model (Cascade model) of PEG/SATG intervention. (Probe on how were they were approached, what trainings they received, were there any challenges on training the farmers? How were the farmers selected? Was the criteria used for selection adequate? Were the PEG activities appropriate for the field conditions of the farmers they trained? What was the feedback from the farmers if any on the interventions? Were they able to see specific impacts on women farmers and youth, what were they? Did they observe transfer of knowledge to neighboring farmers, did the cascade model work? What measures are required to sustain this model? What can be done differently than now?)

Perpetuity of Benefits

- Discuss their view as extension agents on the sustainability of PEG related interventions in the absence of PEG support (Probe on what PEG interventions worked in the field, and what did not work and why/why not? What steps are they taking (if they are) to ensure farmers they trained are continuing these activities, what are the challenges? What additional support do they require?) How will they use their newly acquired skill sets in the future? If they do not wish to continue after PEG support, probe why not?

Spillover Effects to Neighbors

- Discuss their knowledge on the farmers' technology transfer to neighbors. (Probe if they noticed if their trainees shared information with other farmers, beyond contact farmers for Lead farmers, and

¹⁵ Moderators please refer to the PEG Activity and Sub Activity and cascade model note that is given to you for specific probing questions.

other farmers to contact farmers. Probe if they are aware if other farmers who are non-direct PEG beneficiaries used this information and how did they use it? Ask them to cite examples.)

Contributions to Stability

- Discuss the potential contributions that PEG can have on the security situation in Somalia. (Probe if the activities initiated by PEG can help in the ongoing security situation in Somalia? If yes, probe how and if no, ask them to explain why not?) Discuss on what can be done to improve the stability in Somalia through PEG related activities.

Adoption of new technology/Knowledge and practices.

- Discuss about the things that might make people change what they are doing on their farms. I would like you to name some of the things both good and bad that can happen in your community that might cause people to change the things they are doing on their farms. Specifically probe on:
 - Have you seen farmers doing new things in your community? What kinds of new things have you seen?
 - Have you seen any changes in your community because of changes people are making on their farms? Have you seen positive results from farmers trying new things? Have you seen negative consequences?
 - What are some things that make it easier for farmers to try new things on their farms?
 - Have you seen farmers in your community doing anything differently on their farms because of PEG? Have these changes been helpful for farmers? For the community? Have these changes caused any challenges in your community?

Notes/Observations

(List unique and additional observations (including special cases/stories) that came out of the discussion that can help PEG team better understand what worked and what did not work and the reasons and how it can be addressed in the future?)

FOCUS GROUP DISCUSSION GUIDE FOR PRIVATE SECTOR

Date/Location:	
FGD Number:	
Group Type and composition.	

Background

We are from HACO and we are part of a team conducting the final performance evaluation of the Partnership for Economic Growth (PEG) program implemented by SATG. The aim of the evaluation is to understand how the activities of the program have helped to improve agriculture/livestock farming practices at both the household and community levels. As part of today's discussions we will also be asking you about suggestions to further improve the effectiveness of this program and future economic growth programs.

As recipients of the program we hope that you will participate fully in sharing your experience and how you have benefited from the program in an open and honest manner. We assure you that we will not share your individual names with anyone and nothing will come back to you as individuals. You will only be identified as a group. The discussion will last no more than two hours; we kindly request that everyone participate freely. We thank you very much for your willingness to participate in the evaluation.

The discussions are guided by the 5 themes listed below. Use the probing questions within the thematic area to elicit your answer.

PEG Implementation Model¹⁶

- Discuss the merits of the Implementation Model (Cascade model) of PEG/SATG intervention. (Probe on how were they were approached, were the field days helpful to them in linking with the farmers? Were the trainings and grants they received appropriate to their needs? Did the technologies/skills they receive help expand their business, and in what way? If no, why not? Were they able to increase supply in their respective trades? Did they make additional investments as a result of PEG to expand any activities? Were PEG activities suited to the business climate in Somalia? What more can PEG do to improve private sector development in Somalia? Did the cascade model work? What can be done to sustain it or done differently than now?)

Perpetuity of Benefits

- Discuss the sustainability of PEG related interventions in the absence of PEG support (Probe on what PEG interventions worked in the field, and what did not work and why/why not? Did they provide services beyond PEG beneficiaries? What steps are they taking (if they are) in continuing these activities, what are the challenges in continuing this work, what additional support do they require? If they do not wish to continue, probe why not?)

Spillover Effects to Neighbors

- Discuss if they transferred the knowledge and technology they received from PEG to their neighbors. (Probe if they shared information with other farmers, Lead, Contact and others beyond PEG beneficiaries. Probe if they know if this information was used by their neighbors in their farm practices, and ask them to cite examples.)

Contributions to Stability

¹⁶ Moderators please refer to the PEG Activity and Sub Activity note and details on the cascade model that is given to you for specific probing questions.

- Discuss the potential contributions that PEG has had on the security situation in Somalia. (Probe if the activities initiated by PEG can help in the ongoing security situation in Somalia? If yes, probe how and if no, ask them to explain why not? Discuss what more can be done to improve the stability in Somalia through PEG related activities. What do you expect can be done to change or to improve the business environment in Somalia?)

Adoption of new technology/Knowledge and practices.

- Discuss about the things that might make people change what they are doing on their farms. I would like you to name some of the things both good and bad that can happen in your community that might cause people to change the things they are doing on their farms. Specifically probe on:
 - Have you seen farmers doing new things in your community? What kinds of new things have you seen?
 - Have you seen any changes in your community because of changes people are making on their farms? Have you seen positive results from farmers trying new things? Have you seen negative consequences?
 - What are some things that make it easier for farmers to try new things on their farms?
 - Have you seen farmers in your community doing anything differently on their farms because of PEG? Have these changes been helpful for farmers? For the community? Have these changes caused any challenges in your community?

Notes/Observations

(List unique and additional observations (including special cases/stories) that came out of the discussion that can help the PEG team better understand what worked and what did not work and the reasons and how it can be addressed in the future?).

KII GUIDE FOR MINISTRY & PRIVATE SECTOR STAKEHOLDERS

Date/Location:	
Name of Interviewee:	
Organization/Title:	

Background

USAID has commissioned a final performance evaluation of the Partnership for Economic Growth (PEG) program. The aim of the evaluation is to understand lessons learned about conducting agriculture and livestock focused economic growth activities in South Central Somalia as well as the overall contribution at household and community level so that recommendations can be drawn for use by USAID to improve and more effectively implement future economic growth programming.

We'd like to better understand your observations, lessons learned and overall recommendations. Unless you approve, we will not identify you by your name in the transcript nor in the main report that will be written. You will only be identified by your position, and by the level of government at which you work. We take this opportunity to request that you participate in the discussion, which should last no more than one hour. We thank you very much for your willingness to participate in the evaluation.

KII MINISTRY & PRIVATE SECTOR STAKEHOLDER QUESTIONS

EQ

1, 2

1. What is the nature of your organization? Can you please provide a brief description, and a summary of your activities?
2. What are the challenges facing farmers and service providers in agriculture and livestock in South Central Somalia?
3. What support has your organization received from PEG/SATG?
4. In your opinion, what were the successes and most important impact of PEG in South Central?
5. What were the challenges to effective implementation of PEG in South Central? And to what extent would you say these challenges impacted the achievement of results?
6. What have been the benefits and challenges of local partner implementation? What are some things that could improve the implementation model?
7. Did PEG help achieve inclusive economic growth?
 - a. Yes or no? If yes give specific examples, if not what are the reasons?
 - b. Did this contribute positively or negatively to changes in stability or security?
8. I'm going to ask you about technologies/ management practices transferred by PEG:
 - a. What are the most important agricultural practices that have been adopted? To what extent have the transferred technologies/management practices been adopted by the farmers? What challenges have there been to adoption? In terms of affordability, accessibility, ease of application and perceived benefits
 - b. The same for livestock sector.
 - c. What changes both in delivery and technical approach would you make to greater benefit productivity and quality?
 - d. Did these changes bring about an increase in income and yield?
9. Has there been a difference in how PEG has reached men and women to transfer technologies? What are some reasons for these differences?
10. What specific strategies were used to ensure women's inclusion and benefit in the sub-activities and how successful were they? What changes both in delivery and technical approach would you make to greater benefit women and youth?
11. Have there been any investment deals initiated as a result of the assistance received from PEG?

12. What policies, regulations or administrative procedures have been developed as a result of the assistance received from PEG? Specify how many have been passed and how many have been implemented?	
13. Has PEG delivered program activities on time, effectively and at a high level of quality? 14. Do you believe PEG has engaged with all the direct and indirect stakeholders necessary for an effective and efficient implementation as well as a sustainable program? a. What were the challenges to inclusion? How were they mitigated? b. How was stakeholder engagement managed? Direct and indirect 15. How has PEG ensured sustainable partnership/networking with you? 16. What were the challenges with coordination? Between PEG and Ministries, and with beneficiaries in the two sub-activities and other key stakeholders in the sub-activities. How have they been mitigated? 17. What elements of PEG do you think agriculture and livestock farmers will continue to apply after the program has closed? Why?	2, 3, 4
18. How have environmental issues been taken into consideration by PEG? In terms of chemicals used and inorganic fertilizers. a. Are PEG technologies environmentally sustainable? If not what measures would you recommend to make them environmentally sustainable? 19. Has there been a change in how business is done as a result of the activities from PEG? a. When it comes to the value chain development of the agriculture and livestock sectors? 20. In your opinion, how sustainable is the business model for the Research and Agribusiness Incubation Center (RSIC)? What would you do or is required to ensure sustainability of this model? 21. How successful is the cascade model used by PEG to transfer new agricultural and livestock technologies and practices from lead farmers to contact farmers, and from contact farmers to others? Can it be sustained? And what measures are required to sustain it? 22. Overall, how successful has PEG been in ensuring the sustainability of agricultural and livestock activity benefits? (Probe on Non beneficiaries as well) a. What are anticipated limitations? b. What recommendations can you make to mitigate those limitations?	3
23. If PEG were to start over, what changes would you make? What are the main lessons learned from your experience with PEG both positive and negative?	5

KII INTERVIEW GUIDE FOR USAID AND IMPLEMENTER

Date/Location:	
Name of Interviewee:	
Organization/Title:	

Background Introduction

USAID has commissioned a final performance evaluation of the Partnership for Economic Growth program. The aim of the evaluation is to understand lessons learned about conducting agriculture and livestock focused economic growth activities in South Central Somalia as well as the overall contribution at household and community level so that recommendations can be drawn for USAID to improve and effectively implement future economic growth programming.

We'd like to better understand your observations, lessons learned and overall recommendations. Unless you approve, we will not identify you by your name in the transcript nor in the main report that will be written. You will only be identified by your position. We take this opportunity to request that you participate in the discussion, which should last no more than one hour. We thank you very much for your willingness to participate in the evaluation.

KII USAID & IP QUESTIONS

2. What has been your role with USAID/PEG/SATG?
3. How long have you worked for, or been in partnership with, USAID?
4. In your opinion, what were the successes and most important impact of PEG in South Central?
5. What were the challenges to effective implementation of PEG in South Central? And to what extent would you say these challenges impacted the achievement of results?
6. What have been the benefits and challenges of local partner implementation? What are some things that could improve the implementation model?
7. Has SATG's implementation strategy for the sub-activities been effective and if so in what ways?
8. Has PEG been able to achieve the desired results of promoting economic growth? What about improving stability?
 - a. Yes or no? If yes give specific examples, if not what are the reasons?
 - b. Can you give a summary of statistics of achievement? (Collect secondary data where available)
9. How well has PEG managed to maintain quality assurance in delivery of activities?
10. Could you describe the management systems in place and associated challenges in terms of:
 - o Strategic and Operational Planning
 - o Monitoring and Evaluation
 - o Human resource management
 - o Financial administration
 - o Reporting
11. How effective was the coordination between USAID and IPs, DAI and SATG, with Ministries and beneficiaries in the two sub-activities? What challenges were encountered and how have they been mitigated?
12. In your opinion, what do you think worked and what did not work in how beneficiaries were identified and selected for the sub-activities?
 - a. How were challenges of inclusion mitigated?
 - b. How was stakeholder engagement managed? Direct and indirect
 - c. What can be improved about it?

EQ

1, 2

1, 2, 3, 4

13. How were key activities identified and selected within the agricultural and livestock sub-activities? a. What changes both in delivery and technical approach would you make to greater improve productivity, income and yield? 14. What elements of PEG do you think agriculture and livestock farmers will continue to apply long after the program has closed? Why? 15. What evidence is there to show increased food availability and farmer incomes and employment at household levels? 16. How have environmental issues been taken into consideration by PEG? In terms of chemicals used and inorganic fertilizers. a. Are PEG technologies environmentally sustainable? If not, what measures would you recommend to make them environmentally sustainable? 17. In your opinion, what were the most impactful aspects of the sub-activities? And why?	
18. What specific strategies were used to ensure women's inclusion and benefit in the sub-activities? a. What changes both in delivery and technical approach would you make to greater benefit women and youth? 19. How many of the recommendations from the 2014 USAID Gender Assessment did PEG incorporate? (Show recommendation summary sheet) a. What steps are being taken to further incorporate them? b. What challenges have you encountered in implementing these recommendations? c. What changes have you seen as a result of incorporating them, both positive and negative? d. How can the positive changes be sustained?	4
20. How successful has PEG been in ensuring the sustainability of agriculture and livestock sub-activities benefits? a. What are anticipated limitations in ensuring perpetuity of benefits? b. What recommendations can you make to address these limitations?	3
21. If you were to start over, what changes would you make? What are the main lessons learned from your implementation experience both positive and negative.	5

ANNEX 7: LIST OF KEY INFORMANTS INTERVIEWED

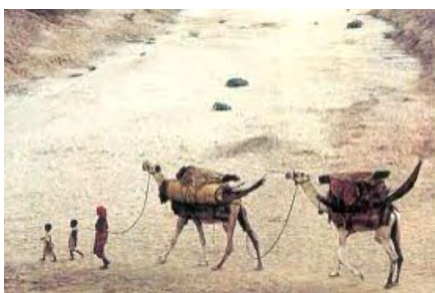
Phase 1 and 2 Key Informants have been redacted.

ANNEX 8: LIST OF FOCUS GROUP DISCUSSIONS

FGD participants and locations have been redacted.

ANNEX 9: FACTSHEET ON DATA COLLECTION AND QUALITY LESSONS LEARNED

Final Evaluation of Partnership for Economic Growth - Lessons from Pilot Data Collection

**Duration:**

September 2015 – March 2016

Purpose and objectives:

To assess the entire data collection and storage system, to ensure all parts of the system are operating efficiently and that the system can generate high quality data.

To test: (i) the questionnaires; (ii) the mobile data collection platform (software and hardware); and (iii) the data quality control system

Key Findings:

Respondents interviewed by telephone were often impatient if there had been no appointments and they were caught unprepared for interviews. In some cases this resulted in the abrupt termination of the call.

There was no final statement in the survey to alert interviewees when the interviews ended. Scripts were automatically saved in devices.

Out of 48 respondents contacted, five (approx. 10 percent) names indicated in list of samples were

ACTIVITY OVERVIEW

In July 2015, USAID/Somalia assigned Task Order AID-623-TO-15-00006 to Somalia Program Support Services (SPSS) for the final evaluation of Phase 2 of the Partnership for Economic Growth (PEG) activity. SPSS carried out the evaluation and submitted an advanced draft to USAID/Somalia on September 24, 2015.

The USAID reviewers, however, had questions on the findings, and reservations related to data quality; they did not approve the draft evaluation. Instead, on January 8, 2016, after discussions among the partners, USAID/Somalia issued a Modification to the Task Order authorizing SPSS to implement a report improvement plan, to include the collection of supplementary data to provide accurate and comprehensive information addressing questions on the draft report. SPSS revised the questionnaires to ensure that final survey data would meet USAID quality standards.

The first round of pilot-testing of the new questionnaires took place at the end of January 2016. When the test results came in, SPSS staff noted significant anomalies in the data set submitted by the sub-contracted firm. SPSS staff decided to do without the subcontractor and continue the consultative process directly with Development Alternatives Inc. (DAI), the lead Implementing Partner, and its sub-contractor, Somali Agriculture Technical Group (SATG).

SAMPLING

A sample set of 40 respondents was selected, both crop and livestock farmers, dispersed among the four target districts of Afgoi, Balad, Awdeghle, and Banadir. From March 13 – 16, 2016, SPSS staff carried out the data collection; of the 40 respondents, 25 were interviewed by telephone and 15 were interviewed face-to-face.

CHALLENGES AND SOLUTIONS***Contents of the scripted questionnaire and its application:***

- Respondents' tight schedules occasionally resulted in impatience about the length of a questionnaire. It is

not true owners of the corresponding phone numbers; Out of 48 respondents contacted, nine (approx. 19 percent) respondents refused to participate for “security reasons;” Respondents were unfamiliar with 3m x 4m tomato plots; on further inquiry it was found that farmers commonly used a quarter of Jibaal as unit of measure.

Implementing Partner:
Development Alternatives Inc.

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Puntland, Somaliland, South Central Somalia

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advisable to book appointments in advance with respondents if possible.

- Many questionnaires were submitted automatically before the end of the interview if the option for farmers (Crop) was chosen at the beginning. To solve this, changes were made within the tool to allow for automatic saving after the final entry was made, preventing automatic submissions.
- Lack of Space - there was no space on the tablet for the measurement of farm land. This was addressed by including absent variables on the questionnaire.

Use of mobile devices

- Respondents were often reluctant to take part in telephone interviews with strangers for security reasons. This can sometimes be avoided by sending a text message prior to the interview and waiting for a response before calling. While waiting, the interviewer can move to the next respondent identified for sampling
- There was occasionally too much noise in the background during an interview as the respondent was either at work or walking. Making prior arrangements by text message on when and where to meet can resolve this problem.
- Interviewees were sometimes unavailable for a telephone interview as their phones were engaged, switched off, or otherwise unreachable. Again, booking appointments with respondents by text message and following up by agreed date and time can resolve this problem.

OPERATIONAL CONSIDERATIONS

To promote quality assurance, it is important to have daily check-ins with field team leaders on issues regarding survey questions and skip logic, as well as challenges in data collection. Daily quality control callbacks will better ensure data quality and will address challenges and issues in the data collection process.

The research team must see to it that data is synced on a daily basis so data can be downloaded and checked every day and all issues can be identified and brought to the attention of team leaders who can make corrections as necessary on a real time basis.

SPSS, along with the DARS, will assess a subset of data collected within the first four days. During analysis of subset data, data collection will be put on hold until the subset is analyzed and the results are found to be satisfactory.

ANNEX 10: LIST OF REFERENCES

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ANNEX 11: DISCLOSURE OF ANY CONFLICTS OF INTEREST

COI forms have been redacted.

ANNEX 12: TEAM CVS

Team CVs have been redacted.