PII-MSU-2

*Expanding Pulse Supply and Demand in Africa and Latin America: Identifying Constraints and New Strategies*

**Lead U.S. Principal Investigator**
Richard H. Bernsten, Cynthia Donovan, and Eric Crawford Michigan State University

**Collaborating Scientists**
David Kiala, University Jose Eduardo dos Santos (formerly known as University Agostinho Neto), Angola; Feliciano Mazuze, Mozambican Institute for Agricultural Research (IIAM), Juan Carlos Rosas, Escuela Agrícola Panamericana (Zamorano, EAP), Honduras

**Project Problem Statement and Justification**

Angola: Common beans and cowpeas are important crops for smallholder farmers in Angola, but marketing constraints are clearly found in surveys in the Planalto region of the country. Looking more specifically at common beans, we find that many farmers sell into the local markets at harvest time simply because of convenience. Farmers who sell in more distant markets (27% of farmers in the region, based on survey estimates) indicate that they choose those markets in order to get higher prices, but they have transport expenses, as well as information constraints, making this marketing more risky. Some 28 percent of farmers determine when to sell their beans based on price, yet the information available to help guide this choice is limited. More research is needed for cowpeas to understand market effectiveness and efficiency. Initial work indicates low price in the market and low quantity marketed making it less competitive.

A key question is whether or not there are areas for greater efficiency in the marketing system that would enable Angolan farmers to contribute greater amounts, substituting for imported beans and cowpeas as well as meeting unmet needs in the urban areas for the quality of beans demanded. Preliminary market research indicates a preference for local varieties, yet smallholder farmers in the Planalto region lack marketing strategies to reach those markets and trade organization appears weak, implying high transaction costs. Approximately 36% of households in a recent survey indicated that common beans were the most important source of cash income from crops, with about two-thirds of household production sold, for those households growing beans. There are three key marketing months for beans: January, February and June, while cowpeas seasonality varies. Research is needed to track the beans and cowpeas through the marketing channels and identify the costs and margins at each transaction level.

Research conducted in the first phase of this project demonstrates the importance of bean marketing for farmers, highlights key aspects on how they market, and identifies the key marketing channels for beans only. It was not possible to include cowpeas. Phase II of the research and training will identify the costs associated with the marketing channels, identify potential sources of information, and work with local organizations to ameliorate the information gaps which are reducing profitability and overall transactions for beans and cowpeas.

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1 At the recommendation of the TMAC, project components in Honduras end September 30, 2011, so there are no FY2012 activities with Honduran colleagues.
Mozambique: In Mozambique, both cowpeas and common beans are marketed and the local market information system (SIMA) shows high seasonality in prices for the common bean, whereas cowpeas tend to have less dramatic variability, with more flexibility in planting seasons and locations. Cowpeas and common beans have different marketing channels, and the preliminary research on this with the market information system indicates that wholesale common bean traders often do not work with cowpeas or other legumes and prefer to specialize. Cowpea markets tend to be more localized, but recent developments suggest that new markets for processing may be arising. Research is needed to identify any new portions of the value chain for cowpeas, as well as track the costs occurring through the various channels, both for cowpeas and common beans. The formation of the Bean Task Force\(^2\) was delayed from Phase I, but will be part of the efforts in the closing months of FY2011 and then into FY2012.

Some common bean traders have demonstrated innovations to gain efficiencies in their trading, using cell phones and automatic 24-hour banking machines. It is our understanding that these innovations linked with new and traditional marketing channels will help to identify where farmers can improve their interactions with markets. Cowpeas tend to be more frequently traded in local markets, and research will focus more on these market channels as well.

Phase I research has identified the basic marketing channels, demonstrated differing seasonal price patterns for cowpeas and common beans, and evaluated where the beans and cowpeas of grown and marketed. Since cowpeas are generally grown in different agroecological zones than common beans, and cowpeas have a lower overall marketed volume, it will require additional time in markets outside the common bean markets.

**Planned Project Activities for FY 2012**

Overview: This research will seek to continue our research on markets and the potential for market enhancements for smallholders in Angola and Mozambique. A key aspect will be establishing a data bank with information on beans and cowpeas. In Angola, cowpea information is scarce and will continue to be a challenge.

Angola and Mozambique: During Phase I of the Pulse CRSP, research in both Mozambique and Angola sought to describe and understand bean producers and their relationship to markets. There is substantial analytical work that will be completed in the next few months, but existing analysis for farmers and trading systems in Mozambique and in Angola has highlighted some key features of bean production and marketing. Beans are seen as a cash crop by many farmers; trade networks are responsive to change; traders travel long distances and may specialize in beans; traders are adapting to new technologies and services (for example, cell phones and automatic teller machines at banks); and farmers make investments in improved varieties. Given what we are learning with this early work, we have identified the need to address efficiency concerns in marketing, both by traders and by farmers.

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\(^2\) Bean Task Force may seem a misnomer as it includes cowpeas and common beans, but in Portuguese, it is *Grupo de trabalho de feijão*. The Mozambican phrase for cowpea is *feijão nhemba* and for common bean, the phrase is *feijão manteiga*.
In both Mozambique and Angola, we will continue to provide training workshops and guidance on value chain research for common beans and cowpeas, including price analysis, partial budgeting on technologies, cost benefit analysis, and market cost structure. The two graduate students undertaking MS studies will finish their programs and return to their home countries in late-2011 to conduct outreach as well as additional research on pulses. Each will help to provide skills to their institutions. Two new IIAM staff will gain English language training for future graduate studies.

**Objective 1: Angola**

1.1 Identify efficiency in marketing channels of beans and cowpeas and leverage points to increase farmer profits and trader volumes.

**Collaborators**

David Tunga, Food Security Department, MINAGRI; Moises Lima and Fabio da Cruz, World Vision PRORENDÁ project, Huambo.

**Approaches and Methods:** Our Pulse CRSP efforts will focus on understanding the market efficiency within current bean and cowpea markets, differentiating the beans purchased for local consumption in urban areas of Huambo and neighboring provinces and the beans purchased for sales in Luanda, by far the most concentrated urban market. Recent research demonstrates that farmers usually sell their beans either from their farms or in local markets for the ease of sales and to meet other needs for funds. Local beans are valued in the markets, yet it is critically important to track the costs and margins down with the value chain identified in early work. This research has focused on common beans as almost no farmers grew cowpeas or marketed cowpeas in the Planalto survey. We will continue to include cowpeas in the market research.

Current research is working within Huambo province to identify the marketing channels, but Phase II will include diagnostics in Luanda as well as a greater focus on the costs and time associated with the various channels. The research methodology will be structured interviews with traders and other key informants in the various segments of the value chain, a method of rapid market appraisals that have been used successfully in Mozambique. A student has been identified that is working in other provinces on cowpeas, since Huambo Province is not a major cowpea production zone. Donovan will lead the market research, and both Kiala and Donovan will participate with an Angolan research assistant and students as well as collaborators in implementing the survey and analyzing the results. Collaboration with other CRSP projects working on varietal development will be developed to help identify market linkages with varieties of high agronomic potential.

**Objective 2: Mozambique**

2.1 Identify efficiency in marketing channels and leverage points to increase farmer profits and trader volumes

Using results from bean market research in 2008 and additional work in May-June 2010, an additional rapid appraisal of bean markets in 2011 will be able to capture the costs and their variability over time. Donovan will lead the work with the Mozambican market information system team and with IIAM researcher. Identification of varieties will be included in this
research, in collaboration with the PSU team and their IIAM researchers. Development of the Bean Task Force is a critical component to taking the research to the stakeholders and jointly developing value chain modifications to meet market demand. The Bean Task Force will include representatives large scale traders, potential processors (no existing processing in Mozambique), small scale traders, farmer associations, and producers.

Collaborators
Jill Findeis, Pennsylvania State University; Magalhaes Miguel and Celestina Jochua, IIAM, Mozambique; Arlindo Miguel and staff at the Agricultural Market Information System (SIMA), MINAG; Stephen Boahen, IITA (Mozambique); Alda Tomo and Isabel Cachomba, IIAM/CESE; Billy Mwiinga, WFP Mozambique P4P coordinator; Cuan Opperman, TradeHub (USAID/Southern Africa Region); Randy Fleming, Agrifuturo (USAID/Moz).

Approaches and Methods: We propose action research with farmers and traders to improve their information systems, while enhancing our knowledge of the markets and potential for growth in bean markets. By “action research”, we use the definition provided by Reason and Bradbury (2001): “a participatory, democratic process concerned with developing practical knowing in the pursuit of worthwhile human purposes, grounded in a participatory worldview. It seeks to reconnect action and reflection, theory and practice, in participation with others, in the pursuit of practical solutions to issues of pressing concern to people” (p.1). To complement the farmer-level research methods used in the Pulse CRSP project, this Phase 2 research makes use of trader interviews. To complement the PSU project with their 8 sites, we will be developing trader research associated with the seed distribution system. The market rapid appraisal in Mozambique showed us that a single market visit was insufficient. Both cowpeas and common beans have markets that shift over time and space throughout the year. To ensure repeated market and more farmer visits, as well as to assist other bean-related activities of Pulse CRSP and IIAM researchers, we have assumed that the vehicle for the Northwest Zonal Research Station will be in place for FY2012, to relieve the extreme transport constraints and dispersed production zones and markets.

2.2 Develop cell phone-based information system for beans, to link farmers and traders to market prices and availability

Collaborators
Arlindo Miguel and staff at the Agricultural Market Information System (SIMA), MINAG; Helder Vicente, Provincial Directorate of Agriculture, Zambézia; Alda Tomo, IIAM/CESE; Billy Mwiinga, WFP Mozambique P4P coordinator; ADRA and World Vision (NGOs)

Approaches and Methods: This new work would link to developments in Zambezia Province to enable greater communication between farmers and markets. It entails additional field interviews with traders and with farmers, with repeated observations through time, through the linkage with the market information system. We will work to establish a link with selected bean traders as key informants on the research, using cellphones. This work will build on the PABRA 2009-2013 country work plan in Mozambique and World Food Programme’s Purchase for Progress (P4P) as well as PSU project research with farm communities. Throughout this work, there will be a focus on market demand and assessment of varietal availability. Improving
knowledge of availability of quality seeds for improved varieties through radio and cell phone may increase their use, and we will work with the Penn State CRSP project on this aspect.

**Objective 3: Capacity Building**

**Angola:** Estevao Chaves, graduate of UAN, is expected to finish his thesis in late 2011.

Donovan with a CESE staff member from Mozambique will conduct additional training for students at UAN/Huambo as well as IIA concerning partial budgeting. Eric Crawford will conduct a cost/benefit training course for students/faculty.

Two UAN staff/students will travel Mozambique to for training courses on partial budgeting, as well as work with SIMA/CESE on price collection while learning about the MIS system in place.

**Mozambique:** CESE staff member Ana Lidia Gungulo is anticipated to finish her thesis by late 2011 and return to Mozambique.

Staff members of the Center for Socio-Economic Studies (CESE) will receive additional training on data analysis, including household survey analysis with TIA data. Survey research methods and cost benefit courses will be directed to CESE staff members to ensure their ability to respond to needs in bean and other research, but will include Directorate of Economics Staff and possibly other collaborators where appropriate.

For IIAM/CESE, it is assumed that the vehicle requested to be able to conduct the critical bean research out of the Northwest Zonal Research Center will be available. The common bean productions zones are in three distinct parts of agroecological Region 10 (map attached).

**Capacity Building: Communication Technology (stemming from extra capacity building funding in FY2011)**

Both Mozambique and Angola have benefited from the Capacity Building project which was developed for computers, cameras, microphones and Camtasia software. Sostino Mocumbi of IIAM and Guilherme Eculica of UAN (UJES) will continue to support enhancement of skills with the technology, as each moves forward developing didactic materials. There is no FY 2012 funding for this area of effort.

**Contribution of Project to Target USAID Performance Indicators**

**Angola:** With the links with the farmer associations, we expect to be able to highlight successful marketing strategies in the local markets. We will also be working to link these associations with buyers in these markets.

**Mozambique:** Through the market information system of MINAG, we will reach producer associations in one of the main bean production zones, while also reaching other associations in the area of research of the PSU Pulse CRSP project. The market price system will enable private sector producers, traders, and processors to access current and useful information using cell phone technology.
The policy research will target trade and investment policy actions to improve the efficiency of bean trading as we present the key cost aspects of the trade and identify ways to minimize them.

**Target Outputs**

**Mozambique**

1) Farmers and traders in Mozambique in bean/cowpea marketing zones of Mozambique will have access to market information via radios and cellphones. Working with NGOs including World Vision and ADRA in Zambezia, at least 4,000 farmers will have access by the end of FY2012.

2) Availability of improved seeds and their use will be enhanced through improved communication of seed supply availability using MIS systems.

**Angola**

In Angola, farmers in the Planalto zone working with World Vision extension agents will have access to market price information through cell phones and radios, where possible. Expected population affected would be at least 20% of World Vision’s 27,000 farmers in the Planalto region. Farmers will increase the volume of sales through marketing channels identified as higher price channels.

**Engagement of USAID Field Mission(s)**

**Angola:** The host country and US PI has met and will continue to meet with staff at USAID/Angola mission to update them on project activities. We will also ensure that research reports are distributed to mission staff and staff are invited to outreach activities.

**Mozambique:** The host country and US PI has met and will continue to meet with staff at USAID/Mozambique mission to update them on project activities. Given MSU’s long term project with USAID/Mozambique, we will be able to ensure that mission staff are invited to outreach events and receive all reports produced under the Pulse CRSP activities, as well as network effectively with other USAID projects in the region.

**Networking Activities with Stakeholders**

**Angola:** The project PIs will meet in Huambo with the development agencies involved in farmer productivity and market extension activities, including World Vision/Angola with its ProRenda project. The links of this work with that project enable also outreach directly to farmer associations (including one women’s based producer association) in the Planalto Region of Angola. Discussions are ongoing with the Farmer to Farmer program sponsored by USAID/Angola.

**Mozambique:** The links with both IIAM researchers in the field and with the market information system SIMA will enable us to conduct outreach both through mass media (internet, TV, and radio) as well as to meet with farmers organizations in the regions in which beans and cowpeas are being promoted. With the research output from Phase I, it is hoped to enter Phase II with a “Feijão” Task Force moving forward to help develop knowledge on the supply and demand of beans and cowpeas. This Task Force will include work with Agrifuturo (USAID/Mozambique)

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3 The word Feijão in Portuguese covers both beans and peas.
and TradeHub (USAID/Southern Africa). It will also help research to identify the key cropping area and associated varieties for promotion to meet market demands.

**Leveraging of CRSP Resources**

**Angola:** UAN is providing all salary support for Dr. Kiala. In addition, it provides vehicles for all research and work environment for Donovan while in Angola, as well as training facilities. Donovan will be able to leverage some travel to Angola with other work under a contract with World Vision in Angola. Thus, trips will be proportionately charged each time depending on work requirements and timing.

**Mozambique:** IIAM/CESE supports the project in various ways. Salary support for Mazuze and CESE analysts is provided through the government budget, as is work space for the activities. It provides vehicles for some of the research. For the new vehicle at the Northwest Zonal Research Center, IIAM/CESE will provide a driver, maintain the vehicle, and cover many of the other operational costs for the vehicle. The Mozambique Food Security project with USAID covers some market research costs in its support of the market information system, and where possible, costs are shared. By combining travel between FSG and Pulse CRSP, Donovan is often able to stretch the travel dollar to cover more trips. Alda Tomo research on beans will also have costs shared with the PABRA network activities, as we leverage those funds.
Training/Capacity Building Workplan

Degree Training:
First Names: Ana Lidia
Last Name: Gungulo
Nationality: Mozambican
Sex: Female
Institution: University of Pretoria, South Africa
Supervising CRSP PI: Cynthia Donovan
Degree Program for training: MS
Program Areas or Discipline: Agricultural Economics
If enrolled at a US university, will Trainee be a “Participant Trainee” as defined by USAID? Not applicable
Host Country Institution to Benefit from Training: IIAM
Thesis Title/Research Area: Expanding Pulse Supply in Mozambique: Identifying Constraints and New Strategies
Start Date: January 2009
Projected Completion Date: December 2011
Training status (Active, completed, pending, discontinued or delayed) Active
Type of CRSP Support (full, partial or indirect) for training activity: Full CRSP support

First Names: Estevao
Last Name: Chaves
Nationality: Angolan
Sex: Male
Institution: Federal University of Vicosa, Brazil
Supervising CRSP PI: Cynthia Donovan
Degree Program for training: MS
Program Areas or Discipline: Agricultural Economics
If enrolled at a US university, will Trainee be a “Participant Trainee” as defined by USAID? Not applicable
Host Country Institution to Benefit from Training: University of Jose Eduardo dos Santos, Angola
Thesis Title/Research Area: price transmission for common beans in Mozambique: A study of spatial market integration
Start Date: January 2009
Projected Completion Date: December 2011
Training status (Active, completed, pending, discontinued or delayed) Active
Type of CRSP Support (full, partial or indirect) for training activity: Full CRSP support
Short-term Training:

Type of training: Intensive English Course
Description of training activity: One CESE analyst will live with a family in South Africa and study English intensively, with 30 sessions per week
Location: Capetown, South Africa
Duration: 8 weeks
When will it occur? February 2012
Participants/Beneficiaries of Training Activity: 1 Anticipated numbers of Beneficiaries (male and female) 1 female
PI/Collaborator responsible for this training activity: Mazuze
List other funding sources that will be sought (if any):
Training justification: In order to gain from regional interactions and research, as well as compete for graduate studies, CESE analysts need to have excellent English skills.

Type of training: Price analysis and market efficiency analysis
Description of training activity: Participants will work with data from market rapid appraisal to understand analytical methods and research issues related to marketing costs and margins
Location: Huambo, Angola
Duration: 1 week
When will it occur? January 2012
Participants/Beneficiaries of Training Activity: 12 (12 from UAN/Angola)
Anticipated numbers of Beneficiaries (male and female) 6 women and 6 men
PI/Collaborator responsible for this training activity: Donovan
List other funding sources that will be sought (if any):
Training justification: the training will enable researchers to use the available information to look at markets and margins, and will help design the coming market research. It will provide empirical methods in basic price analysis that can also be used by students in the UAN Program in Angola, as they conduct market research.

Type of training: Partial Budgeting of Agricultural Technologies
Description of training activity: Based on existing training materials, participants will work with examples and complete analysis to understand analytical methods to compare new and existing technologies based on partial budgeting methods
Location: Huambo, Angola
Duration: 1 week
When will it occur? April 2012
Participants/Beneficiaries of Training Activity: 20 (15 from UAN and 5 from IIA)
Anticipated numbers of Beneficiaries (male and female) 10 women and 10 men
PI/Collaborator responsible for this training activity: Donovan with CESE analyst
List other funding sources that will be sought (if any): IIA collaboration in local logistics
Training justification: The analytical approach to technology evaluation will be able to assist IIA in future technology development choices, as well as provide an empirical method appropriate for students in the UAN Program.

Type of training: Partial Budgeting of Agricultural Technologies
Description of training activity: Based on existing training materials, participants will work with examples and complete analysis to understand analytical methods to compare new and existing technologies based on partial budgeting methods
Location: Nampula, Mozambique
Duration: 2 weeks
When will it occur? August 2012
Participants/Beneficiaries of Training Activity: 12 (10 from Northeast Zonal Center and 2 from SPER- Nampula)
Anticipated numbers of Beneficiaries (male and female) 2 women and 10 men
PI/Collaborator responsible for this training activity: Donovan with CESE analyst
List other funding sources that will be sought (if any): IIAM collaboration in local logistics; MSU FSG to share costs
Training justification: The analytical approach to technology evaluation will be able to assist IIAM researchers and extension officials in future technology development choices.

Type of training: Introductory Cost Benefit Analysis for Agricultural Research
Description of training activity: Participants will work with examples and complete analysis to understand analytical methods of cost benefit analysis
Location: Maputo, Mozambique
Duration: 2 weeks
When will it occur? May 2012
15 (CESE and DAP staff members)
Anticipated numbers of Beneficiaries (male and female) 6 women and 9 men
PI/Collaborator responsible for this training activity: Crawford
List other funding sources that will be sought (if any): MSU FSG project
Training justification: Knowledge of the analytical approaches of CBA are valuable tools to assist IIAM analysts in technology evaluation.

Type of training: Market efficiency analysis
Description of training activity: Participants will work with data from market rapid appraisal to understand analytical methods and research issues related to marketing costs and margins
Location: Maputo, Mozambique
Duration: 1 week
When will it occur? January 2012
Participants/Beneficiaries of Training Activity: 17 (2 from UAN/Angola, 10 from IIAM, and 5 from Directorate of Economics/MINAG, which includes SIMA)
Anticipated numbers of Beneficiaries (male and female) 6 women and 6 men
PI/Collaborator responsible for this training activity: Donovan with SIMA Arlindo Miguel
List other funding sources that will be sought (if any): MSU USAID/Mozambique Food Security Project
Training justification: the training will enable researchers to use the available information to look at markets and margins, and will help design the coming market research. It will provide empirical methods that can also be used by students in the UAN Program in Angola, as they conduct market research.

Type of training: Survey research methods (delayed from FY2011)
Description of training activity: Participants will attend sessions specific aspects of survey methods and evaluate existing survey instruments and methods in exercises
Location: Maputo, Mozambique
Duration: 2 weeks
When will it occur? March 2012
Participants/Beneficiaries of Training Activity: 15 (9 CESE analysts and 6 DAP analysts)
Anticipated numbers of Beneficiaries (male and female) 6 women and 9 men
PI/Collaborator responsible for this training activity: Bernsten and Mazuze
List other funding sources that will be sought (if any):
Training justification: The training will enable analysts to develop and evaluate survey methods for agricultural research and adoption evaluation

Equipment (costing >$5,000): None
### Dry Grain Pulses CRSP: SECOND PERIOD

**Project Title:** Expanding Bean Supply & Demand in Africa & Latin America  
**10/01/11 - 09/30/12**

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**Total**

| Total Direct Cost | $49,040 | $4,560 | $20,260 | $36,040 | $0 | $6,619 | $6,538 |
| Grand Total       | $123,057 | | | | | | |

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### Attribution to Capacity Building

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**Total direct cost budgeted for U.S. institution(s):** $101,720  
59.4%

**Total direct cost budgeted for H.C institution(s):** $69,457  
40.6%
**Objective 1: Angola**

Specific Obj 1. Identify efficiency in marketing channels & leverage points to increase farmer profits & trader volumes

- Rapid appraisal field research in common bean markets conducted with students: x
- Rapid appraisal field research in cowpea markets conducted with students: x
- Common bean market efficiency report drafted and distributed: x
- Outreach with farmer associations and local agencies: x

**Objective 2: Mozambique**

Specific Obj 1. Identify efficiency in marketing channels & leverage points to increase farmer profits & trader volumes

- Report on Rapid Appraisal Survey 2012 finalized and distributed: x
- Outreach on Rapid Appraisal Survey 2012 results with NGOs and farmer orgs.: x
- Market efficiency report drafted and distributed: x
- Outreach to Bean Task Force on marketing efficiency preliminary results: x

Specific Objective 2. Develop cellphone-based information system for beans, to link farmers & traders to market prices & availability

- Cell phone system training for bean producer groups: x
- Preliminary assessment of use of cell phone system: x

**Objective 4: Capacity Building**

**Angola**

- MS thesis finalized: x
- Outreach on MS thesis research: x
- Students trained on price and market analysis: x
- Students trained on partial budgeting analysis: x

**Mozambique**

- MS thesis finalized: x
- Outreach on MS thesis research: x
- CESE staff trained on survey research: x
- CESE staff trained on market efficiency analysis: x
- CESE staff trained on partial budgeting analysis: x
- CESE staff trained on Cost Benefit analysis: x
- CESE staff completes Intensive English course: x

**Name of the PI responsible for reporting on benchmarks**

Donovan  Donovan-Kiala  Donovan-Mazuze

**Signature/Initials:**

Date:
### Output Indicators

<table>
<thead>
<tr>
<th>Degree Training: Number of individuals who have received degree training</th>
<th>2012 Target</th>
<th>2012 Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of women</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Number of men</td>
<td>1</td>
<td>1</td>
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</table>

<table>
<thead>
<tr>
<th>Short-term Training: Number of individuals who have received short-term training</th>
<th>2012 Target</th>
<th>2012 Actual</th>
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<tbody>
<tr>
<td>Number of women</td>
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<td>20</td>
</tr>
<tr>
<td>Number of men</td>
<td>30</td>
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<table>
<thead>
<tr>
<th>Technologies and Policies</th>
<th>2012 Target</th>
<th>2012 Actual</th>
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<tbody>
<tr>
<td>Number of technologies and management practices under research</td>
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<td>6</td>
</tr>
<tr>
<td>Number of technologies and management practices under field testing</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Number of technologies and management practices made available for transfer</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Number of policy studies undertaken</td>
<td>2</td>
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</table>

<table>
<thead>
<tr>
<th>Beneficiaries:</th>
<th>2012 Target</th>
<th>2012 Actual</th>
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</thead>
<tbody>
<tr>
<td>Number of rural households benefiting directly from CRSP interventions - Female Headed households</td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>Number of rural households benefiting directly from CRSP interventions - Male Headed households</td>
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<tr>
<td>Number of agriculture-related firms benefiting from CRSP supported interventions</td>
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<td>3</td>
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<tr>
<td>Number of producer organizations receiving technical assistance</td>
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<tr>
<td>Number of trade and business associations receiving technical assistance</td>
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<td>1</td>
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<tr>
<td>Number of community-based organizations receiving technical assistance</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Number of women organizations receiving CRSP technical assistance</td>
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<td>2</td>
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<tr>
<td><strong>Number of public-private partnerships formed as a result of CRSP assistance</strong></td>
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<td></td>
</tr>
<tr>
<td><strong>Number of HC partner organizations/institutions benefiting</strong></td>
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<td></td>
</tr>
<tr>
<td><strong>Developmental outcomes:</strong></td>
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<td></td>
</tr>
<tr>
<td><strong>Number of additional hectares under improved technologies or management practices</strong></td>
<td>100</td>
<td></td>
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