Center for Sustainable Rural Livelihoods

2010 Annual Report
Executive Summary

The CSRL team and our Partners in Uganda focused this year on initiating Phase II of our field programs. The transition to Phase II activities was based on an in depth assessment of program strengths, weaknesses, and opportunities after five years working with households in Kamuli. Current efforts are focused on achieving sustainable improvements in food security in more households, expanding school-centered activities, and increasing entrepreneurial opportunities for rural households. The program will work with 1,200 households selected in ten Parishes, including the new Parishes of Kisakye, Bugeywa, Kasozi, and Naibowa. An intensive baseline survey of these new households is being conducted prior to the first growing season in 2011 to document the current level of food security, household nutrition, and entrepreneurial activities in the Phase II program households.

Program highlights include (but are not limited to):

Twelve Community Based Trainers were hired with responsibility for 100 households each. New Information Education and Communication (IEC) materials were developed on maize production agronomy. Charts focused on post-harvest handling and grain storage are in process.

Thirty-six demonstration sites were established in the ten program Parishes to enhance farmers’ knowledge and access to extension services. Demonstrations include comparison of soil fertility treatments, open pollinated vs. hybrid maize, and intercropping vs. monoculture for maize and beans.

The CSRL program provided funds to drill two new boreholes and repair seven old boreholes. Also, the CSRL Program Officer and District water officer worked with the communities to build their capacity to take over management of the boreholes. A specific effort was made to train water user committees in these communities in theory and practical borehole management.

Activities in the primary schools continue to expand and intensify. Demonstration gardens designed to “bring the community in” are being set up and used to highlight Service Learning activities and share information about nutritious crops. For the first time, Iowa women farmers were engaged in this process. The school feeding program led by our Community Nutritionist is carefully gathering information about student responses to improved nutrition. And the Service Learning program is attracting some of the brightest student leaders from Makerere University and ISU. Thanks to the generous support of our donors, we now have plans underway to build a dormitory for girls at Namasagali Primary School in 2011.

The creative efforts and hard work of our Associate Directors and collaborators are solving a number of problems facing the small landholder farmers. Improved production and health of pigs on individual farms, and the eventual distribution of their offspring to additional farmers translates to more than 3,000 people benefiting from this project. Student-led research on the use of cell phones has led to a communication campaign for ‘spreading the news’ about the nutritional value of grain amaranth and field beans. Service Learning students also helped test a new seed storage technique for maize and beans that completely eliminated insects in storage.

Dr. Mark Westgate, Director
Uganda Field Operations

Weather situation

Kamuli experienced a prolonged drought that adversely affected farmers’ fields and program demonstration gardens resulting in low yields. The impact of the weather situation is expected to affect the food and nutrition of program households during the hunger period of March to June 2011. It is expected that households will experience lower than normal food supply for home consumption as lower yield meant less food stored. An intensive survey is being conducted in March 2011 prior to the first growing season to document the current level of food security, household nutrition, and entrepreneurial activities in program households.

Initiation of Phase II Programs

Selection of Households

1,200 households were selected from the initial 2,100 selected in 2009. The program is working with 200 households represented by the original six Parishes. Although the Parishes are listed as six the actual number of Parishes is ten with the addition of Kisakye, Bugeywa, Kasozi, and Naibowa Parishes.

Selection and Orientation Community Based Trainers

A total of 12 Community Based Trainers (CBTs) were recruited to work with the program. A three-day orientation workshop was conducted for CBTs. They were introduced to the new approach, their roles and responsibilities were outlined, and they were trained on data collection tools and reporting formats. CBTs then were assigned to their respective areas of operations.

Training the Trainers on Facilitation Skills, Nutrition, and Developing Training Materials

The approach used in farmer training has evolved to embrace more practical and action-oriented approaches that emphasize ‘hands on’ techniques as opposed to more theoretical orientation. A three-day Training of Trainers for Program Staff (VEDCO staff and CBTs) was conducted to equip staff with better facilitation skills to emphasize ‘hands on’ experiences and practical approaches. Nutrition topics were used to test the trainers’ new skills acquired in the facilitation training.

The program is encouraging trainers to use Information Education and Communication (IEC) materials during training activities. Development of these IEC charts forms an integral part of the Phase II activities. In 2010/2011, the CSRL program developed and produced six sets of instructional charts that focus on maize production agronomy. Production of charts focused on post-harvest handling and grain storage is in process. Mango Tree Company has been contracted to develop these materials. The charts are produced in the local language (Luganda) and the instructors’ guides are in English.
**Distribution of Planting Materials**

Farmers selected maize as the enterprise to promote for home consumption and marketing in the first year of Phase II. The 1,200 households participating in the program were to receive five kilograms of improved maize seeds to multiply on their farms. This was linked to the demonstration gardens as part of the training on maize production. In the first year, 640 households received maize (mainly open pollinated varieties), beans, and groundnut seed. Four hundred farmers received maize, 175 beans and 65 groundnut seed. Some of the farmers who received seeds in 2010 have requested that the program link them to seed suppliers so that they can purchase more seeds for the variety of maize introduced by the program. This is miezi mitatu (MM3). The main challenge faced by farmers who received the MM3 maize was low germination. When this was reported to the seed supplier, they agreed to compensate the farmers with new seed. The seed has been delivered and farmers are already planting it now that the rains have started. A germination test was conducted on the maize and beans prior to seed collection. The selected seed yielded a germination rate of 93% and 91% for maize and beans, respectively. The program will be developing training materials for farmers interested in value chain development and marketing. In addition, six schools working with the program to develop school gardens received ten kilograms of maize seeds each.

**On-Farm Demonstration Gardens**

The use of Demonstration Gardens has been expanded to serve as Centers for knowledge and technology transfer to farmers. This has enhanced farmers’ knowledge and access to extension services. Three to four farmer groups are engaged with and learn from each site. In 2010, thirty-six demonstration sites were established in the ten program Parishes. Each demonstration site had five treatments:

- Hybrid maize with soil Nitrogen fertility treatments
- OPV maize with organic fertility treatments (manure)
- OPV maize without additional fertility treatments
- Intercropping beans and OPV maize (most common on-farm production method)
- Intercrop ped beans and OPV maize
- Hybrid maize with soil Nitrogen fertility treatments
- Open Pollinated Maize with soil fertility treatments
- OPV maize with organic fertility treatments (manure)
- OPV maize without additional fertility treatments
- Intercropped beans and OPV maize (most common on-farm production method)

The greater number of demonstration sites has increased the number of farmers attending practical training sessions. Follow-up interviews with farmers who received seed from the program and attended the training indicated the farmers were adopting the agronomic practices taught through demo training. These practices include but are not limited to:

- Preparing gardens well and on time
- Performing seed germination tests
- Using recommended plant spacing, plant density, seeding rates, and soil fertility practices.
- Planting in rows with recommended plant spacing
- Intercropping with different crops
- Identifying symptoms of nutrient deficiency especially
phosphorous, nitrogen and potassium and trying recommended remedies for these deficiencies

**Maize Value Chain Workshop**

The CSRL program and VEDCO aim to increase farmers’ awareness and access to local, national, regional and international markets for priority agricultural products. In Kamuli district, maize was prioritized for value chain development to improve market access.

A workshop involving a variety of stakeholders in the maize value chain was conducted to identify key opportunities and challenges along the maize value chain. This was the first stage of the long process of developing the maize value chain. Attendees mapped out cause and effect relationships to guide the development of logical and practical solutions to these challenges. They also clearly stipulated the roles and responsibility for each actor in the promotion of maize. A total of 23 participants attended (7 females and 16 males). While development of a functional value chain for maize in Kamuli is beyond CSRL program capabilities, the program will continue to ‘do its part’ by training farmers on production and storage methods needed to improve seed quality, and how to develop functional farmer groups/associations as marketing entities.

**Natural Resource Programs**

The CSRL program provided funds to drill two new boreholes and repair seven old boreholes. A consultant was commissioned to supervise the drilling and repair of the boreholes. To date, five old boreholes have been repaired with plastic piping which will prevent rusting, maintain water quality, and make it easier to pump water. The consultant also conducted the hydrological survey to determine the most suitable locations to pave the way for drilling the new boreholes.

Also, the CSRL Program Officer and District water officer worked with the communities to build their capacity to take over management of the boreholes. The water user committees in these communities have been trained both in theory and practical borehole management. The communities have contributed 700,000 UGX (~$300) toward borehole establishment in the area. Of this amount, 200,000 UGX (~$80) was paid to the district water account, and 500,000 UGX (~$220) was deposited into community borehole accounts. This was done to ensure communities are able to repair the boreholes in case of any breakdown, which has not been the case up to now.
School Centered Approach
The Learning Center at Namasagali Primary School is starting to take shape. Demonstration gardens and trials are being set up at the school farm thereby providing materials from which community farmers will be learning. One such trail on Tomato plant management for Dr. Gail Nonnecke’s students has been prepared and will be planted in March. Farmers will be invited to attend the planting so that they can learn about disease management from the exercise. The Iowa women farmers and women farmers from the CSRL program have planted a soybean demonstration garden. Over 40 women participated in this initial Farmer-to-Farmer project. The Learning Center is designed to complement work the CSRL program is doing with farmer groups.

Service Learning Field Day and Cooking Competition
In October 2010, a field day highlighting the gardens developed by the Service Learning program was held for community members and school children working with the CSRL program and other non-program farmers. Over 800 farmers and children attended. Participants were able to see gardens set up by the Service Learning participants and learn about the benefits of planting a variety of crops with high nutritional value. A cooking competition was conducted on the same day to develop recipes for the Grain Amaranth and the Bean CRSP projects.

School Feeding Program
Community Nutritionist, Laura Byaruhanga, was hired this year to continue the pilot school feeding program at Namasagali Primary School. This program is now in its third school term with 76 pupils participating. In addition to maize and beans, vegetables (mainly collard kales) were added to the school lunch after consultation with Laura Byaruhanga’s University Supervisor who advised her to increase vitamins and mineral intake. These vegetables are
obtained from the school garden. During the 2011 first term, 130 students have been recruited to join the pilot project. Nineteen pupils from the 2010 P-7 group graduated from the project after completing their primary education.

**Service Learning 2011**

Makerere University participants for the 2011 Service Learning Program were selected through a two-stage process that included oral interviews and a practical field experience in Kamuli. Ultimately, eight students were selected to participate with four additional students being included as semi-service learning participants. These four students will work with the school that is being used as a control for the Namasagali Primary school feeding program. They will assist in setting up a garden, but they will not be asked to teach at the school. They will be accommodated at the Namasagali trading center.

**Girls Dormitory/Latrine Construction**

In response to donor support, the program is working with local Government and School Administration to construct a Dormitory for Girls at Namasagali Primary School. The Community and school agreed to the contribution to the building’s construction by supplying the necessary bricks and sand. By mid March, the school had mobilized 10,000 bricks, 7 lorries of pit sand, and 3 lorries of lake sand. CRSL contributed fuel to transport the sand, and purchased the lake sand. The CSRL Associate Director for Field Operations and team Program Officer are working with Kamuli District Local government to raise the remaining 30,000 bricks to enable construction work to begin.
Livestock Programs

Activities related to the livestock production and health program continued as in previous years. This included visits to Uganda that included training and inspection of farms that were previously developed as part of the livestock work or the Monsanto funded livestock project. The two-year project funded by Monsanto ended this year. In addition to the original 100 farmers served and supported for the school gardens projects, an additional 13 farmers were served. This included 10 pig farmers (each received a male and female pig), and three goat farmers (one female goat given to each). All told, the work with the schools and individual farmers and the eventual distribution of offspring to additional farmers translates to more than 3,000 people helped by this project.

Ms. Agatha Ampaire is in the process of completing her M.S. degree, which is supported in part by CSRL. Her research was devoted to evaluating the effectiveness of the livestock program and led to the three publications listed at the end of the Annual Report. It is anticipated one new student from Uganda will be accepted into the ISU Animal Science program.

The search for new funding and grants continues. New donors have also contributed to supplement funding from continuing donors. Over $3200 has been raised to date and the expectation for this year will be close to $5,000 to purchase animals.

Technology Innovations

Using Communication Technologies for Rural Development
Graduate student Brandie Martin and Eric Abbott focused on identifying ways in which mobile phones are being used for productive agricultural and small business purposes in Kamuli District, Uganda. With support from CSRL, Martin did her field research during the summer of 2009, which was the basis for her Master’s thesis. She and Abbott also co-authored a paper that she presented at a regional conference in Kampala in March 2010.
Subsequently, UNESCO picked up and listed the paper in April 2010 in its “Information for All Programme” (“Development Calling: The Use of Mobile Phones in Agriculture Development in Uganda”). Results have since been submitted to a journal for publication.

In response to findings from Martin’s fieldwork, Abbott began work with Henry Kizito of VEDCO on development of an overall communication strategy for VEDCO and the Kamuli District that would incorporate new information technologies. In June 2010 Abbott visited VEDCO to discuss a new IT system VEDCO was acquiring that would permit the organization to send and receive SMS messages with farmers. During Phase 1 in 2010, the system would begin sending SMS messages about market information to farmers registered on its system. In Phase 2, which would come later, the system would become interactive. In addition, VEDCO plans to hire a new communications specialist to help develop and coordinate communication activities. Kizito suggested that a workshop be held in 2011 including Abbott to work out a system for identifying key communication messages and channels for priority messages. Two priority areas matching CSRL needs are messages focusing on field bean and grain amaranth production and consumption.

Designing Communication Campaign Materials for Grain Amaranth and Field Beans
During a visit to Uganda in June 2010 with Bob Mazur, two priority project areas were identified where communication could make an important difference. The first concerns grain amaranth, a key potential source of protein for pregnant women and young children. A project team (John Muyonga, Dorothy Masinde, Michael Ugen, Jenipher Bisikwa, Dorothy Nakimbugwe, and Joseph Bbemba) has worked on this initiative. A systematic communication campaign design would help focus on stimulating both production of this crop as well as methods of incorporating it into the diet of the target population. It would also include a plan for systematic evaluation to assess impact. The second concerns another priority CSRL crop for protein, field beans. The communication campaign in this case will build from a Bean CRSP coordinated by Bob Mazur with Dorothy Kanimbuge and others. One key component of the campaign would be the promotion of triple bagging as a method of insect control that would prevent post-harvest loss of beans. Another would focus on lessons learned from the CRSP about seed selection and cultivation. Again, the output would include an evaluation component to assess impact.

Grain Storage Project
Maize and edible beans grown by subsistence farmers are a staple food for millions of people around the world, especially in Uganda. Following harvest, these seeds are subject to storage losses caused by birds, rodents, fungi, and insects. On-farm hermetic storage (i.e., storage in the absence of oxygen) has the potential to substantially reduce these losses without the use of pesticides. The primary insects that cause damage are the maize weevil (maize) and bruchid beetle (edible beans).
Research in Agricultural and Biosystems Engineering at Iowa State University has documented that seed storage in hermetically sealed (air-tight) containers kills the insects rapidly, greatly reducing the amount of grain eaten by the insects. The time needed for 100% insect mortality can be predicted based on temperature, degree of infestation and amount of oxygen initially in the container.

The objectives of the tests conducted in Uganda this year were to demonstrate the feasibility and benefits of hermetic storage using recycled plastic containers, and to implement practical hermetic storage systems. Insect-infested maize and edible beans were purchased in the local market and stored in the 10-L used but cleaned edible oil containers under two conditions: (1) hermetically sealed (airtight) and (2) open to air infiltration but closed to insect migration in or out of the container. Three containers at each condition were stored at ambient temperature for four weeks. Seed weight, seed quality characteristics, and degree of infestation (live and dead) were determined before and after storage. After four weeks of storage, the number of adult insects (live plus dead) detected in the hermetically sealed containers more than doubled for maize and nearly quadrupled for the edible beans. The number of insects more than quadrupled for maize and edible beans stored in the open containers. All the insects (100%) found in the hermetically sealed containers, however, were dead. There was significantly less grain loss in the hermetic containers compared to the open containers. This experiment demonstrated that hermetic storage in recycled containers is feasible for farmers in Uganda and can result in large decreases in grain losses caused by insect infestation.

Ongoing Seed Storage Work

- We are conducting laboratory storage/mortality studies at Iowa State on bruchids. These studies will provide, similar to maize, data to allow us to predict the time for 100% bruchid mortality based on temperature, degree of infestation and the amount of oxygen initially available in the container.
- Additional research is being conducted at Makerere University to further demonstrate proof-of-concept.
- We plan to conduct larger field trials in 2011 with farmers in Kamuli District to further demonstrate feasibility and begin implementation.
Research Activities

Through a project funded by The McKnight Foundation, grain amaranth production areas are being identified, recipes and protocols are being developed and amaranth production, utilization and marketing are being promoted. This project work, led by VEDCO, also explores the impact of grain amaranth promotion on the health status, food security and income of participating communities.

In its first year of funding, the USAID funded project researching biological nitrogen fixation on common beans is underway. This project is studying the possible replacement of traditional nitrogen fertilizers for the soil with commercial seed inoculum applied directly to the bean seed. With research teams in the US, Uganda, Tanzania and Rwanda, the ultimate goal of this project is to improve the production and nutrition of beans and effectively disseminate information and technologies to small landholder farmers.

A two year extension was funded for the USAID-funded Dry Grain Pulse Collaborative Research Support Project, for which Dr. Mazur serves as Principal Investigator: Enhancing Nutritional Value and Marketability of Beans through Research and Strengthening Key Value Chain Stakeholders in Uganda and Rwanda. Total funding for 2008-2012 is $900,000. The CRSP project employs a ‘value chain’ approach for the promotion of common beans. This involves identification of management practices and technologies that will enable small holder farmers to increase bean yield and grain quality, establishing viable businesses that produce and sell quality bean seed, improving post-harvest handling (especially drying and storage, with which Dr. Eric Abbott and his students are assisting), integrating innovative methods of utilizing beans in the diet of a cross-section of the population, and collaboration with traders and food processors to increase farmers’ incomes. The project team is committed to reaching well beyond the farmers involved in field research and technology testing activities. During 2011, we are updating and refining our training materials and approaches to begin working with 400 additional farmers in the CSRL program in Kamuli to introduce new management practices and technologies, and assess how the training materials and approaches can be improved as we begin to scale up our work with even more farm households in Kamuli in 2012. Working with colleagues at the University of Illinois at Champaign-Urbana, we have already finalized translation of two short videos – on solarization and triple bagging – into Lusoga and Luganda for use in Kamuli and elsewhere in Uganda.

Monitoring and Evaluation

The annual Monitoring and Evaluation (M&E) survey is now timed to coincide with the community-identified ‘lean period’ when food stocks are generally at their lowest levels and
work on crops is underway but nothing is ready for harvest. Also the measures of household food security are standardized to ensure correspondence with current internationally recognized indicators. This facilitates comparison of CSRL outcomes with other local, regional, and international programs. Analysis of the baseline data (Oct.-Nov. 2009) for Phase II (2010-2014) programs in Kamuli continues. Dr. Haroon Sseguya was hired to lead this activity at Makerere University. Emphasis is being placed on modifying data files to ensure that subsequent annual survey records can be directly linked to permit time series analysis of household food security, nutritional status, and progress pursuing entrepreneurial activities.