The CSRL team and our partners in Uganda invested a great deal of thought, time, and energy this year to define our strategy for improving the livelihoods of more small-landholder farmers and their families. An in-depth evaluation of our past efforts was undertaken to assess the impact of our program on the well-being of rural households (see Socio-Economic Development). While conditions for most have improved, much remains to be done to increase food security, reach more households, and expand marketing opportunities for rural farmers. We met with community leaders and stakeholders in Kamuli District to gather their views and concerns. We also held a ‘Learning Forum’ in Kampala to glean insights from representatives of farmer cooperatives, NGOs, international seed and nutrition programs, and funding agencies. Our planning efforts culminated this Spring at a Strategic Planning Meeting in Jinja, Uganda with VEDCO staff and Makerere University faculty. A new Strategic Plan emerged from these meetings and is now being implemented. It has five critical goals:

- Increase household food security in Kamuli District, Uganda by applying successful intervention strategies in a greater number of communities
- Improve household nutrition and health in Kamuli District, Uganda by increasing the number and quality of meals at home and at school
- Increase competitiveness of small-landholder farmers in the marketplace through collective marketing and value addition to farm produce
- Empower in-country partners and promote their long-term viability by enhancing their research, education, and training capacity
- Expand total programmatic capacity by increasing base resources and establishing new complementary partnerships
The Tactical Plan to achieve these goals includes a number of administrative changes designed to ensure relevance, leverage resources and increase impact of CSRL activities. A new program coordinator in the CSRL office brings expertise in financial management and grant proposal administration. A new program assistant will assess programmatic efficiency and expand communications with donors and stakeholders. And the Advisory Board is being expanded to include internationally recognized experts in nutrition, agricultural entrepreneurship, and development policy. We are actively seeking program leadership in engineering and human nutrition, as well as complementary program leadership in Africa.

A few of the administrative highlights for 2009:

- Field activities benefitted greatly from the unselfish leadership of Lorna Butler, Eric Abbott, Tom Brumm, and Dick Shultz from ISU
- Plans were initiated to increase the CSRL/VEDCO ‘intervention footprint’ from 800 to 2200 households within the current working parishes
- Expanded microfinance program to support farmer group marketing
- New programs in Health and Nutrition and Engineering Technologies are being implemented
- Program Coordinator, Isabel Reinert, joined the CSRL team to manage budgets, international accounts, and support grant development
- Hired additional field personnel to manage logistics and coordinate expanding CSRL programs in Kamuli
2009 marked the 5th year

CSRL has supported rural development activities in Kamuli District with our partners at VEDCO and Makerere University. As part of our strategic planning process, Dr. Bob Mazur and Dr. Haroon Sseguya, recent PhD in sustainable agriculture and sociology from ISU, guided a team of farmers, development practitioners, and researchers who interviewed a representative cross-section of program households and key informants to evaluate the progress CSRL is making towards its goal of improving livelihoods of rural households.

They evaluated a range of livelihood activities as ‘indicators of well-being’ including: crop and livestock production, daily food consumption, income and capital, non-agricultural economic activities, microfinance loans, asset accumulation and exchange, natural resource management, and nutrition and health status. The results reported here are a preliminary summary of their findings. Formal reports will be published later this year.

The tables below present a number of clear indications that the livelihoods of most rural families have improved since the program began. There has been a dramatic increase in the percentage of food secure households. Although 2008 was a difficult year for crop production, most households remained fairly resilient in terms of food and nutrition security. More households are accumulating assets and adopting proper sanitation and hygiene measures. Farmers are cultivating more land, producing a greater variety of crops, and selling more crops. There also is greater interest and success (although mixed) in raising livestock. More details are provided in other sections of this report.

<table>
<thead>
<tr>
<th>Food Security Levels of Households, 2006-2008</th>
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<tbody>
<tr>
<td><strong>Status</strong></td>
</tr>
<tr>
<td>Food Secure</td>
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<tr>
<td>Food Insecure</td>
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<tr>
<td>Extremely Food Insecure</td>
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<table>
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<tr>
<th>Average No. Meals Consumed Daily, 2006-2008</th>
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<tr>
<td><strong>Meals Consumed Daily</strong></td>
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<td>Mean #</td>
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<tr>
<th>Personal/Household Possessions, (% of households surveyed)</th>
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<tr>
<td><strong>Radio</strong></td>
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<tr>
<td>Radios</td>
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<tr>
<td>Bicycles</td>
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<tr>
<td>Mobile phones</td>
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<tr>
<th>Sanitation &amp; Hygiene (Own/Use), 2006-2008</th>
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<tbody>
<tr>
<td><strong>Latrine</strong></td>
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<tr>
<td>Latrine</td>
</tr>
<tr>
<td>Bathroom</td>
</tr>
<tr>
<td>Rubbish Pit</td>
</tr>
<tr>
<td>Can for washing hands</td>
</tr>
<tr>
<td>Boil drinking water</td>
</tr>
<tr>
<td>Improved stove</td>
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</tbody>
</table>
Serious challenges remain

Although these signs of progress are encouraging, there is significant scope for improvement. Crop yields and livestock production are still a fraction of their genetic potential. Poor soil fertility, limited access to improved genetics, lack of irrigation and other production inputs, and environmental degradation all contribute to chronically underperforming farm operations. Marketing opportunities for farmers continue to be limited by inconsistent production, poor infrastructure, and general lack of marketing knowledge and access. In some cases, improvements in agricultural knowledge, attitudes and practices among farmer groups favor the well trained RDEs and CNHWs, which impacts the effectiveness of group functioning. We are addressing these and other critical issues as CSRL refocuses its program activities for the next five years.

There are also barriers to enhanced livelihoods and threats to household food security that are well beyond the capacity of CSRL programs to address. Lack of capital to purchase production inputs, livestock, or improve farm structures is a major concern. Illness and disease continue to limit productivity and the potential to expand farming operations since most, if not all, operations are done by hand. More than half of the farmers surveyed indicated drought limited yield on their farms in 2008, with nearly one-third indicating concern about drought becoming more severe. A change in rainfall patterns in recent years has made it more difficult for farmers to produce profitable crops.

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<tbody>
<tr>
<td>Lack of capital</td>
<td>Threat</td>
</tr>
<tr>
<td>Illness</td>
<td>% Experienced</td>
</tr>
<tr>
<td>Ignorance</td>
<td>Drought</td>
</tr>
<tr>
<td>Lack of markets</td>
<td>Increased</td>
</tr>
<tr>
<td>Lack of networks</td>
<td>No change</td>
</tr>
<tr>
<td>Lack of land</td>
<td>Decreased</td>
</tr>
<tr>
<td>Gender bias</td>
<td>Health Epidemics</td>
</tr>
<tr>
<td>Poor transport system</td>
<td>Increased</td>
</tr>
<tr>
<td>Lack of labor</td>
<td>No change</td>
</tr>
<tr>
<td></td>
<td>Decreased</td>
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</tbody>
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Continued progress towards meeting these challenges will require even greater investment in human and social capital ‘on the ground,’ more effective ways to disseminate and utilize technical information on the farm, a more rigorous system to monitor and evaluate impacts of our program activities, and a sharply focused research agenda to identify when changes in program priorities are needed.
Susan Namabiro is a CNHW from Nalwoli Parish. Susan is also a small-landholder farmer who now realizes the importance of grain Amaranth in the diet of children under five years of age. When CSRL began working in Kamuli, Susan was pregnant with twins; Babirye and Nakato were born soon thereafter. Her introduction to grain Amaranth was a blessing for Susan and her twins. She immediately included grain Amaranth in their diets. Both girls, now five years of age, are healthy and strong. Susan tells how her work as a CNHW has impacted the health of young children and other vulnerable groups in her community. “We had a lot of children suffering from marasmus [infant malnutrition] and kwashiorkor [toddler malnutrition]. We used to throw plates on the ground and we did not care about hygiene in our cooking places. There were no dish racks. We shared our kitchens with livestock. We never washed our hands after using the toilet...and we had no toilets. After I was trained as a CNHW, I mobilized mothers with young children to feed them grain Amaranth. As the children’s health improved, I became referred to as a ‘musawo’ [doctor].“ Susan also noted it was considered normal for most households to lack food and suffer periods of hunger. But now her household has food throughout the year. She can even derive an income from food sales during these periods since food prices are higher. She sold her surplus maize for UGX 250,000 (~$125) the first year, and UGX 500,000 (~$250) the next year. She has made similar income selling grain Amaranth.

A notable case of malnutrition Susan has handled was that of four-year-old Pauline Nakigudhe. Pauline lived in Kampala with her mother who sold charcoal for income. The girl’s health had deteriorated to the point that her mother brought the child to the village to die. Despite her age, Pauline was not walking. When Susan came in contact with Pauline, she started her on a porridge made from a composite flour of grain Amaranth, millet and other grains. As Susan recalls...“The child’s malnutrition was so severe that the mother was contemplating abandoning the child. I gave them a mosquito net, assisted them to construct a dish rack to keep the utensils clean, taught them to sweep the house and keep it clean.” Within a year, Pauline had recovered and started walking. She is now in nursery school.
Community Training in Health and Nutrition

The CSRL team worked with six schools in Kamuli District during the 2008/2009 year to incorporate crops harvested from school gardens into the school lunch programs. Among the crops grown were orange-fleshed sweet potatoes, grain Amaranth, collard kales, egg plant, and cassava. In addition, ISU and Makerere undergraduate students in the Service Learning Program helped repair and stock a mushroom house and set up beehives at the Namasagali Primary School (see Service Learning insert).

Training materials on hygiene and sanitation have been developed and are being used to educate community members on simple hygiene and sanitation practices important for improving the health of all household members. This project promotes appropriate use of pit latrines, tiptaps, rubbish pits, etc. Adoption rates for these and other sanitation and hygiene practices among program households are shown at the right. Cost-effective methods for long-term storage of harvested grains remains a challenge.

<table>
<thead>
<tr>
<th>Item</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Latrine</td>
<td>100%</td>
</tr>
<tr>
<td>Rubbish pit</td>
<td>83%</td>
</tr>
<tr>
<td>Bathroom</td>
<td>89%</td>
</tr>
<tr>
<td>Dish rack</td>
<td>93%</td>
</tr>
<tr>
<td>Tiptap</td>
<td>86%</td>
</tr>
<tr>
<td>Granary</td>
<td>13%</td>
</tr>
<tr>
<td>Meeting gazebo</td>
<td>64%</td>
</tr>
<tr>
<td>Kitchen</td>
<td>99%</td>
</tr>
<tr>
<td>Kitchen garden</td>
<td>71%</td>
</tr>
<tr>
<td>Record keeping books</td>
<td>61%</td>
</tr>
<tr>
<td>Energy saving stove</td>
<td>78%</td>
</tr>
</tbody>
</table>

The program also identified 30 new cases of severely malnourished children under five years of age. Thanks to the persistent intervention of the VEDCO staff and our CNHWs, all these children are in the process of recovering.

CSRL programs like these are funded entirely by gifts from private citizens, foundations, non-profit groups, companies, and Iowa State employees. You can help us reach more schools and communities by contributing today at www.foundation.iastate.edu/csrl.
Livestock represent a resource for rural households. In addition to producing meat and milk, livestock also provide agricultural collateral to purchase school uniforms and pay school fees. Therefore, a well-managed livestock operation can greatly improve living conditions for resource-poor families. This year, in an effort to make sure the CSRL Livestock Program was addressing farmers’ needs and objectives, we interviewed over 100 farmers to understand the impact of the Livestock Program on their livelihoods, to provide a platform to share their views and needs, and to help them benefit more from the program. Some of the ideas the farmers advanced were already in the pipeline, which is very encouraging as it confirmed the program is moving in the right direction. For example, farmers indicated strongly they needed more training on disease management. In response, we hired a veterinarian this year to strengthen the CSRL and VEDCO team on the ground and help farmers deal with animal diseases. When we asked individual farmers if the program met their expectations, 91% responded ‘YES,’ with 56% rating the program an 8 or better on a scale of 10. The two main reasons farmers gave for rating the program so highly were “we have learned a lot” and “it has improved our lives.” Training farmers in proper animal management has reaped positive results. Those farmers who were trained and received livestock from the program consumed more animal products in their households and sold animals for income more frequently than those who did not receive this support from the Livestock Program. We will use the information collected from these interviews to make further improvements in the Program, which already has improved the lives of many resource-poor farm families.
2009 Highlights

- Continued working with program farmers and two primary schools in Kamuli District supported by a grant received from The Monsanto Fund to place livestock in the hands of 100 farmers over two years

- Placed pigs on 35 farms and goats on 20 farms

- Built and stocked livestock structures for 45 other farms

- Continued training program farmers to improve their ability to manage a sustainable and profitable livestock operation

- A variety of individual and corporate donors continued their generous support for the Livestock Program

Providing goats, chickens and pigs offers many opportunities for small-landholder families and schools. Our goals are to grow the program to train more farmers and help them find new marketing opportunities.

A small donation can make a big difference. Just $70 will provide a farm family with a sow and a boar; $10 purchases 5 chickens; $150 buys a genetically superior goat. Please donate to this program at www.foundation.iastate.edu/csrl.
Betty Mirembe has benefitted in more ways than she can count from working with the CSRL program. Since 2004, she has received training in crop and animal production, planting materials, and has expanded her piggery with funds from the microfinance loan program.

She noted that, “I now possess a number of skills that I have managed to put into practice that have enabled me to achieve whatever I harvest from my farm -- pegging skills for bananas, crop and agroforestry management skills, compost manure production, pest and disease management skills, post harvest and grain handling skills among others.”

Betty’s piggery started with two pigs, which she received from the CSRL program along with training in animal production and health. She has since increased her drift of pigs to 11 animals, not counting those she sold to meet her household living expenses.

To date, Betty has borrowed from the microfinance program two times. The first loan was for UGX 200,000 (~$100). She invested this money to expand the structure of her piggery unit. Once she paid back this loan, she was eligible for a second loan for UGX 400,000 (~$200). This time she invested part of the money to increase the number of pigs in her expanding piggery enterprise. And she used the rest of the loan (~$35) to establish an acre of sweet potatoes in her crop garden. So far, Betty has realized income of about UGX 100,000 (~$50) from the sale of the sweet potato harvest, and she continues to harvest and sell the potatoes a little at a time. She also has been selling enough weanlings and finishing stock from the piggery enterprise to pay for her child’s tuition at Makerere University in addition to covering household expenses. She plans to take a third microfinance loan which she will invest in a further expansion of her piggery -- the main source of stable income for her family.
As of June 2009, a total of 43,220,000 Uganda shillings (~$21,600) had been disbursed to 55 farmers organized into 11 groups. These farmers have saved a total of 10,087,756 Uganda shilling (~$5,040) through their participation in the savings and loan microfinance program. Participating farmers have provided many testimonials on how the microfinance program has improved their livelihoods. They are now in a position to access loans to expand their farm enterprises, which has enabled them to pay their children’s school fees, meet their household expenses, and even accumulate assets they can sell in times of need.

2009 Highlights

- 55 farmers or farmer groups have accessed microfinance loans
- The loan portfolio grew to approximately $10,000
- Repayment rate on or ahead of schedule is 95 percent
- CSRL is making additional funding available to the microfinance program in response to farmer groups seeking larger loans

With your support, the microfinance program can help more Ugandan farmers like Betty Mirembe. Please make a donation at www.foundation.iastate.edu/csrl.
Esereda Kawuna’s life has changed significantly and very much for the better in recent years. Esereda is a Rural Development Extensionist (RDE) from Naluwoli parish, in Butansi Sub County. She is 54 years old and has been working with the Biribawa Elderly and Orphans and Tibikoma farmers’ groups since 2004. Esereda used to own a dairy cow which provided milk to sell. Her average daily income was about 3,000 Uganda shillings (~$1.50). Unfortunately, the cow died and she had to resort to producing crops for the market. Although she had grown beans before, they were only for home consumption because the yields were so low.

Esereda noted, “After being trained by the [CSRL] program, I was able to increase my [bean] yield to 400 kg from an acre, which I use some at home and sell the rest. I also increased my cassava production to an acre. Apart from what we consumed at home, I was able to sell the rest and get about UGX 200,000 (~$100) in 2008. Around that time, I lost my father and I was able to cover his funeral expenses.”

Esereda also learned how to improve the quality of her cassava harvest and now realizes better prices at the market. She used to dry cassava chips on the ground. This practice decreased the value of the product because the soil changed the color and dampness encouraged mold to grow on the chips. The harvest management skills she acquired through the program have enabled Esereda to produce clean cassava chips and diversify the produce she can sell. For 5 kg of fresh cassava, she would receive about 1000 UGX (~$0.50). The same amount of cassava dried into chips brings her about 4000 UGX (~$2.00). Since the dried cassava is easily preserved, she can afford to wait for the best price before selling. The income from the sale of her crops has enabled Esereda to construct a new home and move out of the old dwelling that was falling apart. The additional income also has enabled her to educate her children; her youngest recently graduated from nursing school.
Like many other farmers in the program, Esereda has benefitted from a microfinance loan to invest in improved production for markets. She intends to purchase an ox plough so she can increase crop production and reduce the drudgery of land preparation, which is done almost entirely with hand hoes. She also is looking to link with industry to guarantee a market for her produce.

2009 Highlights

- Conducted market chain analysis for selected enterprises of 73 farmers in Bugulumbya Development Farmers’ Association (BSFA), Namasagali Farmers’ Association (NAFA), and Butansi Farmers’ Development Association (NABFA)

- Established groundnut, maize, poultry, pig, and banana enterprises for income generation with 151 farmers, including 28 acres of groundnuts, 33 acres of maize, and 15 piglets

- Created market information boards in six Parishes to inform farmers of prevailing prices and available markets for their produce. Specific RDEs and CNHWs were assigned responsibility for managing these boards and updating the market information

Expanding CSRL program activities that help increase crop/animal production for markets is the most effective way to improve the livelihoods of more small landholder farmers in the Kamuli District. Please make a donation today at www.foundation.iastate.edu/csrl.
The Goals of the CSRL Service Learning school-garden program are to help establish school gardens as outdoor learning labs that produce supplements for school lunches and help the school children transfer new knowledge and skills to their home gardens and families. The program has attracted the attention of the best undergraduate students in agriculturally related fields at Iowa State and Makerere Universities. Many more students applied this year than could be accommodated.

The Service Learning bi-national team in 2009 included 15 undergraduate students, 2 graduate students, and 4 faculty members from Makerere University and Iowa State University and staff from VEDCO and the local Kamuli District’s primary schools. The team assisted with teaching agriculture, health and science in the primary schools, established and maintained school gardens as an outdoor learning laboratory and production area, and supported projects that supplemented school feeding. Graduate students documented the improved attitudes of primary school children towards agriculture, their skill development in agriculture, health, and English, as well as how the program facilitates knowledge transfer to the children’s home gardens and families. Student participants also learned a great deal:

“My future plans and life in general have been significantly impacted by my time in Uganda. I am motivated to obtain my degree in community/public health and put it to use in the developing world."

“The opportunity to learn and work with others in a less-developed country taught me about cultural and social dynamics, technical aspects of teaching and agriculture, about myself and my skills and goals.”
2009 Highlights:

- Established over 200 new vegetable gardens at two primary schools, planted new propagation beds, helped maintain existing crops, and cleared new areas for production
- Assisted teachers to present agriculture, science, health and nutrition information to children in grades 5 – 7
- Donated about 1000 “gently used” children’s books to two schools to establish their first libraries to enhance English literacy
- The bi-national team completed projects with primary school children:
  - to enhance their knowledge of plant propagation and access to cuttings of nutrient-dense orange-fleshed sweet potatoes
  - to explore beekeeping and construct indigenous beehives as an alternative ag enterprise
  - to learn about personal health and hygiene
  - to learn about sustainable production of trees for fuel and plan for an efficient school kitchen facility
- Graduate student research assessed agricultural knowledge and skills, and the effectiveness of knowledge transfer to home gardens
- Graduate student research evaluated the nutritional status of pregnant women and primary school-aged children in the Kamuli District
- Students presented project summaries to government and community leaders in Kamuli District, to faculty, staff and students at Makerere University, and at the Norman Borlaug World Food Prize Lecture Series held at Iowa State University
- Fostered the development of Makerere University Service Learners Association with 150 members in the new student club
- Initiated and hosted the first Makerere University student intern at Iowa State University

You can help more students benefit from this remarkable program with your donation to Service Learning at www.foundation.iastate.edu/CSRL.

IOWA STATE UNIVERSITY
College of Agriculture and Life Sciences

Center for Sustainable Rural Livelihoods
www.srl.ag.iastate.edu  •  (515) 294-9237  •  susrl@iastate.edu
A number of award winning projects led by Service Learning students were recognized at the Norman Borlaug World Food Prize Lecture Series at Iowa State University.

From Shrubs to Shillings: Beekeeping as Participatory Development for Ugandan Primary School Pupils by Sam Bird, Naboth Bwambale, Nate Looker, and Johnson Nuwagaba

Beekeeping was introduced as a sustainable livelihood and income diversification. Hive construction and maintenance were taught through on-site demonstrations and tutorials. Pupils took the initiative to construct their own hives, indicating an appreciation of and knowledge for beekeeping that can provide future income.

Propagation of Orange Fleshed Sweet Potatoes (OFSP) to Increase Children’s Knowledge of a Nutrient-Dense Garden Crop in a School Garden Program by Ellen Jacobson, Malson Natuhwera, and Noah Bamuwa Mukaya

A field demonstration was conducted to increase pupils’ comprehension of site selection, bed preparation, spacing, selection of cuttings, planting, and mound preparation and maintenance of OFSP. Several cuttings of four beta-carotene-rich OFSP cultivars were distributed to students following the demonstration. Pupils were instructed to plant the cuttings in their home gardens and continue to propagate them so they can maintain a steady beta-carotene-rich food source for themselves and their families.

Proposal to Improve Primary School Kitchens
Rachael Farhat, Alexis Beyer, Amanda Chung, Geoffrey Omuron

An assessment was made of Nakanyoni and Namasagali School kitchens to measure their efficiency, safety, and sanitation. A plan-of-action was developed that would potentially improve the methods used, overall sanitation, and efficiency of the kitchens, as well as decrease the health risks to the cooks and students that worked in or around the kitchens. The fuel-saving design would also cut time students spent gathering firewood for the kitchen, so they could focus more on completing their studies and helping their families.
Increasing School Attendance for Female Pupils through Sanitation Knowledge by Daphine Gumoshabe, Editah Nakamya, Joan Mirembe, and Wren Westin

Primary school girls in the Kamuli district often miss school while menstruating due to a lack of menstrual management resources. The team gathered attitudes and opinions about sanitary napkins from girls who had reached menarche (first menstrual cycle). The girls preferred the sanitary napkins provided over the traditional cloth and expressed interest in developing a student-run garden club to earn money needed to purchase sanitary napkins.

Graduate Student Projects:

Uganda School Garden Program Influences Knowledge, Knowledge Transfer, and Home Gardening Practices by Lisa Wasko, Dr. Gail Nonnecke, Dr. Lee Burras

School garden programs provide quality education targeted at teaching future generations about sustainable and nutritious food production and alternative income-generating enterprises. This study was conducted to document the program’s influence on student knowledge, knowledge transfer, and home gardening practices. Among other findings, this survey indicated pest control was a major challenge for those students who had gardens at home. Obtaining planting materials was a challenge for those who did not have gardens. The study also identified challenges transferring knowledge from the school gardens to those at home.

Assessing the Nutritional Status of Pregnant Women in Rural Kamuli District Uganda by Eric Nonnecke, Benon Musasizi, Dr. Kevin Schalinske, Dr. Manju Reddy

The objective of this study was to establish a baseline of health and nutritional indices for pregnant women in this rural District. Inadequate micronutrient uptake, low BMI, and morbidities were evident and attributed to infrequent consumption of animal-source protein, inadequate calorie intake, and reliance on nutrient-poor staple crops. The study concludes that district-wide nutrition/sanitation/health education, particularly for young women, is essential to improve the livelihoods of the subject population.
Most, if not all, farmers in Iowa rely on mobile (cell) phones to keep in touch with the farm crew, order supplies, access current market information, and hear the latest weather reports. Timely access to such information helps them manage their operations efficiently and profitably. A study conducted by Brandie Martin and Dr. Eric Abbott this summer revealed that small-landholder farmers in rural Uganda also are taking advantage of this new technology.

Use of Mobile Phones for Agriculture Development in Uganda
Brandie Martin and Dr. Eric Abbott
Greenlee School of Journalism and Communication
Iowa State University in cooperation with VEDCO

Mobile phone service is expanding rapidly in rural Uganda, which could have profound impacts on the livelihoods of small landholder farmers. Mobile phones are now widely used by farmers, agricultural processors, and rural marketers. This study identified how mobile phones are being used or could be used in Kamuli District to facilitate access to market information—especially for buying and selling, enabling efficient coordination during agricultural emergencies, and enhancing administration of agricultural-based development activities.

"Because I store the market information from different buyers in my phone, I now know when to wait, store my produce, and sell later at a higher price."

"I am now able to communicate the state of my clients with VEDCO. I feel I am able to perform better because I have quicker access to information."

"Through the use of the phone, we no longer get information too late and I am able to help many more people in my area."
The farmers interviewed in Kamuli District identified a number of recurring themes for agricultural-based use of mobile phones: accessing agricultural inputs, consulting with experts, attaining market information, dealing with agriculture emergencies, and monitoring financial transactions. These themes were independent of gender, status, or group membership.

The vast majority of farmers that own mobile phones have used them to gain access to agricultural inputs including seeds, livestock, and pesticides from local dealers, nongovernmental organizations (NGOs), and community members. Most noted that having market price information saved them money on travel and buying or selling at a loss. More than half of the farmers have used their mobile phones to call a veterinarian, an agricultural-based NGO such as VEDCO, or the National Agricultural Advisory Services (NAADS) for livestock and crop emergencies.

Small to medium-size farm holders involved in a farmer group were more likely to use the mobile phone for agricultural based purposes than were non-group members. This finding suggests that membership in a farmer group promotes knowledge transfer.

A low level of literacy, particularly among women, however, limited full use of mobile phone capabilities for agricultural purposes. These capabilities include: use of the calculator to figure market pricing, use of the loudspeaker for group meetings, storage of agricultural-based information, voice recording of agricultural-based lessons, and use of the camera phone. Female farmers were less likely than were male farmers to access market information. And nearly half of the female farmers were not able to use the phone calculator. Additional training on phone capabilities and voice- or icon-activated applications would likely increase the overall utility of mobile phones for small land-holder farmers.

**Predominant usage of cell phones by male and female farmers in Kamuli District. Results are expressed as a percentage of farmers interviewed**
Conducting research to improve food and nutrition security of small landholder farmers—and sharing that knowledge—is integral to CSRL activities. Three research projects currently are underway and several new projects will begin in 2010.

To enhance nutritional value and marketability of common beans in Uganda and Rwanda. $450,000 from USAID pulse-CRSP
Dr. Bob Mazur lead investigator

Investigators from Iowa State University, Makerere University, National Crops Resources Research Institute, VEDCO, and Kigali Institute of Science and Technology in Rwanda are working to improve yields and quality of four priority bean varieties, enhance their nutritional value and marketability, and increase marketing and consumption of value-added bean products. The project supports three MS students at Makerere University, two PhD students at Iowa State University, and four undergraduate students in Rwanda.

Improving Nutrition through Livestock Rearing and School Gardens. $100,000 from The Monsanto Fund
Dr. Max Rothschild lead investigator

This project provides technical support for improving animal breeds and farming systems for livestock production. It equips farmers with knowledge and skills for disease prevention and control, as well as feeding and management skills to improve livestock production and waste utilization. Thus far, 100 livestock structures have been constructed and stocked. It also provides a limited number of implements for school garden programs.
Promoting production and utilization of grain Amaranth for improved nutrition and health in Uganda. $294,370 from The McKnight Foundation
Dr. Dorothy Masinde co-investigator, in cooperation with Makerere University, Department of Food Science and Technology

This project will identify agro-ecological zones in Uganda with high potential for grain Amaranth production; develop recipes and protocols for acceptable and nutritious products; promote production, utilization and marketing; and assess the impact of promoting grain Amaranth production and consumption on nutritional status, food security, health status and income of participating communities.

Grant proposals pending:

Enhancing nutritional value and marketability of beans through research and strengthening key value chain stakeholders in Uganda and Rwanda
Mazur et al. Submitted to USAID bean CRSP

Poultry production in primary schools to improve childhood nutrition
Rothschild et al. Submitted to USAID

Enhancing biological nitrogen fixation of leguminous crops grown on degraded soils in Uganda, Rwanda, and Tanzania
Westgate et al. Submitted to USAID bean CRSP

Enhancing protein intake in schools and local families through improved poultry and livestock production
Rothschild et al. Submitted to The Monsanto Fund

Graduations!
- Dr. Haroon Sseguya received his PhD degree in Sociology and Sustainable Agriculture from Iowa State University
- Dr. Dorothy Masinde, CSRL Associate Director for Field Operations, received her PhD degree in Sociology from University of Nairobi

Supporting an undergraduate or graduate student in a CSRL-related program is a most effective way to develop the human capital needed to overcome rural poverty and malnutrition in Uganda. Please visit www.foundation.iastate.edu/CSRL today.