These extension efforts focused on the provision of improved early maturing, disease-resistant varieties of maize, beans, cassava, sweet potato (including the Vitamin A-rich orange-fleshed variety), bananas, groundnuts, soybean, a variety of vegetables, pineapples, cardamom, and grain amaranth.

In an effort to guarantee long-term access to improved seeds, the SRL Program supported the development of about 12 seed-multiplication sites per year. These sites were originally associated with the crop demonstration sites, but are now increasingly being managed by individual group members who operate the sites as small businesses. In 2012, the SRL Program counted 65 seed-multiplication sites[19] and 13 soil-fertility demonstration sites on improved furrow (Text Box 1.4). There is also some anecdotal evidence that the number of private-sector commercial seed vendors have increased the volume of improved seeds that they carry in their businesses.

Text Box 1.4. Case Study: Two Successful VEDCO/SRL Seed-Multiplication Sites (Twekembe Farmer's Group and Leeta HIV Group) in Naluwoli Parish

Twekembe Farmers Group has a membership of 18, 17 females and one male. It joined the VEDCO/SRL Program in 2005. In September 2011, the group established 0.75 acres of improved cassava variety for multiplication. Twenty-two members have so far received two 50-kilogram bags of quality planting materials, which is enough to plant 0.25 acres. The cassava multiplication garden has been ratooned (i.e. left after harvest to re-sprout the next season) and more members of the community will benefit from it in August 2013.

Leeta HIV Group has 11 members, nine females and two males. In September 2011, the group established a 0.5-acre cassava multiplication garden. The group members each received two 50-kilogram bags of quality plant material. The site is well maintained by group members, and more community members will get planting materials from this garden in August 2013.

Source: Patrick Sangi. November 2012.

2.4. IR 1.2. Increase the Adoption of Multi-Purpose Trees and Other Natural-Resource Management Practices on Farms

The baseline PRA reported that the major natural-resource management (NRM) problems included indiscriminate tree cutting, farming in fragile lands like swamps, and low adoption of soil fertility and soil and water conservation practices. To address this issue, SRL provided training in some soil management practices as part of the extension messages like agroforestry, composting, mulching, construction of bunds (mounds used for planting tubers), as well as irrigation practices using locally accessible items (e.g. drip irrigation with polythene materials and small cans).

2.4.1. Agroforestry

During the early phases of SRL (2007-2009), the agroforestry program was especially active. Tree planting was complicated by the fact that tree planting was not part of the local culture. One

[19] The current seed multiplication sites include the production of new seed that is resistant to Cassava Brown Streak Disease (CBSD) and African Cassava Mosaic Virus (ACMV). Given the devastating impact of these diseases on cassava production and cassava's role as a buffer to seasonal food insecurity, this is a very important addition to the cropping program.

popular local saying, *gyameragyene*, meant that trees grew by themselves—they were not planted by anyone. Oranges, pine, pawpaws, and mangoes were the commonly planted trees in the name of agroforestry.

The SRL Program's agroforestry activities included support for:

- The development of one module focused on tree planting;
- The organization of agroforestry training for all the target households through the RDEs (for all trees) and CNHWs (for fruit trees).
- Three program-sponsored tree nurseries in three of the six parishes where the program intervenes;
- Two modules focused on tree planting and the organization of agroforestry training for all the target households through the RDEs (for all trees) and CNHWs (for fruit trees); and
- Nine community-based tree demonstration stands, e.g. woodlots managed by community volunteers—one of which is in Namasagali primary school—in three of the six parishes where the program intervenes.

Based on the willingness that many local groups showed for tree planting, the SRL staff has concluded that most local communities:

- Are aware of the need to effectively manage the natural resources or environment; but
- Do not seem to have adequate attitude, knowledge, and/or skills to do it correctly.

While there is anecdotal evidence that the interventions of SRL and other organizations like Integrated Rural Development Initiative (IRDI) that support forestry programs in Kamuli District have reduced the practice of deforestation, this not currently being tracked.

2.4.2. Fuel Conservation and Alternative Fuels

In 2007, students from Engineers for Sustainable World constructed five biogas plants in five farmers' homes. Though the technology worked when the students were around, it was not sustainable. Once the animals died the technology also ceased to function.

2.4.3. Other Natural Resource Management Practices

Other NRM practices that farmers are engaged in include minimal burning of crop residues and instead using them as sources of organic manure; digging water channels, especially in banana plantations; making efforts to plant endangered tree species such as *vule* and *musisi*; mulching (though at a very minimal level); planting grass (*perspurum*) in their compounds; and deep plowing for soil-fertility management. Six farmer-managed water-harvesting techniques were developed between 2007 and 2008. To date, these new techniques are practiced by relatively few individuals and at minimal levels that may not make a significant contribution toward managing the environment.

2.5. IR 1.3. Increase Household Access to and Use of New Climate-Smart Livestock

Livestock activities did not begin until 2006 because by the time the SRL Program started in Kamuli, VEDCO was supporting diversification of crop production for food and nutrition security. Thereafter, livestock was introduced to provide animal protein and improve incomes of the poor.[20] These activities were supervised from 2006 to 2009 by a PEO with a general agriculture background. In 2009, the program hired the first livestock specialist, which was five years after the program started the crop production activities under IR 1.2. The decision to add livestock was a conscious decision to help the most vulnerable households—who often lack any livestock holdings at all—develop small herds that could provide extra income and food. The same herds were expected to provide and strengthen household resilience by providing a source of alternative income when crops fail.

2.5.1. Basic Start-Up VEDCO/SRL Livestock Model (2006-present)

Step 1: Publicize the Program. An essential first step was to familiarize community leaders with the program and its application process. This was done initially at the VEDCO/SRL parish meetings and then at the community level.

Step 2: Application and Choice of Primary Beneficiaries: The SRL technical team then agreed to the selection criteria that was used to identify and recruit potential participants. These criteria were that the beneficiary:

- Belong to a group affiliated to VEDCO;
- Be resident in the VEDCO/SRL areas of operation of Butansi, Namasagali, and Bugulumbya sub-counties;
- Apply for a specific enterprise, e.g. pigs, goats or poultry;
- Be willing to share costs with the program in terms of construction of livestock structures;
- Be prepared to feed and cater livestock treatment as may be necessary;
- Be classified as "food secure;"
- Meet good nutrition standards, i.e. afford a well-balanced diet for the family members; and
- Meet sound hygiene and sanitation aspects, i.e. have a latrine, dust bin, kitchen, and plate rack.

During 2009, being relatively classified as "food secure "was added on the criteria list due to the fact that the farmers had received seeds for crop production from VEDCO.

VEDCO/SRL technical staff visited each applicant to verify whether the farmers qualified to be a potential beneficiary of the program. A total number of 405 farmers showed interest and applied for the program: 203 farmers applied for pig enterprises and 202 farmers for goat enterprises. Out of the initial base of 405 applications, 100 primary beneficiaries[21] were chosen for the on-

[20] Narrative for the annual report for the year 2006 VEDCO/SRL report.

[21] The SRL Program uses the term "primary beneficiaries" to distinguish the initial recipients of the livestock from those who receive a portion of the progeny through "roll on" who are called "secondary beneficiaries."

farm commercial program, 65 for pigs and 35 for goats. Another 30 target farmers received animals in 2010 and 2011 (Table 1.4).

Step 3: Receipt of Initial Stock: Starting in 2006, each pig primary beneficiary received two pigs (one male and one female), while each goat primary beneficiary received one goat with the expectation that a portion of the progeny would be passed on to other target and non-target farmers once the animals produced, usually within a year.

Step 4: Complementary Training to Promote Improved Housing and Feed:
Housing: At least 218 structures have been constructed together with primary beneficiaries: 155 for piggery and 63 for goats. Construction of livestock structures is based on a cost-sharing approach whereby farmers contribute locally available materials in their communities such as sand, poles, timber off cuts, roofing material, water, and aggregates. The program contributes cement, wood preservatives, and labor for construction. In addition to the above structures, subsequent beneficiaries have constructed 144 structures: 113 for piggery and 31 for goats. Further, some of the initial beneficiaries have expanded their piggeries to two or three structures. The use of livestock structures in the management of pigs and livestock has improved the bio-security against major disease outbreaks of African swine fever, foot and mouth disease in pigs, and as well as heart water in goats. Consequently, a number of non-program farmers in the VEDCO areas of operation and beyond are adopting the strategy.

Production and Management Training: Farmers were trained in piggery, poultry, and goat production and management to equip them with practical skills and knowledge in basic managerial practices. The training modules include:

- Breeds, selection of breeding livestock, breeding management, and record keeping;
- Animal health and management (outlines of common diseases, identification of sick animals, disease prevention and control procedures, and the housing of hygiene, sanitation, and production systems); and
- Feeding, feed-resource utilization, feed-ration formulation, and options to improve feed supply and diet.

Additional Supports: In addition to training, the SRL Program provided some initial support to each of the primary beneficiaries who received an animal:

- *Feed:* This included an initial distribution of improved feed—913 kg total—in order to demonstrate the effect of feeding recommended quality and quantity rations on pigs' growth;
- *Maize Seed*: In addition, all farmers were provided maize seed to establish and have enough feed reserve for pigs so that they can feed and grow well. Each piggery farmer was given 19 kg and goat farmers were given nine kg;
- *Pasture Seed*: The primary beneficiaries of goats were supported with pasture seed to help establish enough improved fodder for the goats, including *lab-lab, calliandra, leucinae* and giant *seteria*. The goat farmers were further trained on pasture management practices during field monitoring visits by the technical livestock officers;
- *Drugs*: All primary beneficiaries received drugs to facilitate prevention and disease control of parasites and diseases in pigs, goats, and poultry. All primary farmers were each given 1.5 liters of acaricide and 1.5 liters of de-wormer. All initial vaccinations of

the animals for foot-mouth disease, brucellosis, anthrax, and mange were carried out by the VEDCO livestock staff; and

- *Follow-up Visits*: In addition, the PEOs and RDEs conducted regular follow-ups in order to provide on-site technical support.

Step 5: Assistance with Marketing and Sales: Each of the primary beneficiaries received basic training on value-chain development and marketing.

Step 6: "Pass On" a Portion of the Progeny Produced by the Animals to a Secondary Beneficiary: Each primary beneficiary was expected to "pass on" a portion of the progeny to another target farmer and to assist this farmer in getting established. In contrast to the primary beneficiaries, these "secondary beneficiaries" received only training and some initial assistance with vaccination. This is because the program expected the primary beneficiary who gave them the animal to mentor them.

2.5.2. The VEDCO Commercial Model, 2010-Present

In 2010, the VEDCO/SRL livestock activities were expanded to promote a more commercial model of production for the pig value chain that adapted to three different market settings (rural, peri-urban, and rural urban) (Table 1.6). In contrast to the earlier trainings, which focused on basic restocking and training farmers on the new technologies, the focus of the commercial-model activities program was on (Table 1.4):

- Training the more commercially oriented farmers on three key value chains;
- Facilitating the linkages that the need for feed, buyers, and traders,
- Training the livestock marketing associations; and
- Facilitated collective marketing.

The commercial model was developed through a series of four interlocking activities that included: building public awareness of the model, providing value chain training, fostering linkages, and helping organize marketing associations (Table 1.4).

To facilitate government and private-sector linkages, VEDCO/SRL encouraged a wide range of commercial partners to attend initial briefings on these programs. These linkages plus other linkages with International Livestock Research Institute (ILRI) and Community Animal Health Network (CAHNET), as well as a wide variety of input and output private-sector enterprises, have been key to the successful development of the three marketing associations that the program helped develop in 2010 and 2011 (Table 1.5).

Table 1.4. Basic Start-Up and Commercial Livestock Extension Models Promoted by VEDCO/SRL in Kamuli District, 2006-present

Livestock Model			2006	2007	2008	2009	2010	2011	2012
Basic Livestock Model									
Primary Beneficiary Households	# of Animals Distributed to Beneficiary Households (HHs)	Beneficiary HHs	5	20	39	55	58	39	
		Pigs	5	20	31	20	40	39	
		Goats	0	2	8	35	18		
		Chickens	2						43
	Publicize Model		X			X			X
	Choose Beneficiaries		X			X	X	X	X
	Provide Basic Start-Up Support	Training	X	X	X	X	X	X	X
		Vaccination	X			X	X		
		Housing	X			X	X		
		Feed	X			X	X		
		Farm Support Visit	X	X	X	X	X	X	X
	Assist with Marketing	Value Chain Development					X	X	X
Secondary Beneficiary Households	Facilitate "Roll On" of Progeny Produced from Primary Beneficiary Animals	Beneficiary HH	3	13	21	28	37	33	30
		Pigs	3	10	16	23	31	25	26
		Goats	0	3	5	5	6	8	4
	Facilitate Primary Beneficiaries Mentoring Secondary Beneficiaries & Limited Start-Up Support	Training		X	X	X	X	X	X
		Vaccination						X	X
		Farm Support Visit		X	X	X	X	X	X
Commercial Livestock Model									
Commercial -Oriented Livestock Farmers Belonging to Three Associations	Publicize Model	PEOs					X	X	X
	Provide Value Chain Training	PEO Training					X	X	X
		National Experts					X	X	X
	Foster Linkages	Buyers					X	X	X
		CAHNET					X	X	X
		Input Suppliers							X
	Help Organize Marketing Associations							X	X

Source: VEDCO/SRL Livestock Officer Dr. Nadiope Gideon, based on program records.

Table 1.5. Key Linkages and Partnerships VEDCO/SRL Facilitated to Help Develop Commercial Livestock in 2010 and 2011

Linkage/Partner	Collaboration with VEDO/SRL	Current and Projected Impact on Livestock Development in the Target Villages and Parishes
NGOs and International Agricultural Research Centers (IARCs)		
CAHNET: An NGO that promotes community livestock activities	-VEDCO/SRL subscribed to CAHNET. -Staff has attended CAHNET workshops in Kampala, Arusha, and Nairobi. -In collaboration with CAHNET, VEDCO/SRL developed a communication platform which many commercial farmers currently use on their telephones to let them access market information.	-Staff is better informed about innovative ways of building community marketing capacity. -The leaders of the marketing associations, as well as individual members, can develop better-informed marketing strategies for their livestock.
ILRI	-Staff attended various ILRI workshops that exposed them to innovative marketing ideas. -ILRI exposed staff to the new SMS system for calculating live animal weights. The system lets farmers calculate an animal's weight based on key body measurements.	-The live weight system has helped commercial livestock producers to make more strategic marketing decisions. -VEDCO became more committed to the development of a few marketing associations that focused on livestock (i.e. that were not mixed).
Private-Sector Partners		
Private Sector Chick suppliers in 2010 - 2012	Helped farmers negotiate group prices	-Lowered farmers input costs, which increased their revenue. -Lower mortality rates for chickens.
-Butembe Vet Care Center (Jinja) -Busoga Farm Supply (Jinja) Dan (Kampala) -National Animal Genetic Resources Center and Data Bank (NAGRIC&DB) (Entebbe)	Helped farmers negotiate group prices for key veterinarian supplies that they need.	
Hill Top Feed Company (Jinja)	Helped farmers negotiate group prices for improved supplies that they need.	Low prices quality feeds increased chicken survival and productivity
Commercial Slaughterhouses from Kampala	Attended some of the initial meetings and negotiated deals with associations.	Helped the livestock associations develop better marketing strategies.
Government Partners		
District-Level Livestock Offices	Attended some of the SRL workshops and parish information sessions.	Provided information about disease outbreaks

Source: VEDCO/SRL Livestock Officer Dr. Nadiope Gideon, November 2012.

Table 1.6. VEDCO/SRL Support of the Development of Pig Value Chain, Kamuli District Uganda, 2010-present

Value Chain Category	Approximate % of Target Farmers Involved in Different Value Chain Packages[22]	Support	2006-2009	2010	2011	2012
Rural-Rural: This package focuses mostly on the sale of piglets to other farmers that want to raise pigs. This is because of the market challenges of doing commercial piggery.	Approximately 60%	Awareness creation	0	X	X	X
		Meeting	0		X	X
		Training	0	X	X	X
		Linkages	0		X	X
		Marketing	0		X	X
Rural-Peri-Urban: This package focuses on selling adult porkers for slaughter in the peri-urban and rural trading centers/market centers.	Approximately 30%	Awareness creation	0	X	X	X
		Meeting	0		X	X
		Training	0	X	X	X
		Linkages	0		X	X
		Marketing	0		X	X
Rural-Urban: This package focuses on selling adult porkers to wholesalers (buyers) coming from major towns.	Approximately 10%	Awareness creation	0	X	X	X
		Meeting	0		X	X
		Training	0		X	X
		Linkages	0			X
		Marketing	0			X

Source: VEDCO/SRL Livestock Officer Dr. Nadiope Gideon, November 2012.

2.6. IR 1.4. Increase the Access of Vulnerable Groups (Very Poor Women, HIV/AIDS-Affected Households, and Youth) to New Climate-Smart Technologies that Increase Productivity and Resilience

The SRL Program recognized there is a category of its target group more vulnerable to the effects of poverty and inequality. These include school children, families living in absolute poverty, people living with HIV/AIDS, people with disabilities, and the elderly. SRL activities were carried out to increase the access of vulnerable groups (very poor women, HIV/AIDS-affected households, and youth) to new climate-smart technologies.

Another category of activity under this IR was the assistance given to two pilot initiatives that target vulnerable groups:

- Supporting school gardens in nine primary schools, including two schools that benefit from the a more intensive-set activities (through service learning and other types of targeted support) for the mid-day school feeding program; as well as
- Supporting one pilot Nutrition Education Center (NEC) in Naluwoli Parish.

Although both programs are under the direct supervision of the SRL community nutritionist, she is also tasked with facilitating (and tracking) some of the other supports that SRL is providing to these groups. One output of the M&E workshop was to develop a draft list of monitoring and IR-level impact indicators that the community nutritionist will help to co-track with the agricultural and livestock officers in the coming year.

[22] By farmer not by group, as there may be farmers doing different packages in the same group.

2.6.1. School Gardening Programs

VEDCO's initial involvement focused on promoting agricultural skills transfer, knowledge, and changing students' attitudes toward agriculture as a profession in six schools. In 2011, these activities expanded from six to nine schools, two of which also benefited from some target assistance for school feeding. Each CBT is assigned to at least one school. Since 2006, SRL helped create school gardening and poultry units in Namasagali primary school to complement the basic agricultural support (mostly to maize) that it provides to the other schools.

One important function of the school gardens was to promote the development of practical agricultural skills and a positive attitude about agricultural employment among both the teachers and pupils. The food outputs of the school programs in turn supplement the school's feeding program. Crops grown in these gardens include a variety of vegetables (tomatoes and eggplants), cassava, sweet potatoes, and fruit trees. School children and teachers have shown a lot of enthusiasm in the program (Text Box 1.5). SRL has supported the school gardens program by:

- Providing fruit tree seedlings to schools to establishment tree woodlots;
- Training students and teachers on agricultural practices, nutrition, and health;
- Establishing demonstration and seed-multiplication gardens for nutrient-dense crops for knowledge transfer;
- Promoting the production and consumption of nutrient-dense crops like grain amaranth for children under five, lactating mothers, and people living with HIV/AIDS;
- Organizing exchange or exposure visits. Students attending the national agriculture show in Jinja get exposed to new technologies in agriculture and agro-processing;
- Expanding the school lunch program to include energy and nutrient-dense foods; and
- Creating an "Establish and Grow" fund supported primarily by Iowa State University (ISU) students.[23]

ISU and Makerere University (MAK) faculty have led these activities. Undergraduate students at both schools participate in an ISU/MAK summer-service learning program, which is a six-week cross-cultural immersion at Namasagali and Nakanyonyi primary schools. As an indicator of the positive impact of these activities on the schools and the students, the number of ISU students has gradually scaled up from two in 2006 to eight in 2012, and the number of MAK students has increased from three in 2006 to 15 in 2012.

[23] Establish and Grow: www.iastate.....

Text Box 1.5. Case Study: Household-Level Impact of VEDCO/SRL School Garden Activities in Kamuli District

Although the school enterprises were not managed to the desired level, their presence helped teachers, pupils, and parents to develop positive attitudes toward agricultural activities. The positive attitude was expressed as follows:

- *Learning ground and sharing of information/technology*: This applies to mainly the pupils and teachers. Pupils happily engage in agricultural activities either for learning purposes, production of food, or income generation. Pupils are able to try out what they learn from school gardens in their small gardens at home (e.g., making and using manure, recommended agronomic practices like spacing). Some students, however, make no effort to put into practice the knowledge and skills acquired from school gardens/enterprises due to lack of interest, lack of land, lack of encouragement or support from the parents, and/or general laziness. The pupils who make effort to try out the knowledge and skills at home served as trainers of their parents – a practice that has benefited the community, especially the non-VEDCO households. Practical sessions in the field have reinforced teaching and learning. Teachers have developed better and simple ways of delivering content to the pupils in a more understandable way. Parents or communities around the schools got the opportunity to access improved cassava cuttings and learn from the gardens.
- *Availability of lunch to pupils and teachers*: Through school gardens, schools were able to provide lunch to the pupils in form of porridge (sometimes mixed with eggs), cooked maize, and cassava. Provisions of food made pupils (and teachers) assured of something to eat. The worry of being hungry and losing concentration in class was minimized. Parents were relieved from the burden of contributing towards pupils' lunches (either in the form of cash or maize). This has made most homes feel more food secure because the food that used to be taken to school remains at home. Provisions of food at school also saved teachers from buying food. Cases of pupils invading and destroying people's sugar cane plantations in search of food reduced.
- *Improved performance of the pupils*: Some parents and teachers acknowledged that provisions of food from the school gardens helped some pupils improve their academic performance. These pupils had a more settled mind and concentrated on the learning as opposed to those that spent most of their time wondering what they would eat. The situation also applies to the teachers. A teacher cannot be effective with a hungry stomach. Provisions of food were reported to have contributed to reduced incidences of pupils falling sick during school time and repeating classes (pupils attend class more regularly than before).
- *Contribution to increased student enrollment:* As a result of improved academic performance, parents who had removed their children from the schools (on grounds of poor performance) have returned them to school.
- *Improved health:* The exposures to sanitation and hygiene were mentioned to have contributed to reduced cases of pupils with jiggers.
- *Improved working relationships between parents and teachers*: When pupils used to be sent home for reasons of defaulting or failing to make their contributions towards lunch, many parents felt annoyed. Some interpreted it is the teachers not liking them and their children. Teachers used to look at VEDCO as an organization that selected against teachers in favor of working with farmers. Currently VEDCO is looked at as an inclusive organization interested in improving livelihoods of everybody.
- *Digging no longer seen as a punishment*: Because of the school gardens, teachers are dropping the practice of using digging as a punishment for pupils. Cultivation/digging is now being seen more as a necessary productive activity than a punishment as it used to be seen. Pupils are now more interested in gardening and actively help parents in the fields as opposed to before where pupils disliked the hoe.
- *Tools saved from getting lost*: In the beginning, pupils were requested to take hoes that they would use in the school gardens. The children would lose the hoes, pushing the parents to buy new ones. To some parents, it was really a burden. Provision of hoes by VEDCO saved the parents for getting worried about losing their hoes, as many could not afford buying new ones.
- *Reduced risk and worry over pupils being exposed to accidents as they rushed home to 'grab' some lunch.*

Analysis of the above issues shows that the school enterprises have not only benefited the school community of pupils and teachers but people living around the school as well. Some have used the gardens as their learning grounds, while others have been able to access planting material of improved varieties of cassava. The enterprises, being of benefit and of interest to many, encouraged people to restrain their animals from destroying the gardens.

Source: Summary of service learning experiences in the VEDCO/SRL Program records.

2.6.2. Special Activities Targeting Vulnerable Households and Groups

A second set of activities under this IR targeted vulnerable households that were identified by local community leaders. The SRL Program currently supports eight HIV/AIDS-affected households. A number of isolated activities in support of widows, elderly, and youth groups were pilot tested in 2007 and 2008.

All that was extended to the mainstream SRL-targeted households, most of which were selected from the group of households identified as "food insecure" or as "extremely food insecure" by local leaders, was also extended to these families. Given their particular circumstances—most notably their limited labor resources and bad health – the program emphasized the importance of kitchen vegetable gardens (KVGs) for micronutrient-rich vegetables. A number of indigenous vegetables like cabbage, amaranth (leafy and grain), onions, nakati (*solanumnigrum*), eggplants, and pumpkins were also promoted amongst vulnerable households and in schools. In particular, grain amaranth, credited with high-value proteins and unsaturated oils, was widely accepted by community members who observed that it boosted the nutrition status of community members, especially the extremely wasted ones and HIV/AIDS victims. Farmers also observed that the kitchen vegetable gardens were not land intensive, are culturally acceptable, and have long harvest periods. Seven of the eight HIV/AIDS groups were also provided poultry to rear.

3.0. Early Evidence of Impact

There is a great deal of qualitative evidence that shows SRL's crop and livestock activities have increased food availability. Since SRL has not yet identified any single impact indicator for the entire strategic objective, this section focuses on analysis of some of the impact indicators for specific IRs that were tracked either by the program or the SRL Program quantitative surveys.

3.1. IR 1.1. Increase Household Access to and Use of New Climate-Smart Crop Technologies that Increase Productivity and Resilience

3.1.1. Sources of New Plant Material

One important sub-objective of the SRL Program was to facilitate farmers getting access to improved inputs. Survey results of 2006 indicated that most farmers used their own crop seeds for planting, with SRL supplementing new and improved crop varieties. Other sources included purchasing from the local crop-input supply stores and access from other NGOs and government programs. To date, a high percentage of vulnerable households being targeted by the program remain highly dependent on the program for access to improved seed and inputs. While there is anecdotal evidence from sources that certain supply stores have increased their supply of the improved planting material, there is no clear trend data on this. Given the critical importance of developing private-sector seed supply, this is a topic that an ISU or MAK student might wish to investigate next summer (2013).

In the first phase of interventions with program farmers (2005-2009), the farmer trainings included extension information on a wide variety of crops. These included maize, beans, cassava, sweet potatoes, groundnuts, bananas, and grain amaranth. In conjunction with this, the field agents collected information on the sources of seed utilized by the target farmers, which

included: on-farm storage and SRL material support (in some cases provided at a cost share) purchased from neighbors or local seed salesman, gifted from neighbors, or provided as part of a research project or government extension program.

Farmer surveys indicate the majority of farmers derived seed/planting materials from locally harvested materials stored on their farms. Only a small percentage—from two to 13% of those surveyed—purchased or obtained seed from neighbors, seed men, or the government.

3.1.2. Substantial Impact on the Average Land Area Being Farmed[24]

When the program started operating in Kamuli in late 2004, the majority of the community members were cultivating less than 2.5 acres. This drastically changed such that by 2007—two years since the launch of the program—more than half of the beneficiaries were planting three acres or more (Table 1.7). Thus, as indicated by the external evaluation report, community members were motivated to increase the acreage of land under cultivation because of the technologies (seed) and extension services that the program was offering.

From 2009 onwards, although new beneficiaries joined the program, assessing impact without discounting multiplier effects of the program on the new target farmers is impossible. This is because the new beneficiaries were from communities where the old beneficiaries live or from contiguous communities, implying that the new beneficiaries may have been already indirectly benefitting from the program. Their resource endowments were also closely similar. For instance, in 2006 over 60% of the beneficiaries were cultivating 2.4 acres or less, which was reduced to 47.5% in 2007. However, in 2009, both the old and new SRL target farmers were cultivating a hectare or less (around 2.4 acres). Even in 2011, the figures did not differ much (51%). What can be concluded from this is that after the introduction of the program in 2004, there was a general increase in the amounts of land cultivated by community members and the trend seems to have been both for previously participating and new beneficiaries. This can be confirmed using the evaluation reports of the program, whereby community-based trainers (RDEs and CNIIWs) provided services to group members and non-group members alike.[25]

[24] Sseguya, H. and Masinde, D. 2005. *Towards Achievement of Sustainable Rural Livelihoods in Kamuli District, Uganda: A Baseline Assessment*. Center for Sustainable Rural Livelihoods, Iowa State University, USA

[25] Mazur et al. 2006, Isubikalu, P. 2009. *Evaluation Report: Sustainable Rural Livelihood Improvement Program in Kamuli District, Uganda*. Ames, Iowa: Center for Sustainable Rural Livelihoods, Iowa State University for VEDCO.

Table 1.7. Changes in Total Land Owned and Cultivated for the Vulnerable Program Targeted by VEDCO/ SRL, 2006-2011

Land	2006 (n=320)	2007 (n=337)	2008 (n=308)	2009 (n=318)		2011 (n=318)	
				Old (n=263)	New (n=55)	Old (n=263)	New (n=55)
Total Land Owned (Acres)							
0.0-1.9	44.3	17.1	24.0	26.3	25.5	27.7	35.8
2.0-2.9	8.5	18.5	20.2	22.1	18.2	22.5	9.4
3.0-4.4	18.7	29.5	26.3	29.0	18.2	25.3	13.2
4.5-6.9	11.7	14.7	11.0	14.5	10.9	13.4	7.5
7.0+	16.8	20.2	18.5	8.0	27.3	11.1	34.0
Total Cultivated Land (Acres)							
0.0-1.9	52.5	26.1	not valid	38.2	40.0	33.7	39.6
2.0-2.4	15.2	21.4		14.9	12.7	17.9	11.3
2.5-3.4	10.1	20.0		20.6	12.7	15.5	9.4
3.5-4.4	5.7	15.6		13.0	14.5	14.3	5.7
4.5+	16.5	16.9		13.4	20.0	18.7	34.0

Source: Annual SRL Program Evaluation datasets 2006-2011 in Sseguya, Mazur and Masinde 2012: 16-17.

3.1.3. Major Impact on Crop Diversity[26]

It is noteworthy that for all crops there was an increase in percentage of households growing the different crops between 2005 to 2007; crop diversity decreased in 2008 due to weather and disease shocks in late 2007, when most areas were affected by devastating floods and a major outbreak of the African Cassava Mosaic Virus (ACMV), which led to low or no yields for some crops.[27] The proportion of households selling crops also increased steadily from 2006 to 2009.[28]

Especially important was the introduction of crops that were not extensively grown in the area prior to the SRL Program: bananas and grain amaranth. Bananas are one of the staples in the area, but community members always had to buy them from markets. Market vendors accessed the bananas from other parts of the country, located over 400 kilometers (km) from Kamuli. Thus, introducing bananas was seen as a potentially commercial venture for the communities. It is not surprising that close to 50% of the target household producing bananas were selling them as compared to those selling beans (almost same percentage growing but less that 40% selling) (Table 1.8).

Planting materials for the Vitamin A-rich orange-fleshed sweet potato were first multiplied in demonstration units and later distributed to households. Over 1,000 households have adopted the potatoes, and there are plans of processing them into other products like chips, flour, and doughnuts once community members realize enough surplus production. Small livestock (chicken, pigs, and goats) interventions are also at early stages of implementation to contribute to

[26] **Source:** Sseguya, Mazur and Masinde 2012: 18-19.
[27] VEDCO/SRL M&E annual reports 2008, Isubikalu, P. 2009. Evaluation Report: Sustainable Rural Livelihood Improvement Program in Kamuli District, Uganda. Center for Sustainable Rural Livelihoods, Iowa State University, Ames, Iowa, USA.
[28] Data for new and old households in 2009 does not show a significant difference. This was basically due to drought conditions that prevailed during that year. In 2011, data on sale of crops was not collected.

protein sources. Thirty-six multiplication centers have been established in all the three sub-counties.

In 2009, when the program expanded its operations into new households, the percentages of households growing certain crops—mostly cassava, groundnuts, and bananas—notably decreased. In fact, for cassava, a higher proportion of the new households added in 2009 were growing cassava compared to those households that were participating in the program since 2005. This was attributed to new strains of cassava diseases (Cassava Brown Streak Disease, or CBSD) that affected the new cassava technologies that the program developed more than the pre-existing varieties (although both the recent technologies and existent cassava varieties were susceptible to the disease). The new cassava materials were developed to be resistant to ACMV, but not CBSD. For bananas, even the soil health conditions were not supportive to crop production, but the most serious cause of the decline was banana bacterial wilt disease,[29] which decimated farmers' fields.

Groundnut production was also affected by weather conditions (delayed rains) and disease (groundnut rosette). It should be noted that—except for crops such as maize that had been traditionally grown by communities for a long time as staples—for other crops, the percent of households growing more crops increased, ensuring stability of food production as well as diversity. Also, as indicated in the previous section, the acreage increased compared to baseline conditions.

Table 1.8. Percentages of Survey Households Producing and Selling Crops Promoted by the VEDCO/SRL Program, 2006-2011[30] (in kg)

Crop	2006 (n=320)	2007 (n=337)	2008 (n=308)	2009 (n=318)		2011 (n=318)	
				Old (n=263)	New(n=55)	Old (n=263)	New (n=55)
Grown							
Maize	95.9	98.5	94.5	95.8	92.7	90.5	94.5
Beans	66.3	89.9	70.7	66.5	51.0	65.0	54.5
Groundnuts	52.2	77.5	35.3	29.7	30.9	33.5	41.8
Sweet Potatoes	55.0	98.2	69.7	66.9	65.5	83.7	87.3
Cassava	51.6	95.3	68.4	49.1	38.1	61.9	70.9
Bananas	17.8	91.4	53.2	25.5	21.8	37.3	29.1
Grain Amaranth	N/A	54.3	9.2	21.7	10.9	11.8	9.1
Sold							
Maize	56.9	72.5	N/A	85.5	90.9	N/A	N/A
Beans	39.7	33.9	N/A	58.5	50.9	N/A	N/A
Groundnuts	31.9	39.4	N/A	29.3	30.9	N/A	N/A
Sweet Potatoes	31.3	34.2	N/A	65.8	65.5	N/A	N/A
Cassava	30.3	53.6	N/A	48.3	38.1	N/A	N/A
Banana	8.1	48.6	N/A	25.1	20.0	N/A	N/A
Grain Amaranth	N/A	20.8	N/A	9.5	7.0	N/A	N/A

Source: Annual VEDCO/SRL Program Evaluation datasets 2006-11 in Sseguya, Mazur and Masinde 2012: 20.

[29] VEDCO monthly monitoring reports, 2008, 2009.

[30] **Methodology:** The yield data was collected during the survey by way of structured questioners (farmers estimates).

3.1.4. Successful Increases in Crop Productivity (Yields)[31]

The program collected yield data from a variety of sources (Table 1.9):

- One source was the periodic quantitative surveys, which were based on farmers' recollected harvest for specific harvests. Data for 2006 was not comprehensively collected, which makes it unfit for presentation. Thus, what is reported is yield data starting from 2007.
- Other sources of yield data were the various joint research projects that the program managed with different partners like the Bean/Cowpea Collaborative Research Support Project (CRSP).

Table 1.9. Farmer-Reported Yields for Major Crop Enterprises Promoted by VEDCO/ SRL Program in Kamuli District (Kg/Acre kg/ha)

Crop	Kg/Hectare (based on yield plots)			Kg/Acre (based on estimated harvests and areas planted)						
	Average Yields for On-Farm Field Trials[32]	Research Station Yield Averages		2006 (n=320)	2007 (n=337)	2008 (n=308)	2009 (n=318)		2011[33] (n=318)	
		OPV	Hybrid				Old (n=263)	New (n=55)	Old (n=263)	New (n=55)
Maize	550*2.5	4.5tn	7tn	N/A	589.	394	467	316	TBD	TBD
Beans	360*2.5	2.0tn		N/A	132	266	121	100	TBD	TBD
Groundnuts	640*2.5	2.7tn		N/A	194	358	249	1737	TBD	TBD
Sweet Potatoes				N/A	1380	1794	263	933	TBD	TBD
Cassava				N/A	1125	1215	88.	1012	TBD	TBD
Grain Amaranth				N/A	82	122	368.	191		

Sources: Annual SRL Program Evaluation datasets 2007-11 in Sseguya, Mazur, and Masinde 2012: 20.

Results indicate that the yields for maize were high after the program introduced new maize varieties in the community, although these decreased a bit in 2007 due to vagaries of weather. A comparison of 2009 data between old (those in the program since 2005) and new (those who were added as target households in 2009) households indicates that the old households reported higher yields than new households. For beans, a similar situation is reflected, whereby yields were comparatively higher up to 2008. In 2009, yields for old households were also higher than for new households.

Three things should be noted: First, cassava yields were comparatively very low for old households, especially by 2009 when the problem of CBSD became more serious and farmers reported total loss of their crop.[34] Second, due to serious drought conditions and unpredictable rains, yields for most crops in 2011 were very low, especially for major crops such as maize and beans, making comparisons between old and new households difficult.[35] Third, although the enterprises introduced led to increases in yields, these are still low compared to the potential

[31] **Source:** Sseguya, Mazur and Masinde 2012: 20-21.
[32] **Source:** Sseguya, Mazur and Masinde 2012: 20-21 and Table 1.10 below.
[33] **Source:** Sseguya, Mazur and Masinde. 2012.
[34] Haroon 2009, M&E report final evaluation phase 1.
[35] Haroo 2009, M&E report final evaluation phase 1

yields reported by research in Uganda (Table 1.10). The improved-but-still-low yields of crops in the program area imply a need for the program to consider addressing other agronomic and soil management practices that are not being addressed. One good example of how these issues should be addressed in collaboration with local partners is SRL's joint research programs with the International Bean/Cowpea CRSP, which started in 2008.[36] A fourth issue is that SRL's collaborating partners used a very different methodology for calculating yields which limits the effectiveness of comparisons such is these. SRL is planning to develop more standardized methodologies for reporting yields in the next phase.

Table 1.10. Yield Gap Between On-Farm and Research-Station Trials of Selected Crops in Uganda (kg/hectare)

Crop	On Farmers' Fields	On Research Stations
Maize	550	3,000
Beans	360	2,200
Groundnuts	640	3,250
Bananas	1,870	4,500
Coffee	370	3,500
Sweet Potatoes	5,300	35,000
Cassava	3,100	1,500
Grain Amaranth	500	1,000

Sources: (1) Adapted from MAAIF (2010) in Haroon Ssegguya, Robert Mazur and Dorothy Masinde 2012: 20-21; (2) National Crop Resources Research Institute (NaCRRI): participatory variety selection from trial sites in the Great Lakes Cassava Initiative (GLCI) partner supervised fields in eastern and central Uganda. May 2011 report, and (3) Uganda Bureau of Statistics (UBOS): Uganda Census of Agriculture 2008/2009.

3.2. IR 1.2. Increase the Adoption of Multi-Purpose Trees and Other Natural-Resource Management Practices on Farms

Currently there are no indicators being used to track the SRL Program's NRM activities. It would be extremely helpful if the next SRL quantitative survey could provide information on how much of this increase can be attributed to SRL's support for the commercial tree nurseries and training. It would also be useful if the program could access some of the satellite images and aerial photos being collected by other environmental agencies in order to better track what if any impact SRL's programs are having on the rate of deforestation.

3.3. IR 1.3. Increase Household Access to and Use of New Climate-Smart Livestock

3.3.1. Basic Start-Up Livestock Program (2006-present)

One strength of VEDCO/SRL has been its careful monitoring of the evolution of the initial stock of animals that the program supplied (Table 1.10). From the initial 130 target farmers who were primary beneficiaries, a total of 362 farmers have received animals:

- **Pigs:** 73% of the target households who received pigs have shared progeny with other farmers. Approximately 36% of the pigs provided produced offspring given to farmers. To date, a total of 268 farmers have received pigs.
- **Goats:** Approximately 49% primary goat beneficiaries who received goats have shared progeny with other farmers, hence a total of 94 goat beneficiaries.

[36] CSRL Archives.

Other data being tracked (Table 1.11) shows that:

- To date, the cumulative number of offspring from the original stock is 119 goats and 927 pigs;
- Total sales have reached 23 goats and 687 pigs;
- 31 goats and 113 pigs have been passed on to secondary beneficiaries; and
- At least 13 pigs have been slaughtered for home consumption. There have not been any goats slaughtered for home consumption. The low numbers of consumption are counteracted by purchase of meat when farmers make sales of livestock. Farmers usually by purchase meat after sales of livestock because they cannot consume the entire goat or pig if they were to slaughter it at home.

Some fatalities have occurred; 17 goats and 270 pigs died (Table 1.11). Causes of death in goat has been due to mostly heart water disease transmitted by ticks and hemonchus, a gut worm that sucks blood. Farmers are continuously reminded about the procedures of tick and worm control as the percentages of exotic blood increases in their stock through cross breeding.

The major cause of death in pigs has been outbreaks of African swine fever which can nether be prevented by vaccination nor treated. Efforts have been made to encourage housing pigs to increase bio-security, which has led to a declining number of losses during outbreaks now.

Despite these losses, the current stock to-date from the basic program that has resulted from the SRL-provided animals is (Table 1.11):

- 560 pigs, up from 155 pigs; and
- 201 goats, up from 63 goats.

This figure underestimates the actual impact of the activities on livestock ownership since the program only stocks the impact of the "seed stock" it provided farmers. There is abundant anecdotal evidence that many successful livestock adopters have purchased additional animals, which have provided critical cushions to help them save and manage risk (Text Box 1.6).

Text Box 1.6. Case Study: Successful and Less Successful Adoption of the Basic VEDCO/SRL Livestock Technology Package

Successful livestock adopter: Mary Waimaga, Butansi Parish, Bulunga Village Butansi Sub-County. Mary Waimaga is member of Butansi Trust farmers group, she received livestock support which included two pigs (male and female), one livestock structure, feeds, drugs, and acaricides from the program in 2009. From one pig structure, she has expanded it to three structures with seven pens containing 12 pigs. She has been selling pigs to maintain her household needs and pay school fees for her daughter at Makerere University and bought a heifer, which has now calved down twice. She therefore has now 12 pigs and three heads of cattle.

Less successful livestock adopter: Magada James, Kasambira Parish, Bukapere B Village, Bugulumya Sub-County. Magada James is member of Balinegomba group. He received 2 piglets(male and female). In addition the program supported him with feeds, drugs, maize seed, cost shared in the construction of the pig structure, and necessary training in pig management. Unfortunately, the African swine fever outbreak occurred in Bukapere and he lost all the pigs. Since then he has not re-stocked. His pig structure eventually collapsed, hence no sign of sustainability and continuity of the program.

Sources: Farmer testimonials in the VEDCO/SRL livestock database, updated August 2012.

Table 1.11. VEDCO/SRL Indicators Tracking the Evolution of its Basic and Commercial Livestock Activities in Kamuli District

Indicators Tracked in the VEDCO Livestock Data Base	2012
Types of Enterprises Practiced by All of the Farmers Receiving Livestock Services from the VEDCO Program	
Goats	94
Pigs	268
Total	362
Commercial VEDCO Livestock Activities (2010-Present)	
Number of Livestock Associations Working in the Target Parishes	3
Number of Livestock Producer Groups Working with the Target Farmers	66
Number of Target and Non-Target Farmers Receiving Services from the Program Through the Associations	
Target VEDCO Farmers	118
Non-Target VEDCO Farmers	229
Total Farmers	347
Primary and Secondary Beneficiaries of the VEDCO Start-Up Livestock Activities	
Evolution of the Current Stock of Animals Given to the Primary Target Farmer Beneficiaries (Note: figure does not include the number of animals that farmers have purchased or acquired from other sources)	
Goats	201
Pigs	560
Number of Offspring Produced by the Original VEDCO Stock Given to Target Households	
Goats	119
Pigs	927
Number of Offspring Produced by the Original VEDCO Livestock Stock Given to Target Households that has been "Passed On"	
Goats	31
Pigs	113
Number of Animals from the Original VEDCO Livestock Stock Consumed	
Goats	0
Pigs	38
Number of Animals from the Original VEDCO Livestock Stock Sold	
Goats	23
Pigs	837
Number of Animals from the Original VEDCO Livestock Stock that have Died	
Goats	17
Pigs	270

Source: VEDCO/SRL Livestock Tracking Data, updated August 2012. VEDCO/SRL Livestock Officer Dr. Nadiope Gideon,

3.3.2. Commercial Livestock Activities (2010-present)

To date, VEDCO/SRL's monitoring of the commercial livestock activities of the program has focused on tracking activities of the three associations (Table 1.12). The key impacts at this level are the creation of three associations comprised of 347 members (118 target farmers [34%] and 229 non-target farmers [66%]) (Table 1.12). Only one of the three associations is considered sustainable (Table 1.12). A key challenge for the next phase of the program will be to identify and monitor how the three associations will need to sustain their activities over the long-term.

Currently only one of the three is considered sustainable, which is not surprising considering that the associations were just created.

Table 1.12. Activities and Structure of the Associations that VEDCO/SRL Supports in Kamuli District

Name of the Association and Year Created	Number of Producer Groups Belonging to Association & Number of Registered Members	Association Activities, Achievements, and Goals	Autonomous Resources & Negotiated Deals	Level of Success and Major Challenges
Butansi Piggery Association (2012)	36 groups 148 non-target farmers 52 target farmers	**Activities:** -Collective purchase of feed and drugs. **Achievements:** -Members have managed to sell as a whole their group produce to big abattoirs in the region.	-Association-managed commercial piggery facilities. -Association-managed bulking centers for pig feeds. -The association has created a village savings and loan association (VSLA) that provides small loans to members. - Negotiated deals with Kamuli Farm Supply, Kazimini Input Dealers, and Agro-Ways Limited for agricultural inputs.	-They have been successful with collective purchase feeds in Jinja and collective marketing of pigs. -Major challenges are capacity building in market research and stable markets.
Bugulumbya Piggery & Poultry Association (2012)	21 groups 61 non-target farmers 37 target farmers	**Activities:** -Collective marketing of pigs. -Collective purchase of feeds. **Achievements:** Members have managed to collectively sell their pigs.	-Negotiated deals with Kamuli Farm Supply, Kazimini Input Dealers, and Agro-Ways Limited for agricultural inputs. -The association has created a VSLA that provides small loans to members.	-They have been successful in getting secure market in Kamuli and Jinja. -Challenges are formal registration at the district, capacity building on value chains, monitoring, and documentation.
Bwiiza Piggery Association (2012)	9 groups 20 non-target farmers 29 target farmers	**Activities:** Registration of members and constitution writing. **Achievements:** They have 49 members and are registered at the district level.	Association managed to mobilize resources for the collective purchase of feeds.	Association is still under initiation stage.
Totals	-66 producer groups represented -229 non-target farmers -118 target famers			

Source: Program notes from Gideon Nadiopie, Sangi Patrick, John Sembera, and Ronald Balibuzani consolidated by Kato Stephen, November 20-23, 2012.

3.4. IR 1.4. Increase the Access of Vulnerable Groups (Very Poor Women, HIV/AIDS-Affected Households, and Youth) to New Climate-Smart Technologies that Increase Productivity and Resilience

Each PEO has kept detailed records on each of the vulnerable groups they support. To date, however, there has been no systematic tracking of the program data on agricultural support to vulnerable groups. This information would be very useful to analyze given the abundant qualitative evidence that the program has indeed had a major impact on the beneficiaries' lives.

Members of these families mentioned improvement in their lives, mainly through having adequate food—as a result of the material support in terms seeds for vegetables, banana suckers, and poultry—and better health (Text Box 1.7).[37] They also mentioned developing a commercial-oriented attitude, which they did not have before. Selection of specific families for support created two categories of people: supporters who felt it was a worthy venture (mainly those in SRL Program), and those that felt jealous (mainly those outside SRL). Some people did not like the poor families selling them new, improved planting materials like banana suckers. Later in Phase II of the program, these groups joined the mainstream VEDCO/ SRL-supported groups.

Text Box 1.7. Case Study: Early Impact of the VEDCO/SRL Program on the Namasagali HIV/AIDS Group

The group has a membership of 25 members drawn from a number of villages. Almost all members are HIV positive. They are actively involved with the program from which they have, like other groups, accessed planting materials and training in agriculture and nutrition-related activities. As a vulnerable group, they have received additional medical and counseling support from SRL. Apart from the SRL Program, they also got support from a government program (National Agricultural Advisory Services, or NAADS) in the form of training and demonstration units for chicken, peanuts, and a cow.

The members have realized a number of improvements, including increased food for consumption arising from increased and variety production, improved diets and nutrition status, and improvements in sanitation and health status. They have also started up an internal savings scheme that members can borrow from at a modest interest rate. They have also established new friendships as a result of the group activities. Finally, and a bit interesting, is their enhanced social standing. They reported improved confidence and reduced shyness as well as an increase in membership. As one member observed, "We can confidently speak out regarding our status because we have an external actor who comforts us and brings us together to address our common problem." Another one stated that, "Our numbers have increased as a result of the progress we are making. We started with six members and now we are over 20."

Source: Sseguya, H. 2006. Annual Evaluation of the Livelihoods Improvement Program. Ames, Iowa: Center for Sustainable Rural Livelihoods, Iowa State University

This data has, however, been tracked by the PEOs since the start of these activities. The "draft" list of indicators that the community nutritionist developed to measure the agricultural support being given to the graduates of the NEC is an example of the type of tracking that VEDCO/SRL might consider in the future.

[37] VEDCO/SRL. 2006. Narrative for the 2006 Annual Report.

4.0. Lessons Learned and Recommended Next Steps

4.1. Lessons Learned

4.1.1. IR 1.1. Increase Household Access to and Use of New Climate-Smart Crop Technologies that Increase Productivity and Resilience

Observations:

Substantial progress has been made on increasing the yields on most crops. To date, however, there is no standard system for reporting yields. Thus the yields being reported in the quantitative surveys are reported one way and the yields being reported for the Bean/Cowpea CRSP and Harvest Plus Project are reported differently. More standardized reporting could help strengthen SRL's collaborative research and extension programs with these institutions.

Staff still reports huge post-harvest losses, which are reducing the impact of these yields on food security.

Recommendations:

- VEDCO/SRL needs to expand its collaboration with the national agricultural research organization and the relevant MAK faculty researchers and students that conduct applied research and extension on crop production and post-harvest handling in coordination with the same producer groups, associations, and staff working on the program's SO2 activities;
- VEDCO/SRL and ISU need to reflect on ways they could better harmonize their reporting on crop yields; and
- Since the crop production activities follow the same model of graduating target farmers from a basic package of innovations to a more commercial model of farming through associations, SRL might consider tracking these activities separately for IR 1.1 as is currently done for livestock.

4.1.2. IR 1.2. Increase the Adoption of Multi-Purpose Trees and Other Natural Resource Management Practices on Farms

Observations:

To date, the VEDCO/SRL activities have focused on agroforestry at the expense of promoting soil fertility management/soil and water conservation practices. Despite the uneven staffing of this component, the program has been—and continues to be—very active in both agroforestry and NRM.

Recommendations:

Prior to the March planning meeting, conduct an assessment of the program's NRM activities to date that can provide a basis for future planning, monitoring, and evaluation.

4.1.3. IR 1.3. Increase Household Access to and Use of New Climate-Smart Livestock

Observations:

Despite a late start, the livestock component of the program has increased livestock ownership for all but a small fraction of the target households. The same program has enabled about one tenth of the target households to become commercial livestock producers. Many of the program's current livestock activities—especially those orchestrated through the three livestock associations—are improving livestock production for non-target farmers as well. The same livestock associations—and linkages being formed by and through them—are helping to set the stage for sustaining these activities once the SRL funding ends or is scaled back.

Most, but not all, of the SRL's livestock activities are being tracked in ways that enable SRL to:

- Monitor the impact of these activities on vulnerable and less-vulnerable target farmers, and
- Identify the most pressing constraints that the newly created livestock associations are likely to face in the near future.

Given the program's careful tracking of livestock from the start, SRL simply needs to determine which indicators are the most important to track and develop more user-friendly systems for data entry, analysis, and reporting. More efficient user-friendly tracking systems will help the program determine which villages and target farmers still need help and which can be graduated.

Recommendations:

- Prior to the March 2013 planning meeting, conduct an assessment of the program's livestock activities to date that can provide a basis for future planning, monitoring, and evaluation, and identify which indicators that are currently being tracked should continue to be tracked; and
- Develop simple forms for data entry and analysis so that it will be easy for the livestock specialists to update the most critical information regularly.

4.1.4. IR 1.4. Increase the Access of Vulnerable Groups (Very Poor Women, HIV/AIDS-Affected Households, and Youth) to New Climate-Smart Technologies that Increase Productivity and Resilience

Observations:

There is a great deal of quantitative and qualitative data from the RDE and CBT reports and extension workers' observations that VEDCO/SRL's support for vulnerable groups and the five target schools where it is currently working has helped many of these groups increase the crop and livestock production of their members. Another recent initiative has been a series of program activities that are designed to increase the agricultural production of the families of the children being released from the Nutritional Educational Center. This information is just now being analyzed and reported on.

Recommendations:

- Review current indicators being used and the ones reviewed and proposed in the SWOT analysis that staff conducted in preparation for this workshop; and
- Develop simple tracking sheets that will facilitate the CBTs and PEOs entering information on the agricultural assistance given to vulnerable groups and its impact on a regular basis. This information is needed for strategic planning.

4.2. Cross-Cutting Lessons Learned

4.2.1. Monitoring and Evaluation

Observations:

Given the evolution of the activities of the activities under this SO over the last 10 years, there is little consensus on desirable impacts for the sum total of activities being executed.

One strength of the SRL Program is that it has the luxury of working back from a successful program that has already achieved the strategic objective for many households. The principal challenge today is to develop simple, user-friendly tables and spread sheets for analyzing and reporting on the indicators, which each team decides are the best ones for tracking program execution and impact for each IR.

Recommendations:

Prior to the March 2013 planning meeting, the SO1 team needs to develop a complete list of indicators for the activities in the sectors, some of new indicators they would like to add, and include the SO-level indicators that would track:

- Productivity per unit area (acre) planted in the survey based on some standard methodology for calculating yield that is recognized by the major partners;
- The use of external inputs—especially seed and fertilizers for crop production at the household level;
- The number of farmers adopting a certain minimum package of livestock; and
- The number of farmers who have adopted a minimum number of key agricultural innovations.

4.2.2. Iowa State University and Makerere University Special Projects

Observations:

Each year, between 20 and 30 undergraduate students participate in the service-learning program. Another five to 10 ISU and MAK graduate students are either directly or indirectly involved with the SRL Program, and many ISU and MAK faculty are interested or actually come out for short-term support.

Recommendations:

One of the key recommendations from the September 2012 workshop was to develop a list of applied research topics that could provide input for management decisions that the program is likely to face in 2013 and 2014 (Table 1.13).

Table 1.13. Suggested Areas for Applied Research and Case Studies that Could Contribute to the VEDCO/SRL M&E System for SO1

Topic	Short-Term Case Study (One Week; Undergraduate, Graduate, or Faculty)	Three-Month Project (Master's Thesis)	One- to Two-Month Research Project	Long-Term Research Project
IR 1.1. Increase Household Access to and Use of New Climate-Smart Crop Technologies that Increase Productivity and Resilience				
Case studies of specific group-sponsored demonstration sites and multiplication gardens for crops and livestock (with pictures) using standard indicators from the program	Single group or comparison of a successful group with a less successful one	Historical analysis of groups working in a given parish	Comparative study of successful vs. less successful demonstration sites	
Case study of a private-sector seed producer (with pictures) using standard indicators from the program	Single-group case study using standard indicators developed by the program		Multiple-group case study using standard indicators developed by the program	
Comparative study of different methodologies for calculating yield (including a literature review of standard practices in M&E in Uganda and for the major international agencies and NGOs)	Case study of one farmer or one household's production in one time period using different methodologies		Larger case study of multiple households in for a single crop and comparing government crop data	
Literature review of standard IARC (International agricultural research center), NGO, and bilateral indicators for tracking food availability activities			Yes (in Uganda or the US)	
Longer-term research project (by a MAK and/or ISU faculty member) to track the execution and impact of activities under this IR				Yes
IR 1.2. Increase Household Access to and Use of New Climate-Smart Livestock				
Comparative analysis of successful vs. less successful groups and individuals working in livestock using standard program indicators	Case study of one RDE experience with SRL livestock programs	Parish case study of SRL livestock using SRL, government, and PRA data collected by the program		

Topic	Short-Term Case Study (One Week; Undergraduate, Graduate, or Faculty)	Three-Month Project (Master's Thesis)	One- to Two-Month Research Project	Long-Term Research Project
Longer-term research project (by a MAK and/or ISU faculty member) to track the execution and impact of activities under this IR				Yes
IR 1.3. Increase the Adoption of Multi-Purpose Trees and Other Natural Resource Management Practices on Farms				
Comparative analysis of successful vs. less successful groups involved in agroforestry using standard program indicators	Case study of an individual household or group involved in agroforestry (successful vs. less successful)	Parrish case study		
Review of indicators used to track NRM component of food security programs in Uganda in order to identify: (a) promising technologies; and (b) useful indicators		Yes	Yes	
Longer-term research project (by a MAK and/or ISU faculty member) to track the execution and impact of activities under this IR				Yes
IR 1.4. Increase the Access of Vulnerable Groups (Very Poor Women, HIV/AIDS-Affected Households, and Youth) to New Climate-Smart Technologies that Increase Productivity and Resilience				
Case studies of specific schools or vulnerable groups using standard indicators	Case study of a single group			
Comparative study of different case studies/tracking data used on all of the SRL-affiliated schools in order to establish a list of recommended indicators for tracking the agricultural impacts of school gardens		For one parish	For the six parishes	
Quantitative review of all school lunch/school garden programs in Kamuli District	Compare and contrast of two nearby schools: one SRL affiliated and one not	For a parish	A complete review of all elementary school programs (SRL-affiliated and not) in the six parishes using some of the standard program indicators	A complete review of all elementary school programs in the six parishes using some of the standard program indicators (SRL-affiliated and not) to situate the SRL program in a larger context for

Topic	Short-Term Case Study (One Week; Undergraduate, Graduate, or Faculty)	Three-Month Project (Master's Thesis)	One- to Two-Month Research Project	Long-Term Research Project
				the entire district

Source: VEDCO/SRL staff recommendations, M&E Workshop, November 2012.

4.2.3. Integration of Quantitative and Qualitative Analyses into Case Studies and Testimonials

Since its inception, the SRL Program has used case studies and testimonials to illustrate its program and its impact on individuals and groups. Although case studies are informative, they are far more powerful when they integrate case-study data with the numbers the program is tracking in its M&E system.

Chapter 2

Strategic Objective 2 (SO2)
Build Diversified Livelihood and More Resilient Markets to Improve Food Access

John Sembera, Ronnie Balibuzani, and Jane Sempa[38]

1.0. Background

The SRL baseline survey showed that most households had limited cash with which to purchase extra food when the cropping season was bad. This was reflected in the low levels of cash income, the small percentage of cash crops that were sold, and the very limited developing of income-generating activities (IGAs). The net impact of this situation was that most farmers were forced to develop a host of negative coping strategies that further eroded their ability to manage risk.

1.1. Major Sources of Cash Income

The baseline participatory rural appraisal (PRA) in 2004 and 2005 showed a strong commonality but some important differences between the sub-counties in terms of the most common ways that households earned income from crop and non-crop enterprises. In Butansi and Bwiiza sub-counties, men are engaged in bringing in household income throughout the year from both on-farm and off-farm sources. On the other hand, in Namasagali sub-county, women are the ones engaged throughout the year in making income as well as spending it monthly. Farm income is derived mainly from sale of farm produce, particularly sweet potato, maize, common bean, millet, cassava, and groundnuts. Other farmers acquire household income from non-farming activities such as offering veterinary services and engaging in small-scale businesses, such as local hotels, saloons, shops, and trading in sand.

1.2. Percentage of Crops Sold

The baseline data showed that 50% of respondents sold almost half of their produce to generate household income. In particular, groundnuts (61%), maize (60%), beans (60%), cassava (59%), sweet potato (57%), and bananas (46%) were the most popular crops sold.[39] At the sub-county

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Jane Sempa has served as the VEDCO monitoring and evaluation manager since 2009. Prior to this she was the SRL monitoring and evaluation expert in Kamuli District (2005-2009).
The team was assisted during the September workshop by **Grace Babiyre**, currently the VEDCO programs manager for the central region (2011 to present). Prior to this she served as the VEDCO team leader for the eastern region, (November 2005-December 2010), as assistant program officer for the eastern region (May 2005-November 2005), and senior agriculture extension officer (October 2004-April 2005).

[39] Sseguya H. and Masinde D. 2005. Toward Achievement of Sustainable Rural Livelihoods in Kamuli District, Uganda: A Baseline Assessment. Centre For Sustainable Rural Livelihoods, Iowa State University, USA.

level, most farmers in Butansi sub-county reported to have sold at least two of the above-mentioned crops, followed by Bugulumbya and finally Namasagali.[40]

1.3. Levels of Food Access

The VEDCO/SRL baseline PRA identified 42.5% of the 800 households in the baseline survey as being "extremely food insecure" (Table 2.1).

Table 2.1. Criteria for Household Food Security Rating at Baseline for the 800 VEDCO/SRL Phase I Farmers in Butansi and Namasagali Sub-Counties in Kamuli District in February 2005[41]

Food Secure (9.2 %)	Food Insecure (48.3%)	Extremely Food Insecure (42.5%)
• Have a full granary or store of food • Eat four times a day • Eat a variety of foods • They are happy most of the time • Rarely fall sick • Possess cultivated land with a variety of crops	• Have a half-full granary or store of food • Eat two times a day • Occasionally eat a variety of foods • Occasionally fall sick • Buy food at times	• Have no granary or store of food • Eat once a day • Do not change foods eaten at home • Work for food from other community members • Usually appear sickly • Children usually eat from the neighbors' homes • Have malnourished and stunted children • Husband and wife always absent from home

Sources: Sseguya, H. Mazur, E.R and Masinde, D 2009. Harnessing community capitals for Livelihood Enhancement: Experiences from a Livelihood Program in Rural Uganda. Community Development 40(2): 123-138.

1.4. Food Insecurity Coping Strategies, Income-Generating Activities, and Credit Access

Households classified as "extremely food insecure" had few, if any, assets (e.g. granaries) or IGAs. Most households survived by working on the fields of other farmers, either locally or in another area of Uganda. Most food insecure households relied heavily on borrowing food, which they were forced to return after the harvest, thus further reducing their capacity to conserve food stocks for future shortages (Text Box 2.1).

Most IGAs were traditional, like charcoal, brick making, and transportation activities that served the local market. The development of more profitable IGAs was constrained by farmers' limited access to investment capital, limited understanding of potential markets, and how to prepare for them (Text Box 2.1). Crop sales were the principal source of cash, and most of the cash earned was used for routine family expenditures or to purchase livestock.

[40] Sseguya H. and Masinde D. 2005. Toward Achievement of Sustainable Rural Livelihoods in Kamuli District, Uganda: A Baseline Assessment. Centre For Sustainable Rural Livelihoods, Iowa State University, USA.

[41] **Methodology:** The food-security rating tool was used in February 2005, whereby community representatives generate indicators for each of the three categories of food security status: food secure, food insecure, or extremely food insecure. Meanwhile, names of each of the household from beneficiary groups are written on small pieces of manila paper (10cm x 10 cm). Representatives from each group then used these indicators to rate each household regarding their food security status. This was done for all the 800 beneficiary households.

Although Kamuli District included offices of a number of national credit facilities, most farmers relied on traditional credit. Most farmers belonged to credit circles. In this practice, each member contributes an agreed-upon cash figure and all of the members' contributions are given to one member. Come the next month, another member benefits. This practice is similar to the well-known merry-go-round practices among women's groups throughout Africa. Some of the farmer groups, such as *kikolwa ayenda munomukabi* in Kasambira Parish, also offered small loans to the community members who are not in the group.

Established financial institutions that farmers used to access credit services include the Foundation for International Community Assistance (FINCA), Uganda Finance Trust, village banks, and businessmen who offered credit through informal channels. Many farmers feared receiving loans from formal finance institutions because of the high interest rates and an unrealistic recovery period that is not suitable in their (farming) context. Despite the high interest rates, about 36% of the respondents had accessed credit in the past year, mostly from friends or relatives (21%) and from their own farmer groups (10%). The main reasons for accessing credit were to pay for school fees (16%), general home expenses (7%), hospital bills (5%), setting up a business (4%), or buying farm inputs (3%). When credit was accessed from banks or savings and loan facilities, the loan was often used to resolve family problems like paying school fees or medical fees and was rarely re-invested.

1.5. Interaction Between Credit, Income-Generating Activities, and Market Information and Food Access

The net impact of this situation was to create a repetitive cycle of food insecurity and poverty that made it virtually impossible for the most vulnerable farmers to escape. If rainfalls were good and they had an abundant harvest, the most food insecure households still had to repay in double what they had borrowed before and sell crops for routine needs (Text Box 2.2). Since there was little or no knowledge about food storage or food processing, there was almost no incentive to either store and/or to transform products into forms that would give them a higher cash return. In sum, the lack of granaries, non-governmental organizations (NGOs), and food-processing technologies gave farmers little buffer to either over- or under-produce.

The same situation discouraged the wealthier farmers and civil servants who had cash from investing in new agricultural technologies for fear that the resulting increased production might:

- Precipitate a price collapse (at best); and/or
- Produce massive spoilage (at worst) when the resulting increased production outstrips the local capacity to sell the product and/or to store it until it can be sold or consumed.

Text Box 2.1. Coping with Limited Food Access and Access to Formal Credit in Kamuli District (2005)

Coping Strategies
Naluwoli and Namasagali parishes: "In times of food scarcity, community members indicated that they borrow in-kind from other community members at a rate of one bag of maize or millet for two bags in return. Other coping methods include purchase from shops, using resources saved from previous months of plenty; for those households with inadequate resources, the number of meals is reduced or food is sought from rich relatives and friends."

Butansi Parish: "In the context of business opportunities, community member reported that there is no successful case in the parish that can serve as an example. Due to fear of jealousies and a weak economy in the community, whoever accumulates resources runs to big towns. In addition, community members noted that trends in business have been fraught with exploitation, especially by middlemen. This is unlike in the past, especially in the years when the cooperative movement was active (1962-1990s). Additionally, there is lack of credible sources of market information and credit. Members asserted that they are not aware of what to do in order to create successful business. Discussions revealed that the months of food scarcity are February-April. Members cope through purchasing from shops, borrowing (at a rate of one bag or tin for two in return) or asking for assistant from friends and relatives in a better position, either with regard to food or money that is used to purchase food."

"Agriculture is the primary activity but farmers do not have access to market or marketing information. Except in Namasagali and Bwiiza parishes, few community members have employment opportunities outside the parish. Other local activities included charcoal burning, making handicrafts, fishing, civil service, and trade in agricultural produce and rearing of small livestock."

Access to Credit
"Most of the farmers received income within their own groups in a practice they called 'circles.' In this practice, each member contributes an agreed-upon cash figure and it's given to one member. Come the next month, another member benefits. There were some farmer groups (e.g., *kikolwa ayenda munomukabi*) that offered some small loans to the community (*Kasambira*)."

Source: Sseguya H. and Masinde D. 2005. Toward Achievement of Sustainable Rural Livelihoods in Kamuli District, Uganda: A Baseline Assessment. Centre For Sustainable Rural Livelihoods, Iowa State University, USA.

2.0. Evolution of the SRL Activities to Increase Food Access

2.1. The Role of the VEDCO/SRL Microfinance and Enterprise Development Officer

Since 2006, the VEDCO/SRL Program has had a full-time credit officer. One of the most important roles of the credit officer is to train the farmer groups in savings and credit; enterprise selection, planning and management; training in farming as a business; financial records keeping; and collective marketing. These trainings are done with training modules that were developed by program staff.

The same officer is responsible for the identification and selection of the VEDCO target farmers for credit groups,[42] as well as overseeing disbursement from the SRL Program's microcredit finance and enterprise development program. He has also helped facilitate the access of many VEDCO and non-VEDCO farmers to loans from other microfinance institutions in the district.

[42] To be eligible for a loan, a candidate had to be an active farmer groups member, form a credit group of five trusted members, and be considered "food secure" and capable of repaying the loan. This selection criterion made the farmers more selective regarding whom to include within their groups, thus excluding some of the vulnerable farmers.