Appendix C

Project Workplan for the first 18 months (April 1, 2008 to September 30, 2009).

Attached to the Workplan are "Semi-Annual Indicators of Progress" and "Performance Indicators for Foreign Assistance Framework and the Initiative to End Hunger in Africa" forms.

Dry Grain Pulses CRSP

RESEARCH AND TRAINING WORKPLAN

18 Month Funding Period (April 1, 2008 to September 30, 2009)

Project Title: ***Enhancing Nutritional Value and Marketability of Beans through Research and Strengthening Key Value Chain Stakeholders in Uganda and Rwanda***

Lead U.S. Principal Investigator and University:
Robert E. Mazur, Center for Sustainable Rural Livelihoods, Iowa State University, rmazur@iastate.edu

Host Country PIs and Institutions:

Makerere University (Kampala, Uganda)
Dorothy Nakimbugwe, Dept. of Food Science & Technology, dnakimbugwe@agric.mak.ac.ug, dngabo@yahoo.co.uk

National Crops Resources Research Institute (Kampala, Uganda)
Michael A. Ugen, Beans Programme, m.ugen@naro-ug.org, michaelugen@yahoo.com

Volunteer Efforts for Development Concerns (Kampala, Uganda)
Henry Kizito Musoke, vedco@vedco.co.ug, vedco@infocom.co.ug

Kigali Institute of Science and Technology (Kigali, Rwanda)
Hilda Vasanthakaalam, Dept. of Food Science & Technology, h.vasanthak@kist.ac.rw, hildajeya@hotmail.com

I. Project Problem Statement and Justification

Agriculture in East Africa is characterized by women and men working in small scale, rainfed production, averaging 2 hectares per household (FAO 2006). Erratic bimodal rainfall patterns in recent years further challenge cropping results (ARB 2007). Farmers have very limited access to extension, training, inputs (quality seeds, fertilizers, etc.), improved agronomic practices, new technologies, and credit (KDA 2004; Nkonya et al. 2004). Producers not well linked with profitable markets, especially to emerging sectors of domestic and regional markets (Ehui & Pender 2005). Private traders operate on a small scale with limited investment capability. Availability and use of processed products at present remains very modest. As a result of low production levels, hunger is widespread (WFP 2006) and the vast majority of the rural population lives in absolute poverty (KDA 2004).

Our recent efforts to introduce new agronomic practices and technologies demonstrate encouraging progress (Butler & Mazur 2007). Ongoing collaboration since 2004 of Iowa State University (ISU), Makerere University (MAK), and Volunteer Efforts for Development Concerns (VEDCO) in Uganda's Kamuli District (Mazur et al. 2006; VEDCO 2006) using a sustainable livelihoods approach has increased food security and market readiness from 9% to 77% among 800+ farm households in the past 2½ years (Sseguya 2007). The main crops grown in Kamuli district are maize, beans, sweet potatoes, cassava, bananas, rice and coffee (Sseguya & Masinde 2005). Most (90%) of participating households produce beans, but only 20% sell some in 2007. The SL approach livelihood focuses on understanding and supporting individual and community capabilities, assets (natural, physical, human, financial, social, cultural and political capital), goals, strategies and activities. Diversification of livelihood opportunities and activities is crucial to sustainability (Ellis 2000). In combination with SL approaches, scientific

knowledge, improved technologies, financial assistance, and changes in government policies can have significant positive local impacts (Helmore & Singh 2001). Participatory research methods can generate knowledge that people can apply to improve their individual and collective well-being (Selener 1997).

Beans provide a *strategic opportunity* to help meet the Millennium Development Goal targets of reducing hunger and poverty. Improved beans production in Uganda and Rwanda offers unique opportunities to address the deteriorating food security situation there and elsewhere in sub-Saharan Africa. The short growth period and two growing seasons offers great opportunities to contribute to rural poverty alleviation - playing an essential role in sustainable livelihoods of small scale farmers and their families, providing food security and income to the most vulnerable group, the women and children. Testing whether yield improving technologies result in beans (Aim 1) with better nutritive value or processing characteristics (Aim 2) is an important under-researched issue in this region. Improved linkages to emerging markets is also essential (Aim 3).

Central problems limiting production of quality beans and higher yields

- Declining soil fertility and inefficient cropping systems unable to utilize available resources effectively and efficiently
- Limited accessibility and affordability of quality seeds, non-seed inputs and other yield improving technologies
- Effects of drought and other weather related factors compromise productivity and quality
- Diseases (root rot, anthracnose, angular leaf spot, common bacterial blight, viruses, rust, ascochyta blight) and insect pests (bean stem maggots, aphids, storage weevils)

Central problems relating to nutritional value and processing of beans

Pre- and post-harvest losses for beans are very high throughout the value chain, mostly due to poor harvest and post-harvest practices and poor on-farm storage facilities. Poor pre- and post-harvest handling also results in the majority of beans on the market characterized by mixed varieties and poor quality with high levels of foreign matter, rotten or shriveled beans, and infestation. The lack of value-added bean products having reduced preparation times makes bean preparation laborious with high fuel requirements; consumers also tire of monotonous flavor. As a result, an increasing number of people are abandoning or reducing their bean consumption despite its documented high nutrient content and health benefits.

The nutrition value of beans is negatively affected by anti-nutrients such as phytates, trypsin inhibitor, lectins, polyphenols, saponins, oligosaccharides and hemaglutinins (Kebede et al., 1995). However, treatments such as de-hulling, soaking, milling, fermentation and germination or malting and cooking enhance the digestibility and nutritional value (Matella 2005; Martín-Cabrejas 2006; Shimelis & Rakshit 2007; Nergiz & Gökgöz 2007; Cevdet & Gökgöz 2007).

Central problems inhibiting increased marketing of beans and derived food products

Prospects of marketing increased quantities of beans and new agro-processed bean products within the Ugandan and regional markets requires carefully examining production and marketing constraints (increased farm productivity, producer incentives, and access to better markets). Equally important is examining prospects for increasing demand for beans and agro-processed products (understanding consumers' tastes and preferences, increased consumer awareness of benefits of consuming beans and other value-added products, increasing consumer choices of value-added products, etc.).

II. Planned Project Activities for April 1, 2008 – September 30, 2009

Objective 1: To Improve Harvested Bean Quality and Yields

Collaborating Host Country and U.S. Researchers and Institutions:

Iowa State University (Ames, Iowa)
Mark E. Westgate, Department of Agronomy, westgate@iastate.edu

Approaches and Methods:

Obj. 1a. Determine and Prioritize Key Production Constraints of Six Priority Bean Varieties

Approaches and Methods

- Conduct participatory rural appraisals (PRA) to determine current local knowledge, attitudes and practices related to planting, weeding, soil fertility/nutrient management, and mitigation/control strategies for diseases and pests in four varieties of common bean in Kamuli district, Uganda, and two common bean varieties in Nyagatare district, Rwanda
- Prioritize constraints to increased production
- Prioritize constraints to improved quality

Benchmarks

Apr. – Sept. 2008

- Participatory rural appraisal guides/tools developed
- Participatory rural appraisal conducted
- Production constraints prioritized
- Quality constraints prioritized

Oct. 2008 – Mar. 2009

- Knowledge, attitudes and practices documented
- KAPs analyzed and report written

Obj. 1b. Improve Quality and Yields of Beans through Evaluation of Better Production Practices

Approaches and Methods

- Evaluate yield and quality of the beans (NABE 6 [white dry bean, small seeded] and K 131 [carioca dry bean] and K 132 and NABE 4 [red mottled beans] in Kamuli and Luweero districts in Uganda, and RWR 1668 and RWR 2245 in Nyagatare district in Rwanda)
- Evaluate practical management strategies to increase and stabilize seed yield and seed quality in participatory field research
- Carry out on farm demonstrations for farmers on better agronomic practices

Benchmarks

Apr. – Sept. 2008

- Availability of certified seeds for red and mottled bean varieties established

- Locations and farmer cooperators selected for research and demonstration
- Site and location visited by US team

Oct. 2008 – Mar. 2009

- Recommended irrigation and fertigation practices for profitable yields defined
- Field sampling and laboratory procedures to quantify bean quality established
- Trials planted, managed and harvested
- Seed samples submitted for analysis
- Yields under standard production practices from first crop season quantified and analyzed
- Crop production and soil management strategies evaluated
- Harvested bean quality for each demonstration site and experimental treatment quantified

Apr. – Sept. 2009

- Yield and quality of beans harvested from second crop season quantified and analyzed
- Impacts on bean quality from improved harvest and storage techniques documented

Obj. 1c. Strengthen Farmers' Collective Capabilities to Learn and Share Innovative Practices

Approaches and Methods

- Promote adoption of recommended practices to increase yield of quality beans through RDE and farmer training, and facilitating access to superior varieties and priority inputs

Benchmarks

Apr. – Sept. 2008

- Selected farmers mobilized to participate in training in better management and evaluation of research process and outputs

Oct. 2008 – Mar. 2009

- Farmer and extension training manuals developed for use by trainers (researchers and extension agents)
- Farmer knowledge on participatory research methodologies/designs enhanced for better trial implementation

Apr. – Sept. 2009

- Recommended research results incorporated in RDE training procedures and promotion protocols

Objective 2: To Enhance Nutritional Value and Appeal of Beans through Appropriate Handling and Processing

Collaborating Host Country and U.S. Researchers and Institutions:

Makerere University (Kampala, Uganda)
John Muyonga, Dept. of Food Science & Technology, muyongaj@agric.mak.ac.ug

Center for International Tropical Agriculture Research (CIAT-Africa)
Martha Nyagaya, Nutrition Programme – Harvest Plus, m.nyagaya@cgiar.org

Iowa State University (Ames, Iowa)
Suzanne Hendrich, Department of Food Science & Human Nutrition, shendric@iastate.edu

Approaches and Methods:

Obj. 2a. Establish the Key Causes of Post-Harvest Losses of Beans

Approaches and Methods

- Conduct participatory rural appraisals of current knowledge, attitudes and practices (KAPs) related to pre- and post-harvest handling
- Establish the basis and magnitude of post-harvest losses associated with different stages of post-harvest handling and storage (harvesting times, threshing method, drying, storage and packaging)
- Correlate knowledge, attitudes and practices with post-harvest losses, based on both the primary information obtained during the survey and the results of laboratory analyses

Benchmarks

Apr. – Sept. 2008

- MS and PhD students admitted
- Participatory rural appraisals conducted
- Knowledge, attitudes and practices assessed

Oct. 2008 – Mar. 2009

- Post-harvest losses prioritized
- Post-harvest management innovations promoted via training

Apr. – Sept. 2009

- Post-harvest management innovation adoption evaluated

Obj. 2b. Evaluate Impacts of Improved Post-Harvest Practices on Post-Harvest Losses in Study Sites

Approaches and Methods

- Promote adoption of recommended pre- and post-harvest handling practices that address the identified major causes to minimize post-harvest yield and quality losses
- Assess the effect of the above practices on post-harvest losses by comparing between two groups of bean farmers: one group using the recommended practices and the other group not

Benchmarks

Oct. 2008 – Mar. 2009

- Pre- and post-harvest losses reductions documented and analyzed

Apr. – Sept. 2009

- Further loss reductions documented and analyzed

Obj. 2c. Develop Protocols for Bean Products with Enhanced Nutritional and Organoleptic Properties

2c-1. Determine Digestibility and Utilization, Amino Acid Quality and Iron Bio-Availability

Approaches and Methods

- Determine nutritional and physico-chemical properties of bean varieties, and influences of agronomic and post-harvest handling practices on those properties
- Investigate the effect of pre-treatment of beans (malting, pre-soaking, roasting) on nutritional value of products.

Benchmarks

Apr. – Sept. 2008

- Initial recipes identified and disseminated

Oct. 2008 – Mar. 2009

- Nutritional and physico-chemical analysis initiated
- Analysis of benefits for nutritionally vulnerable people initiated

Apr. – Sept. 2009

- Best processing techniques to enhance protein and carbohydrate digestibility determined

2c-2. Develop Nutrient-Dense Bean Flour and Value-Added Recipes Utilizing Developed Bean Flour

Approaches and Methods

- Develop a semi-processed bean flour using the response surface methodology using preferred bean varieties from Uganda and/or Rwanda
- Develop recipes for nutritious, value-added products, using the developed bean flour
- Determine the acceptability and shelf-life of the developed products
- Promote the recipes for uptake in communities
- Demonstrate flour preparation for participating farmers to take it up as an enterprise

Benchmarks

Oct. 2008 – Mar. 2009

- Bean flour development initiated
- Protocol for semi-processed bean flour initiated

Apr. – Sept. 2009

- Acceptability data for developed products generated and analyzed
- Processing protocols for adoption by bean processors refined and promoted

Objective 3: To Identify Solutions for Constraints to Increased Marketing & Consumption

Collaborating Host Country and U.S. Researchers and Institutions:

Makerere University (Kampala, Uganda)
Barnabas Kiiza, Dept. of Agricultural Economics & Agribusiness, bkiiza@agric.mak.ac.ug
Gabriel Elepu, Dept. of Agricultural Economics & Agribusiness, elepu@agric.mak.ac.ug

Volunteer Efforts for Development Concerns (Kampala, Uganda)
TDB

Iowa State University (Ames, Iowa)
Helen H. Jensen, Department of Economics, hhjensen@iastate.edu

Approaches and Methods:

Obj. 3a. Identify Solutions to Production and Marketing Constraints Faced by Producers of Beans

Approaches and Methods

- Conduct baseline surveys of producers to generate information on production and marketing constraints, and terms of trade between farm and non-farm sectors
- Analyze value chain components and linkages to identify strengths and weaknesses
- Identify barriers and challenges farmers face in accessing emerging markets
- Initiate and facilitate farmers' interaction with small, medium and large scale wholesale and retail enterprises to promote distribution and purchase of beans and value-added bean products
- Train farmers and farm groups to more successfully market beans
- Identify ways to improve packaging methods, packaging materials and storage conditions

Benchmarks

Apr. – Sept. 2008

- Local stakeholders and partners identified to address adoption constraints
- Producers' marketing constraints identified

Oct. 2008 – Mar. 2009

- Value chain analysis initiated
- Priorities for education and training activities developed

Apr. – Sept. 2009

- Farmers trained and facilitated to improve their marketing of beans

Obj. 3b. Characterize Consumer Demand and Preferences for Beans and Agro-Processed Products

Approaches and Methods

- Participatory appraisals and baseline surveys of producers and consumers to determine knowledge, attitudes and practices regarding processing and human consumption of beans

Benchmarks

Apr. – Sept. 2008

- Qualities of beans corresponding to farmers' preferences determined

Oct. 2008 – Mar. 2009

- Consumer demand and preferences for beans characterized

Apr. – Sept. 2009

- Consumer demand and preferences for bean products characterized

Obj. 3c. Increase Consumer Awareness of Benefits of Consuming Beans and Value-Added Products and their Access to New Products

Approaches and Methods

- Train community members on the benefits of consuming beans
- Demonstrate value addition in beans and preparation of bean recipes to community members

Benchmarks

Apr. – Sept. 2008

- Nutrition awareness levels of benefits of bean consumption determined

Oct. 2008 – Mar. 2009

- Product improvement strategies identified
- Strategies and practices identified to promote consumer awareness and purchase

Apr. – Sept. 2009

- Farmers trained on benefits of bean consumption
- Community members trained on value addition and preparation of various bean recipes
- Follow-up on community trainings conducted

Objective 4: To Increase the Capacity, Effectiveness and Sustainability of Agriculture Research Institutions that Serve the Bean Sector in Uganda and Rwanda

Collaborating Host Country and U.S. Researchers and Institutions:

Makerere University (Kampala, Uganda)

John Muyonga, Dept. of Food Science & Technology, muyongaj@agric.mak.ac.ug

Barnabas Kiiza, Dept. of Agricultural Economics & Agribusiness, bkiiza@agric.mak.ac.ug

Gabriel Elepu, Dept. of Agricultural Economics & Agribusiness, elepu@agric.mak.ac.ug

Center for International Tropical Agriculture Research (CIAT-Africa)

Martha Nyagaya, Nutrition Programme – Harvest Plus, m.nyagaya@cgiar.org

Iowa State University (Ames, Iowa)

Mark E. Westgate, Department of Agronomy, westgate@iastate.edu

Suzanne Hendrich, Department of Food Science & Human Nutrition, shendric@iastate.edu

Helen H. Jensen, Department of Economics, hhjensen@iastate.edu

Approaches and Methods

- Engage students in learning appropriate theories and methods in discipline and multidisciplinary format
- Integrate students into research projects
- Guide development of students' research proposals and supervise their research

Benchmarks

Apr. – Sept. 2008

- Partnerships developed and formalized; roles of key partners defined, confirmed
- Training 3 MS students (Food Science & Technology, and Agricultural Economics and Agribusiness) at Makerere University initiated (enrollment and registration completed)
- Training 2 PhD students (Food Science & Human Nutrition, and Agronomy) at Iowa State University initiated (enrollment and registration completed)
- Research collaboration initiated

Oct. 2008 – Mar. 2009

- Research-development partnerships consolidated
- Training 3 MS students at Makerere University ongoing
- Training 2 PhD at Iowa State University ongoing

Apr. – Sept. 2009

- Training 3 MS students at Makerere University ongoing
- Training 2 PhD at Iowa State University ongoing
- Inter-organizational learning fostered
- Preliminary results disseminated (conferences, publications, websites)

Degree Training
First and given names: Cyrille
Last name: Syanobe
Citizenship: Rwandese
Gender: Male
Degree program for training: MSc
Program areas / Discipline: Food Science & Technology
Host Country Institution to benefit from training: Kigali Institute of Science and Technology, Rwanda
University to provide training: Makerere University, Uganda
Start date: August 2008
Project completion date: August 2010
Type of CRSP Support (full, partial or indirect): partial

Degree Training
First and given names: TBD
Last name: TBD
Citizenship: Ugandan
Gender: Female
Degree program for training: MSc
Program areas / Discipline: Food Science & Technology
Host Country Institution to benefit from training: Makerere University, Uganda
University to provide training: Makerere University
Start date: August 2008
Project completion date: August 2010
Type of CRSP Support (full, partial or indirect): partial

Degree Training
First and given names: TBD
Last name: TBD
Citizenship: Ugandan
Gender: TBD
Degree program for training: MSc
Program areas / Discipline: Agricultural Economics & Agribusiness
Host Country Institution to benefit from training: Makerere University, Uganda
University to provide training: Makerere University
Start date: August 2008
Project completion date: August 2010
Type of CRSP Support (full, partial or indirect): partial

Degree Training
First and Other Given Names: Gerald
Last Name: Sebuwufu
Citizenship: Ugandan
Gender: Male
Degree Program for training: PhD
Program Areas or Discipline: Agronomy
Host Country Institution to Benefit from Training: Makerere University, Uganda
University to provide training: Iowa State University

If enrolled at a US university, will Trainee be a "Participant Trainee" as defined by USAID? Yes
Supervising CRSP PI: Mark Westgate
Start Date: August 2008
Projected Completion Date: May 2012
Type of CRSP Support (full, partial or indirect): partial
If providing Indirect Support, identify source(s)s of leveraged funds: Iowa State University
Amount Budgeted in Workplan, if providing full or partial support: $46,089
Direct cost: $38,375
Indirect cost: $7,714
U.S. or HC Institution to receive CRSP funding for training activity: Iowa State University

Degree Training
First and Other Given Names: Geoffrey Arijole
Last Name: Nyakuni
Citizenship: Ugandan
Gender: Male
Degree Program for training: PhD
Program Areas or Discipline: Food Science and Human Nutrition
Host Country Institution to Benefit from Training: Makerere University, Uganda
University to provide training: Iowa State University
If enrolled at a US university, will Trainee be a "Participant Trainee" as defined by USAID? Yes
Supervising CRSP PI: Suzanne Hendrich
Start Date: August 2008
Projected Completion Date: May 2012
Type of CRSP Support (full, partial or indirect): partial
If providing Indirect Support, identify source(s)s of leveraged funds: Iowa State University
Amount Budgeted in Workplan, if providing full or partial support: $46,089
Direct cost: $38,375
Indirect cost: $7,714
U.S. or HC Institution to receive CRSP funding for training activity: Iowa State University

Short-term Training
Type of training
Description of training activity
Location
Duration
Scheduling of training activity
Participants/Beneficiaries of Training Activity
Anticipated numbers of Beneficiaries (male and female)
Amount Budgeted in Workplan
Direct cost:
Indirect cost:
If Leveraged Funding is to be used to Support this Training Activity, indicate the Source and Amount

Equipment (costing > $5,000)
Specific Type of Equipment to be purchased: motorcycle
Justification for equipment to achieve workplan objectives: transportation to farmers and fields
Institution to benefit from equipment: VEDCO
Institution to purchase equipment: VEDCO
Amount Budgeted for Equipment item: $6,500 (including fuel and maintenance)

III. Contribution of Project to Target USAID Performance Indicators:

(Complete the "Performance Indicators – Targets for Workplans" form for the project for the obligation period April 1, 2008 – September 30, 2009.)

Completed (attached)

IV. Target Outputs:

(Identify specific outputs to result from this project by the end of 30 months (September 30, 2010) that are expected to lead to developmental outcomes)

- Reports regarding recommended practices for crop production, and both pre- and post-harvest management procedures to improve quality of harvested beans and increase yields
- Training manuals (for VEDCO's Rural Development Extensionists, farm group members, etc.)
- Stronger links between farmers groups and associations to diverse types of buyers
- Reports of superior processing methods to protect protein and carbohydrate digestibility
- Recipes for widespread use, including for nutritionally vulnerable people
- Protocol for bean flour processing promoted for commercialization
- New value-added bean products designed for identified consumer markets

V. Engagement of USAID Field Missions

(Identify specific activities to be carried out during workplan period to engage USAID country or field missions so as to inform them of Pulse CRSP activities and to position project in HC or other developing countries for Associate Awards)

USAID agricultural initiatives in Africa seek to build economies, establish and enhance partnerships, and harness science and technology to meet the needs of the vulnerable and impoverished. This project will help USAID meet its goals for improved well-being in Uganda and Rwanda through agricultural activities designed to promote best practices, develop and market nutritious bean-based value-added products, and successfully link farmers and producers to markets. We will meet periodically with Mission staff devoted to realization of their agriculture-related strategic objectives (SO 617-007 Economic Growth, Agriculture and Trade in Uganda) and SO 696-007 (Economic Growth, Agriculture and Trade) in Rwanda. We will also invite them to project-sponsored activities and share results of our research-development activities.

VI. Networking Activities with Stakeholders

(Identify planned networking activities with public and private stakeholder groups to ensure widespread promotion and dissemination of outputs in Host Countries)

To realize project objectives and actively promote institutionalization of positive impacts of research project finds and impacts, we will effectively engage diverse key stakeholders throughout the project and in annual workshops:

- Work with farmers, groups and associations to understand local livelihoods, agronomic practices, their previous and current linkages with various types of institutions and service providers (governmental and non-governmental), private sector traders, and transporters
- Interact regularly with various types of institutions and service providers (governmental and non-governmental), private sector traders, transporters, small, medium and large scale processors and distributors etc., to gain and maintain appropriately broad perspectives on key issues in the value chain, benefit from their special expertise, and build consensus and collaborative relationships for high levels of continued success
- Hold periodic planning and review meetings to involve all partners so that challenges and constraints are discussed and strategies to deal with them developed together
- Facilitate broad involvement in research design, data collection instruments and processes, and data analysis
- Share results from various stages of the project to encourage constructive criticism and strengthen usefulness, impact and sustainability of intervention results
- Involve other developmental partners with similar interests for complementarily and dissemination of results to other areas and countries
- Project results will be shared with the research and developments communities in Uganda, Rwanda and the region through workshops and various types of publications

VII. Leveraging of CRSP Resources

(Identify existing or future opportunities to be pursued to leverage additional resources for planned Pulse CRSP research, training and outreach activities)

- In addition to the direct collaboration between food scientists in Uganda, Rwanda and the U.S. in this project, link work done by NaCRRI and ISU with ISAR (Institut des Sciences Agronomiques du Rwanda) and MSU through a linkage with the Pulse CRSP project directed by James D. Kelly
- Iowa State University is contributing to partial support for two Ph.D. students from Uganda
- Explore bases for possible collaboration with relevant USAID-funded projects in Uganda and Rwanda, as well as other relevant projects in these countries
- Identify, with Mission staff, the potential for an Associate Award
- Explore possibilities of funding from members of the bean producer and processor industry
- Work to identify agencies that may fund related research, training and outreach and prepare proposals as appropriate

Dry Grain Pulses CRSP
Research, Training and Outreach Workplans
(April 1, 2008 - September 30, 2009)

SEMI-ANNUAL INDICATORS OF PROGRESS BY INSTITUTIONS AND TIME PERIOD

Project Title: **Enhancing Nutritional Value and Marketability of Beans through Research and Strengthening Key Value Chain Stakeholders in Uganda and Rwanda**

	Abbreviated name of institutions in columns below														
	Iowa State Univ.			Makerere Univ.			NaCRRI			VEDCO			KIST		
Benchmark Indicators by Objective	10/1/08	4/1/09	10/1/09	10/1/08	4/1/09	10/1/09	10/1/08	4/1/09	10/1/09	10/1/08	4/1/09	10/1/09	10/1/08	4/1/09	10/1/09
Objective 1	***Improve Bean Quality and Yields***														
PRA tools for KAP study developed	x			x			x			x			x		
PRA conducted and data collected				x			x			x			x		
Local agronomic KAPs documented					x			x			x			x	
KAPs analysed and reported		x			x			x			x			x	
Production constraints prioritized				x			x			x			x		
Quality constraints prioritized				x			x			x			x		
Certified seeds of bean varieties establ.							x			x			x		
Locations & farmer cooperators selected	x			x			x			x			x		
Site and location visited by US team	x		x	x		x	x		x	x		x			x
Irrigation/fertigation practices defined		x	x					x	x		x	x			
Field sampling tech. & lab proced. establ.		x			x			x			x			x	
Trials planted, managed and harvested								x	x		x	x			
Seed samples submitted for analysis		x	x		x	x		x	x		x	x		x	x
Yields quantified and analyzed		x	x					x	x						
Crop & soil mgmt. strategies evaluated		x	x					x	x						
Harvested bean quality quantified		x	x		x	x		x	x					x	x
Harvest & storage tech. impacts docum.		x	x		x	x		x	x					x	x
Farmers mobilized for training							x			x					
Extension training manuals developed					x			x			x				
Farmers trained in research methods					x			x			x				
Research results incoporated in training						x			x			x			
Objective 2	***Enhance the Nutritional Value and Appeal of Beans***														
PRA conducted & KAPs assessed				x			x			x			x		
Post-harvest losses prioritized								x			x			x	
Post-harvest mgmt. innovations promoted								x			x			x	
Innovation adoption documented									x			x			x
Loss reductions documented & analyzed			x		x	x		x	x		x	x		x	x
Recipes identified and disseminated	x			x			x			x			x		
Nutrit./physico-chem. analysis started		x			x									x	
Analyzing benefits for vulnerables initiated		x			x									x	
Best processing techniques determined			x			x									x

Bean flour development initiated					x									x	
Bean flour product protocols dev. initiated					x									x	
Product accept. data generated/analyzed			x			x						x			x
Processing protocols refined & promoted			x			x									x

Objective 3	***Increase Marketing and Consumption of Beans and Bean Products***														
Local stakeholders & partners identified				x			x			x			x		
Producers' mktg. constraints identified	x			x			x			x			x		
Value chain analysis initiated		x			x						x				
Education & training priorities developed			x		x			x			x				
Farmers trained, facilitated for marketing						x			x			x			
Qualities of preferred beans determined	x			x			x			x			x		
Consumer pref./demand characterized		x	x		x	x					x	x		x	x
Nutrition awareness levels determined				x						x			x		
Product improvement strategies identified		x	x		x	x		x	x		x	x		x	x
Community training on bean consumption						x						x			x
Follow-up on community trainings						x						x			x

Objective 4	***Increase Capacity, Effectiveness & Sustainability of Ag. Research Institut.***														
Partnerships developed/formalized	x			x			x			x			x		
Training 3 MS @ MU initiated, ongoing				x	x	x							x	x	x
Training 2 PhD @ ISU initiated, ongoing	x	x	x												
Research collaborat. (Unvi.,NARO,NGO)	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Research/dev. partnerships consolidated			x			x			x			x			x
Inter-organizational learning fostered		x	x		x	x		x	x		x	x		x	x
Prelim. results dissem. (conf., websites)			x			x			x			x			x

Name of the PI responsible for reporting on benchmarks	Robert Mazur	Dorothy Nakimbuwe	Michael Ugen	Henry Musoke	Hilda Vasanthakaalam
Signature/Initials:					

Date: _____

Dry Grain Pulses CRSP
Research, Training and Outreach Workplans
(April 1, 2008 -- September 30, 2009)

PERFORMANCE INDICATORS/TARGETS
for Foreign Assistance Framework and the Initiative to End Hunger in Africa (IEHA)

Project Title: Enhancing Nutritional Value and Marketability of Beans through Research and Strengthening Key Value Chain Stakeholders in Uganda and Rwanda

Lead U.S. PI and University: Robert E. Mazur, Iowa State University

Host Country(s): Uganda, Rwanda

Output Indicators	2008 Target (Apr 1-Sept 30, 2008)	2008 Actual (Apr 1-Sept 30, 2008)	2009 Target (Oct 1 2008-Sept 30, 2009)	2009 Actual (Oct 1 2008-Sept 30, 2009)
Degree Training: Number of individuals who have received degree training				
Number of women	1		1	
Number of men	4		4	
Short-term Training: Number of individuals who have received short-term training				
Number of women	0		0	
Number of men	0		0	
Technologies and Policies				
Number of technologies and management practices under research	4		5	
Number of technologies and management practices under field testing	4		5	
Number of technologies and management practices made available for transfer	2		3	
Number of policy studies undertaken	0		0	
Beneficiaries:				
Number of rural households benefiting directly	60		120	
Number of agricultural firms/enterprises benefiting	0		2	
Number of producer and/or community-based organizations receiving technical assistance	4		16	
Number of women organizations receiving technical assistance	4		16	
Number of HC partner organizations/institutions benefiting	4		4	
Developmental outcomes:				
Number of additional hectares under improved technologies or management practices	4		30	