**LEGUME INNOVATION LAB FOR COLLABORATIVE RESEARCH
ON GRAIN LEGUMES**

FY 2013 – 2014 WORKPLAN

Project Code and Title:
SO4.1 Impact Assessment of Dry Grain Pulses CRSP investments in research, institutional
capacity building and technology dissemination for improved program effectiveness

Lead U.S. Principal Investigator (PI) and affiliated Lead U.S. University:
Mywish Maredia, Assoc. Professor, Agricultural, Food and Resource Economics (AFRE),
Michigan State University

Host Country and U.S. Co-PIs and Institutions:
Eric Crawford (Co-PI) and Byron Reyes, Agricultural, Food and Resource Economics, Michigan
State University

US and HC PIs/collaborators of other Legume Innovation Lab Projects

I. Project Problem Statement and Justification:

Impact assessment is essential for evaluating publicly-funded research programs and planning
future research. Organizations that implement these programs should be accountable for showing
results, demonstrating impacts, and assessing the cost-effectiveness of their implementation
strategies. It is therefore essential to document outputs, outcomes and impacts of public
investments in research for development (R4D) activities. Anecdotal data and qualitative
information are important in communicating impact to policymakers and the public, but must be
augmented with empirical data, and sound and rigorous analysis.

Building on the momentum and experience gained over the last three years, the proposed
research will contribute towards evidence-based rigorous ex ante and ex post assessments of
outputs, outcomes and impacts with the goal of assisting the Legume Innovation Lab program
and its Management Office (MO) to achieve two important goals--accountability and learning.
Greater accountability (and strategic validation) is a prerequisite for continued financial support
from USAID and better learning is crucial for improving the effectiveness of development
projects and ensuring that the lessons from experience – both positive and negative – are heeded.
Integrating this culture of 'impact assessment' in publicly funded programs such as the Legume
Innovation Lab will ultimately help increase the overall impact of such investments.

II. Planned Project Activities for the Workplan Period (April 1, 2013 – September 30, 2014)

Objective 1:
Conduct impact pathway analysis, provide advisory role to the MO, and be responsible for
technical leadership in the design, collection and analysis of data for strategic input and impact
evaluation

Collaborators:
U.S. and HC PIs from other Legume Innovation Lab projects

Approaches and Methods:

One of the objectives of this project is to play an advisory role to the Management Office of the Legume Innovation Lab on research priorities, performance assessment, and on strategies for achieving maximum impact. In this capacity, the Project lead PI will review all the proposed research projects with the aim of

a. Defining impact pathways for project outputs and inculcating an impact culture within the Legume Innovation Lab; and
b. Advising the MO and the project team on ways to integrate data collection and impact evaluation strategies as part of the Innovation Lab project design; and providing technical leadership in the design, collection and analysis of baseline and end line data for strategic input and impact assessment

In FY 13-14, the project plans to implement the following activities under each of these sub-objectives.

1a. Defining impact pathways for project outputs and inculcating an impact culture:

To maximize its utility, we plan to conduct such impact pathway analysis for all the projects to be funded by the Legume Innovation Lab at the outset during the proposal and workplan development phase. The goal is to integrate impact pathway planning in all subcontracted Innovation Lab projects to help foster an impact culture in the Legume Innovation Lab community. With this aim in mind, one of the project team members will participate in the project planning meetings planned in FY 13 and present the concepts, tools and guidelines for developing the impact pathway for projected research outputs. The impact pathway analysis will serve as a tool to capture each project's projected outputs, outcomes and impact. This analysis and forward thinking will help the researchers define the 'vision of success' and identify strategies to achieve that vision as part of the activities/partnerships planned over the next 4.5 years.

As a follow-up to the impact pathway analysis and as part of an ongoing review (and M&E) of research portfolio, this project will put together a database that will give a synopsis of the types of outputs to be generated by different research projects across the Legume Innovation Lab by the end of FY 2017, potential scale or impacts envisioned by the research team over the next 4.5 years, impact pathway and indicators along that pathway to achieve developmental outcomes (in the form of impacts at the beneficiary/adopter level). This will then be used in subsequent years to monitor the progress towards the achievement of research outputs and the planned strategies for achieving the vision of success.

As part of the advisory role of the lead project PI, the project team will assist the MO in developing a handbook and tools for collecting the FTF required performance indicators data. This data reporting tool and guidelines for collecting the performance indicators data will be included conveyed to each Legume Innovation Lab team at the project planning meetings scheduled in May-June 2013.

1b. Technical leadership in the design, collection and analysis of baseline and end line data for strategic input and impact assessment: Legume Innovation Lab's investments in

"research for development" fall across the wide spectrum of activities ranging from basic/fundamental research to applied/adaptive research to technology transfer. Since resources to conduct research are scarce, many Innovation Lab projects undertake pilot scale initiatives and programs designed to test science-based interventions in a developing country setting with the aim of identifying the most effective strategies/models which can then be scaled up to achieve developmental impacts. For a research project to be successful in achieving this goal requires some forethought on the design of field activities and a strategy for collecting appropriate baseline and follow-up data or making use of available data. The purpose of such strategizing is to make sure that at the end of an intervention/activity, opportunity to assess the cause-effect relationship between a research project and indicators of outcomes/impact is not lost. As part of this project, the PIs will work with other research project PIs to assess the feasibility of integrating data collection and impact evaluation strategies as part of their Legume Innovation Lab project design. The project team will use the opportunity of participation in the planning meetings and follow-up discussions while the teams are finalizing their workplans, to identify opportunities for collecting baseline data and integrating impact evaluation research as part of the project design.

As of the date of writing this workplan, the following opportunities have been identified for baseline data collection in FY 14:
a. Socio-economic baseline study on the constraints and opportunities for research to contribute to increased productivity of climbing beans in Guatemala: This will be a joint activity with the SO1.A4 project team under their objective 1b '*Genetic improvement of climbing black beans for the highlands of Central America and Haiti.*' This study will be designed to establish a baseline about production of climbing beans in the highlands of Guatemala, and to better understand the current status of the climbing bean/maize intercropping production system. Information and data concerning cultivated area, number of different species grown, number of farmers utilizing this cropping system, production problems, seed quality and culinary preferences will be collected to help establish priorities for the climbing bean breeding program.
b. Study on the market potential for biopesticides in Benin: This will be a collaborative activity with the SO1-B1 project team, specifically with Dr. Leonard Hinnou from INRAB-Benin, under their objective 3 '*Scaling of solutions.*' This study will be designed to assess the potential groups that can develop, market and sell biopesticides, and serve as the logical "pass-off" groups in host countries for scaling up these technologies. This study will serve as a baseline to assess the market potential for biopesticides (e.g., what farmers are willing to pay, what will be the costs to enter the market place for small industries, what are skill-sets that need to be developed for womens' groups to potentially make and profit from selling such materials, etc.) and will determine the networks of NGOs and other organizations where the project can "pass-off" educational approaches (e.g., animations) for scaling.

For these two studies, the Impact Assessment team will provide technical leadership in the form of human resources and professional expertise in data collection (i.e., sample design, evaluation design, designing data collection instruments, training enumerators, data entry templates, etc.) and analysis. This will be a joint activity with the relevant research team and rely on the logistical support from the host country partners. Resources for data collection have been budgeted under the relevant research projects.

In addition to these two baseline assessment studies, this project will work with the SO2.1 and SO2.2 project teams and provide input in the survey and data collection efforts planned

under their project in FY 14. This input will be in the form of review of survey instruments, sampling strategy, and the method and approach of collecting desired data to achieve the research objectives. We will seek for opportunities to use this planned surveys to achieve broader research questions from the perspective of the Legume Innovation Lab, and/or design the sampling plan such that it can also serve as a baseline for a future impact evaluation study.

Other activities to be conducted under this sub-objective in FY13 and FY14 include:
a. Finalizing the report of the pre-biocontrol agent baseline assessment study conducted in Burkina Faso in 2012. This report will be published as an MSU Staff paper before the end of 2013.
b. Continue discussions with the existing and new project teams (that will be awarded through a competitive process) to assess the following:
   i. Potential of existing data sets that can inform about the baseline and help in the analysis of impact attribution
   ii. Possibility of collecting relevant baseline data in FY 15 through FY 17.
   iii. Possibility of writing joint proposals to leverage resources from other sources to conduct impact evaluation studies of pilot activities.
c. Plan for two socio-economic assessment studies which will occur in FY 16 or FY 17 to assess the impact of biocontrol research in Burkina Faso (in collaboration with SO1-B1 project team) and the impact of bruchid resistant bean varieties in Tanzania (in collaboration with SO1-A4 project team).

Objective 2: Conduct ex ante and ex post impact assessments

Collaborators:
Robert Shupp, Department of Agricultural, Food and Resource Economics
Enid Katungi and Jean Claude Rubyogo, CIAT/PABRA
Barry Pittendrigh and Julia Bello-Bravo, UIUC and Malick Ba, INERA (Burkina Faso)
U.S. and HC PIs from other Legume Innovation Lab projects
HC collaborators of the BTD project in Honduras, Guatemala and Nicaragua

Approaches and Methods:
Under this objective, this project plans to: 1) assess the realized (ex post) impact of the Legume Innovation Lab (and the predecessor CRSP program's) investment in technologies/outputs where there is evidence of adoption, and 2) enhance future impacts by engaging in innovative and evidence-based research that will serve as an input in making strategic research priority decisions by the Legume Innovation Lab program, and in developing strategies for technology dissemination for maximum impact.

In FY 13 and FY 14, following research studies and activities will be undertaken under this objective based on discussions with and interest expressed by the Management Office and the AOR, USAID.

2a. The economics of supply and demand for the sustainable development of legume grain seed system: The impact of research investment in crop improvement research is dependent upon the availability (supply) and affordability (demand) of seeds of improved varieties. Assessment of factors that contribute to the success and sustainability of seed systems for grain legumes in different socio-economic and agricultural systems contexts is

therefore an important area of research to enhance the impact of past research by the CRSP and future investments by the Legume Innovation Lab. This project will conduct field research to address the following research question:

What factors contribute to the sustainability of seed systems?
The seed dissemination project implemented in four countries in Central America under the Bean Technology Dissemination (BTD) project offers a good opportunity to do an in-depth analysis of the unique features of different models for seed multiplication and distribution so as to identify principles of sustainability present/absent from these different models and derive implications and lessons for broader applicability to other countries where Innovation Lab research programs are active. A research study focused on identifying "elements of sustainability of the bean seed system' is jointly planned with the Monitoring and Evaluation (M&E) component of the BTD project (led by M. Maredia), and includes the following components: a) Three surveys in Nicaragua (completed in 2012): i) A survey of 153 Community Seed Banks (CSB), ii) a survey of 480 Nicaraguan farmers who received bean seed in 2011, and iii) the cost of production record keeping by158 CSBs during the 2011-12 bean seed growing season; b) Assessments in Honduras and Guatemala (to be completed in FY 14, as described below) to evaluate the effectiveness of different models of bean seed dissemination used in the two countries and assess the constraints, challenges, and factors contributing to the success (or failure) of different models, and to evaluate the benefits of improved seed distributed by the BTD project from the perspective of the Beneficiaries

The proposed work to address the objectives of the assessment studies in Honduras and Guatemala will involve: 1) Conducting interviews (using semi-structured questionnaires) with representatives of organizations/entities along the seed value chain and collecting data/information that will help us assess the constraints, challenges, and factors contributing to the success (or failure) of different seed distributions systems. These interviews will be conducted in July-August 2013 by Dr. Byron Reyes, Assistant Professor and David DeYoung, a graduate student in AFRE, MSU. Both have the necessary language skills and have extensive experience working in this region. 2) Conducting surveys of beneficiaries of the seed distribution efforts. The sample of farmers to be surveyed (500 in each country) will be selected using a two-stage cluster sampling method. The survey will focus on farmers' perception of the efficiency and effectiveness of the methods used to distribute the seeds, the quality of seed received through the BTD project, and the economic gains experienced from planting improved variety seeds. The field work will be carried out in summer 2013 (July-August) through NITLAPAN of the *Universidad Centroamericana* (UCA). David DeYoung from MSU will participate in enumerator training and provide supervisory role during the field work, along with the staff of NITLAPAN. Data entry and cleaning will be done by NITLAPAN and survey data files will be submitted to MSU for analysis and reporting (to be completed in FY 14).

Potential work beyond C. America: Assessment of factors important for the sustainability of bean seed systems is a high priority area also for PABRA. Our interactions with the PABRA Theme Leader (J. C. Rubyogo) and CIAT socio-economist (E. Katungi) indicates some ongoing research by PABRA/CIAT in Uganda, Ethiopia and Tanzania to understand the complexity of legume seed availability and accessibility, and their keen interest to collaborate with us in expanding the research to other grain legumes (i.e., cowpea) and other countries. In FY 13-14, we plan to explore

collaborative research opportunities with the PABRA/CIAT team focused on following research topics:

- Role of grain market in sustaining seed demand
- Limitations and potential of private seed sector and farm based seed production in bean seed production and marketing
- Viability of quality declared seed (QDS)
- Strategies to reduce the cost of production and distribution of quality declared seeds or certified seeds
- Willingness of small holder farmers to pay for quality seed over grain?

The scope of activities addressing these research questions in FY 14 and beyond will be contingent upon availability of resources. As a priority, if funds are available, we plan to implement research studies in one or two countries addressing the question of willingness to pay for quality seed over grain. The methodology/ approach to address this research question will consist of first conducting field experiments in farmers' fields to demonstrate the value of planting seed vs. grain of the same variety (to keep the genetic component of the planting material constant) and then conducting choice experiments (CE) and/or biding experimental auctions (BEA) to test farmers' willingness to pay for seed vs. grain. These experiments could include three treatments related to the type of materials used for planting: grain (saved from previous harvest or purchased from the market), quality-declared seed, and certified seed. The experiments could be designed to understand the following elements of seed demand – quantity of seed, frequency of seed purchase, and willingness to pay for seed for a given quantity and frequency. The major field costs of doing this study will include conducting the field experiments in different sites (to represent different agro-ecological and socio-economic conditions) (estimated to be $5,000/site) and going to the field (after harvest) to conduct the CE/BEA experiments (crude estimate = $ 7,500/site).

2b. Systematic analysis of existing datasets to assess the role of grain legumes in smallholder farming systems: In FY13-14, as part of objective 2, we plan to utilize available secondary data (i.e., the Living Standards and Measurement Survey/Integrated Agricultural Surveys – LSMS/ISA, agricultural censuses, other nationally representative surveys such as TIA in Mozambique or panel surveys in Kenya and Zambia by FSG) to develop profiles of potential clients and beneficiaries of grain legume research, and to understand the constraints and potential impact of the adoption of new technologies by grain legume growers. Descriptive and statistical/econometric analysis techniques will be used to generate information that can help us understand:

a. The role of grain pulses in farmer's livelihood and food security strategies
b. Potential role of pulses in diet diversification
c. Factors influencing the adoption of productivity enhancing technologies in grain legumes by resource poor farmers

A graduate student will be recruited to help put together the datasets and do the analysis. Results of this study will be made available in the form of a report as well an Impact Brief and will highlight major results of this cross-country study and include implications of the findings on what might the Legume Innovation Lab be doing to increase adoption and impact from its investments in research.

2c. **Field Experiment on the Dissemination of Post-harvest Technologies in Burkina Faso:**
This is a carry-forward activity from FY 12, jointly conducted with the UIUC and INERA research team (under the former CRSP IPM-omics research project). The field activities for this

study were concluded in January 2013 and data were submitted to MSU in late Spring 2013. We plan to complete the data analysis and report writing as part of the FY 13-14 workplan. The description of this study as implemented in late 2012/early 2013 (FY 13) is as follow.

Problem statement and study objectives: Globally every year, substantial resources are invested by the public sector on agricultural research to generate new knowledge, technologies, and practices targeted towards small-scale farmers living in developing countries. Although there currently exist a number of innovative solutions in the scientific literature that can help improve the lives of people in developing nations, much of this is in a form (for e.g., articles in scientific journals, research reports, extension bulletins) that is not reaching the true target audience at a scale required to generate impact. This is due to a variety of constraints, including the low literacy level on the part of the target audience, and a weak and often an ineffective agricultural extension system that is not able to scale up and scale out the transfer of scientific knowledge to end users living in remote rural areas. This study is an attempt to test the effectiveness of an approach (i.e., the use of animated educational videos) to address both these constraints so as to increase the impact of agricultural research investments, focusing on cowpea producers in Burkina Faso.

Cowpea bruchids (*Callosobruchus maculatus*) can cause damage to cowpea (*Vigna unguiculata*) seeds in storage, resulting in post-harvest losses. To avoid these losses, many farmers sell their cowpea soon after harvest when the price is low. This not only reduces income for farmers but also makes the household more vulnerable as they cannot afford to buy back cowpeas during the lean period, when the prices are typically higher than when they sold. Chemical control methods can be used to control this pest, but growers in Africa often do not have access to the chemicals, or cannot afford them. To address these problems researchers have tested and come up with several non-chemical, low-cost and simple approaches such as (i) exposing the grain to the solar heat to kill the insects and eggs, and (ii) triple bagging the grain in plastic sacks, among other solutions. These techniques have been developed and well-recognized among the scientific community for a long time. Recently, as part of the "Scientific Animations without Borders[SM]" (SAWBO) project, researchers at the University of Illinois at Urbana Champaign (UIUC) and its partners have developed animated videos on these two technologies to increase accessibility of this knowledge to low-literate farmers around the world. These educational videos can be delivered at a low cost through the Internet and easily shared with a large number of end-users through digital media such as cell phones and DVDs. This approach thus has the potential to bridge the gap that exists between research and impact by using the information and communication technology and a community's own social networks as 'mediums' to transfer scientific knowledge at a low cost to a large number of farmers.

The success of this approach, however, depends on two critical ingredients: 1) the effectiveness of the animated educational materials in inducing 'learning' among low-literate farmers; and 2) the development of innovative (i.e., cost-effective) strategies to deploy these educational materials to a large number of farmers. This study uses a randomized control trial (RCT) field experiment conducted in Burkina Faso in 2012-13 to primarily address the first issue. However, one of the indicators of 'learning' (and thus the success of the knowledge delivery method) is the use/adoption of the technology/practice being conveyed through a delivery mechanism, and often the constraint to the adoption of a technology is that it is either not available or economically inaccessible to farmers in rural areas. Thus, a second research question addressed by the field experiment is whether the technology adoption outcome (after 'learning' takes place) is a function of the availability/accessibility of inputs to farmers or the nature of technology itself.

Methodology and Data: Under a collaborative research project, the UIUC and the Agricultural and Environmental Research Institute (INERA) had planned to pilot test the deployment of the two videos on post-harvest technologies in selected villages in Burkina Faso using the government extension system. This opportunity was used to design the pilot initiative as a field experiment based on the principle of randomization in the assignment of the 'treatments.' The experiment consisted of two treatments (labeled 1 and 2) to address research question 1 (i.e., effectiveness of animated videos in inducing 'learning'), and two treatments (labeled A and B) to address research question 2 (i.e., does learning induce adoption, if input availability is not a constraint). For research question 2 the focus was only on the triple bagging technology. In treatment 1, extension agents used the animated videos to deliver the information on the two post-harvest technologies. In contrast, in treatment 2 they used the traditional extension method (i.e. live demonstration) to deliver the same information. In treatment A, extension agents left in the village (i.e. made available) a number of sets of plastic bags that farmers could buy and use for triple bagging. In contrast, in treatment B they did not leave plastic bags in the village; instead, they only provided to the participants information on where to buy these plastic bags.

The combination of these two sets of treatments resulted in four groups of treatment villages labeled 1A, 1B, 2A and 2B. Twelve villages across two provinces were randomly assigned to each of these four treatment groups (using randomized cluster experiment design). The experiment was divided into two phases. In the first phase, extension agents implemented the treatments after the cowpea crop was harvested (November 2012). Within each village, farmers were invited to attend a training session where the two post-harvest technologies were disseminated as per the treatment group a village was randomly assigned. Prior to the session, 20 attendees were randomly selected to collect baseline data on their prior knowledge about the storage techniques and exposure to the two technologies. In the second phase, a follow-up impact evaluation survey was conducted 6-8 weeks after the training for a sub set of 12 farmers per village (total sample size = 576 farmers). These farmers were randomly selected from the list of 20 farmers who attended the training session and had completed the pre-treatment knowledge module. The research paper to be completed in the next few months will present the results of the field experiment survey data analysis by estimating the average treatment effects and comparing the outcomes across four randomized treatment groups. The pre- and post-treatment data will be used to estimate the treatment effect related to 'learning' using difference-in-difference analytical approach. This will also serve as a robustness check for the estimated treatment effects to address the first research question.

Objective 3: *To build institutional capacity and develop human resources in the area of impact assessment research*

    Collaborators: None

    Approaches and Methods:

    This project will address the objective of institutional capacity building and human resource development through the following activities planned in FY 13 and FY 14:

    a. Presentations and interactions with other Legume Innovation Lab research project teams: As part of objective 1a, we plan to conduct educational sessions at project planning meetings (FY 13) and/or Global PI meetings (FY 14) to build capacity across the Legume Innovation Lab in developing and using impact pathways, understanding the concepts

related to theories of change, and in systematically collecting credible data for reporting on FTF performance indicators. The discussion and exchange of information/ideas envisaged in this process will increase awareness and influence the outlook of CRSP scientists towards impact assessment research and its importance. This will help contribute to enhancing the impact culture within the host country partner organizations.

b. Research activities under objectives 1b and 2 will involve host country PIs/collaborators in the planning and conduct of field data collection as much as possible.

c. Activities planned under this project will involve following graduate students in the planning and conduct of field research and write-up of research results. These students will be recruited from within the Department of Agricultural, Food and Resource Economics at MSU (see the details on trainees in the Training section).
   o David DeYoung (US citizen) – Partial support
   o Syed Hamza Haider (Pakistan citizen) – Indirect support (leveraged funding)

- Short course on impact assessment. A short-term training on novel methods to assess impact of agricultural projects is planned for the end of 2013 in Honduras and possibly at the PCCMCA meeting in 2014 to be held in Nicaragua (contingent on budget availability). This course will focus on teaching theoretical concepts and demonstrating practical applications of these concepts to economists, faculty, and students from local universities and research centers, including the use of statistical software. Researchers and economists from national research centers and universities (e.g. DICTA, FHIA, INTA, INIAP, Zamorano, CURLA, UNA, UNAN) will be invited to attend. This course will be led by Legume Innovation Lab PIs fluent in the local language and will include possibly a graduate student from MSU, an economist from Zamorano, and possibly an economist from CIAT (to be determined). The duration of the course will be three full days. This will be a joint activity in collaboration with NARS partners, who will cover the local cost of organizing the short course and supporting the participants.

III. Contribution of Project to USAID Feed the Future Performance Indicators:

Not applicable

IV. Outputs:

Specific outputs to result from this project by the end of FY 14 (September 30, 2014) include:

a. Completion of one thesis papers on the economics and sustainability of bean seed systems in Central America.

b. Completion of two Impact Briefs

c. Completion of 2 manuscripts for publication in academic journals and/or presentations at professional meetings.

V. Engagement of USAID Field Mission(s)

No specific plans for engagement of USAID Field Mission(s) are envisioned in FY 13 and FY 14. Project activities in host countries will mainly involve data collection, accessing secondary data, and information gathering through stakeholder interviews. Data collection will be done in collaboration with HC partners in countries where Legume Innovation Lab is already engaged and where activities are occurring in concurrence with USAID country or field missions.

VI. Partnering and Networking Activities:

All the activities occurring in specific countries through field research will involve collaboration with host country institutions and partners. Host country institutions will not only be involved in the planning and design of data collection efforts, conducting surveys, data entry and report writing, but also in the dissemination of results to broader audience and stakeholder groups. Opportunities will be sought to present papers based on this project's research results in national and international policy and professional forums.

Results emanating from this impact assessment research project will be published in the form of Impact Briefs and will be posted on the Legume Innovation Lab website. They will be also shared with appropriate USAID mission offices through the Legume Innovation Lab Management Office and host country partners.

VII. Leveraging of Legume Innovation Lab Resources:

The project PIs will be actively engaged in identifying opportunities to partner with other international impact assessment and Grain Legume research programs/projects and seek for opportunities to leverage resources to achieve common research goals. Some examples of anticipated leverage activities include:

- Planned adoption studies by CIAT and PABRA: In the coming 6-9 months, PABRA (in collaboration with CIAT and NARS partners) is planning to implement bean adoption surveys in Zambia (July-August 2013), Malawi (September 2013), Burundi (August-September 2013) and Mozambique (February-March 2014). This project will try to coordinate with CIAT/PABRA team to leverage this opportunity to design these surveys such that they can serve as 'baseline' assessment for future evaluations of grain legume research efforts in FTF focused countries. The cost of implementing these surveys to achieve the objectives of PABRA in each country range from $20,000 to $30,000. Potential exists to use this opportunity to establish 'sentinel sites' representing grain legume cropping systems in East and Southern Africa with the aim of collecting longitudinal data that can help address important research questions on the role of beans in the livelihood and dietary strategies of small holder farmers and the adoption (or constraints to the adoption) of new technologies. However, achieving these broader goals requires resources beyond those committed by PABRA. Thus, opportunities to leverage additional resources to achieve broader objectives (i.e., establishment of sentinel sites to monitor the role and contribution of grain legumes in household livelihood and dietary strategies) will be sought. In the absence of these additional resources, efforts will be made by this project to partner with CIAT/PABRA by providing technical input in the questionnaire design, sampling strategy, and data analysis to ensure that quality data are collected that will be helpful in addressing important (but limited) research questions.

- MSU-based research project funded by the Gates Foundation called "Guiding Investments in Sustainable Agricultural Intensification in Africa (GISAIA)." The GISAIA project offers another opportunity to address common research objectives related to the role of grain legumes in agricultural intensification in small holder farming systems. The GISAIA project is planning to use nationally representative panel data from Kenya, Zambia, Malawi, Ethiopia and Tanzania to address research questions related to factors influencing the adoption of productivity enhancing technologies by resource poor

small holder farmers. We plan to partner with them to seek for opportunities to include related questions focused on grain legume crops. Discussions are currently underway to explore the possibility of expanding the analysis to include Central American and South Asian countries to get a cross-regional comparative study on the use of inputs and improved technology in cereal-legume cropping systems.

- Exploring funding opportunities in response to RFAs in the area of impact assessment research. For example, the International Initiative for Impact Evaluation (3ie) routinely issues RFPs to promote research in the area of impact evaluation of development interventions in developing countries. In the next round, opportunities will be sought to leverage funding from this organization to conduct 'impact evaluation' of a legume based project in partnership with host country PIs and collaborators to promote objective 2 of this project.

- The Department of Agricultural, Food and Resource Economics at MSU has awarded a Graduate student recruitment fellowship to Mr. Syed Hamza Haider for Fall 2013 under the mentorship of M. Maredia. This project will use this fellowship opportunity to fund this student to contribute towards data analysis planned under Objective 2 (activity 2b).

VIII. Timeline for Achievement of Milestones of Technical Progress:

See the attached excel file

Training/Capacity Building Workplan for FY 2013 – 2014

Degree Training:
First and Other Given Names: David
Last Name: DeYoung
Citizenship: USA
Gender: Male
Training Institution: Michigan State University
Supervising CRSP PI: Mywish Maredia
Degree Program for training: M.S.
Program Areas or Discipline: Agricultural Economics
If enrolled at a US university, will Trainee be a "Participant Trainee" as defined by USAID? No
Host Country Institution to Benefit from Training: None
Thesis Title/Research Area: Assessment of bean seed systems in Central America
Start Date: Fall 2011
Projected Completion Date: Spring 2014
Training status (Active, completed, pending, discontinued or delayed): Active
Type of CRSP Support (full, partial or indirect) for training activity: Partial

First and Other Given Names: Syed
Last Name: Haider
Citizenship: Pakistan
Gender: Male
Training Institution: Michigan State University

Supervising CRSP PI: Mywish Maredia
Degree Program for training: Ph.D.
Program Areas or Discipline: Agricultural Economics
If enrolled at a US university, will Trainee be a "Participant Trainee" as defined by USAID? No
Host Country Institution to Benefit from Training: None
Thesis Title/Research Area: Role of grain legume crops in the small holder farming systems
Start Date: Fall 2013
Projected Completion Date: Spring 2017
Training status (Active, completed, pending, discontinued or delayed): Pending
Type of CRSP Support (full, partial or indirect) for training activity: Indirect

Short-term Training:
Type of training: Introduction to the concepts, tools and methods related to impact pathways and FTF performance indicators
Description of training activity: Conduct educational sessions at project planning meetings on constructing impact pathways and collecting/reporting performance indicators data
Location: Various (Puerto Rico, Quito, Lusaka, Maputo, Accra, Dakar)
Duration: 2 hours
When will it occur? May-June 2013
Participants/Beneficiaries of Training Activity: US and HC PIs of the Legume Innovation Lab program
Anticipated numbers of Beneficiaries (male and female): 70 (50 male, 20 female)
PI/Collaborator responsible for this training activity: M. Maredia and B. Reyes
List other funding sources that will be sought (if any): none
Training justification: Proper understanding of the concepts and importance of achieving impacts on developmental goals is critical to instill at the outset of project development so that the project teams can integrate this understanding in their project workplans and plan for appropriate outreach, linkages and partnership activities needed to translate project outputs into outcomes and impacts.

Type of training: Introduction to novel methods to assess impact of agricultural projects and practical applications.
Description of training activity: Conduct a three-day intensive training on current theory to assess impact and practical applications of this theory. The training will also include basic use of statistical software (i.e. STATA, SPSS) for data manipulation and analysis.
Location: Honduras (Tegucigalpa), Nicaragua (place TBD) (tentative)
Duration: Three days
When will it occur? November 2013 (Honduras), April 2014 (Nicaragua during the PCCMCA meeting).
Participants/Beneficiaries of Training Activity: Economists, researchers, and students from National Research Centers and universities (private and public). The beneficiaries will also include staff from collaborating Legume Lab projects from Honduras, Ecuador, and possibly Guatemala (conditional on them attending the PCCMCA meeting in 2014 in Nicaragua).
Anticipated numbers of Beneficiaries (male and female): 40-70 (5-8 female)
PI/Collaborator responsible for this training activity: B. Reyes and M. Maredia

List other funding sources that will be sought (if any): The cost of organizing the event and supporting the participants will be covered by local NARS partners

Training justification: Having worked in developing countries for several years, one of the challenges we face is the absence of trained personnel to conduct impact assessment of Legume Lab projects and agricultural projects in general. Further, having participated in regional scientific meetings have made us realize that faculty at national universities and research centers many times lack the theoretical and practical experience to conduct sound and rigorous research. Thus, we consider it is of extreme importance for us to contribute with our knowledge to help build local capacity in research centers and universities in developing countries. Further, it is expected that this training could foster links and create opportunities for potential research collaboration between participants.

Equipment (costing >$5,000)**: None**