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**HORTICULTURE
INNOVATION LAB**

UC DAVIS
UNIVERSITY OF CALIFORNIA

Feed the Future Innovation Lab for Collaborative Research on Horticulture

Request for Proposals

Assessing Impediments to and Benefits of Adoption of Good Postharvest Management Practices

Important Dates:

- RFP issued – August 14, 2014
- Online Q&A at <http://uc-d.adobeconnect.com/hortrfps/> –September 2, 2014 from 12:30 to 2:30 p.m. (Pacific)
- Proposals due - September 30, 2014 at 4:30 p.m. Pacific
- External reviews completed – October 14, 2014
- Funding decisions announced – October 25, 2014
- Funded proposal team meets with Horticulture Innovation Lab and travels to target countries - November and December 2014
- Projects begin – January 1, 2015
- Projects end – August 31, 2019

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Abstract

Assessing Impediments to and Benefits of Adoption of Good Postharvest Management Practices

The U.S. Agency for International Development (USAID) and the Horticulture Innovation Lab is soliciting proposals from U.S. university researchers and their in-country partners to address impediments to improvements in postharvest handling systems for horticultural crops in Feed the Future countries. This postharvest program will identify the impediments to adoption of improved postharvest handling practices, quantify and demonstrate the benefits of improved postharvest practices, and create a dataset for the Horticulture Innovation Lab that they can use to build a model to predict the benefits of various postharvest handling interventions for horticultural crops. Impediments to adoption of improved practices may be related to market structure, power balance, lack of resources, lack of time, policy impediments, and cultural and/or social factors. Collaboration and support from local organizations including in-country governments, universities and research institutions, USAID Missions, NGOs and farmer organizations are an integral part of a successful proposal. Projects will be funded for up to \$1.6 million for a project period of up to five years, not to exceed \$320,000/year.

Funding request contingent on funding

This solicitation is occurring prior to the Horticulture Innovation Lab receiving funds for the 2014-2019 extension. Funding for this solicitation is contingent on the Horticulture Innovation Lab receiving requested funds. All preparation and submission costs are at the applicant's expense. Issuance of an RFP does not constitute an award commitment on the part of the Government, nor does it commit the Government to pay for costs incurred in the preparation and submission of an application. An invitation to submit an application does not constitute an award. Any and all funding is subject to the availability of funds to USAID.

About the Horticulture Innovation Lab

Innovation Labs for Collaborative Research. The Horticulture Innovation Lab is one of ten Innovation Labs for Collaborative Research funded by the United States Agency for International Development (USAID). These programs were known as Collaborative Research Support Programs (CRSPs) until 2013 and have the following goals and characteristics:

- Coordinated, multi-disciplinary research programs that are collaboratively developed and cooperatively implemented, with shared responsibilities between U.S. and host country institutions and scientists. Our goals are to support economic growth and to reduce poverty through the generation of knowledge and technologies important to the development of agriculture and natural resources of developing and transition countries, while also contributing to the improvement of agriculture in the U.S.
- Long-term activities carried out largely in developing countries. Research proposals are selected competitively and are subject to review by USAID.
- Development of the human and institutional capability of research organizations in the countries where our activities are located. Research projects are a vehicle for this capacity development, as are graduate degree programs, research assistantships, and workshops. The institutional relationships established between our programs and host country institutions are intended to be enduring and to transcend the life of the program.

Horticulture Innovation Lab. The Horticulture Innovation Lab builds international partnerships for fruit and vegetable research to improve livelihoods in developing countries. The program began in 2009 when USAID selected the University of California, Davis to lead a five-year program (then called the Horticulture Collaborative Research Support Program, or Horticulture CRSP). The program team and its projects help the world's poorest people break out of a persistent cycle of poverty by improving smallholder farmers' abilities to grow and sell high-value crops. Improving livelihoods—through higher profits and diversified, nutrient-rich diets—is a primary goal for the Horticulture Innovation Lab's research efforts around the world. The program's work is focused on ensuring gender equity, improving information access, targeting innovative technologies and increasing research capacity.

The Horticulture Innovation Lab projects span the value chain of fruit and vegetable production, from seed systems to postharvest processing. Individual projects are led by U.S. university researchers, with collaborating partners in developing countries. In its first five years, the Horticulture Innovation Lab funded 61 projects in more than 30 countries. These projects ranged from six-month Trellis projects, which paired graduate students with developing country organizations, to three year, multi-country comprehensive projects, which addressed bottlenecks throughout an entire value chain. Projects involved 18 U.S. public universities, more than 200 universities and organizations in the developing world, and 366 undergraduate and graduate students. These projects have field-tested 583 new technologies, 514 of which are currently ready for transfer.

As a result of the Horticulture Innovation Lab's activities, 31,841 individuals (54% women) received short-term training, and 9,859 farmers (63% women) applied new technologies or management practices on their farms. Between Africa, Asia, and Latin America, 11,042 hectares are now under improved management practices or managed with improved technologies, as a result of our work. These trainings and technologies also benefited 6,169 rural households – 1,725 of them considered vulnerable.

Horticulture Innovation Lab objectives and pillars

The Horticulture Innovation Lab is committed to:

- Increasing capacity of scientists, development professionals, farmers, students, intermediaries, and institutions to address horticultural challenges.
- Improving access to reliable horticultural information.
- Increasing empowerment of women and disadvantaged groups working in horticulture.
- Improving horticultural systems, from seed to consumption, as a result of collaborative research.
- Improving opportunities for smallholders and entrepreneurs in horticultural markets.
- Improving the nutritional status of people as a result of including horticultural crops in diets.

Our work focuses on these six pillars:

Commitment to horticultural value chain research. We support research that tackles knowledge gaps along the entire value chain for important horticultural products. Our research provides much needed baseline information, and information about barriers to adopting new technologies or crops. We support adaptive research and research that enables farmers to have greater access to markets through innovative technology

Commitment to innovation and scaling. We support the development and dissemination of technologies that provide advanced tools to stimulate and facilitate horticultural development worldwide. The work of an innovation in horticulture is to make something better, more efficient, healthier, or more productive and profitable. The Horticulture Innovation Lab believes that specific technologies and innovations have the ability to solve problems and challenges and to reduce barriers within the horticulture sector. The Horticulture Innovation Lab focuses on technologies that reduce on farm costs, reduce postharvest losses, use labor more efficiently, empower women, take advantage of ICT opportunities, and use limited natural resources more sustainably.

Technologies and innovations come in a variety of forms. “Hard” technologies are devices, prototypes and designs that improve our lives and in some way change the current system. “Soft” technologies encompass innovation in systems, behaviors, and methods within the horticulture sector. Assemblies of ideas and thought processes make up a soft technology. For example, a new device for cooling produce is a hard technology while a new system developed to train farmers in postharvest cooling could be considered a soft technology.

Advances in technologies, when combined with innovative delivery methods, can turn unproductive and unprofitable systems into more productive and profitable ones. We support projects that address the constraints to horticultural production through modern research practices. We work closely with USAID in-country missions, our Regional Centers and local and regional partners to scale technologies or techniques developed by our collaborators.

Commitment to capacity building. Our projects build the capacity of our partners and their institutions worldwide to improve horticultural research and production. Together, we build the capacity of students and their faculty mentors in the developing world, and the capacity of various actors involved in the horticulture sector, including extension workers, farmers, traders, processors and marketers through targeted trainings and information dissemination. One of the

strengths of the Innovation Labs for Collaborative Research is their role in building the capacity of students, faculty, institutions and participants in the horticultural value chain. Projects build capacity through training, information dissemination, and through the participation of students, local community members, and other value chain actors in project activities. For students, capacity building is embedded within the collaborative research program between U.S. universities and developing country institutions. The nature of these embedded programs ensures that the research students are engaged in is relevant to their home countries. In general, Horticulture Innovation Lab project research takes place in the focus country, which means that involved students are much more likely to find employment in their country and in their field of interest as a result their Horticulture Innovation Lab research experience.

Long-term training. The Horticulture Innovation Lab projects provide long-term training through a mixture of models, including supporting graduate degrees in the U.S., at home institutions, and at third party institutions in the developing world.

Short-term training. The Horticulture Innovation Lab projects will offer extensive short-term training opportunities. These will be embedded in the research projects, offered through our regional centers, and incorporated in the activities of the information management and dissemination activities of the Management Entity. Short-term training will be geared towards a variety of stakeholders engaged in horticultural crop production, handling and marketing, including seed producers, farmers of small and medium-sized plots, traders, and marketers, as well as researchers and extension educators.

Commitment to nutrition sensitive horticulture. We support research that improves understanding of nutritious crops from production to consumption and enhances their availability. Nutrition is uniquely important in poverty reduction. All of our research projects will be nutrition sensitive, and will seek to understand the roles of nutrition within their projects. All projects will identify the possible nutrition-related impacts of their research or interventions, and will outline how their project will contribute positively to human nutrition at the household, community, local and/or regional levels. The management team at UC Davis will work with projects throughout their lifecycle to ensure that they are nutrition sensitive.

Commitment to empowering women and the most vulnerable. Our research and interventions will be designed to empower women and vulnerable people. Women and other vulnerable people (the elderly, people with diseases, indigenous peoples, people living in conflict) often work in horticulture value chains, and much of this work is unpaid labor. The Horticulture Innovation Lab seeks to understand how women and members of vulnerable groups can benefit from the production of fruits and vegetables, either as income generating crops or as crops that complement a healthy and diverse diet. Unfortunately, little is known about how horticultural crops could better benefit these at risk populations.

Our research and interventions are aimed at empowering women and vulnerable people. We conduct baseline studies within all of our projects that increase knowledge about women and vulnerable groups. We design technologies and interventions that specifically target these groups. Trainings and research projects are equitable. Our project teams are trained on empowerment and responsive project planning, and all projects are assessed on their impact on the empowerment of women and the most vulnerable. In addition, the management team at UC

Davis will work with funded projects to ensure that projects are gender sensitive, women's participation is encouraged, and women and vulnerable people benefit from the research.

Commitment to sharing information. We make our research and global horticulture knowledge available in readily accessible and easily understandable formats. We work to understand, package and share both technical information and information about the best practices for information dissemination. We work with other horticulture partners like the Global Horticulture Initiative and the International Society for Horticultural Science to be the leaders of horticultural information dissemination. We seek to better understand how and where farmers get their information. We explore how intermediaries and their associated information channels best develop and provide credible, relevant information in order to better help horticulture farmers around the world. This effort includes creating fact sheets, summarizing research findings from projects into usable data sheets, and developing and circulating simple, concise methodologies for enhanced information dissemination. We support trainings and conduct research that improves intermediaries' ability to connect farmers with up-to-date horticultural research. This effort includes the continuation of our efforts looking at the appropriate use of Information and Communications Technologies (ICT) and how such tools can both expand information access and use and help us better understand target audiences and their evolving needs. Across all projects, the management team at UC Davis works with our collaborators to enable them to better package and deliver the information from their project research. This expands the impact of all of our projects and enables more people to benefit.

Regional Centers

Projects will be expected to work with our three Regional Centers. The Centers have six strategic objectives:

1. Increase farmer knowledge of improved horticultural practices.
2. Increase the number of regionally specific horticultural technologies.
3. Increase local adoption of horticultural technologies by smallholder farmers.
4. Improve the research and management capacity of the host institutions.
5. Increase investments in and the number of entrepreneurs working with horticultural technologies.
6. Contribute to the Global Horticulture Knowledge Bank, and build networks between Centers.

The Centers meet these objectives by integrating with new and existing Horticulture Innovation Lab research projects, synchronizing with new and existing USAID/BFS funded value-chain projects and Mission-led horticulture projects, building strategic relationships with partners, conducting research, and building local management, research, and horticulture capacity. Each Center focuses on innovation and technology; working in parallel with each Horticulture Innovation Lab funded research project to test and modify new technologies, host workshops and activities and serve as a regional resource for project PIs.

Horticulture Innovation Lab and Feed the Future

The Horticulture Innovation Lab's goals associated with battling malnutrition, improving gender equity, and providing income to smallholder farmers aligns well with the U.S. Government's Feed the Future Initiative. Feed the Future pursues two paths: (1) addressing the root causes of hunger that limit the potential of millions of people; and (2) establishing a lasting foundation for change by aligning USAID resources with country-owned processes and sustained, multi-

stakeholder partnerships. Through USAID leadership in this initiative, we advance global stability and prosperity by improving the most basic of human conditions – the need that families and individuals have for a reliable source of quality food and sufficient resources to access and purchase it.

Feed the Future and other U.S. government priorities – including global health and climate change – allow us to confront the growing challenges of global poverty, disease, water scarcity, climate change and depleting natural resources. By addressing these complex challenges and promoting our values, we protect our own security and lay the foundation for a more peaceful and prosperous future for all. More information on Feed the Future can be found at <http://www.feedthefuture.gov>.

Solicitation

Assessing Impediments to and Benefits of Adoption of Good Postharvest Management Practices

The U.S. Agency for International Development (USAID) and the Horticulture Innovation Lab is soliciting proposals from U.S. university researchers and their in-country partners to address impediments to improvements in postharvest handling systems for horticultural crops in Feed the Future countries (<http://www.feedthefuture.gov/countries>). This postharvest program will identify the impediments to adoption of improved postharvest handling practices, quantify and demonstrate the benefits of improved postharvest practices, and create a database that the Horticulture Innovation Lab can use to build a model to predict the benefits of various postharvest handling interventions for horticultural crops. Impediments to adoption of improved practices may be related to market structure, power balance, lack of resources, lack of time, policy impediments, and cultural and/or social factors. Collaboration and support from local organizations including in-country governments, universities and research institutions, USAID Missions, NGOs and farmer organizations are an integral part of a successful proposal. Projects will be funded for up to \$1.6 million for a project period of up to five years, not to exceed \$320,000/year.

Postharvest losses of horticultural crops range from 30-80% in the developing world, depending on the crop and weather conditions. Losses are commonly due to physical damage from rough handling, inadequate packaging, poor temperature management and lack of cooling, lack of information and the activity of diseases and insects after harvest. Recommended practices to reduce postharvest losses are well known among experts in the field, but have not translated into improvements in postharvest handling in the developing world. The challenges to implementing improved postharvest handling practices, including those that require little to no financial resources, are not well understood.

Development agencies and donors are keenly interested in reducing postharvest losses in an effort to increase food availability to a growing population and to increase the sustainability of our agricultural systems. Donors need more information about existing postharvest losses and documentation of the benefits of improved postharvest practices in maintaining the quality of produce and reducing losses to guide their investment decisions.

The project will be divided into three parts, 1) assessment of current postharvest practices, produce losses and impediments to adoption of best practices, 2) quantify and demonstrate the benefits of utilizing good postharvest practices for horticultural crops, and 3) create a database from part II that can later be used by the Horticulture Innovation Lab to build a model to predict the benefits of postharvest interventions.

Part 1: Assessment

The program should begin with an assessment of current postharvest practices, produce quality and losses (both qualitative and quantitative) at various stages of the value chain to determine the baseline situation in the region of the project for horticultural crops. Refer to the following site for recommended practices

(<http://postharvest.org/CSAM%20Gathering%20data%20on%20Postharvest%20loss%20challenges.pdf>).

- a. A baseline assessment of existing postharvest systems and practices for a range of the most popular horticultural commodities, to include leafy greens, and ripe fruit-vegetables.
- b. Quantify baseline postharvest losses of selected commodities at each stage of the value chain (harvest, transport and market), including quantitative and qualitative losses.
- c. Work with farmer groups to implement Good Postharvest Practices for selected commodities, utilizing only locally-available resources. Document the challenges encountered in implementing improved practices and technologies.
- d. Conduct socio-economic assessment of the obstacles to adoption of improved postharvest handling practices and technologies and develop a strategy to address/overcome these impediments.

Part II: Quantify and demonstrate the benefits of Good Postharvest Management (GPM)

- a. Quantify the benefits of Good Postharvest Management
 - i. Project team should collect valid, quantitative data based on laboratory or tightly controlled field experiments on the benefits of specific Good Postharvest Management practices to reduce postharvest losses (both qualitative and quantitative) of various categories (leafy greens, ripe fruit, fruit vegetables, tubers) of horticultural crops under different climatic conditions .
- b. Demonstrate the benefits of Good Postharvest Management
 - i. The project team will select a group of produce items to focus on in this study that represent important produce items in the region, and with various postharvest challenges (water loss of leafy products, crushing damage to ripe fruit, etc.)
 - ii. Demonstrations of Good Postharvest Management will be developed in collaboration with several farmers growing these crops while other farmers continue their standard practices in nearby fields/markets, as related to:
 - Harvest maturity
 - Shade after harvest
 - Careful handling throughout supply chain
 - Sanitation and food safety considerations
 - Packaging
 - Cooling or cool storage

- Transportation to market
- Protection during marketing
- Drying (where practiced or desired)

The process of setting up the demonstrations and working with the farmers to implement these demonstrations will be a learning process that can follow from or contribute to the Assessment of Impediments to adoption of improved postharvest practices.

- iii. Farmers using Good Postharvest Management will be provided with the tools needed such as clippers, harvest umbrellas, crates, Cool Bot™, etc. An effort should be made to create a structure/practice through which the farmer must contribute to the costs of these technologies so that commitment is assured, perhaps by loaning the equipment to the farmers and working with them at the end of the demonstration to develop a strategy to buy them, if they are interested.
- iv. Evaluations of the produce (temperature, wilting, market price, market opportunities, losses) from the GPM and the standard practice farms will be made.
- v. Workshop tours will demonstrate for the farmers, marketers, USAID Missions and Value Chain Projects, and policymakers the differences between the two systems.

Part III: Create a database of the benefits of postharvest interventions

- a) Data from Part II will be used create a database that will later be used by the Horticulture Innovation Lab to predict, for a given scenario (climatic region or country, crop, season, location in postharvest supply chain), the benefits of investing in an improved postharvest technology or practice. PIs may be asked to coordinate the database development with another organization(s) that will be utilizing the data to build the model. Contact the Horticulture Innovation Lab for more information.)

Other recommendations

PIs are strongly encouraged to include a socio-economist and sociologist on their project team who will play a significant role in identifying impediments to adoption of Good Postharvest Practices. PIs should utilize existing assessments of postharvest loss in their project plans, as appropriate.

PIs should consider collaboration with some of the postharvest experts from many developing countries who have been trained in postharvest quality assessment and postharvest biology and technology. Two sources of information about local experts include:

http://www.linkedin.com/groups/Postharvest-Training-3770124?home=&gid=3770124&trk=anet_ug_hm

http://postharvest.org/networkingresource_persons.aspx

Target countries

Projects can take place in more than one country, but are encouraged to focus on 3 or fewer countries. Projects must take place in the [Feed the Future](#) zones of influence in Feed the Future countries. Following is a list of current Feed the Future countries. Countries in italics are those

where the USAID Missions emphasize horticulture value chains. While this request for proposals is not limited to those italicized countries, projects may find greater support and success in those countries.

- **Africa:** Ethiopia, Ghana, *Kenya, Liberia*, Malawi, Mali, *Mozambique*, Rwanda, Senegal, *Tanzania*, Uganda, and *Zambia*
- **Central America and the Caribbean:** *Guatemala, Haiti*, and *Honduras*
- **Asia:** *Bangladesh, Cambodia, Nepal*, and *Tajikistan*

More information on Feed the Future, including the zones of influence can be found at <http://feedthefuture.gov/countries>

Proposal Evaluation Criteria

Proposals will be reviewed by at least three reviewers external to Horticulture Innovation Lab. Reviewers are solicited worldwide and have relevant experience to the topic areas. External reviewer ratings and comments will be combined with those of the Horticulture Innovation Lab Management Entity. Final approval of all Horticulture Innovation Lab projects is made by the Horticulture Innovation Lab Management Entity in consultation with the USAID AOR and country USAID Missions. Proposals will be rated by the following criteria:

- Project impact: How well does the proposed project contribute to attainment of the Horticulture Innovation Lab and Feed the Future goals, objectives and themes? What is the potential for project success? (10 points)
- Capacity building: How well are university faculty, and graduate and undergraduate students from focus countries engaged in the project? Is a significant (and appropriate) amount of funding is being provided to the focus-country organizations? (20 points)
- Scientific merit: How well developed is the assessment and demonstration plan? Is there a clear plan for how data will be collected to assure its accuracy? Does the project description instill confidence in the knowledge and skills of the researchers to accomplish the objectives of this project? Are the proposed research and outreach methods appropriate? (20 points)
- Participatory partnerships: How well qualified is the research team to conduct the project? Is the proposed team sufficiently diverse institutionally (universities, IARCs, NGOs, Private Sector, etc.), disciplinarily (social, biological and physical scientists), and by gender for the intended research? Is a socio-economist included in the project? Were developing country stakeholders and/or USAID Missions sufficiently involved in the conception and design of the research application? How well does the research proposal integrate stakeholders into the research program? Have collaborations been forged with other groups involved in similar work? Effectiveness of identified groups of local stakeholders? (25 points)
- Gender nutrition and enabling environment: How well is the gender of stakeholders (end-users, trainees, and other participants) taken into account? To what extent has gender sensitivity been integrated into activities? Has significant consideration been given to gender issues in project development? Have potential negative effects on nutrition been considered? Are there measures in effect throughout the life of the project to respond to unintended negative consequences related to gender or nutritional status? (15 points)

- Monitoring, evaluation and impact plan: How well is the Monitoring and Evaluation (M&E) plan developed and designed specifically for the proposed project? Are benchmarks established so progress toward achieving objectives can be measured? Are the measures of success measurable and the documentation of success legitimate? (10 points)

Successful proposals will:

1. Be comprised of an interdisciplinary research team. Proposals must be submitted by a lead PI from a public U.S. university. Proposals must include an interdisciplinary and international research team. The team must consist of U.S. university researchers and researchers from Feed the Future countries, at a minimum. Successful proposals will include teams with a variety of research specialties as appropriate for the project proposed, such as, but not limited to, agricultural scientists, nutritionists, postharvest biologists, economists, gender specialists, and sociologists. It is appropriate to budget for a research manager or coordinator.
2. Include rationale of how this research will impact development practices. Horticulture Innovation Lab research should benefit people working in development, including USAID employees, contractors, and in-country project managers.
3. Describe how this proposed project aligns with or complements USAID Mission and focus country government priorities. Information on Feed the Future country priorities can be found at <http://feedthefuture.gov/>.

Proposal preparation and submission instructions

Who may submit proposals:

Proposals are limited to U.S. university researchers with PI status. Research proposal teams must include a U.S. university lead in association with an in-country collaborating institution, at a minimum.

Funding restrictions and cost share

Proposals are not to exceed \$320,000/year for five years (\$1.6 million total). Each applicant will be required to identify 25% of the total federal dollars per year in matching funds from non-federal sources.

1. *Indirect Costs*. Institutions may claim indirect costs at their federally-negotiated rate. If no approved rate applies, the institution may take up to 10% of total direct costs for their indirect costs. **An approved indirect cost rate agreement (if applicable) must be provided at the time of proposal submission.**
2. *Cost Sharing*. Cost sharing is required at 25% of the total federal funds requested from the Horticulture Innovation Lab. The cost share must consist of non-federally funded contributions that meet the criteria detailed in 22 CFR 226.23. Cost sharing may include, but is not limited to: 1) principal investigator/senior personnel effort; 2) in-kind contributions; 3) cash contributions; 4) unrecovered indirect costs; 5) indirect costs on principal investigator/senior personnel effort. **Cost-sharing documentation from the contributing entity must be provided at the time of proposal submission** (in most cases, this will be in the form of a letter signed by the authorized organizational representative). Some items that are ineligible for cost sharing are existing equipment, administrative services, office and lab space, and administrative fees in lieu of indirect costs. The required cost share may come from any combination from the main institution and subaward(s) as appropriate. Provide a detailed cost-sharing narrative listing institution(s), dollar amounts, and descriptions.

Proposal format and submission

Proposals should be submitted online at:

<http://ucanr.edu/survey/survey.cfm?surveynumber=13512>

Two files must be submitted:

1. Complete proposal in PDF format (one file).
2. Complete budget in Excel format using the Horticulture Innovation Lab budget form.

Proposals should be formatted as 8.5" x 11" pages, single-spaced, 1 inch margins on all sides, Times New Roman, font size 12. Proposals not submitted in the correct format will not be reviewed.

Sections of the proposal

I. Cover Page

The Cover Page can be made in accordance to your institution's requirements but must include the following:

- Project Title
- Lead Institution Applying for the Award
- Names, titles, mailing addresses, email addresses, and telephone and FAX numbers of Principal Investigators and Collaborators
- Signature and contact information for authorized official from the Lead Institution
- Contact information for person to contact for proposal questions
- Contact information for person responsible for negotiating final contract

II. Project Summary Page

The Project Summary Page is limited to one page and should include only the following

- 200- to 250- word abstract (to be used when describing the project to USAID, reviewers, media, and other interested persons)
- Up to 5 keywords
- List of countries and the Feed the Future regions in each country where project will take place
- Total amount of money requested.
- Percentage of requested funds (\$) that will be sent to Focus Country Institution(s)

III. Technical Narrative

20 pages maximum for items a through l (suggested page number limits are included in each section; literature cited does not count towards 20 page limit)

a) Introduction

Introduction should include, but is not limited to, a statement of the problem, project justification, approach, and expected impacts. (~2 pages recommended)

b) Overall objectives addressed

Include a description of how project fits with the objectives of Horticulture Innovation Lab, Feed the Future, and the specific Feed the Future plans within the target country(s). (~1 page recommended)

c) Specific project objectives

Include a list and description of project objectives. (~1 page recommended)

d) Activities and methodology

Outline the activities and methodologies required to accomplish each objective. Successful proposals should include the project research plan and outline how research is to be conducted, analyzed and disseminated. (~5 pages recommended)

e) Roles of partners

Indicate the team members whose expertise is critical to each phase of the project and the role the partners played in project development. (~1 page recommended)

f) Timeline of activities

Include a timeline to accomplish activities and expected outcomes. (~1 page recommended)

g) Outreach and capacity building

Outreach, extension, and capacity building are central to any Horticulture Innovation Lab Project. This section should include explicit details of how project outputs will be

disseminated to local farmers as well as how the project builds local capacity. Describe involvement of graduate and undergraduate students from U.S. and focus country(s). Thoughtful consideration of the modes of information delivery are crucial (i.e. if a workshop is planned, there should be concrete reasons as to why a workshop is a better outreach method than other methods). Provide a list of outreach activities and deliverables. (~2 pages recommended)

h) Sustainability

Indicate how the project will be sustained beyond the funding cycle. (~1 page recommended)

i) Gender, nutrition and social equity

Gender and social equity is central to achieving Horticulture Innovation Lab goals. This section should include a plan on how gender and other issues were taken into consideration in this proposal, how constraints that limit women and vulnerable groups' participation in agricultural development are addressed, and how community level gender issues will be approached to achieve gender parity. How well is the gender of stakeholders (end-users, trainees, and other participants) taken into account? To what extent has gender sensitivity been integrated into activities? Has significant consideration been given to gender issues in project development? Have potential negative effects on nutrition been considered and mitigated? Are there measures in effect throughout the life of the project to respond to unintended negative consequences related to gender or nutritional status? (~1 page recommended)

j) Innovative technologies

Describe any "disruptive" or innovative technologies or processes included in the proposed project and their potential for impact. Please outline any plans for scaling these technologies. (~1 page recommended)

k) Regional Centers

Outline how this project will work with or complement the work of the Regional Centers, particularly the Center located near the project site. For more information on the Regional Centers, see Appendix II. (~1 page recommended)

l) Literature cited

m) Monitoring and evaluation plan

Projects funded to address the goals of the Horticulture Innovation Lab will be evaluated based on a results-based (logical) framework and all proposals must include a monitoring and evaluation (M&E) plan. Projects will address Objectives through defined Activities that will have specific Outcomes (deliverables/outputs) and Measures of Success. Monitoring and evaluation plans will be refined during the initial phases of the project and used to assess progress toward objectives. Proposals must include baseline assessment of situation in terms of the topic area and region. Within this framework, we define the following terms and provide a sample table below:

- a. *Objectives*. A statement of intention. Objectives should be specific, measurable, achievable, realistic and time-bound (e.g. reducing postharvest losses of leafy vegetables in East Africa in year 1).
- b. *Activities*. Research or training/outreach programs intended to achieve the objectives (e.g. determine the benefits of perforated plastic bags for reducing water loss, evaluate the use of evaporative coolers for short term storage and transport, & conduct a 3-day workshop and demonstration for women's farmer groups)

- c. *Outcomes* (Deliverables/Outputs). Expected results of the activities(e.g. documented effects of plastic bags and evaporative coolers on weight loss, 50 women farmers trained in postharvest technology).
- d. *Measure of Success*. How will you decide if your activity was successful? (e.g. perforated plastic bags and evaporative cooling led to an X% reduction in water loss of leafy greens, X trainees implement improved postharvest practices).
- e. *Documentation of Success*. How will you objectively document the success of your activities? (e.g. extension bulletin in local language(s) on benefits of perforated bags and evaporative cooler, results of pre- and post-training quizzes to document knowledge gained)
- f. *Impact*. What is the long-term result of the activities and outcomes? (e.g. reduced losses of leafy greens after harvest)

Objective 1:				
Activities	Outcomes	Measure of Success	Documentation of Success	Impact
Insert more rows as needed.				

n) Performance indicators

The indicator table below must be completed for each proposed project. This initial indicator table will be used to evaluate your proposal. Once awarded, the UC Davis team will work with your project team to establish additional indicators, as appropriate for your project. Projects are not expected to gather data on all of the following indicators. Chose those indicators that are appropriate for your project and within your capabilities to measure. More information about the Feed the Future indicators can be found at: http://feedthefuture.gov/sites/default/files/resource/files/ftf_scorecard_indicators_definitions_2013.xls

Horticulture Innovation Lab Indicators	FY15 Goals	FY 16 Goals	FY17 Goals	FY 18 Goals	FY19 Goals	Total for Project
Number of new partners						
Number of U.S. students with development jobs						
Number of associate awards and partnerships						
Number of faculty and scientific exchanges						
Number of grants and publications for partner scientists						
Number of informational fact sheets						
Number of staff, faculty, and partners trained in gender equity						
Number of crops analyzed for nutritional content						

Feed the Future Indicators	FY15 Goals	FY 16 Goals	FY17 Goals	FY 18 Goals	FY19 Goals	Total for Project
Change in household dietary diversity score (HDDS)						
Change in amount of different crops produced, consumed, and sold						
Amount of postharvest loss reduction						
Change of availability of fruits and vegetables in markets						
Number of public-private partnerships formed						
Value of incremental sales (collected at farm-level)						
Number of improved handling facilities						
Women's Dietary Diversity: Mean number of food groups consumed by women of reproductive age						
Number of jobs attributed to FTF implementation						
Women's Empowerment in Agriculture Index						
Number of hectares of land under improved technologies or management practices as a result of USG assistance						
Number of farmers and others who have applied improved technologies or management practices as a result of USG assistance						
Number of individuals who have received USG supported long-term agricultural sector productivity or food security training						
Number of individuals who have received USG supported short-term agricultural sector productivity or food security training						
Number of rural households benefiting directly from USG interventions						
Number of vulnerable households benefiting directly from USG assistance						
Number of technologies or management practices in one of the following phases of development: Phase I: under research as a result of USG assistance; Phase II: under field testing as a result of USG assistance; Phase III: made available for transfer as a result of USG assistance						

IV. Statement of institutional experience

Include a description of the international development experience for each institution involved in the project and a description of successful projects conducted by institutions in similar project area(s). (1 page limit)

V. Curriculum vitae (CV).

Include one curriculum vitae or bio-sketch for the lead PI, Co-PIs, and key project personnel. (2 pages maximum per CV)

VI. Budget.

Budget must be submitted using the Horticulture Innovation Lab budget in Excel. The link to the budget is at: <http://horticulture.ucdavis.edu/main/funding.htm>

VII. Budget justification and cost sharing narrative.

A separate budget justification and cost-sharing narrative is required for each institution requesting funding. Each budget justification (items a. – j.) is limited to three pages per institution, and each cost-sharing narrative (item k.) is limited to one page per institution. The justification should be formatted in the order listed below. Incomplete justifications may be returned without budget review.

- a. Senior Personnel. Provide names and titles for all senior personnel, including those who are not being paid by the project. State the appropriate amount of effort as a percentage or calendar months for each key person on the project. Senior personnel from another institution should be reflected on the corresponding budget and budget justification for that institution.
- b. Support Personnel. Provide the title/position/role for all support personnel. Administrative salary is not allowed as a direct cost.
- c. Travel. Travel during November and December of 2014 will be covered by other Horticulture Innovation Lab funds, DO NOT include that in this budget. Detail domestic travel using applicable rates (mileage, etc.). Provide a full explanation for each anticipated international trip—this explanation needs to include the following information (per trip):
 - names and/or number of travelers
 - destination country
 - number of days

Provide the method of calculation for each international trip including applicable per diem rates. All USAID funded travel must be purchased in compliance with the Fly America Act. Entry to and exit from the U.S. **must** be on a U.S. flag air carrier. Travel budget must include air travel and lodging for the U.S. P.I. plus at least one focus country collaborator to attend the Horticulture Innovation Lab Annual Meetings in Zambia, Asia (budget for Cambodia), Central America (budget for Guatemala), Africa (budget for Tanzania) and Asia (budget for Nepal) in years 1, 2, 3, 4, and 5 of the program, respectively.

- d. Materials and Supplies. List specific supplies and costs if possible; if specifics are unknown, list specific categories of supplies. No miscellaneous or contingency categories are allowed. All goods and services must meet the source, origin, and nationality requirements set forth in 22 CFR Part 228 for the authorized geographic code 937. The following goods are restricted and may not be purchased without prior approval:
 - agricultural commodities
 - pharmaceuticals

- pesticides
- US Government-owned excess property
- fertilizer

PRIOR APPROVAL will be deemed to have been met when:

- the item is of US source/origin;
 - the item has been identified and incorporated in the program description or schedule of the award (initial or revisions), or amendments to the award; and
 - the costs related to the item are incorporated in the approved budget of the award.
- e. Equipment. Equipment is defined as tangible, non-expendable property having a useful life of more than one year and an acquisition cost of \$5,000 or more per unit. Motor vehicles and used equipment are not allowed. All goods and services must meet the source, origin, and nationality requirements set forth in 22 CFR Part 228 for the authorized geographic code 000, the United States. Detail each piece of equipment by name/model/type.
- f. Participant Training. Guidelines for participant training are found in ADS Chapter 253 – Training for Development: <http://www.usaid.gov/policy/ads/200/253.pdf>. Detail each training program separately using one of the following identifiers: **in-country**; **third-country**; **US-based**. Each program **must** have a title/description, proposed country, approximate number of participants, and approximate dates. Costs for each program **must** be broken down into three categories: **instruction** (books, equipment, supplies, course handouts, registration fees, academic tuition and fees); **participant costs** (per diem, medical exams, visa fees, health and accident insurance premia, federal/state/local income taxes); **travel** (cost of transportation to and from the training site and travel within the training site. All USAID funded travel must be purchased in compliance with the Fly America Act. Entry to and exit from the U.S. **must** be on a U.S. flag air carrier.).
- For all in-country training, costs and allowances may be proposed by the training provider for review and approval by the Horticulture Innovation Lab Management Entity.
 - For third-country and U.S.-based short-term training (fewer than six months), program allowance rates (such as standard per diem rates) are based on the General Services Administration (GSA)'s Standardized U.S. Government Federal Travel Regulations, as established by the General Services Administration (GSA). These rates are found at **41 CFR 301-7 and 301-8**.
 - For third-country long-term training (greater than 6 months), costs and allowances may be proposed by the training provider for review and approval by the Horticulture Innovation Lab Management Entity.
 - For U.S. long-term training (greater than six months), please refer to The Institute for International Education (IIE) for the Department of State which researches and publishes the long-term training allowance rates for U.S. training sites which are available on request. Annual tuition caps for out-of-state students are currently at \$23,640 for undergraduate students and \$28,958 for graduate students (a five percent inflation factor may be added for each successive year).
- g. Other. Some examples are greenhouse fees, maintenance agreements, honoraria, repairs, analyses, and long-distance toll charges. All goods and services must meet the source, origin, and nationality requirements set forth in 22 CFR Part 228 for the authorized geographic code 937. Travel fees and insurance should be included under “Travel” or “Participant Training” as appropriate.
- h. Graduate Student Fees. Enter research graduate student fees here (i.e. student is working on the project in a research capacity and is not directly receiving training or units towards a

degree by virtue of employment). For program training, the fees should be reflected in the participant training section of the budget.

- i. Subawards. Briefly list each subaward here and include yearly and cumulative amounts. Each subaward will have its own, separate budget and budget justification. Do not fill in the subaward totals on the main budget sheet as they will auto-fill after entering in any applicable subaward budgets on the provided worksheets. The subaward budget sheets also allow for subawards—enter the appropriate total amounts for each on the worksheet and detail the budget in the justification.
- j. Indirect Costs. Institutions may claim indirect costs at their federally-negotiated rate. If no approved rate applies, the institution may take up to 10% of total direct costs for their indirect costs. **An approved indirect cost rate agreement (if applicable) must be provided at the time of proposal submission.**
- k. Cost Sharing. Cost sharing is required at 25% of the total federal funds requested from the Horticulture Innovation Lab. The cost share must consist of non-federally funded contributions that meet the criteria detailed in 22 CFR 226.23. Cost sharing may include, but is not limited to: 1) principal investigator/senior personnel effort; 2) in-kind contributions; 3) cash contributions; 4) unrecovered indirect costs; 5) indirect costs on principal investigator/senior personnel effort. **Cost-sharing documentation from the contributing entity must be provided at the time of proposal submission** (in most cases, this will be in the form of a letter signed by the authorized organizational representative). Some items that are ineligible for cost sharing are existing equipment, administrative services, office and lab space, and administrative fees in lieu of indirect costs. The required cost share may come from any combination from the main institution and subaward(s) as appropriate. Provide a detailed cost-sharing narrative listing institution(s), dollar amounts, and descriptions.

VIII. Supporting Budget Letters.

The following supporting budget letters must be attached.

1. Indirect Cost Rate agreements for any institution (main and sub) that requests indirect costs (if applicable).
2. Signed letter(s) of commitment or support from all subawardees to the main applicant including any pledged cost-share dollars. Letter should be signed by the authorized organizational representative.
3. Signed letter of commitment or support from the main applicant's institution that supports the level of cost-sharing on the proposal. Letter should be signed by the authorized organizational representative.

IX. Additional Letters of Support (if any).

Please provide general letters of support. Letters of support can include letters that indicate other sources of funding. Please indicate the objectives addressed by the additional funding in comparison with the current funding request and the respective costs. Letters of support can also be solicited from USAID Missions or their partners.

Appendix I - Gender Assessment

Principles

1. Gender refers to social characteristics of men and women, such as their different roles within the family or in farming and the types of behavior expected of them (for instance, women are gentle and faithful, men are strong and free). These issues speak to the ability of women and men in specific communities to carry out certain farming activities, to be able to travel outside their immediate area for training and meetings, to be sufficiently educated to participate in training, and so on.
2. Gender stereotypes will vary among cultural groups. It is necessary to be aware of how they function in your particular cultural group because they will affect constraints for both sexes. For instance, if you want to add more weeding on a man's crop and weeding is a woman's task in that culture, you may not get your technology adopted. Include in your proposal an assessment of how you will deal with this.
3. Gender issues also speak to who farms which crops and/or which practices do they do in farming. What are the differential usages of men and women regarding natural resources (water, firewood, etc.)? For instance, women's inability to participate in formal employment or their restraints in mobility may result in their using natural resources in order to get cash. For instance, in Africa women may cut down trees to sell the wood because they have no other income source.
4. Gender issues also exist in regard to scientists, extension agents, and students. This includes both numbers and in men's and women's perspectives.
5. Consider that one of the Horticulture Innovation Lab's goals is to sensitize host country stakeholders at all levels - farmers, extension agents, local and national government officials, researchers, university faculty, etc. - to gender issues.

The Horticulture Innovation Lab Management Entity can provide further help in formulating gender-sensitive criteria for your specific project. It can also offer training of trainers for teachers and trainers so they can incorporate gender training in their courses throughout the course of your project.

Assessment Criteria (Use those that apply to the work you are doing.)

General:

1. Review your stakeholder/participant list and consider the gender issues with each group.
2. In writing your proposal make the sex of your participants explicit - eg. Men and women farmers/students.
3. Go beyond numbers to consider gender stereotypes that might hamper participation of one group or other.
4. Add relevant gender training to all training programs, long and short term.

Farm/Enterprise level:

1. Specify the gender division of labor for Horticulture Innovation Lab activities in your target area. Make it clear in your proposal what these are and the implications for your proposal.
2. Identify constraints on women - mobility, resources, etc. - so you can include ways of dealing with this in your proposal.
3. Clarify whether you will be dealing with men or women producers, marketers, and other stakeholders, or both. If not with both, please explain why not.

4. In addition to being gender sensitive, we ask you to be farmer sensitive. Show us that farmers and other stakeholders have been consulted on the various phases. And thus that what you are proposing corresponds to their needs.

Extension level:

1. Aim at working with a minimum of 50% women. If necessary figure out how to find relevant women in or near the communities who might be able to work as assistant extension agents. For instance, you will be working with extension services. You want to provide extension workers with bicycles but women in that area have traditionally not ridden bicycles. How will you handle this? Discuss the constraints in your research area in your proposal as also any relevant constraints on women/men farmers.
2. At the community level take into account how men and women are organized into associations, how group activities are structured, and what tasks provide for group communication such as doing laundry by the stream, or drinking tea under the shade tree.
3. Please provide gender assessment of the information knowledge transmission systems associated with your problem statement.

Training:

1. Short-term in-country training. Programs should be designed to include both sexes.
2. All courses should provide gender training at some level relative to the course subject and level.
3. Degree and certificate training should be offered to students of both sexes. The guidelines you should include in your proposal should be on the lines that 50% women is the desired percentage and the minimum percentage of female students should be 33%. If the percentage of women will be lower than 50% please provide an explanation for this and state what your project will do to ameliorate the situation.

Scientists:

1. Include women scientists in both the US and host countries. If you cannot do this, explain the constraints that have prevented this.

Appendix II – Regional Centers

In collaboration with partner institutions, the Horticulture Innovation Lab Regional Centers serve the regions of East Africa, Central America and Southeast Asia to showcase technologies and innovations that can improve horticulture in their respective regions. The Central America center is located at The Panamerican Agricultural School, Zamorano, Honduras, the East Africa center is at the Practical Training Center with the Kenya Agricultural Research Institute (KARI) in Thika, Kenya and the Southeast Asia center is at Kasetsart University in Bangkok, Thailand.

The centers connect horticultural researchers, extension workers, farmers, non-governmental organizations (NGOs) and relevant private sector partners within their respective regions. The centers each serve as a regional repository for horticultural technologies and knowledge, provide training programs, facilitate the evaluation and adaptation of horticultural technologies, and develop mechanisms for sharing ideas within and across borders. The centers work with national agriculture research and extension systems, agricultural universities, NGOs and the private sector to provide ongoing training for the local horticultural industry and for trainers both at the centers and across the regions. The centers draw on local experts who have received technical training through advanced degree programs or train-the-trainer courses. The centers provide testing grounds for horticultural technologies and physical facilities for workshops and training sessions.

The objectives of the Regional Centers are to:

1. Increase farmer knowledge of improved horticultural practices
2. Increase the number of regionally specific horticultural technologies
3. Increase local adoption of horticultural technologies by smallholder farmers
4. Improve the research and management capacity of the host institutions
5. Increase investments and number of entrepreneurs working with horticultural technologies
6. Contribute to the Global Horticulture Knowledge Bank, and build networks between centers

One of the Centers' major roles is to test horticultural technologies, adapt them to local conditions, and scale up their use regionally. This research builds capacity at the Centers and for the students and farmers who participate in the testing and adaptation. Currently, the Centers are testing pest exclusion nets, seed drying beads, Coolbots for cold storage, innovative insulation panels, solar dryers, solar irrigation pumps, macro tunnels, mesh houses, and facilitated solarization.

For more information about the Regional Centers, visit <http://horticulture.ucdavis.edu/main/centers.html>

Each proposed project should outline ways that they could work with or complement the work of the Regional Centers, particularly the Center located nearest to the project site. Projects will be partially evaluated on their plan to collaborate with the Regional Centers. This could include;

1. Training at the Center. Please expand on; what type of trainings, who is the audience, what resources are needed, expertise provided, and expertise needed.
2. Conducting research at the Center. How would the proposed research project; collaborate with Center staff to design and implement research activities, or use the Center to test and evaluate new technologies.

Examples of past activities:

The Centers have hosted a number of workshops for various Horticulture Innovation Lab projects, as well as collaborated on research and dissemination activities. For example, the Regional Center in Thailand has collaborated with the “Implementing drying beads for seeds” project led by UC Davis by hosting a workshop and other training activities. This Center has also trained farmers on various technologies through the “Empowering women vegetable growers with drip irrigation” project led by North Carolina A & T State University. Similarly, the Regional Center at Zamorano (Honduras) hosted a *Phytophthora* diagnostics training course with Horticulture Innovation Lab PI Jean Ristaino, with 22 participants from Central America attending.

The Horticulture Innovation Lab’s Program Officer-Regional Centers will be available to help proposed projects align with each Center as needed.