

Trellis Fund Project Descriptions 2014

Technical projects:

- **Title: Promoting Pepper and Okra Production for Increased Producer Income and Nutrition**

Country: Ghana

Description: Samsford Enterprises has 170 hectares under production and over 530 hectares of additional undeveloped land – farmed by and available to small-scale producers in the area. In this undeveloped land and surrounding farms, Samsford Enterprises would like to increase production of pepper and okra, to sell in local markets and increase nutrition for network producers and their families. Producers are very familiar with pepper and okra and often it is women farmers and farmers' wives that grow these crops in their "kitchen gardens". This project would build upon women's knowledge of these crops, as well as educate all farmers on best crop management practices. In an area where horticulture crops can be scarce, increased production of a high value crop and better yields will boost incomes and nutrition. To disseminate best crops management information the US graduate student, Sammy Ford and a Ghanaian agricultural student will go to each farming community, conduct trainings, as well as set-up a demonstration garden in the Samsford fields.

Student skills requested: technical crop management experience (ideally in arid conditions), facilitation, workshop design, agricultural education, communication

- **Title: Seed Storage**

Country: Zambia

Description: During the wet season in Zambia's eastern province, an excess of food results in waste due to a lack of storage facilities and procedures. In addition, knowledge of traditional seed saving techniques and storage facilities has disappeared, making it necessary for farmers to purchase new seeds each season. This project will build/modify an appropriate storage structure for seeds and dried fruits, and teach farmers about the most effectively, locally appropriate ways to dry and store fruits, vegetables, and seeds. At the end of the project, farmers and farm teachers will feel confident saving their own seeds, drying their own food, and storing both seeds and dried foods.

Student skills requested: Seed saving, postharvest (particularly solar drying of fruits and vegetables), seed storage, seed selection, facilitation, agricultural education.

- **Title: Moringa Project for Livelihood Diversification, Nutritional Enhancement, and Sustainable Land Use**

Country: Ghana

Description: This project will train 180+ farmers on the Moringa Oleifera tree, which is valued for its high nutritional value, sustainable agricultural uses, and its use in

making innovative products. Moringa demonstration plots will be established in each selected community. Farmers will learn how to diversify their income sources by making nutritional, herbal and hygienic productions from Moringa leaves. These products include a nutritional powder, herbal tea, and liquid hand-washing soap. They will also be trained in sustainable agricultural practices involving Moringa, such as fertilizer production, animal feedstock production, and agroforestry/intercropping. Entrepreneurial skills, marketing, nutrition and how to incorporate Moringa into the local diet will be covered.

Student skills requested: Background research, literature review, problem framing, development of learning materials, agroforestry, training and facilitation

• **Title: Basic pesticide safety education to commercial vegetable growers and pesticide handlers in Chitwan district, Nepal**

Country: Nepal

Description: Vegetable crops are gaining popularity as a major cash crop in Nepal with increasing demands. Per capita consumption of vegetables in Nepal has almost doubled to 105 kg over the past two decades in Nepal. Chitwan is one of the leading vegetable producing districts in Nepal. However, due to lack of proper knowledge on pesticide application, pesticide handling and usage, the vegetable growers in the region are facing a severe pesticide exposure, and consumers face very high pesticide residues on products. This project proposes to train 180 vegetable farmers in pesticide handlers in the region on basic pesticide safety information and handling to reduce their exposure to harmful pesticides as well as pesticide residue on harvest products.

Student skills requested: designing Knowledge-Attitude-Practice (KAP) surveys, safe pesticide handling and use, knowledge of pesticides used in vegetables, farmer education, developing educational materials.

• **Title: Promoting Soil Science Education in Malawi to Combat Erosion and Improve Agriculture Yields**

Country: Malawi

Description: Malawi ranks among the African countries whose agriculture is most severely at risk from climate change. Exacerbating the adverse effects of climate change is the widespread decline in soil health. Degraded soils result in decreased agricultural productivity and environmental stability. Malawi's population is projected to grow by over 50% in the next ten years, so unproductive soils could result in famine and social unrest. In an effort to arm farmers with the knowledge they need to improve their soils, this project will combine "classroom" instruction on soil science with hands-on simple qualitative soil tests. With technical support from a US graduate student and their Malawian counterpart, farmers in Khundi village, in rural Lilongwe, will attend soil science workshops and conduct inexpensive qualitative soil tests. The expected outcomes of this project are improved soil health, increased crop yields, and decreased erosion.

Student skills requested: soil science, horticulture, interest in/knowledge of tropical landscapes (especially in Africa), workshop facilitation

• **Title: Market Potential for Organic Produce**

Country: Kenya

Description: For over 6 years, DIG has worked in farming communities in Kenya with vulnerable populations (HIV+ and widow groups). One of the biggest challenges facing the smallholder farmers is accessing markets. The proposed project will begin to address this challenge and capitalize on the market potential for organic produce. This project will work with DIG-trained farmers in Migori District, Western Kenya to 1) train farmers in growing for market, 2) pilot an innovation, yet simple database of trained farmers and their real time harvests to enable aggregate produce for market and 3) establish an organic market stall in Rongo Town, Migori District.

Student skills requested: agricultural market development, understanding of supply and demand, market surveys, interviewing, facilitation, cost analysis

• **Title: Enhancing quality and market value of chili pepper in Mali**

Country: Mali

Description: Chili pepper is an important vegetable crop in Mali. Both men and women are involved in the chili pepper value chain. Men are the main producers and women the main processors, marketers, and end-users. Major constraints faced by chili value-chain stakeholders include poor harvesting, post-harvest handling and processing practices. These constraints often lead to high post-harvest losses (60-80%), poor produce quality and low market prices. Through this project, we wish to empower men and women stakeholders in the chili pepper value chain with in-field and postharvest handling practices and processing technologies that would reduce postharvest losses while improving quality and market value.

Student skills requested: postharvest technologies (specifically with chili pepper), developing postharvest trainings for low-resource farmers, facilitation

Language: French preferred

• **Title: Project with Horticulture Innovation Lab's Regional Center at Kasetsart University**

Country: Thailand, possibly Bangladesh

Description: The Horticulture Innovation Lab has 3 Regional Centers, which bring together key regional players to improve the livelihoods of smallholder farmers and small businesses in the region. The centers work on researching and locally adapting horticultural technologies, training farmers and other stakeholders around the value chain, and building capacity at local institutions. For this project, a Trellis student will work with the Regional Center at Kasetsart University, in Thailand on a project focused on low-tech, easy to replicate postharvest technologies for smallholder farmers in Bangladesh. The student will conduct a literature review on

postharvest issues on fruits and vegetables (not ornamentals) in Bangladesh, and then provide postharvest recommendations and training objectives to the UC Davis/Kasetsart University team that is implementing the project.

Student skills requested: ability to condense scientific postharvest information into basic, easy to following learning objectives and lesson plans; knowledge of low-tech postharvest technologies; PowerPoint; workshop facilitation; working with extension

Note: depending on timing, student may have the opportunity to travel to Bangladesh with the project team to assist with training extension agents in postharvest. Due to the project set up, this trip is likely to be planned on fairly short notice. If the student is unable to make the trip work with his/her schedule, he or she will travel to Thailand to work with Kasetsart Center staff on preparing the training and adapting postharvest technologies so that they will work in Bangladesh.

Concept notes:

Note: Concept Notes come from organizations that want graduate student assistance in developing a full project proposal (including monitoring and evaluation). The graduate student will visit the organization in March/April 2015 to work on proposal development. The proposal will then be submitted to the Horticulture Innovation Lab. If it is accepted, the student will then travel to the organization for a second time to help implement the project.

• Topic: Cucurbit and eggplant IPM

Country: Bangladesh

Problem Statement: Vegetables are one of the most important cash crops and potential source of vitamins and minerals of poor people. Vegetables cover 0.2 million hectares of land in Bangladesh, but production costs are increasing due to lack of improved cultural practices. Cucurbit vegetables and eggplant are cultivated year-round, but farmers' profits are quite low as pests cause 30-40% losses on average (losses can be as high as 60-70%). Fruit flies and fruit and shoot borers are the most harmful pests for both vegetables. Farmers use pesticides that are seriously hazardous for the environment and human health, and also increase production costs. In most cases, farmers mix 2-3 pesticides and spray the crops multiple times per day. To overcome this situation the project intends to introduce alternative environmentally friendly Integrated Pest Management Practices through farmer field schools.

Student skills requested: needs assessment, group facilitation, IPM, safe pesticide handling, familiarity with Farmer Field Schools, grant writing

**• Topic: Building Scientific and Research Capacity in the Horticulture Sector
Country: Ghana**

Problem Statement: The northern regions (known as the Food Basket of Ghana) are the poorest regions in Ghana and basically made-up of rural communities with agriculture and agriculture-related professions the predominant jobs of most people, including women, who make up about 60-70% of farmers within the horticultural industry in the region. Horticulture research especially at the postharvest level has received little attention and is mostly carried out by government research institutions and tertiary institutions in northern Ghana. Initial surveys show that much of the research on horticulture in the region is at the production level and the findings are most times with the individual researchers, which sometimes are very difficult to access. There are therefore not many published papers or information on the horticultural industry in the region. Despite the fact that the northern regions have both human and environmental conditions (e.g. dry season vegetable farming), the lack of scientific knowledge and innovative technologies coupled with lack of information and extension services to horticultural farmers has made the sector not lucrative enough for young agricultural graduates or investors to venture into. These challenges have led to lack of improvement in the horticultural sector within the regions leading to low yields having adverse effects on incomes and livelihoods of farmers.

Student skills requested: grant writing, budget preparation, knowledge of statistical models (SAS, GENSTAT), data analysis, facilitation, surveys/interviews, general project management

**• Topic: Sweet Potato
Country: Ghana**

Problem statement: Sweet potato cultivation in Ghana relies on cut vines, which are not available year-round, and are sometimes diseased as they sprout. Just before the main planting period, the vines are scarce. If we could use strips for augmentation for higher yield it would increase availability when desired. This project will compare the yield, disease incidence, planting material available, and length of time to cultivation between sweet potato vines and sweet potato slips.

Student skills requested: Background research, problem framing, project development, facilitation, agronomic research experience (ideally on sweet potatoes)

**• Topic: Sustainable Agricultural and Natural Resource Management
Country: Ethiopia**

Problem Statement: In Ethiopia, major causes for food loss include pre-harvest and post-harvest losses, inefficient marketing, distribution, and consumption mechanisms. Ministry of State Farms in 1978 pointed out that, the postharvest losses of perishable (vegetable and fruit) food crops amounted to about 30%. Every day hundreds of trucks bring fruits and vegetables from different regions of the country to the capital city, Addis Ababa. Different informal and formal information

sources mentioned that, in the biggest vegetable and fruit markets places a minimum of 50-60 meters³ of spoiled vegetable/fruit waste is generated daily and disposed of to the landfill by waste collectors. The main reasons for this situation are absence of skill and knowledge of stakeholders in the market chains, lack of policies, high moisture content, insect infestation and damage during handling (packing, storage, transportation). Thus reduced food loss/waste through these causes can make a significant contribution to food security in the country. According to businessmen in the sector, within one day, the prices of the products fell by half or more. If the fruits and vegetables do not sell while they are fresh, the businessman is forced to dispose of them as waste. By calculating these risks, the middle traders offer very low prices for the farmers. Consequently the farmers earn very low prices.

Student skills requested: Problem framing, stakeholder mapping/analysis, market analysis, project management, postharvest processing/loss reduction

• **Topic: Vegetable Gardens in Guatemala**

Country: Guatemala

Problem Statement: The village of Cimientos was settled by indigenous people who had been refugees in Mexico during the Guatemalan civil war. When the war ended, they returned to Guatemala, but resettled in a very isolated region of the country. This region has poor infrastructure, and roads are nearly impassible for part of the year and very slow otherwise. The people of Cimientos lost their traditional gardening skills while living in refugee camps, and now subsist on a diet of corn and beans. This project will teach basic gardening skills to interested women, organize the women into a supportive garden group, and also teach the women how to use the vegetables they are growing.

Student skills requested: home gardening, project management, grant writing, community organizing, facilitation, community needs/assets assessment, nutrition education

Language: Spanish

For more information about the Horticulture Innovation Lab's Trellis Fund, please visit <http://horticulture.ucdavis.edu/main/trellis.html>.