



USAID Farmer-to-Farmer Special Program Support Project
Small Grants Program

Final Milestone Report

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Table of Contents

	<u>Page</u>
Overview	3
Objectives	4
Hosts	4
Table 1: Project Indicators	5
Outcomes	5
Milestones.....	5
Volunteer Accomplishments	
Table 2: Title of Assignments.....	6
a. Surendra P. Singh (Assignment 1)	6
b. Ross H. Penhallegon (Assignment 2)	7
c. Dilip Nandwani (Assignment 3).....	8
d. Usha R. Palaniswamy (Assignment 4)	8
e. Muamba J. Kabeya (Assignment 5)	9
f. Ramon A. Arancibia (Assignment 6).....	9
g. Sammy L. Comer (Assignment 7).....	10
h. Surendra K. Dara (Assignment 8)	10
i. Jose Carlos Verle Rodrigues (Assignment 9).....	11
j. Prabode Illukpitiya (Assignment 10)	11
Table 3: Host training, activities, and locations that received assistance	12
Figure 1: Number of beneficiaries impacted	13
Figure 2: Map of Bangladesh showing impact	13
Public Outreach Events.....	14
National Daily Newspapers: List of articles.....	14
Facebook, Social Media Postings.....	14
Figure 3: Outreach of project activities through different daily newspapers.....	15
Annexure I: Images of farm visits, hands-on activities, and training workshops.....	16
Annexure II: Certificates of Participation.....	21
SOW-EOA reports: pages numbers	22 through 164

Table of Contents

	<u>Page</u>
SOW (Scope of Work) #1	22
EOA (End of Assignment report) #1	27
SOW #2.....	39
EOA #2	44
SOW #3.....	56
EOA #3	63
SOW #4.....	72
EOA #4	76
SOW #5.....	86
EOA #5	93
SOW #6.....	106
EOA #6	113
SOW #7.....	120
EOA #7	126
SOW #8.....	133
EOA #8	138
SOW #9.....	144
EOA #9	148
SOW #10.....	153
EOA #10	159

Building Capacity in Sustainable Agricultural Research, Extension and Education for the Women Farmers in South Asia, 2015

Overview

The main objectives of this project were to provide technical assistance and build capacity in sustainable vegetable cultivation to women's groups, extension agents, faculty and small-scale farmers in Bangladesh. Volunteer experts in their respective fields were able to disseminate information that enhances adoption of new and improved farming practices through training workshops, factsheets and a website in collaboration with hosts Bangladesh Agriculture University (BAU) and CARITAS Bangladesh, a Non-Government Organization. We estimate 2,671 farm family members benefited from this project. The overall impact stretches across six districts and eight villages (see table 3) and can be summarized from the individual 'volunteer trip reports' found under "Volunteer Accomplishments". BAU faculty and researchers received training to upgrade curriculum and outreach activities which further replicate training to enhance and educate farmers in the region. BAU in collaboration with Non-Government Organization (CARITAS, Bangladesh) organized workshops in organic vegetable cultivation, sustainable production methods, food security and nutrition to families in rural areas of Bangladesh. Topics included organic seeds, identification and management of insects-pests and diseases, do-it-yourself biopesticides, biofertilizers, composting, season extension, vegetable grafting and more.

Participant populations included farmers, extension agents, BAU faculty, graduate students, and staff, plus field staff of hosts (BAU and CARITAS), and other organizations as mentioned in the assignment reporting. Our aim was to reach the women farmers in particular. As the table below suggests, 276 women attended the trainings, which represents 37% of attendees. In 2011, the census reported the ratio of males to females in Bangladesh was basically equal, 100.3 to 100, respectively (National Institute of Population Research and Training, NIPORT, 2013; Bangladesh Demographic Health Survey, 2011). Also in Bangladesh, there is a lack of female empowerment (such as decision making or attending workshops), which was pointed out in the United Nations Development Program's (UNDP), Human Development Report (2015). The overall farm families benefited increases female representation resulting in excess of 37% female farmers, a good level of participation given the cultural context/local conditions cited.

This project was carried out between March 18, 2015 to March 21, 2016 as a small grant award from Volunteers for Economic Growth Alliance (VEGA) Farmer-to-Farmer Special Program Support Project (SPSP). The award was for a total of \$150,000 as a Fixed Amount Award.

Objectives:

The main objective of this project was to provide technical assistance and build capacity in sustainable vegetable cultivation to women's groups, extension agents, faculty and small-scale farmers in Bangladesh. The following list itemizes our approach.

- i. Improve capabilities, practices or technologies on vegetable production (conventional and organic)
- ii. Improve the knowledge and skills of young faculty and researchers in agriculture education
- iii. Improve marketing strategies for organic produce and understanding of economic returns for producers

Hosts:

- a. Bangladesh Agriculture University, Mymensingh
- b. CARITAS Bangladesh

Bangladesh Agriculture University (BAU) was the main host for this project. Dr. Md. Ashraful Islam was the local coordinator from BAU and collaborated with CARITAS Bangladesh to conduct training workshops. CARITAS Bangladesh assisted and coordinated with farmers in workshop trainings and field visits. A few other institutions were assisted or collaborated (Government, or Research Institutes and Non-Government Organization). Participants received training, or met with officials of these organizations to brief or update about the project in Bangladesh.

Additionally, a few other partners in the project participated. Hunger Free World, Bangladesh and ARORA Development Organization are Non-Government Organization (NGO) that organizes agriculture development work for improved nutritional access and food security. Department of Agriculture Extension (DAE), is a Government organization in Bangladesh whose mission is to provide eco-friendly, safe, climate resilient, sustainable productive good agricultural practices and sustaining natural resources to ensure food security as well as commercial agriculture with a view to accelerating socio-economic development of the country. SAARC Agriculture Center, an International organization states its 'Agriculture Vision 2020' would help maximize benefits from available options, enhance ability to face threats and new challenges and to harness the opportunities forthcoming in the region managed by the South Asian Association for Regional Cooperation (SAARC). Finally, Bangladesh Agriculture Research Institute is the largest National research institute in Bangladesh. Its Training and Communication Wing is responsible for human resource development through conducting trainings and arranging scholarships for higher studies. Dissemination of information through print and electronic media, organizing seminars and symposia are also the important areas of activities of this wing.

Table 1: Project Indicators

Indicator	Males	Females	TOTALS
Number of hosts benefited			2
Number of volunteers fielded			10
Number of persons directly assisted:	464	278	742
Number of persons trained:	452	273	725
Total number of farm families members benefited**			2671

*Based on 4.6 family members per household

Outcomes:

There were ten volunteer assignments with multiple objectives in each assignment. These were accomplished through ten volunteer experts with outcomes as follows:

1. Sustainable approach, environmental friendly and safe production of organic vegetables was demonstrated to farmers, extension agents, and faculty.
2. Enhanced capacity of two host organizations and collaborated/assisted four NGO's and institutions in organic vegetable production.
3. Beneficiaries trained in organic farming and long term approach for sustainable production of vegetables.
4. Technology of vegetable grafting for increased tomato production to address soil borne diseases such as bacterial wilt was disseminated to 64 farmers.
5. Knowledge transfer in decomposition and formation of organic manures to 120 farmers.

Milestones:

July 2015- Milestone 1: One SOW developed and volunteer fielded

September 2015- Milestone 2: Two SOWs developed and volunteers fielded

December 2015- Milestone 3: Four SOWs developed and volunteers fielded

March 2016- Milestone 4: Three SOWs developed and volunteers fielded.

Volunteer Accomplishments

Table 2: Volunteer assignments accomplished from April 2015 through March 2016:

SOW. No.	Title of Assignment
1	Improve the knowledge and skills of young faculty and researchers in agriculture education
2	Improve capabilities, practices or technologies on organic farming
3	Training in grafting vegetables (tomato and eggplant) and provide services to meet the requirements of Good Agricultural Practices (GAP) for producing vegetables
4	Preparation, composition and use of organic fertilizers
5	Improved Home Gardening Techniques with Organic Farm Emphasis
6	Offseason/year round vegetable production in Bangladesh
7	Pre and Post-harvest management of fruits and vegetables
8	Preparation and use of herbal pesticide or biofungicides
9	Record the important pest and diseases of fruits and vegetables and their integrated management
10	Sustainable marketing for organic production

i. **Surendra P. Singh (Assignment 1):**

Title: *Improve the knowledge and skills of young faculty and researchers in agriculture education.*

Host: Dr. Md. Ashraful Islam (BAU), Mr. Subrato Kumar Kuri (BAU)

Dates: Sept. 10-20, 2015

Total persons directly assisted = 99

In collaboration with the host BAU, the following selected topics for workshops, presentations and discussions were held for the Bangladesh Agricultural University (BAU) faculty and researchers. Additionally, NGO staff members at selected NGOs received this training. An Interactive Overview of Agricultural Education and Teaching: Need and Rationale for Restructuring / Developing Competency Based Curriculum- Time to Fill Skill Gaps and Regain Relevance.

- Agricultural Research and Development in Bangladesh: Strengthening Competencies for Research and Strategies, Tips for Writing Competitive Research/Grant Proposals.
- Challenging Faculty to Improve Teaching and Learning- Teaching Smarter Not Harder: How to Prepare to Teach More Effectively.
- Food and Agribusiness Management Education in Transition: The Changing Needs of a Global Market Place and Industry Engagement.

- Adult Education and Andragogy- Principles and Process: Systems Approach for Training of Trainers.

Participants actively participated and asked relevant questions or made relevant comments based on their experiences.

Dr. Singh visited CARITAS Bangladesh and gave a presentation on agribusiness development, linking farmers with markets and agribusiness education for its middle level supervisors and field officers. The workshop was attended by 16 supervisors and field officers of CARITAS Mymensingh regional office. Lively discussion followed the presentation. Most of the discussion was on how to link farmers with markets both for agricultural products and for other products. A visit to a local trade school and farm accompanied the CARITAS Bangladesh visit.

Dr. Singh presented and discussed the topic “Adult Education and Andragogy- Principles and Process: Systems Approach for Training of Trainers” to nine supervisors and field staff of different projects at a program funded by Danish International Development Agency (DANIDA) and implemented by Department of Agriculture and Extension (DAE) under Ministry of Extension. In the afternoon the volunteer visited the Germ Plasm Center and other departments at BAU, where he met and discussed various subjects of interest to faculty and researchers.

ii. **Ross H. Penhallegon (Assignment 2):**

Title: *Improve capabilities, practices or technologies on organic farming*

Host: CARITAS Bangladesh

Dates: Oct. 12-20, 2015

Total persons directly assisted = 81

Dr. Penhallegon visited the villages of Naokuchi, Upazilla- Jhinaigati, District- Sherpur and in CARITAS, the villages of Tabadia, Sagordighi Thana, Upazilla- Ghatail, District: Tangail and in the north, Daodhara, Upazilla- Nalitabari, District- Sherpur villages. He visited numerous gardens in each village. Each garden was evaluated on how to better produce vegetables. Some of the common suggestions were to manage soil health better by having the soil analyzed every 3 to 5 years, decrease manganese amendments and consider crop rotation for Nitrogen management. The use of wood ash was explained: It is OK for root crops but if there are no root crops only use ash every 4 to 5 years as it will increase the phosphorus and potassium in the soil. In the fruit trees root rot was a problem. Advice was given on testing and resolving these problems. Other common problems included insects, and appropriate advice was communicated to farmers to resolve these common pests. Additional advice was given on proper composting methods, pruning, and gaining fresh, productive seeds, cloves, and desired cultivars. Each of these suggestions is aimed at improving production.

iii. **Dilip Nandwani (Assignment 3):**

Title: *Training in grafting vegetables (tomato and eggplant) and providing services to meet the requirements of Good Agricultural Practices (GAP) for producing vegetables*

Host (BAU and CARITAS): Dr. Md. Ashraful Islam and Subrato Kumar Kuri of BAU
Regional Manager of CARITAS

Dates: February 20-March 2, 2016

Total persons directly assisted = 64

Dr. Nandwani visited villages around Mymensingh and Haluaghat districts with two hosts where he met with farmers and introduced organic vegetable gardening practices, discussed with farmer groups production issues. Training was conducted on tomato grafting techniques and their benefits. Training was conducted on disease diagnosis and correction. By the end of the training, participants were able to identify current pest problems correctly and practice grafting on tomato and eggplant. The volunteer visited gardens and offered garden-specific advice to farmers, which all benefited from witnessing. A few suggestions made to improve production include: using sanitizing practices (such as cleaning tools, rouging and removing infested plants from the garden), plant spacing and soil test. The volunteer also provided a CD on tomato grafting to local Coordinator, Dr. Ashraf Islam which contained PowerPoint presentations, literature and fact sheets, a grafting guide and videos on tomato and cucumber grafting. These resources will be shared by coordinator with trainees.

iv. **Usha R. Palaniswamy (Assignment 4):**

Title: *Preparation, composition and use of organic fertilizers*

Host (BAU): Dr. Md. Ashraful Islam, Mr. Subrato Kumar Kuri

Dates: Dec. 23 – 30, 2015

Total persons directly assisted = 120

Dr. Palaniswamy observed the potential for increased capacity building for composting and organic farming in Bangladesh. Her workshops were two-part, a presentation followed by hands-on activities. Farmers were very interested in this topic and learned about local ingredient choices to supply nitrogen and carbon to the compost pile; how to separate kitchen wastes and field wastes for the composting and what items will enhance the final product. There was also a good discussion comparing the yield data from published literature on selected crops grown using regular compost vs. chemical fertilizers followed by a detailed explanation of the long term benefits of using compost in the soil to enhance crop growth and development, to produce quality and nutritional valued crops as well as supporting the environment. It was pointed out that these practices reduce the expenses and increase revenue for the farmer.

v. **Muamba J. Kabeya (Assignment 5):**

Title: *Improved Home Gardening Techniques with Organic Farm Emphasis*

Host: Vangnamari Union Group, Gourpur District, Chaiz Nilaxmia Group, Gourpur District, Caritas NGO, Haluaghat District

Dates: January. 22-30, 2016

Total persons directly assisted = 103

Dr. Kabeya's training activities included improved techniques on home vegetable gardening with a focus on organic farming using the concepts of crop planning, intensive vegetable farming, crop rotation and soil fertilization (through the use of manure and compost) to enrich the soil, and increase both biological and economic yields. These practices will help the farmers prevent the build-up of soil problems including soil nutrients, soil borne diseases, weed suppression and pest control, thereby increasing crop production, and increasing households' income and nutritional outcome. An important discovery by the volunteer was that home gardens were considered as having one or two fruit trees, not necessarily having a vegetable garden. Therefore, increasing these farmers knowledge on vegetable production using good, organic practices will improve their family's nutrition as well as their income.

vi. **Ramon A. Arancibia (Assignment 6):**

Title: *Offseason/year round vegetable production in Bangladesh*

Host (BAU): Dr. Md. Ashraful Islam, Mr. Subrato Kumar Kuri, BAU

Dates: Nov. 15-27, 2015

Total persons directly assisted = 83

Dr. Arancibia met farmer groups with local coordinator, Abdul Momen Miah and Mr. Subrato Kumar Kuri and visited horticulture farm of host (BAU). Mr. Dhiresh Chiran, Executive Director of APORA Development Organization, was involved in meeting with a group of farmers associated with CARITAS. The volunteer focused on year-round issues that would not be dealt with in other discussions aimed primarily at increased production. Topics included flood management and flood tolerance technologies such as grafting on tolerant rootstocks e.g. tomato grafting on brinjal. Also, becoming aware of cultivar choices based on heat tolerance, flood tolerance, etc. Higher and lower temperatures become a parameter to be managed by mulching, shading and cultivar selection depending on season. Wind management was also discussed with such solutions as windbreaks and row covers. Row covers also aid in temperature management and insect-pest control. Emphasis was also given to production of sweet potato since it has been recognized as the most nutritious vegetable available.

vii. **Sammy L. Comer (Assignment 7):**

Title: *Pre and Post-harvest management of fruits and vegetables*

Host (BAU, and Caritas NGO): Dr. Md. Ashraful Islam, Mr. Subrato Kumar Kuri, BAU
Caritas NGO, Haluaghat District

Dates: March 10-18, 2016

Total persons directly assisted = 19

Prof. Comer trained participants from CARITAS NGO that work directly with the local farmers on a day-to-day basis. The topic addressed was that of Pre- and Post-harvest Management of Fruits and Vegetables. It consisted of 19 trainers, 5 women and 14 men. The workshop was conducted over a three day period, March 13-15, in cooperation with the Marketing and Sustainability of production section. Materials were developed that included pre- and post-harvest management, what do we know, how to reduce post-harvest losses, what are the post-harvest operations, pre- harvest losses, fruit quality, and losses at various stages of production. Farmers are in need of education and agricultural knowledge in post-harvest management to prevent losses, thereby increasing income. This could be arranged in partnership between the Department of Agriculture Extension (DAE) and Bangladesh Agriculture University (BAU). Several procedures are recommended to improve crop production and yield. These include the use of mulches to prevent fruits from ground contact, which damages the fruit; yield current practices of breaking off fruits to the use of sharp hand tools that prevent plant damage; obtain and use proper containers for harvesting and storing fruits and removal of diseased or damaged fruits to prevent spread to other stored product; and finally to utilize waste materials in the compost pile to improve soil nutrients.

viii. **Surendra K. Dara (Assignment 8):**

Title: *Preparation and use of herbal pesticide or biofungicides*

Host (BAU): Dr. Md. Ashraful Islam, Mr. Subrato Kumar Kuri, BAU

Dates: 18 – 21 January, 2016

Total persons directly assisted = 49

This assignment had two major activities. The first one involved organic vegetable growers affiliated with Hunger Free World and the program staff in the village of Agmundia, Kaligong, Jhenaidoha district. The second activity was to visit conventional vegetable fields in Shahbazpur in Jessore (Agriculture production zone of Bangladesh) and meet with the farmers. Several fields were visited for both major activities. In both cases, data was collected on current insect-pest and disease problems, as well as the level of farmer knowledge relative to overall production management. It was determined that farmers need information about good agricultural practices, Integrated Pest Management (IPM), insecticide resistance problems, environmental and human health risk with excessive use of

chemical pesticides, and sustainable agriculture. In the second major activity, the volunteer found that farmers were not aware of sustainable agriculture or IPM practices, but did know about potential environmental and human health issues and insecticide resistance. Those who are aware of what are good agricultural practices feel alone as they do not find any community support. There is a need for regular training and a support system that encourages sustainable agricultural practices. A specific recommendation is for farmers to consider spraying pesticides – even if they are biopesticides – as the last option, noting that good agricultural practices, in general, ensure good plant health. It would also be prudent to develop crop production and pest management guidelines. Dr. Dara found a widespread need for education on pest, their biology and the symptoms they cause (how to diagnose the problem). This need expands into good agriculture practices (GAP) and the need for continual learning and fine tuning to improve overall crop production.

ix. **Jose Carlos Verle Rodrigues (Assignment 9):**

Title: *Record the important pest and diseases of fruits and vegetables and their integrated management*

Host (BAU): Dr. Md. Ashraful Islam, Mr. Subrato Kumar Kuri, BAU

Dates: October 3 -12th 2015

Total persons directly assisted = 103

Dr. Rodrigues was able to work jointly with Bangladesh Agricultural University (BAU) reaching 103 vegetable and fruit farmers in order to identify the main pest and diseases affecting their crops. Disease, pest and pathogen names were provided based on the symptoms, damage, developmental stage and based on previous experience of the expert along with follow-up advice for each farm visited or farmer instructed. Dr. Rodrigues also provided several recommendations on the disease and pest problem, for further consideration. There is an immediate need for better identification and characterization of pathogens, their vectors and the main pest that are already limiting plant yield. Farmers, extension personal, NGO and students are more aware of the importance of plant pest and disease control now and were instructed to consider this awareness when planning their future work. The adoption of organic management system could provide assistance in the control of these problems.

x. **Prabode Illukpitiya (Assignment 10):**

Title: *Sustainable marketing for organic production*

Host (BAU and CARITAS): Dr. Md. Ashraful Islam, Mr. Subrato Kumar Kuri, BAU
Regional manager, CARITAS Bangladesh

Dates: March. 10-19, 2016

Total persons directly assisted = 21

Dr. Illukpitiya, under the theme of "Supporting farmer driven organic business ventures", covered the specific areas of agricultural technology in organic farming, entrepreneurship development, business planning and marketing of organic produce, and sustainability issues. The participants were from the non-governmental organization called CARITAS Bangladesh and most of them were field level officers. Each participant was given copies of the materials used including PowerPoint presentations, enterprise budgets, pictures, and diagrams. This group of participants made plans to explore opportunities for developing locally based micro-enterprises around organic agriculture. They showed interest in entrepreneurship development, and adaptation to simple technology i.e planning via enterprise budgets for agricultural operations. This is modeled after formal business and marketing plan preparation in agribusinesses, in university courses, and action on sustainable agricultural practices.

Based on PERSUAP description, no volunteers were involved with using pesticides in this project. We had volunteers that educated farmers about pesticide use and even offered simple do-it-yourself home recipes for making bio-friendly pesticides and fertilizers. However, no volunteers directly dealt with pesticides.

Table 3: Host trainings, Activities, and Locations that received assistance

Host Received Training	Activities	Location
BAU, CARITAS	Farmers training	Naokuchi, Upazilla- Jhinaigati, Daodhara, Upazilla- Nalitabari, District- Sherpur villages. Tabadia, Sagordighi Thana, Upazilla- Ghatail, District: Tangail, Mymensingh, Jessore, Netrokona, and Jhenaidah
BAU, CARITAS	Training of Trainers	Mymensingh, Dhaka
BAU	Farm visits and consultation	Sherpur, Tangail, Mymensingh, Jessore, Netrokona, and Jhenaidah
BAU	Seminars	Mymensingh, Gajipur

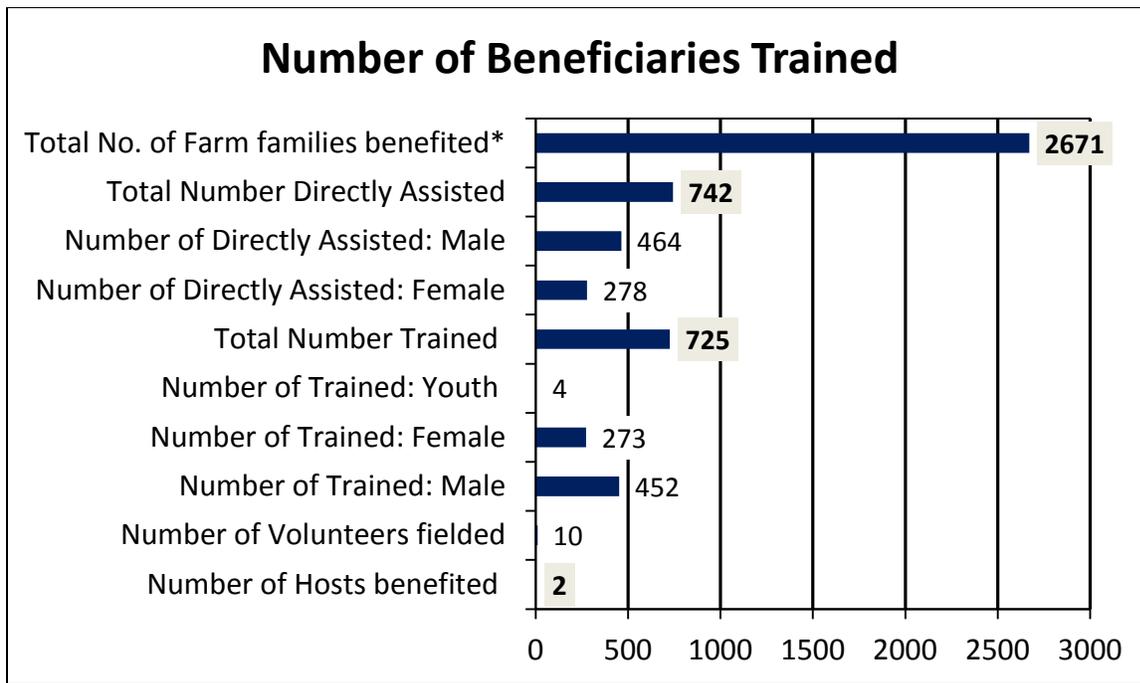


Figure 1: The number of personnel benefitted through the training and the “training-of-the-trainers (ToT) program.



Figure 2: Map of Bangladesh showing the project

Public Outreach Events

The project activities were disseminated through different national Bengali and English Daily newspapers. The following is a list of media coverage outlets, which published project activities.

National daily newspapers

1. <http://www.bdchronicle.com/detail/news/32/23223>
2. <http://www.kalerkantho.com/online/country-news/2015/09/14/268579>
3. <http://www.banglanews24.com/fullnews/bn/425351.html>
4. <http://www.somoyerkonthosor.com/archives/285392#sthash.efRks4Rw.dpuf%E0%A6%B8%E0%A6%AE%E0%A7%9F%E0%A7%87%E0%A6%B0>
5. <http://www.breakingnews.com.bd/articles/campus/breakingnews.67771.details>
6. <http://www.1newsbd.com/2015/09/14/105463>
7. <http://www.bartabazar.com/archives/47510>
8. <http://www.bdanswer.com/news/236978>
9. <http://gnewsbd24.com/single.php?id=26804>

Moreover different Social Medias like Facebook, and Personal blogs of the volunteers were also used as outreach for the project activities.

Facebook:

1. https://www.facebook.com/photo.php?fbid=10153841945770883&set=pcb.10153841947035883&type=3&__mref=message_bubble
2. https://www.facebook.com/sammy.comer.52/posts/1323816330978116?__mref=message_bubble
3. https://www.facebook.com/photo.php?fbid=906546746128053&set=pcb.906547726127955&type=3&theater&__mref=message_bubble

In addition to news reporting and photo sharing, the training workshops conducted in Bangladesh were discussed on social media. Planned activities after returning to the US include sharing the experience with faculty, students, and the public. The project coordinator, Dilip Nandwani, plans to share the Farmer to Farmer program information with other stakeholders in his research projects and to publish via newsletters. One volunteer was interviewed by a local newspaper on TSU-USAID-VEGA project as well the purpose of the current assignment. The volunteer shared with journalists the John Ogonowski and Doug Bereuter Farmer-to-Farmer Program (F2F), the objectives of TSU-VEGA project, and the benefits of vegetable grafting. The volunteer will share photos with colleagues and post on volunteer's TSU website for promotion of VEGA project achievements.

Annexure I

Images of farm visits, hands-on activities, and training workshops conducted by F2F volunteers.



Professor Penhallegon with Dr. Md. Ashraf Islam trying to detect a farmer's problem during Farmer to Farmer (F2F) training



Professor Comer and Dr. Illukpitiya with Dr. Md. Ashraf Islam at the training of trainers (ToT) Session with the participants.



Dr. Nandwani conducting a practical session with the women farmers on vegetable grafting during Farmer to Farmer (F2F) training.



Dr. Palaniswamy conducting a practical session with the farmers on compost preparation during Farmer to Farmer (F2F) training.



Dr. Arancibia conducting a practical session with the farmers on year round vegetable production during Farmer to Farmer (FtF) training.



Dr. Muamba with Professor Dr. Md. Abdul Momen Miah and Subrato Kumar Kuri conducting a practical session with the farmers on sustainable home gardening during Farmer to Farmer (F2F) training.



Professor Comer and Dr. Illukpitiya with Dr. Md. Ashraful at souvenir exchange with the Dean, Faculty of Agriculture, BAU (Prof. Dr.M. Afzal Hossain).



Dr. Dara with the farmers during F2F training associating with Hunger Free World, Bangladesh.



Dr. Rodrigues, Dr. Md. Ashrafur Islam and Mr. Subrato Kumar Kuri with the women farmers during F2F training to detect field diseases from the field.



Dr. Singh with the participants during a workshop with young faculties at BAU.

Certificates of Participations



Certificates awarding the participants for attending the workshop and the training of trainers (ToT)



Scope of Work Outline

Assignment 1: *Improve the knowledge and skills of young faculty and researchers in agriculture education.*

TSU-VEGA project: 'Issues and Challenges in Sustainable Agricultural Research, Extension and Education for farmers in Bangladesh'

Host Information:

Host Organization Name: Bangladesh Agricultural University (BAU)		Address: Department of Horticulture Faculty of Agriculture Bangladesh Agricultural University Mymensingh 2202 Bangladesh	
Email Address:	ashrafulmi@bau.edu.bd	Website:	http://www.bau.edu.bd
Primary Contact Name: Dr M Ashraful Islam		Secondary Contact Name: Subrato Kumar Kuri s_kuri@bau.edu.bd	
Cell phone: +8801716807130 Phone (office): +880 91 66401-6 extn 6479 Fax: +880-91-61510		Cell Phone: 8+80-1716-779829	
Title: Associate Professor		Title: Assistant Professor	
Gender: Male		Gender: Male	
Host Type: Public Sector, Academia, University			
Have we worked with this host before? No			

Background:

The broad development issue which this assignment addresses is capacity building by enhancing, strengthening knowledge and skills of young faculty members, researchers, extension personnel and other professionals involved in outreach. The overall goal is to improve agricultural education, training, research and outreach that would foster economic and rural development of rural areas, food security, and improves nutrition and food safety with focus on alleviating constraints to promote women entrepreneurs. The activities conducted under this assignment will help achieve the second goal (Improve the knowledge and skills of young faculty and researchers in agriculture education) as stated under the Tennessee State University Farmer-to-Farmer Program in Bangladesh.

Scope of Work:

Bangladesh has a primarily an agrarian economy. Agriculture is the single largest producing sector of the economy since it comprises about 18.6% of the country's GDP and employs around 50 percent of the total labor force. The performance of this sector has an overwhelming impact on major macroeconomic objectives

like employment generation, poverty alleviation, human resources development and food security. A high rate of productive employment generation is essential for Bangladesh to achieve sustainable, broad-based economic growth and the household income levels required for food security and the diversified balanced diets essential to combat malnutrition. Three overriding constraints face the agriculture and non-agricultural sectors of the Bangladesh's economy: (1) poor governance; (2) poor state of infrastructure; and (3) a lack of skilled manpower, including professionals at educational institutions, technical, vocational and middle management expertise. Research on development in developing countries has shown that agricultural education and training plays a role in providing skilled manpower for agricultural development and conducting meaningful research, thus providing farmers and other stakeholders with new techniques, technology and knowledge. Innovation of new technologies and management capacities for more intensive and modernized agriculture becomes paramount in maximizing agricultural productivity, output to ensure food security and alleviate rural poverty in the country.

For effective development of agriculture and rural development in land scarce countries like Bangladesh there is need to create viable opportunities to transform agriculture into agribusiness and harness the competitive leverage for carrying forward the process of rural development. For ensuring efficacy in the agro-food sector, there is need to put in place the systems and practices that offer forward and backward linkages between agricultural research and extension, other stakeholders and the global market. Higher education institutions in a country are supposed to provide setting where interdisciplinary expertise and knowledge needed to find solutions too many of today's socio-economic problems are found. Professionals at these institutions, because of their expertise, are supposed to conduct research and policy analysis to provide valuable insights into different aspects of the society and the economy. But there is also the need for conversion of university-based research into knowledge and information in lay terms for the benefit of various stakeholders. Herein lies the role of partnership between the researchers, extension personnel, NGOs, and other organizations. An effective partnership between interdisciplinary team of researchers at university with NGOs and government agencies, can fulfill not only task of providing information in lay terms to stakeholders, but can also facilitate the transformation of knowledge gained from research into effective programmatic actions. For this partnership to be to be successful agriculture professionals need to be well trained and have relevant skills, up-to date knowledge to deal with problems of changing socio-economic environment and evolving technology and markets.

Agriculture is quickly changing and evolving, and with it, a revised set of knowledge and skills are needed to address new challenges in evolving modern agriculture. As attitudes, expectations and employment in agriculture is changing, there is evidence that skills and competencies of graduates and others involved in educating /training do not meet the needs of today's agricultural sector. As the country moves toward its middle-income path, several factors could constrain its growth and development, one important being the supply of skilled human resources. There is increasing consensus that Bangladesh is facing a growing skill gap. This gap is emerging between the skills that industries and businesses require and what young people in educational institutions, whether academic or vocational training. The

emerging skill gap could impose human costs and constrain Bangladesh's economic growth and development.

Objectives:

Within the context of the above brief discussion of related issues facing agricultural education and development, the **objectives** of the proposed workshop(s) are as follows:

- To provide professional development training and information to faculty/ staff at university to upgrade/ enhance their teaching skills, guide faculty in evaluating, restructuring curriculum, and discuss rationale for restructuring agricultural education and development of Competency Based Curriculum.
- To discuss agricultural research for development in Bangladesh with the purpose of introducing research, research process to enhance and strengthen research competencies of young faculty, researchers' and NGOs staff,
- To provide guidelines and tips for developing successful competitive research proposals. The purpose will be to enumerate and describe some main points that should be taken into consideration while developing a successful research proposal.
- To provide training to enhance competencies of trainers for agribusiness development as a strategy for rural development and provide guidance in implementation of agro-entrepreneurship training programs and the sequencing of major events.

Deliverables:

- Faculty/staff aware of skill- gap to address new challenges in agriculture and understand need, rationale for restructuring curricula to keep curricula relevant to graduate job ready graduates.
- Faculty/ staff skills (pedagogical and business) enhanced.
- Faculty/staff knowledgeable, understand the process of skill-gap analysis and curriculum review and restructuring for higher education in agriculture.
- Better teaching skills and classroom instruction practices developed for more effective learning by students.
- Faculty research capability enhanced. Better understanding of research and research process among young faculty members, extension personnel, and NGO staff who attend the workshop(s).
- Faculty/ researchers are better equipped to develop successful research / grant proposals.
- Trained trainers (extension personnel and NGO staff) to provide training to other large groups and spread information on agribusiness development as strategy for rural development.
- Better trained trainers with improved knowledge of adult education and guidance in implementation of agro-entrepreneurship training programs and the sequencing of major events.
- Regular dialogue maintained at both local and international levels for agribusiness and rural development.

Duration and Dates of Assignment (including travel):

Aug.-September 2015 (two weeks)

Background and Host Organization Profile:

Bangladesh Agricultural University (BAU) is the largest and most important agricultural school in Bangladesh. It is located in the district of Mymensingh approximately two hours drive from the capital Dhaka. BAU is working together with NGOs with unprivileged farmers (indigenous groups) in rural Bangladesh and are seeking a senior scientist in the field of plant health to conduct training sections on pests & diseases affecting vegetables and fruits and support the identification of causal agents. A diverse number of crops have been promoted among the farmers in order to enhance their diet based mostly in rice. Additional surpluses of production could generate an extra income by selling the production on local markets.

Participant Profile:

Faculty, Researchers, Instructors

Tasks to be performed:

To achieve the objectives identified for this assignment, the volunteer expert will be engaged in the following activities:

- Meeting with BAU project team to learn about their plan on assignment training sessions planned and the profile of the participants
- Assessment of current practices and knowledge in agriculture education
- Provide on-site technical input on the topic
- Discuss both commercial and household level small scale organic farming
- Discuss plant nutrition, soil health, soil biology, nutrient cycle, manipulation of nutrient in compost and consistent production of compost

This assignment will strengthen faculty, teachers and researchers their knowledge and skills in agricultural education and improved knowledge in various topics in education.

Volunteer:

Surendra P. Singh

Assignment date:

Aug.-Sept. 2015

Host Contact

Dr. Md. Ashraf Islam
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The host institution of the project is Bangladesh Agriculture University (BAU) and local coordinator is Dr. Ashraf Islam, Associate Professor at Faculty of Agriculture.

Tennessee State University Contact

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John Ogonowski and Doug Bereuter Farmer-to- Farmer Program

Asia F2F

End of Assignment Report

Assignment 1: *Improve the knowledge and skills of young faculty and researchers in agriculture education.*

Project: Issues and Challenges in Sustainable Agricultural Research, Extension and Education for Women Farmers in Bangladesh

Volunteer name: Surendra P. Singh

Assignment number: TSU-USAID-VEGA-1

Assignment dates: Sept. 10-20, 2015

Name of host(s): Dr. Md. Ashraful Islam, BAU

Number of Persons Directly Assisted (Persons who received face-to-face or hands-on technical assistance, training or advice from the F2F volunteer. This is also considered program direct beneficiaries. “Persons Trained” are ALSO counted as “Persons Directly Assisted” and represent a sub-category of “Persons Directly Assisted.”)

Female: 2

Male: 5

Youth:

Number of Persons Trained (Training defined as: formally structured training activities, usually in a classroom, which do not lead to an academic degree, or a learning activity taking place in a classroom or workshop with learning objectives and outcomes) 90

Female: 11

Male: 81

Youth:

This end of assignment report is in partial fulfillment of an assignment under the Project “Issues and Challenges in Sustainable Agricultural Research, Extension and Education for Women Farmers in Bangladesh” funded by the USAID-VEGA. The development issue which the volunteer’s assignment addresses is to enhance, strengthen knowledge and skills of young



faculty members, researchers, extension personnel and other professionals involved in outreach. The overall goal is to improve agricultural education, training, research and outreach that would foster economic and rural development of rural areas, food security, and improves nutrition and food safety with focus on alleviating constraints to promote women entrepreneurs. The activities conducted under this assignment will help achieve the second goal (Improve the knowledge and skills of young faculty and researchers in agriculture education) as stated under the Tennessee State University Farmer-to-Farmer Program in Bangladesh. The volunteer arrived in Dhaka, Bangladesh on September 11, 2015 at 9:00 pm and was received at the airport by host Dr. Md. Ashraful Islam. The volunteer stayed in a Hotel in Bangladesh overnight and the next morning (September 12, 2015) he left for Mymensingh with Dr. Islam by car at 10:00 am, where Bangladesh Agricultural University is located. After reaching Mymensingh, the volunteer checked in the hotel at 2:00 pm and met with hosts (Dr. Islam and Mr. Kuri) to plan activities for the next day. The next day meetings were conducted with hosts to go over the program for workshops on September 14 and 15, 2015 and plan activities for September 16 and 17, 2015. Other arrangements for presentations during the workshop were discussed and finalized.

The main objectives of the assignment and workshops were:

1. To provide professional development training and information to faculty/ staff at university to upgrade/ enhance their teaching skills, guide faculty in evaluating, restructuring curriculum, and discuss rationale for restructuring agricultural education and development of Competency Based Curriculum.
2. To discuss agricultural research for development in Bangladesh with the purpose of introducing research, research process to enhance and strengthen research competencies of young faculty, researchers' and NGOs staff. Also to discuss growth of organic agriculture worldwide as well as in Bangladesh.
3. To provide guidelines and tips for developing successful competitive research proposals. The purpose was to enumerate and describe some main points that have been taken into consideration while developing a successful research proposal.
4. To provide training to enhance competencies of trainers for agribusiness development as a strategy for rural development and provide guidance in implementation of agro-entrepreneurship training programs and the sequencing of major events.

In order to accomplish these objectives the host requested training of faculty, researchers, and NGOs staff through a set of workshops. They also requested that the workshop facilitator meet one-to- one with interested faculty members, researchers, and NGO staff to discuss any specific problem that they might have. In order to accomplish the above mentioned objectives several



workshops topics were proposed

to the host. The host selected the following topics for workshops for presentations and discussions for the Bangladesh Agricultural University (BAU) faculty, researchers and NGO staff members at selected NGOs.

- An Interactive Overview of Agricultural Education and Teaching: Need and Rationale for Restructuring / Developing Competency Based Curriculum- Time to Fill Skill Gaps and Regain Relevance.
- Agricultural Research and Development in Bangladesh: Strengthening Competencies for Research and Strategies, Tips for Writing Competitive Research/Grant Proposals.
- Challenging Faculty to Improve Teaching and Learning- Teaching Smarter Not Harder: How to Prepare to Teach More Effectively.
- Food and Agribusiness Management Education in Transition: The Changing Needs of a Global Market Place and Industry Engagement.
- Adult Education and Andragogy- Principles and Process: Systems Approach for Training of Trainers.

Detail power point presentations were prepared and interactive presentations were made. In addition these power point presentations were e-mailed to all those participants who wanted. Most participants requested copy of presentations. A copy of program for workshops on September 14 and 15, 2015 and activities on September 16 and 17th are attached herewith.

The first workshop (“Agricultural Research and Development in Bangladesh: Strengthening Competencies for Research and Strategies, Tips for Writing Competitive Research/Grant Proposals”) was conducted on the Sept. 14th morning and was attended by 27 faculty members, researchers, and graduate students at BAU. Also there were participants from NGOs in the audience. The two other workshop presentations (“An Interactive Overview of Agricultural Education and Teaching: Need and Rationale for Restructuring/Developing Competency Based Curriculum- Time to Fill Skill Gaps and Regain Relevance” and “Challenging Faculty to Improve Teaching and Learning- Teaching Smarter Not Harder: How to Prepare to Teach More Effectively”) were presented in the afternoon. The same group of participants attended these workshops as in the morning workshop. The last workshop concluded after 5:30 pm. Participants appeared to be quite interested in the presentations during the workshop. The two other workshops (“Food and Agribusiness Management Education in Transition: The Changing Needs of a Global Market Place and Industry Engagement” and “Adult Education and Andragogy-Principles and Process: Systems Approach for Training of Trainers”) were conducted on September 15th morning and afternoon. These workshops were attended by 38 participants mostly BAU faculty and researchers and some NGO staff and a few from private sector. Participants actively participated and asked relevant questions or made relevant comments based on their experiences. Comments made by participants are attached herewith. The volunteer met with participants on request, if asked to meet and discuss questions related with topics.



Recommendations made by

volunteer at BAU

Research on development in developing countries has shown that agricultural education and training plays a role in providing skilled manpower for agricultural development and conducting meaningful research, thus providing farmers and other stakeholders with new techniques, technologies and knowledge. Higher education institutions in a country are supposed to provide setting where expertise and knowledge needed to find solutions to problems are found. There is a increasing consensus that Bangladesh is facing a growing skill gap. Before market-driven opportunities could be increased there is need to enhance human resources in a meaningful way. One of the ways to improve human resources to close skill gaps is to make education more relevant at higher education institutions. There is need to examine teaching and research being conducted at higher agricultural education institutions. The following recommendations may be considered for enhanced agricultural curriculum and preparation of young professionals for careers in agricultural education, research and extension.

- I. The purpose of education/training programs should be to improve education and training to make it more market-relevant by developing more market-relevant skills in identification and problem solving at the university, research organizations and for continuing education purpose.
 1. A survey may be conducted of employers hiring agriculture graduates and former graduates to assess specific skill and knowledge requirements of employers.
 2. Evaluation and modernizing, restructuring the existing curriculum in different departments. All instructional programs should be reviewed at least once every two-to three years and desired changes studied, developed and implemented if conditions warrant.
 3. Curriculum development workshops may be conducted for faculty and administrators.
 4. Curriculum developers must involve a range of stakeholders for identification of relevant evaluation and revision of curricula. Strong linkages between the educational institution and the labor market and those employers are established. This will help in defining the learning contents and improving quality standards.

To encourage greater cross-fertilization of ideas private sector, former students, faculty, extension workers, the ministries of education and agriculture, research organizations should interact and provide feedback in order to develop market responsive curricula for high quality relevant agriculture research and development education.
 5. Develop and strengthen training programs for those who do not have college level education but are involved in development work in agriculture or agriculture related areas. These would be short term training programs ranging from a few days to few months depending on the subject matter and the trainees.



faculty and staff development opportunities

1. Faculty members may be provided opportunities for reorienting their knowledge and skills of various subjects through exchange programs, short courses or workshops within and outside the country. Develop partnerships or collaborative arrangements with faculty in other countries, help facilitate faculty exchanges and participation in relevant workshops.
2. Faculty members may be offered opportunities for completing higher degrees. They may be provided up-to-date computers, new technology, and library resources for improving and updating their knowledge.

III. Improvements in technology, facilities including library facilities.

1. Make available computers and new technology to students and improved library facilities.
2. Improve availability of textbooks, reference books, international journals and other relevant reading materials.

IV. Changes in teaching methods

1. More use of audio-visual aids, less time spent in lecturing. Provide students time to think, and ask questions. More interactions between faculty and students.
2. More experiential learning be facilitated for students. Homework or projects involving solving and decision making be encouraged. Students may work individually or in groups.
3. Internships are crucial to building a cadre of well-prepared young professionals for careers in agriculture research, development education. Internships opportunities be explored and facilitated for students.

V. Educational institutions may include entrepreneurship and business skills into the agricultural curriculum and forge stronger links with the private sector.

VI. Encourage younger faculty members to get involve in applied and problem solving interdisciplinary research. Research programs should be geared to problem solving research much of which needs to be done in cooperation with other disciplines. Organize workshops, short courses to develop research skills and proposals in their areas and facilitate their attendance in these workshops. Provide release time for faculty to conduct research.



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Develop

- mentor programs where senior/ experienced faculty members work with younger less experienced faculty members and graduate students and mentor them.
- VII. Form teams of scientists for agricultural research initiatives. Select faculty on the basis of programmatic research needs and if possible develop some niche areas for research. Develop a national, regional, and state research agenda for different areas and develop research priorities.
 - VIII. The challenge is to develop research programs with high impact and train graduate students as the new generation of scientists. This will require teams of researchers pursuing relevant problems in a sustained manner that yields clear solutions and when applied provides vigor for the agricultural education.
 - IX. Develop strategies/ programs to market agriculture programs among prospective students and educating public about modern agriculture and developing new career opportunities in agriculture. It is essential that public and parents of prospective students know that agriculture science is part of STEM disciplines and move away from perception of agriculture is a dying industry with low prestige careers.

On the morning of September 16, 2015, the volunteer visited the regional office of Caritas Bangladesh (CB) in Mymensingh with hosts and Professor Abdul Momen Miah, Department of Agricultural Extension and Education at BAU. Caritas Bangladesh is a national, non-profit, development organization established by the Catholic Bishop’s Conference of Bangladesh to carry out activities of integrated social welfare and development, founded in 1967 and re-introduced in 1976. It has head office in Dhaka and eight regional offices. Its priorities include:

1. Human resource development through education, formation and capacity building.
2. Establishment of Social justice and Human rights through capacity building of the poor of the women and of ethnic communities,
3. Health care,
4. Ensure ecological sustainability and sustainable livelihood through the use and preservation of natural resources and capacity building in disaster management and climate change adaptation.

Upon arrival at Caritas Bangladesh, the Regional Director Mr. Apurbo Mrong described the Caritas mission, priorities and projects/ activities being conducted by Caritas in the region. The volunteer was asked to discuss and present a presentation on agribusiness development, linking farmers with markets and agribusiness education for its middle level supervisors and field officers in field. The workshop was attended by 16 supervisors and field officers of Caritas Mymensingh regional office. Lively discussion followed the presentation. Most of the discussion was on how to link farmers with markets both for agricultural products and for other products. All the participants conduct different projects under the umbrella of Caritas. The discussion mainly centered on marketing system and how to improve, develop marketing system considering existing constraints. The main constrains of the marginal farmers that they are not getting the actual price due to the middlemen involved in trading. The volunteer was asked to



make recommendations regarding ways to improve marketing by small and marginal farmers and what more can be done to link farmers with markets. These recommendations are listed below in the report.

At 2:00 pm the same day the volunteer visited a Technical School operated by the Caritas in the outskirts of Mymensingh. The school provides both technical and general education. The main goal of the school is to make the school dropout learners skilled in different marketable trades and enhance marketable employment potentials among the poor school dropout young boys, girls and the women. The principal of the school described the purpose and curriculum of the certificate program which include certificate in areas such as - Auto Mechanic, Electrical, Welding, Electronics, and Tailoring. The school is a boarding school and fee is minimum.

Later in the afternoon, we visited a farmer Mr Anowar Hossian Suruj in the village of Poshim Somonia para, PO: Surjopur in Haluaghat, Mymensingh to discuss marketing system at farmers level. Several farmers were present during the meeting at the farm. We discussed with Mr Anowar Hossian Suruj who is following the organic production of vegetables on his farm. His farm is only 0.5 acre but he is following very intensive production on farm. He appeared to have very good knowledge in crop production and keeps in touch with NGO and Extension personnel, and follows their advice. He takes his product for sale to the nearby market. He is happy with his level of production and satisfied with his marketing efforts as he receives premium price of his products in the market. He also, mentioned that there is demand for his organic products. He showed his vermicomposting process. He appears to become a model farmer in the area and many farmers are trying to follow his example.

The next morning on September 17th the volunteer visited a program funded by Danish International Development Agency (DANIDA) and implemented by Department of Agriculture and Extension (DAE) under ministry of extension. . This is an integrated development project, its Regional Coordinator and Deputy Director DAE Mr. J. C. Pandit welcomed and described/discussed various projects being conducted under the program. The volunteer presented and discussed the topic “Adult Education and Andragogy- Principles and Process: Systems Approach for Training of Trainers”. Nine supervisors and field staff of different projects operated under this program were in the audience. In the afternoon the volunteer visited the Germ Plasm Center and other departments at BAU. Where he met and discussed various subjects of interest to faculty and researchers.

On September 18th the volunteer reviewed activities with hosts Dr. Ashraful Islam and S. Kuri. and left for Dhaka for his flight back to the United States on the night of September 19th. The volunteer worked on his end of assignment report during the day on September 19, 2015.

Comments Made by Work Shop Participants:

In general all participants made positive comments for nice and informative presentations by the key note speaker Prof. S.P. Singh and the Country co-coordinator Dr. Md. Ashraful Islam for



organizing the workshop.

Following are examples of comments on workshops conducted at BAU on September 14 and 15, 2015.

- * Professor Dr. Md. Azizur Rahman (Dept. of Horticulture, BAU): This workshop is an initial step for positive changes. As well as it has inspired the young participants.
- * Mr. Nurul (From a business organization): This workshop has created the new opportunity to work with new concept and develop projects. All of the topics of Dr. Singh were really nice for exchanging ideas and good for us.
- * Professor Dr. Md. Abdul kader (Dept. of Agronomy, BAU): It has been a very wonderful workshop. Its sessions were really fruitful to us. Sustainable agriculture and organic farming is very much important for Bangladesh. But we need to assure quality and adequate amount of organic foods. As well as it is really important to create some demands for safe foods. This workshop will help the stakeholders to generate some policies regarding organic farming.
- * Dr. J.C. Pandit (PD, DFID-DANIDA): Lecturing related to adult learning and agri-business is relevant to my present works. And I really realize that safe food is a crying demand for us and we should assure the yield potential for organic food producers.
- * Tania Rahman (Horticulturist, Horticulture Centre, and DAE): Discussions were nice and effective to me. Topics were helpful for us and we will disseminate the knowledge to our farmers.
- * Rubina Yesmin (Upazilla Agriculture Officer, Mymensingh, and DAE): We will now talk with our farmers to produce the organic food stuffs. Hope, government, NGO, industries and general public will make a consensus to produce the organic food stuffs through PPP. As well as I also motivate the general farmers to take more concern on organic farming and sustainable agriculture.
- * Mst. Samsia Kowsari (Lecturer, DAEE, BAU): I have gathered so much knowledge and exposure on organic farming by this workshop.
- * Miss Upama Mondal (lecturer, Dept. of Genetics and Plant Breeding, BAU): As a new faculty of BAU I have learned a lot by teaching tips lecture.
- * Mr. Al-Amin (MS, Dept. of Horticulture, BAU): Actually I have learned many things from Prof. Singh. We need to produce and preserve the food organically as well.
- * Mr. Anik (MS, Dept. of Horticulture, BAU): This is my first workshop. Organic farming is very much important for Bangladesh. Our women are producing homestead organic vegetables from the ancient time. So, I would like to say that women are doing this then why not the men? As well as we need to control the extremity of the middle man to control the market price for the organic farmers. I think as well that our all stakeholders like academia, politicians, policy makers and the public should realize the importance of sustainable agriculture in context of Bangladesh.



* Mr. Rahad (MS, Dept. of Horticulture, BAU):

Horticulture, BAU): Now, this is our responsibility to go to the farmers and make them aware about the importance of organic farming.

* Mr. Kanchan (MS, Dept. of Horticulture, BAU): Actually I would like to say that, in some cases our farmers have biased attitude to grow foods like they grow organic foods for themselves but inorganic for the general public consumption purposes. As well as we need to conserve the soil's phycho-chemical characteristics by organic farming.

* Mr. Mehedi (MS, Dept. of Horticulture, BAU): Organic farming is really essential to eradicate the poverty from Bangladesh.

* Miss Rupa (MS, Dept. of Horticulture, BAU): This is my first workshop. It helps me to get unique knowledge on organic agriculture and research needs.

* Miss Mishu (MS, Dept. of Horticulture, BAU): organic farming may improve the socio-economic conditions for the poor farmers in Bangladesh. We need to motivate our farmers to adopt the organic farming.

* A participant from AIS, DAE: This workshop must create a new arena for organic farming in Bangladesh.

Recommendations made at Carita and DAE-DANIDA Workshops.

The recommendations made by the volunteer regarding linking farmers with markets and improving marketing in general include: 1) develop farmer associations/ organizations among farmers and develop farmers' markets, 2) develop cold storage/ warehouse facilities to preserve vegetables and fruits, 3) provide credit to farmers so that they do not have to pay back s to moneylenders soon after harvesting 4) develop marketing information system and make possible for farmers to find out prices of major agricultural products each morning through radio, TV or they may use cell phone to obtain prevailing prices of commodities that day. It will help farmers to decide whether to sell products or wait.

The general purpose of training programs should be to develop and strengthen small enterprises including farming by facilitating growth and competitiveness. The examples of training components are –development of facility, up-grading technical skills of trainers and developing materials for training and how to encourage farmers and entrepreneurs to attend training. Assistance may be needed in developing relevant training programs, developing training materials, and information dissemination.

Improvements, Impacts and Future Impacts:

It is too early to observe any long term improvements and impacts with respect to the objectives and as result of workshop presentations. However, if the above mentioned comments by faculty and graduate students are any indication, the workshop has provided some ideas for faculty and



researchers for discussions and

eventual improvements, implementation in teaching and research at BAU. They actively participated and asked relevant questions or made relevant comments based on their experiences. The volunteer was encouraged by the positive, encouraging comments made by participants regarding the relevancy and timely nature of workshops and presentations. The volunteer however, do not have any illusions about the resistance to change. Changes are always hard to come by, as there is always fear of unknown. The desire to change at administrative level including among some faculty and researchers was obvious. Most comments were favorable. A list of comments made by participants are attached herewith. I believe that by working with select group of administrators and faculty and showing them how changes could benefit them and their students, and how they could be made possible to produce positive results. The ideas presented and recommendations made were enthusiastically accepted by senior faculty and junior faculty members equally. Young faculty members appreciated the teaching and research tips for developing their teaching and research skills. Similarly, recommendations made at other workshops for NGOs were also appreciated as they indicated that the recommendations are practical and achievable.

It is expected that administration at BAU would consider recommendations to evaluate and restructure curriculum to make it more market relevant. Also, it is expected that faculty members will use discussions at the presentations and recommendations to improve their teaching and research skills. There is already some interest shown by the faculty, researchers and NGO staff to develop facilities and expertise to offer relevant programs.

One of the reasons why I decided to accept assignment in Bangladesh was so that I would have the opportunity to work and interact with future generation of Bangladeshi professionals in agriculture and educators in an instructional capacity. The cooperation and hospitality the volunteer has received throughout his stay in Bangladesh and at BAU has been excellent. Overall, my experience in Bangladesh was positive and I enjoyed the opportunity to interact with Bangladeshi people. I appreciated the feeling that I was doing something important, not only helping them to grow professionally and students to have an education, but bringing the world to many who would never get a chance to travel.



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Few pictures are presented below during the conduction of Assignment number: TSU-USAID-VEGA-1



Fig. 1: Welcome address by Dr M Ashraful Islam (Local coordinator) for the workshop



Fig. 2: Mr Anowar Hossain Suruj (leader of Farmers group) is showing the vermicompost preparation



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Fig. 3: Photo session with the farmers group of Haluaghat, Mymensingh



Fig. 4: An ideal home for growing vegetable production in Haluaghat, Mymensingh



Scope of Work

Assignment 1: *Improve capabilities, practices or technologies on organic farming*

Project Title: Issues and Challenges in Sustainable Agricultural Research, Extension and Education for Women Farmers in Bangladesh

Overall Program Objective(s) and expected outcomes

The main objective of this project is to provide technical assistance in sustainable vegetable cultivation to women's groups, extension agents, faculty and small-scale farmers in Bangladesh. This will be achieved in collaboration with host institute (BAU). The information will be disseminated to enhance adoption of new and improved farming practices through training workshops, factsheets and a website.

Assignment period and length: March 10-18, 2016

The Objectives of the Assignment –

Bangladesh Agriculture University (BAU)'s objective is to improve the lives of those the program is targeting. One way of achieving this objective is by complementing donor and government support to BAU through self-help efforts such as organic vegetable farming initiative. The expert volunteer is expected to train BAU staff in organizing organic farming business ventures, developing local market/promotion of organic farming. The volunteer has also been requested to help these farmers learn how they can improve crop production, increase income and at the same time attain positive nutritional outcomes for their households.

- a) Sustainable approach and production of organic food, which will be safe for the people.
- b) Introduce for the adoption of organic production technology of crops and find out the approach which will be a long term basis for sustainable production and hazard free environment
- c) To build up a network among the safe food producers and build up a stable and improved marketing channel to encourage the producers as well as to get more economic return.

Assignment Tasks–

Before leaving the US: The volunteer is encouraged to research information on farmland management, intensive farming, rotational cropping, and soil treatment. Photos, slides and videos clips showing rotational cropping, farm layout, etc. would be helpful, keeping in mind that the majority of those who will participate in this training are either semi-illiterate, or illiterate. TSU-VEGA project design assignments with the assumption of some pre-departure

preparation by the volunteer. Actual preparation time will vary, based on the experience of the volunteer, as well as access to information or training resources of the volunteer. TSU relies on the volunteer to assess the tasks outlined in this SOW and to make his or her own judgment about how much and what kind of preparation is needed prior to arriving in Bangladesh.

The use of videos, PowerPoint presentations and hands-on activities to emphasize main points is strongly recommended during the assignment. These should be prepared, as much as possible, in advance of the assignment.

*Please note that if the volunteer identifies any specific materials necessary for the implementation of an assignment, he/she must first receive approval from TSU Project Coordinator prior to departure

In-Country Activities: It is anticipated that the volunteer will train traditional farmers mainly women's group on assigned topics. The volunteer will produce a guide or fact sheet on marketing, farm business and planning along with an end of assignment report which will include recommendations for increased profitability that can be easily adapted.

Post-Assignment Activities: Upon the volunteer's return to the U.S., the volunteer is encouraged to discuss his or her Farmer-to-Farmer (F2F) assignment in Bangladesh and the U.S. government's initiatives in assisting nations in need around the world. At least two outreach events upon returning to the United States are requested, and the results should be communicated to Dr. Dilip Nandwani (dnandwan@tnstate.edu).

Deliverables

- Produce a simple-to-read manual on farm business, management and marketing that would specifically cover topics from the assignment.
- Write final report including recommendations relevant to the farm project

Indicators for the Evaluation of Impact-

An increase in yields, gross and net income and the adaption rate of volunteer recommendations will be indicators for evaluation of impact. A higher score of the association by the F2F organizational development indicator (ODI) after 30 months, due among others, to their ability to deliver quality services to its members. Monitoring visits will be made by BAU staff to ensure host implements volunteer recommendations and improvements resulting from such adaption will be recorded.

Scope of work

Bangladesh is still far behind considering the organic food production and efficient product marketing. There is lack of knowledge in organic farming in general and production practices. Successful effort to promote organic farming is largely depends on importance of organic production and efficient marketing of products. People are concerned about the safe food production to be free from health hazard. Both men and women can be involved through the safe

food production to develop sustainable production of crops, postharvest work, build up their capabilities for improved crop production technology for vegetables.

Host Organization:

Established in 1961, Bangladesh Agricultural University (BAU) is the oldest and the largest Agricultural University in Bangladesh. The BAU faculty focuses on teaching research and extension. Being a public University, one of BAU's mandates is to generate and help transfer of improved agricultural technologies to the stakeholders. BAU is the country partner in this project implementing the project activities in the country. BAU plays a major role in identifying the farmer needs and organizing the training sessions and evaluating the short term and long term impacts on the participating farmers. There is a dearth of technical manpower with updated knowledge and skill on improved composting by utilizing local materials that are available freely or at low cost. Thus, the volunteer will assist in building capacity for the project technical staff and conduct the participating farmer training sessions.

Participant Profile:

Small farmers with <1 ha land holdings, cultivating vegetables (Okra, eggplant, tomato, cucumber, pumpkin); low literacy level with about 50% of the farmers able to read and write in Bangla.

Tasks to be performed:

To achieve the objectives identified for this assignment, the volunteer expert will be engaged in the following activities:

- Meeting with BAU project team to learn about their plan on assignment training sessions planned and the profile of the participating farmers
- Target audience: students, faculty, general public interested in organic agriculture
- Topics to be covered:
 - Exploring markets for organic produce
 - Target audience: producers, marketing agents, NGO's
 - Topics include: Organic marketing situation (US example), consumer perceptions, supplies and producer market outlets, consumer barriers to purchasing organic food, marketing strategies
 - Developing local market/promotion of organic farming
 - Topics include:
 - Understanding the challenge, Set up consideration – factors to be considered in business model, Management of product line: product availability, quality, future product development plans, Organizing supply chain

This assignment will strengthen organic vegetable farm management, marketing issues, organizing organic business venture, thus creating opportunities of household income generation and improved employment opportunities in Bangladesh.

Volunteer:

Assignment date: March 9-18, 2016

Host Contact

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The host institution of the project is Bangladesh Agriculture University (BAU) and local coordinator is Dr. Ashraf Islam, Associate Professor at Faculty of Agriculture.

Tennessee State University Contact

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Tennessee State University, Nashville, TN
Phone: 615-963-1897
E-Mail: dnandwan@tnstate.edu

To continue and strengthening the above mentioned research, BAU need technical assistance in the areas as described in the scope of work for ten volunteer assignments. The ten assignments identified are in areas in high demand from the host institution to deliver training for women's groups, farmers, and faculty to build their capacity in production agriculture, food safety, nutritional awareness, and create opportunities to improve quality of life of the people of Bangladesh.

Volunteer Qualifications

- Must have a university degree in agricultural economics or related with extensive knowledge in agriculture economics, business, or marketing.
- Must have at least five years' technical experience in agriculture economics.
- Must have previous experience with training groups in developing countries. Experience working with women's groups, or groups of illiterate farmers preferred.
- Must be computer literate, capable of working in MS Word and PowerPoint.

Anticipated Work Schedule-

- Days 1: Volunteer will be picked up from the airport and given a local cellphone for use while in Bangladesh. Meet with BAU office staff and assignment host for briefing.

- Day 2: Travel to Khulna or Mymensingh to meet with host organization and discuss workshop schedule.
- Days 3-8: Conduct training
- Days 9: Completes final report
- Day 10: Debriefing
- Day 11: Departure

Beneficiaries

(Anticipated – To be confirmed by volunteer during assignment)

- a. Direct beneficiaries: female b. Direct beneficiaries: male
 c. Indirect beneficiaries: female d. Indirect beneficiaries: male

Expected Outcomes

- Women's farmer group (20-30 each) will acquire knowledge on sustainable organic farming, farm record keeping
- Improve farm yields and farmer income
- Increase knowledge of BAU project staff and faculty in organic farming business

Financial Information for Calculating Volunteer Travel Advance

- a. Lodging: # of days in Dhaka or Mymensingh; 9 x US\$60 or 70.0 for lodging
 b. M&IE: # of days in Mymensingh; 9x\$70.0 (US\$630.0)

Above are approx. numbers and actual will be calculated by Business office, TSU after return and submission of expense report by volunteer. Visa fee (\$160.0) for US Citizens. E-ticket will be provided few days prior to travel.

Assignment Logistics

This assignment will take place in Mymensingh, near Dhaka. The volunteer will be lodged at University guest house or a hotel, few minutes' drive away from the project site. Guest house and has electricity, internet, restaurant and running water available.

Materials recommended for the assignment

- Personal prescriptions (sometimes it is difficult to find certain drugs in country)
- Personal laptop with spare battery
- All weather shoes or boots
- Anti-malaria medication
- Sacs of oral rehydration salt (also available locally)
- Antibiotic
- Disinfectant
- Pain killer (can be purchased in Dhaka)

*Many of these items listed can be purchased in Dhaka but there may be quality and price differences.



John Ogonowski and Doug Bereuter Farmer-to-Farmer Program Asia F2F

End of Assignment Report

Assignment 1: Improve capabilities, practices or technologies on organic farming

USAID-VEGA and Tennessee State University requires a record of your volunteer activities to learn from your work and use that knowledge to develop future assignments. Documenting and learning from completed assignments is critical to the long-term success of the overall program. We are particularly interested in the impact of your work on the people and organizations you interacted with. Therefore, we ask you to answer the following questions to enable us to better understand the activities and impacts that occurred during your assignment.

Typically, you will have 1 or 2 days at the end of your assignment to finalize your end of assignment report. We recommend that you keep a daily journal of your activities, recommendations, and impacts to assist in completing this report.

Please note that in addition to this completed report with specific questions, other assignment deliverables may be required, as stated in your scope of work.

Your assistance in providing this summary report will help us to ensure that your assignment has the maximum impact possible. Your efforts are greatly appreciated!

Volunteer name: Ross H. Penhallegon

Assignment number: TSU-USAID-VEGA-2

Assignment dates: Oct. 12-20, 2015

Name of host(s): Caritas and World Vision, Bangladesh

Number of Persons Directly Assisted (*Persons who received face-to-face or hands-on technical assistance, training or advice from the F2F volunteer. This is also considered program direct beneficiaries. "Persons Trained" are ALSO counted as "Persons Directly Assisted" and represent a sub-category of "Persons Directly Assisted."*)

SEE SIGN IN SHEETS.

Female: 60

Male: 21

Youth:

Train the trainer – Caritas and World Vision organization attendees learning and listening: 16

Number of Persons Trained (*Training defined as: formally structured training activities, usually in a classroom, which do not lead to an academic degree, or a learning activity taking place in a classroom or workshop with learning objectives and outcomes*)

Female: 60

Male: 21

Youth:

Please answer the following questions in as much detail as you think is necessary.

1. What were the **objectives** of your assignment? What assistance did your host request? *(Please note any changes made in your scope of work during your assignment.)*
 - Train farmers on organic vegetable methods and production principles.
 - Help them understand how to increase production, mainly through doubling their production areas.
 - Show and educate them how to grow vegetables better, through better seeds, planting, irrigation, fertilization, composting, pruning, soil types; weed-insect and disease management principles; plus how to reduce weed, insect and diseases on vegetable plants.
 - Talked of potential markets.
2. What **activities and assistance** were parts of your assignment? Who was involved? What topics were addressed? *(Details regarding any materials that were developed, the number of people trained, the organizations that participated in your programs or that you met with, etc., are all very important.)*

Day 1 (World Vision, Bangladesh): 10-15-2015

Location: Village -Naokuchi, Upazilla- Jhinaigati, Distric- Sherpur

We walked through about 6 different garden areas in the village. Each garden was evaluated on how to better produce vegetables.

Suggestions:

- In general the gardens were doing very well. To improve production, they were told to plant their vegetables a little further apart to increase air circulation and reduce the yard long bean bacterial leaf spot.
- Check soil pH every 3-5 years. This can be done by the NGO.
- They have been using dolomite and they need to be careful of applying too much manganese. Plants don't use much manganese
- After planting a non-bean crop beans, they will add N to the soil. If they use beans, the bean plant will leave nitrogen in the soil.
- Compost – Each farm had a compost pile. We made suggestions on how to make the compost better.
- Explained the use of wood ash: It is OK for root crops but if there are no root crops only use ash every 4 to 5 years. Wood ash will increase the P and K in the soil and may be too high. It would be good to check it.
- A few plants had aphids, so they were told to use a tablespoon of liquid soap in a liter of water and spray on the aphids or other soft bodied insect.

Day 2 (Caritas, Bangladesh): 10-16-2015

Location: Village- Tabadia, Sagordighi Thana, Upazilla- Ghatail, District: Tangail

Observations and Suggestions:

- Banana – Found interior bacteria rot and root rot. Not sure where the rot was coming from. The rot needs to be identified by collaboration with Bangladesh Agricultural University and Caritas, Bangladesh.
- Gourd – Also had root rot, and the plant was severely wilting because the root rot had destroyed the small hairs roots and the plant was not getting enough water and nutrients. Beans had been planted where the bananas and yard long beans had been planted. There was a question asked about cross contamination? Soil test would verify if there was cross contamination.
- Yard long bean – has a bad case of bacterial leaf spot. Space the plants further apart for good air circulation.
- Mango – Found bad powdery mildew and centers need to be pruned for more air circulation.
- Rice – seemed to also have 8 inches of rot on the main stem. The pathogen needs to be identified through BAU plant pathology laboratory collaboration with Caritas, Bangladesh.
- Eggplant – The tops were curled. The crop was finished but the tops were curled. The whole field had 90% curl.

Day 3 (Caritas Bangladesh): 10-17-2015

Location: Village- Daodhara, Upazilla- Nalitabari, District- Sherpur

The drive way is north near the India border. We met with around 30 women and Caritas group. We met the ladies in the middle of large rice fields and visited a few gardens. Show and tell works so much better.

Observations and Suggestions:

- Compost was mainly dirt so it needed more manure and more dry leaves. Educated them on how to compost.
- Mango trees had very bad powdery mildew; they need to be pruned.

- Palmento was said to have too much of a rine. Many citrus are not ripening in Bangladesh or at least the citrus I have seen. The skin had insect damage. They have an insect that is cutting off the plants, which is usually called a cutworm. Let the chickens walk around the garden and the cutworms will be eaten or will go away.
 - Guava and mango insects: get a one liter pop bottle, cut a hole in the side; and add molasses or other sweet sticky material. The molasses needs to liquify or be fluid. It will catch most of the bad bugs.
 - Garlic had 17 plus cloves and it should have only 4 cloves and a few corms. They use the same cloves over and over again. Have someone go to Dhaka and get some good garlic and give each family one of the good cloves.
3. What **significant recommendations** did you make to the host? (*USAID requires that we collect significant recommendations made to the host for reporting purposes. At the time of a follow-up survey with the host, we will collect information as to which recommendations were adopted.*)

If you worked with multiple hosts, please list recommendations for each host separately or indicate if all of your recommendations were the same for all hosts.

October 15, 2015 Naokuchi village of Jhinaigati, Sherpur.

Day 1 Recommendations:

- Test the soils at least every 5 years or sooner.
- Be careful in using wood ash, use every 4-5 years for non-root crops or yearly with root crops.
- Beans were getting a leaf bacterial spot and leaf rust. Aerate the plot with more space between the plants.
- Keep soil pH at 6.5-7.2.
- When liming use dolomite every 3-5 years. Dolomite has magnesium in the mix and only small amount of magnesium is needed.
- Learn how to build better compost.
- For compost, use a lot of the falling leaves, house refuse, animal manure, leaves, etc.

October 16, 2015 Tabadia Village of Ghatail, Tangail

Day 2 Recommendations:

- Gourd – had root rot. A plant sample should be sent by Caritas to Bangladesh Agricultural University (BAU) – plant pathology lab to determine which root rot is in the soil and advise on solution.
- Banana – also do a soil and root test to determine which root rot is causing the banana trees to slowly die. See if there is a connection to the previous crop of beans.
- Yard long beans – bacterial leaf spot, but not too bad.

- Rice sample also had a bacterial stem rot. Need to identify the pathogen specifically. Seek BAO pathology lab assistance.

October 17, 2015 Daodhara Village of Nalitabari, Sherpur

Day 3 Recommendations:

- Compost – mix 1/3 manure, 1/3 leaves or weeds and 1/3 soil and add water to make moist.
 - Mango – prune open the center of the trees for good air circulation and better sun light. Fertilize more, since they are not fertilizing mango at all.
 - Palmetto – had a thick rind, due to the weather - is my best guess. It is not ripening as many citrus in the Bangladesh area. This is called weather. The marks on the skin were due to insects.
 - Cutworms that were cutting off the plants require chickens to “scratch” in and around the plants and eat the cutworms.
 - To control insects that get into the mango and guava, get a 1 to 1 ½ liter pop bottle, cut a hole in the side of the liter bottle; add a liquid slurry of molasses into the bottom of the liter bottle. The hole cut out of the side of the bottle is so the insects can enter. They will be stuck to the sticky molasses.
 - Garlic has very small cloves, due to planting the same garlic over and over again. They need some new garlic that has 4-5 garlic cloves.
4. Did you observe any **improvements or impacts** with respect to the objectives and expected results outlined in your assignment scope of work? (This can include new attitudes observed, immediate changes put in place, etc.). Please explain.

Day 1 10-15 Naokuchi village.

- The village leader was a lady and she was already talking about doubling her area of production, which in kind; would help her double her income.
- The ladies group was very intense in listening to how to improve their garden areas and how important it was to be late.
- The local field rep. said they are doing soil and pH testing every 5 years.

Day 2 10-16

- There currently is a need to get plant samples analyzed through the BAU – plant pathology lab. Test for root rot in the banana; test for root rot in the bean roots and test the gourds for root rot also. Look for contamination from the bean plantings.

Day 3 10-17

- They need to get the good quality of planting materials like garlic and sweet cultivars of orange as they are looking for sweet orange.

5. What **future impacts** do you anticipate as a result of your assignment? *(Please explain and list ways in which you think the results of your assignment can be measured 6 months from now.)*

Day one – 10-15 Naokuchi village.

- Each lady in the group would be growing more vegetables on more ground, thus increasing their production each year. The hope was to double their production each year.
- The group will follow the pH recommendation to keep the soil between 6.5 and 7.2, allowing the plants to improve nutrient uptake. This should improve the quality and yield of their crops.
- Use wood ash only on root crop areas.
- Use the hand lenses to properly identify leaf bacterial spot and powdery fungus problems.

Day two - 10-16

- Gourds – if root rot, a copper sulfate could be applied to reduce the root rot disease.
- Banana – once the disease is identified, solutions can be implemented. A banana expert may be needed.
- Yard long bean – a longer rotation to other sites. Beans can be a major carrier of secondary problems.
- Rice – root rot also but the rice is in water or wet soil. Ask the rice expert on solutions.

Day three 10-17

- Better made compost will provide the plants more uniform nutrients.
- Pruning the mangos will increase the fruit production. Increasing the mango fertility will also increase the yields.
- The palmetto needs more P and K for fruit development. Use some wood ash. The weather is believed to be the main cause of the fruit not being sweet.
- To control mango and guava insects, place a 1 liter bottle with one inch of runny molasses in the bottles. Cut out a hole in the liter bottle so the insects can enter the bottle.
- Garlic – find and plant newer garlic cloves.

6. Drawing on your volunteer experience, please provide us with any **recommendations for follow-up activities** to build on your assignment (e.g., things that USAID-VEGA or TSU can do to further support the host).

Day one – 10-15 Naokuchi village.

- Did the farm double its production area?

- Did the grower use a soil test?
- Did the grower have their soil tested?
- Did the farm double their income?

Day two- 10-16

- Did the root rot go away in the gourds?
- Did the root rot of the banana go away?
- Yard long bean – leaf bacterial canker. Has the disease lessened?
- Rice – was the root rot reduced?

Day three 10-17

- Did the group improve their compost?
- Did they prune the mango trees?
- The palmetto had a thick rine. Warmer and longer good weather would help.
- Cutworms – did they let the chickens run in the garden with bigger plants and get soil insects?
- Did they use molasses to catch fruit flies?
- Did they obtain good garlic from Dhaka and distribute to local farmers.

7. What effect did your assignment have on you personally and/or professionally (for example, new knowledge, contacts, etc.)?

I would enjoy making more garden or farm visits to see how the growers are doing. There is a need for more production recommendations to increase food production. Each village requested that a volunteer return.

Naokuchi village.

Talk in terms the ladies or growers can understand.

Reduce the amount of wood ash unless they are growing root veggies.

Each village I visited, the request came to come back again so they can show us how they have improved? A great idea.

8. Did you do any **outreach** activities (e.g., blog post, Facebook post, photo sharing, interviews with local media, etc.) while you were in country? If yes, please explain. If no, please explain planned activities for when you return to the US.

- My Blogger, 10-16, and 4 Facebook postings. I had 36 people reading the sites.
- The hits continue to happen on the FB sites. Date 10-16. And Continue – 10-17

10-18 – Ashraf and I walked around the Bangladesh agricultural University (BAU) campus looking at all of the different departments and programs. We spent time out at the horticulture farm and germplasm center, and helped to teach mango ripening to students and faculty.

We visited the department heads office, visited with the Dean of Agriculture (Professor Dr. Md. Afzal Hossain) and the Vice Chancellor (Professor Dr Md. Ali Akbar) of the university. He has many contacts with Oregon State University and we had a good discussion with him about USAID- FTF program.

9. Please also write a **personal letter to your host**. This letter will be translated (if needed) and delivered to your host. *Please use the attached letter template.*

FOR BAU LOCAL COORDINATOR USE ONLY:

Please provide a total and also list Consolidated Volunteer Recommendations below, by host. (If there are different recommendations for different hosts, please add a separate section for each host).

Host Name: Dr. Md. Ashraful Islam

Total # of Economic Recommendations: 05

Volunteer Recommendations - Economics:

- Be careful in using wood ash, use every 4-5 years for non-root crops or yearly with root crops.
- Aerate the plot with more space between the plants.
- For compost preparation-mix 1/3 manure, 1/3 leaves or weeds and 1/3 soil and add water to make moist.
- Open the center of the trees for good air circulation and better sun light. Fertilize more, since they are not fertilizing mango at all.
- To control insects that get into the mango and guava, get a 1 to 1 ½ liter pop bottle, cut a hole in the side of the liter bottle; add runny slurry of molasses into the bottom of the liter bottle. Cut out a whole in the side of the bottle so the insects can enter. They will be stuck to the sticky molasses.

Total # of Organizational Recommendations: 03

Volunteer Recommendations - Organizational:

- Learn how to build better compost
- Test the planting materials to confirm health regarding the disease of Banana, gourds and bean and through collaboration with Bangladesh Agricultural University (BAU)
- Help to collect good quality planting materials like garlic, orange etc.

Total # of Financial Recommendations: 0

Volunteer Recommendations - Financial:

Total # of Environmental Recommendations: 0

Volunteer Recommendations - Environmental:

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Pictures of field visits by volunteer









Scope of Work Outline

Assignment 3: *Training in grafting vegetables (tomato and eggplant) and provide services to meet the requirements of Good Agricultural Practices (GAP) for producing vegetables*

Project Title: Issues and Challenges in Sustainable Agricultural Research, Extension and Education for Women Farmers in Bangladesh

Overall Program Objective(s) and expected outcomes

The main objective of this project is to provide technical assistance in sustainable vegetable cultivation to women's groups, extension agents, faculty and small-scale farmers in Bangladesh. This will be achieved in collaboration with host institute (BAU). The information will be disseminated to enhance adoption of new and improved farming practices through training workshops, factsheets and a website.

Assignment period and length: February 20-March 2, 2016

The Objectives of the Assignment –

Bangladesh Agriculture University (BAU)'s objective is to improve the lives of those the program is targeting. One way of achieving this objective is by complementing donor and government support to BAU through self-help efforts such as organic vegetable farming initiative. The expert volunteer is expected to train BAU staff in intensive vegetable farming, crop planning and rotation soil treatment such as the use of manure and compost, and the use of lime to enrich the soil to increase yields. The volunteer has also been requested to help these farmers learn how they can improve crop production, increase income and at the same time attain positive nutritional outcomes for their households.

1. Improve the quality and quantity of tomato
2. The objectives of grafting will be to increase tomato production to combine with flood and bacterial wilt resistant brinjal will be treated as stock and tomato as a scion)
3. Improve the nutritional status of family by increasing the production of tomato and generate employment for women through the involvement of grafting

Assignment Tasks–

Before leaving the US: The volunteer is encouraged to research information on vegetable grafting, tomato and eggplant and other crops, production, supplies and materials needed etc. Photos, slides and videos clips showing tomato grafting, eggplant or other vegetables such as watermelon etc. would be helpful, keeping in mind that the majority of those who will participate

in this training are either semi-illiterate, or illiterate. TSU-VEGA project design assignments with the assumption of some pre-departure preparation by the volunteer. Actual preparation time will vary, based on the experience of the volunteer, as well as access to information or training resources of the volunteer. TSU relies on the volunteer to assess the tasks outlined in this SOW and to make his or her own judgment about how much and what kind of preparation is needed prior to arriving in Bangladesh.

The use of videos, PowerPoint presentations and hands-on activities to emphasize main points is strongly recommended during the assignment. These should be prepared, as much as possible, in advance of the assignment.

**Please note that if the volunteer identifies any specific materials necessary for the implementation of an assignment, he/she must first receive approval from TSU Project Coordinator prior to departure*

In-Country Activities: It is anticipated that the volunteer will train traditional farmers mainly women's group on topics related to assignment but not limited to tomato and other vegetables grafting techniques, vegetable production and promoting healthy diets.

The volunteer will produce a **guide** on vegetable grafting techniques with details of methods, materials etc along with an **end of assignment (EOA) report** which will include **recommendations** for increased profitability that can be easily adapted.

Post-Assignment Activities: Upon the volunteer's return to the U.S., the volunteer is encouraged to discuss his or her Farmer-to-Farmer (F2F) assignment in Bangladesh and the U.S. government's initiatives in assisting nations in need around the world. At least two outreach events upon returning to the United States are requested, and the results should be communicated to Dr. Dilip Nandwani (dnandwan@tnstate.edu).

Deliverables

- 1) Introduce alleged benefits of utilizing grafted plants in a field culture system and reasoning behind that concept
- 2) Successfully demonstrate & teach proper grafting techniques and necessary supplies (selecting and growing rootstock/ scion material, top grafting techniques, proper site of graft union on stems, sealing the graft union) to farmer group consists of mainly women
- 3) Successfully demonstrate & teach proper environmental controls for grafting (shade/ net house/ high humidity environment etc for transplants)
- 4) Successfully demonstrate & teach disease control precautions and mitigations (sterilization etc)
- 5) Show a successfully grafted in situ tomato plant over the course of the visit

- 6) Produce a simple-to-read manual on vegetable grafting that would specifically cover topics on grafting techniques, methods, materials and supplies etc.
- 7) Write final report including recommendations relevant to the assignment

Indicators for the Evaluation of Impact-

An increase in yields, gross and net income and the adaption rate of volunteer recommendations will be indicators for evaluation of impact. A higher score of the association by the F2F organizational development indicator (ODI) after 30 months, due among others, to their ability to deliver quality services to its members. Monitoring visits will be made by BAU staff to ensure host implements volunteer recommendations and improvements resulting from such adaption will be recorded.

Scope of work

In developing countries like Bangladesh, there is a serious lack of infrastructural and marketing facilities. This results in heavy post-harvest losses of fresh produce, and purchase options vary considerably depending on the nature of the commodity. These losses represent a significant food loss to the country and economic loss to the producers particularly. It is sometimes possible to replace these losses in quantity by increasing production. But if the levels of losses remain constant their production must increase at a proportionately higher rate which is generally not possible in the short run. In fact what is more likely to happen is that an increase in production will result in an increase in the losses too due to marketing inadequacies in handling the extra volume leading to price decline and the economic losses to the producers would be still greater.

Primary scope of work is to successfully teach and demonstrate grafts, and grafting techniques, culture, care, and implications of Tomato scion material onto Eggplant (brinjal)/ local Solanum rootstock during first week of November 2015.

Support small-scale women farmers to improve yield, quality, income and sustainability of household tomato gardens by grafting tomato with brinjal as a stock. Integrated pest management; plant disease identification and eradication; high-yield flood tolerant tomato will be encouraged to increase the area of cultivation and consume more vegetables.

Pest and diseases (mainly soil-borne) affected quality of tomato, eggplants, and other vegetables. Vegetable grafting techniques is new to Bangladesh and not adapted widely. Applying tomato grafting can have the potential impact for the producers to improve the quality of plants, fruits and losses from diseases. Mostly, women farmers are involved in the vegetable farming and need to improve their knowledge of vegetable grafting, production and postharvest handling and maintain the quality of the products. Reducing the losses of products can increase the income for the family.

Host Organization:

Established in 1961, Bangladesh Agricultural University (BAU) is the oldest and the largest Agricultural University in Bangladesh. The BAU faculty focuses on teaching research and extension. Being a public University, one of BAU's mandates is to generate and help transfer of improved agricultural technologies to the stakeholders. BAU is the country partner in this project implementing the project activities in the country. BAU plays a major role in identifying the farmer needs and organizing the training sessions and evaluating the short term and long term impacts on the participating farmers. There is a dearth of technical manpower with updated knowledge and skill on improved composting by utilizing local materials that are available freely or at low cost. Thus, the volunteer will assist in building capacity for the project technical staff and conduct the participating farmer training sessions.

Participant Profile:

Small farmers with <1 ha land holdings, cultivating vegetables (Okra, eggplant, tomato, cucumber, pumpkin); low literacy level with about 50% of the farmers able to read and write in Bangla.

Tasks to be Performed:

To achieve the objectives identified for this assignment, the volunteer expert will be engaged in the following activities:

- Meeting with BAU project team to learn about their plan on assignment training sessions planned and the profile of the participating farmers
- Assessment of current vegetable cultivation, production and transplant production practices
- Provide on-site technical input and hands-on training on vegetable grafting and best management practices
- Discuss both commercial and household level small scale vegetable production
- Discuss plant nutrition, soil health, soil biology, nutrient cycle, manipulation of nutrient in compost and consistent production of compost

This assignment will strengthen vegetable transplant production, farm management, production practices, nutrient and food safety, thus creating opportunities of household income generation and improved employment opportunities in Bangladesh.

Volunteer:

Dr. Dilip Nandwani
Tennessee State University
Nashville, TN

Assignment date: February 20-March 2, 2016

Host Contact

Dr. Md. Ashraful Islam
Associate Professor and Coordinator
Department of Horticulture, Faculty of Agriculture
Bangladesh Agricultural University
Mymensingh 2202
Bangladesh

Phone (office): +880 91 66401-6 x 6479
Fax: +880-91-61510
E-Mail: ashrafulmi@bau.edu.bd

The host institution of the project is Bangladesh Agriculture University (BAU) and local coordinator is Dr. Ashraf Islam, Associate Professor at Faculty of Agriculture.

Tennessee State University Contact

Dr. Dilip Nandwani
Associate Professor (Organic Agriculture)/Principal Investigator
College of Agriculture, Human and Natural Science,
Tennessee State University, Nashville, TN

Phone: 615-963-1897
E-Mail: dnandwan@tnstate.edu

Volunteers for Economic Growth Alliance (VEGA) Contact

Leia D'Amboise
Program Manager
734 15th Street NW, Eleventh Floor
Washington, DC 20005

Phone: Main: 202-223-7012 | Direct: 202-367-9995
Email: ldamboise@vegalliance.org

Host Institute (Bangladesh Agriculture University) Background

Bangladesh Agricultural University (BAU) will be host institute for the project. Horticulture Professor Dr. Ashraf Islam and his team will assist PI in implementing the project, coordinate training workshops and make logistic arrangements for the US volunteers. BAU will be sub awarded to organize training workshops, provide facilities, field visits, accommodation for the participants (farmers) and demonstration on their Horticulture farm. BAU is planning to establish a demonstration site for young organic entrepreneurs on their farm. The participating farmers would benefit from the training workshops proposed in this proposal. To compensate their time spent and use of facilities, BAU will be contracted to assist and organize ten training workshops for the experts/volunteers. *Bangladesh Agricultural University* (BAU) is the leading agricultural research institution in Bangladesh. Current research program in horticulture is focused on

sustainable vegetable production, food security, organic farming practices and training farmers, students and extension agents. Horticulture Department is one of the important departments of the total 43 departments at BAU which offers Masters and PhD degree programs. It conducts applied research and giving emphasis on organic production techniques for safe and healthy produce considering excessive use of chemical fertilizers. Horticulture department is collaborating with Plant Pathology and Entomology departments and conducting research in integrated pest and disease management of fruits and vegetables such as application of fertilizers and pesticides for crop production. Horticulture department has a germplasm center, where fruits and vegetables accessions are screened and maintained. Postharvest research is conducted in crops to extend the shelf life and quality. Also, pond dyke vegetable production is performing to make awareness of the nutritional value.

To continue and strengthening the above mentioned research, BAU need technical assistance in the areas as described in the scope of work for ten volunteer assignments. The ten assignments identified are in areas in high demand from the host institution to deliver training for women's groups, farmers, and faculty to build their capacity in production agriculture, food safety, nutritional awareness, and create opportunities to improve quality of life of the people of Bangladesh.

Volunteer Qualifications

- Must have a university degree in agronomy or agricultural economics with extensive knowledge in rotation farming and intercropping, organic farming
- Must have at least five years' technical experience in vegetable grafting, production and nursery management
- Must have previous experience with training groups in developing countries. Experience working with women's groups, or groups of illiterate farmers preferred.
- Must be computer literate, capable of working in MS Word and PowerPoint.

Anticipated Work Schedule-

- Days 1: Volunteer will be picked up from the airport and given a local cellphone for use while in Bangladesh. Meet with BAU office staff and assignment host for briefing.
- Day 2: Travel to Mymensingh to meet with host organization and discuss workshop schedule.
- Days 3-7: Conduct training
- Days 8: Completes final report; debriefed and departs for home

Beneficiaries

(Anticipated – To be confirmed by volunteer during assignment)

- a. Direct beneficiaries: female b. Direct beneficiaries: male
- c. Indirect beneficiaries: female d. Indirect beneficiaries: male

Expected Outcomes

- Women's farmer group (20-30 each) will acquire knowledge on vegetable grafting techniques.
- Increase farm yields and income from quality transplants
- Increase knowledge of BAU project staff and faculty in vegetable grafting

Financial Information for Calculating Volunteer Travel Advance

- a. Lodging: # of days in Dhaka or Mymensingh; 7 x US\$50 or 60.0 for hotel and \$25.0 for guest house
- b. M&IE: # of days in Mymensingh; 7x\$70.0 (US\$490.0)

Above are approx. numbers and actual will be calculated by Business office, TSU after return and submission of expense report by volunteer. Visa fee (\$160.0) for US Citizens. E-ticket will be provided few days prior to travel.

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This assignment will take place in Mymensingh, near Dhaka. The volunteer will be lodged at University guest house or a hotel, few minutes' drive away from the project site. Guest house and has electricity, internet, restaurant and running water available.

Materials recommended for the assignment

- Personal prescriptions (sometimes it is difficult to find certain drugs in country)
- Personal laptop with spare battery
- All weather shoes or boots
- Anti-malaria medication
- Sacs of oral rehydration salt (also available locally)
- Antibiotic
- Disinfectant
- Pain killer (can be purchased in Dhaka)

*Many of these items listed can be purchased in Dhaka but there may be quality and price differences.



Farmer-to-Farmer Program Asia F2F

End of Assignment Report

Assignment 3: *Training in grafting vegetables (tomato and eggplant) and provide services to meet the requirements of Good Agricultural Practices (GAP) for producing vegetables*

Volunteer name: Dr. Dilip Nandwani

Assignment number: TSU-USAID-VEGA-3

Assignment dates: February 20-March 2, 2016

Name of host(s): - Caritas NGO, Mymensingh District

Number of Persons Directly Assisted

Female: - 33

Male: - 31

Number of Persons Trained

Female: 33

Male: 31

Please answer the following questions in as much detail as you think is necessary.

1. What were the **objectives** of your assignment? What assistance did your host request? *(Please note any changes made in your scope of work during your assignment.)*

With the partnership of Bangladesh Agriculture University, the objective(s) of the assignment was to improve the lives of farmer groups the program is targeting. One way of achieving this objective is by complementing donor and government support to BAU through self-help efforts such as organic vegetable farming initiative. The expert volunteer was expected to train farmers groups and BAU staff in tomato production and vegetable grafting. The volunteer was requested to discuss tomato diseases, cucurbits (squash, gourd, watermelon etc) production and yields for improved income for their households.

1. Improve the quality and quantity of tomato
2. Address soil borne disease issue (bacterial wilt, fusarium wilt etc) and hands on training in tomato grafting using wild eggplant rootstock
3. Improve the nutritional status of family by increasing the production of tomato and generate employment for women through the involvement of grafting

2. What **activities and assistance** were parts of your assignment? Who was involved? What topics were addressed? (*Details regarding any materials that were developed, the number of people trained, the organizations that participated in your programs or that you met with, etc., are all very important.*)

Before driving to Mymensingh, where field site training was arranged, I spent a day in Dhaka and visited horticulture farms in Gajipur at Bangladesh Agriculture Research Institute (BARI) with Dr. Ashraful Islam (local coordinator), Dr. Nazim (BARI), and organic vegetable researchers.

The research team conducting field experiments on range of vegetables including pepper, tomato, cucumber, watermelon, squash, gourds, eggplants etc. During farm visits and discussions with farmers and BARI researchers, I noticed disease infestation in tomato, wilt and other soil borne diseases.

Next day, I drove with local coordinator Dr. Islam to Mymensingh. We (Dr. Ashraful Islam and Mr. Subrato Kumar Kuri) visited various farms in the communities practiced by farmers. Dr. Islam, Mr. Kuri and coordinator of local NGO (Caritas) facilitated in communities farmers mobilization and interpretation, whereas Dr. Ashraful Islam assisted in the overall coordination and logistics.

Home gardens in communities have few fruit trees at their backyard, some vegetables and/or ornamentals. The discussion on organic home vegetable gardening generated enthusiasm and welcomed by the farmers mostly comprised of women than men.

The training sessions were similar in all villages but the approaches were a bit different depending on the participants' needs and aggressiveness to solve their problems, mostly women and also the training facilities and materials.



Horticulture farm visit at BARI, Gajipur with local coordinator, BARI researcher and staff

Training at Durgapur, Netrokona District.

Organic vegetable gardening was introduced and the participants were encouraged to adopt and practice home gardening as very good alternative for family nutritional needs and income generating, especially for women. A total of 33 participants attended this one-day training, including 14 women and 19 men.

Training on tomato grafting conducted in an open yard under the tent. Participants were sitting around on chairs and desks. After introduction, participants were asked first about disease problems in vegetables in particular tomato, eggplant, squash, watermelon, cucumber, gourds etc. Participants were shown pictures of bacterial wilt and other soil borne diseases and they recognized having these disease issues in their vegetables. They were asked about vegetable grafting and no one was aware of that, however, they knew about mango grafting and couple of them practicing on some ornamentals.

I talked about concept of vegetable grafting, various tomato grafting techniques, cleft, and tube grafting method in tomato, benefits. Local coordinator had arranged tomato and brinjal (eggplant) seedlings. Various grafting supplies and materials I brought from US such as silicon clips, grafting blade, scalpel, trimmer, vegetable grafting guide and used during the training sessions.

Participants learned benefits of grafting, various methods and hands on training conducted and participants practiced tube grafting on tomato and eggplant. Flip charts were used to explain methods, techniques and various steps in tomato grafting. I also talked about cucumber and watermelon grafting and explained difference between two (tomato and cucumber grafting) though, both are similar in many ways.



Teaching tomato grafting to farmer group at Durgapur, Netrokona District



BAU horticulture farm visit and Graduate students

We walked thru vegetable garden areas in the village after training session. Each garden was evaluated on how to better produce vegetables. In general the gardens were doing very well. Bottle gourd, bitter melon, cauliflower, cucumber, spinach, yard long beans and fruit trees observed. To improve production, they were told to sanitize practices such as cleaning tools, weeding and removing infested plants from the garden, plant spacing and soil test.

Bottle gourd had root rot, and the plant was severely wilting because the root rot had destroyed the small hairs roots and the plant was not getting enough water and nutrients. Beans had been planted where the bananas and yard long beans had been planted. Yard long bean had symptoms of bacterial leaf spot. Plants were lacking adequate spacing and crowded, so had poor air circulation. Eggplants' tops were curled.

Training at Monikura, Haluaghat, Mymensingh District.

Same training was replicated at this location. This is a Christian base community belonging to an NGO called 'Caritas'. The community is well organized and more developed comparing to the last communities visited. They are well engaged in traditional vegetables home gardening. Some families practice home gardening with variety of vegetables growing in the garden as well as involved in nursery plants and grafting mango and ornamental plants.



Volunteer teaching tube grafting method in tomato to participants



Trainees practicing tomato grafting

After the field visits on various home gardens and also the demonstration plot on home garden set up by Bangladesh Agricultural University, the participants were assembled in open yard under the tent of the village community. The participants were asked to share their expectations and some questions on the knowledge on grafting, tomato disease and production practices.

I provided a CD on tomato grafting which contained PowerPoint presentations, literature and fact sheets, a grafting guide and videos on tomato and cucumber grafting.

After the session, participants were asked for feedback and questions. Group really appreciated the training on the concept of tomato grafting to avoid disease problem saying that, this training was specifically for women in the community because they do not engage in the large-scale farming but only men. Applying the tomato grafting techniques will help them become to some extent independent from their husbands, as organic vegetable home gardening will enhance the source of their family nutrition and income generating.

I visited Winrock International office and met with Director, also met with USAID officer and briefed about TSU-VEGA project. I update him eight volunteers assignments as well as ending of current project next month and plan of submitting new proposal on continuing technical assistance in organic farming for Bangladesh.

3. What **significant recommendations** did you make to the host? (*USAID requires that we collect significant recommendations made to the host for reporting purposes. At the time of a follow-up survey with the host, we will collect information as to which recommendations were adopted.*)
 - i. **Seeds and healthy seedlings**- Raise healthy seedlings of tomato and eggplants as well as for cucurbit crops for grafting. Seeds may be treated with hot water or chlorox to minimize soil borne disease especially if seeds are saved from previous crop.
 - ii. **Sanitization** – Most farmers in Mymensingh district have been growing vegetables using traditional methods and practices and do not take into account the proper sanitization practices. Cleaning and washing of tools in grafting is important to avoid transmission of disease. Use clean, high-quality, treated seed and avoid tobacco use. Keep seedlings in a sanitized space, wash hands before and after touching seedlings, keep work-spaces clean with detergents and/or alcohols, wear gloves, and work on clean surface.
 - iii. **Record keeping** – Keep records of grafts, methods, and label grafted plants (rootstocks and scion) for the varieties, date etc. Keeping records will help farmers understand the progress of grafting, avoid mistakes in labeling and make changes where necessary.
 - iv. **Healing chamber** – A healing chamber is important for the success of tomato grafting. Chamber can be constructed by wood or metal material (2’x4’), cover with clear plastic to maintain humidity (90%) and temperature. Cover chamber with shade cloth for first 3-4 days (dark) and gradually remove shade cloth to increase light in a week before moving to nursery or in the field.
 - v. **Tools and technique**– Grafting tools are cheap and easily available such as a shaving blade. Local innovation may be needed for using silicon clips with grafting clips

and/or other locally available material such as rubber band or jute thread for graft union making sure not to damage seedling stems. Tube grafting in tomato is easy, simple and with some practice can be easily adopted and skilled.

4. Did you observe any **improvements or impacts** with respect to the objectives and expected results outlined in your assignment scope of work? (This can include new attitudes observed, immediate changes put in place, etc.). Please explain.

The immediate impact was increased in knowledge and hands on training in vegetable grafting. At the end of each training, positive feedback received from the participants. Trainees were happy to receive new knowledge and training. Yes, there was great enthusiasm shown by the participants during the training. This was observed at all locations. During the feedback sessions, participants acknowledged how the training was very important and beneficial to them as individual and community as whole. They have been facing with poor yields in tomato, eggplant and other cucurbit crops due to pest and diseases pressure, and as a result it cost them to invest more capital in agrochemicals inputs such as fertilizers and pesticides. Use of grafting in tomato and cucurbit crops for their gardens, they said it will help them to curb all these problems and save more money, and the same time increase their vegetable yield.

5. What **future impacts** do you anticipate as a result of your assignment? *(Please explain and list ways in which you think the results of your assignment can be measured 6 months from now.)*

The next planting period in these communities will be summer if farmers adopt all the recommendations provided to them, they will be an increase in their vegetables home garden yields to meet their family nutritional needs and as well household income for those anticipating to sell the excess from the garden produce.

6. Drawing on your volunteer experience, please provide us with any **recommendations for follow-up activities** to build on your assignment (e.g., things that USAID-VEGA or TSU can do to further support the host).
 - Monitoring the farmers' adoption on the skills acquired from the training. There is great enthusiasm and promises from the farmers to adopt the good agricultural practices but if this is not monitoring by the local extension agents, the effort might be forfeited.
 - Further training on farm book keeping records by an expert. This will enable them track the farm activities, which will help them determine areas to improve and build on the success.
 - Promoting the importance of organic vegetables home gardens, especially in the Mymensingh district and Netrokona communities.
 - Facilitate grafting training sessions with these communities and provide assistance.

- Integrated Pest Management (IPM) follow-up training.
7. What effect did your assignment have on you personally and/or professionally (for example, new knowledge, contacts, etc.)?

I have been doing F2F assignments for few years now and each time I undertake F2F assignment, it makes me improve on my training capabilities. This assignment enabled me to train different groups with different reception behaviors; this helped me on how to modified my field as well as classroom training techniques back in my college and cooperative extension department where I frequently organize workshops and trainings for farmers. I was able to interact with various farmers groups and shared their crop production issues and need of community development in these villages from my site observation.

8. Did you do any **outreach** activities (e.g., blog post, Facebook post, photo sharing, interviews with local media, etc.) while you were in country? If yes, please explain. If no, please explain planned activities for when you return to the US.

Yes. I was interviewed by local newspaper on TSU-USAID-VEGA project as well purpose of current assignment. I shared with journalists the John Ogonowski and Doug Bereuter Farmer-to-Farmer Program (F2F) program, objectives of TSU-VEGA project and benefits of vegetable grafting. I plan to write a blog post and photo sharing with my colleagues and my TSU website for promotion of VEGA project achievement.

FOR BAU LOCAL COORDINATOR USE ONLY:

Please provide a total and also list Consolidated Volunteer Recommendations below, by host. (If there are different recommendations for different hosts, please add a separate section for each host).

Host Name: Dr. Md. Ashraful Islam (Local Coordinator)

Total # of Economic Recommendations: 07

Volunteer Recommendations - Economics:

- *Grafting system (tomato graft on indigenous brinjal) can be practiced to control some diseases like wilt of tomato*
- *Silicon clips or different types of tubes will be used according to the size of stem of tomato and brinjal.*
- *For the successful operation of grafting, some precautions should be taken like cleaning the hand, blade, work areas etc.*
- *Be careful regarding the stock and scion placement during the grafting operation.*
- *Different levels of shadow intensity (eg 7 days total dark which will be covered by black polythene, next few days under the polythene shade for the 50% sun and then preparation for planting in the main land) should be provided for the successful grafting.*
- *Locally healing chamber can be constructed*
- *Local innovation can be initiated to reduce the cost as well as the availability of the product for the grafting operation/activities (eg. materials of healing chamber, clips etc).*

Total # of Organizational Recommendations: 04

Volunteer Recommendations - Organizational:

Farmers can easily accept the technology which will help to generate income, more vegetable production as well as the safe vegetable production. So recommendations are

- *There is great enthusiasm and promises from the farmers to adopt the good agricultural practices. So, it is necessary to monitor the farmers.*
- *It is necessary to provide some materials like seeds and the grafting materials to initiate the program.*
- *Promotion of safe food production through introducing different technology to reduce the pest and diseases of pests.*
- *Further facilitate grafting training sessions with these communities and provide assistance to solve the problem from their work.*

Total # of Financial Recommendations: 0

Volunteer Recommendations - Financial:

Total # of Environmental Recommendations: 0

Volunteer Recommendations - Environmental:



Scope of Work

Assignment 4: *Preparation, composition and use of organic fertilizers*

Project Title: Issues and Challenges in Sustainable Agricultural Research, Extension and Education for Women Farmers in Bangladesh

Overall Program Objective(s) and expected outcomes

The main objective of this project is to provide technical assistance in sustainable vegetable cultivation to women's groups, extension agents, faculty and small-scale farmers in Bangladesh. This will be achieved in collaboration with host institute (BAU). The information will be disseminated to enhance adoption of new and improved farming practices through training workshops, factsheets and a website.

The expected outcomes are as follows:

- i. Improve capabilities, practices or technologies on vegetable production (conventional and organic)
- ii. Improve the knowledge and skills of young faculty and researchers in agriculture education
- iii. Better understanding of economic returns for producers
- iv. Marketing strategies for organic produce

Assignment period and length: December 2015 (9-11)

Objectives:

1. To know how to decompose or be experienced to the formation of organic manures
2. To identify any materials which help to decompose the waste products or the products of organic fertilizer quickly.
3. To introduce different kinds of organic fertilizer with their composition and show the demonstration of the performance of organic fertilizers on vegetables
4. To learn how to prepare and apply the organic fertilizers at the right stage of plant growth
5. To compare the organic and inorganic fertilizers on the quality of the vegetables as well as on the production cost of vegetables

Scope of work

To involve the women farmers in the process of decomposing of kitchen or waste products of home or surroundings. Increase the fertility of soil, efficiency of fertilizer use and reduce the infestation of disease and insects. Increase the quality of vegetables through using the organic

fertilizer application for the production of vegetables. Also, some organic fertilizers has been introduced commercially which will be disseminated among the farmers by showing the performance of different fertilizers and find out the recommended dose of organic fertilizers for the high yield and safe food production.

Host Organization:

Established in 1961, Bangladesh Agricultural University (BAU) is the oldest and the largest Agricultural University in Bangladesh. The BAU faculty focuses on teaching research and extension. Being a public University, one of BAU's mandates is to generate and help transfer of improved agricultural technologies to the stakeholders. BAU is the country partner in this project implementing the project activities in the country. BAU plays a major role in identifying the farmer needs and organizing the training sessions and evaluating the short term and long term impacts on the participating farmers. There is a dearth of technical manpower with updated knowledge and skill on improved composting by utilizing local materials that are available freely or at low cost. Thus, the volunteer will assist in building capacity for the project technical staff and conduct the participating farmer training sessions.

Participant Profile (target Groups):

Primary target is Women farmers. Small farmers with <1 ha land holdings, cultivating vegetables (Okra, eggplant, tomato, cucumber, pumpkin); low literacy level with about 50% of the farmers able to read and write in Bangla. BAU faculty/extension agents/field assistants would also receive training.

Tasks to be Performed:

To achieve the objectives identified for this assignment, the volunteer expert will be engaged in the following activities:

- Meeting with BAU project team to learn about their plan on composting and vermicomposting training sessions planned and the profile of the participating farmers
- Assessment of locally available ingredients for composting
- Provide on-site technical input and hands-on training on composting with particular reference to:
 - agro-waste/kitchen waste raw materials from the respective locations and their pre-processing for use in compost beds
 - elimination of pathogens from compost beds
 - Compost bed management
 - quicker and enhanced production of enriched compost
 - quality control of compost and evaluation of quality
 - maintenance techniques of compost and its care
 - nutrient content of compost and comparative benefits (economics) of quality compost over ordinary compost and animal manure
- Provide updated information on compost production using low cost materials
- Discuss both commercial and household level small scale compost production

- Educate the participants in application of effective dosages of compost for cultivating various vegetables and cultivated crops
- Discuss plant nutrition, soil health, soil biology, nutrient cycle, manipulation of nutrient in compost and consistent production of compost
- Deliver information (classroom teaching) on packaging and marketing of compost for storage and sale.

This assignment will strengthen compost education, research, production, and marketing, thus creating opportunities of household income generation and improved employment opportunities in Bangladesh.

Volunteer:

Dr. Usha Palaniswamy
Florida A&M University

Assignment date: Dec. 23-31, 2015

Host Contact

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The host institution of the project is Bangladesh Agriculture University (BAU) and local coordinator is Dr. Ashraf Islam, Associate Professor at Faculty of Agriculture.

Tennessee State University Contact

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Host Institute (Bangladesh Agriculture University) Background

Bangladesh Agricultural University (BAU) will be host institute for the project. Horticulture Professor Dr. Ashraf Islam and his team will assist PI in implementing the project, coordinate training workshops and make logistic arrangements for the US volunteers. BAU will be sub awarded to organize training workshops, provide facilities, field visits, accommodation for the participants (farmers) and demonstration on their Horticulture farm. BAU is planning to establish a demonstration site for young organic entrepreneurs on their farm. The participating farmers would benefit from the training workshops proposed in this proposal. To compensate their time spent and use of facilities, BAU will be contracted to assist and organize ten training workshops for the experts/volunteers. *Bangladesh Agricultural University* (BAU) is the leading agricultural research institution in Bangladesh. Current research program in horticulture is focused on sustainable vegetable production, food security, organic farming practices and training farmers, students and extension agents. Horticulture Department is one of the important departments of the total 43 departments at BAU which offers Masters and PhD degree programs. It conducts applied research and giving emphasis on organic production techniques for safe and healthy produce considering excessive use of chemical fertilizers. Horticulture department is collaborating with Plant Pathology and Entomology departments and conducting research in integrated pest and disease management of fruits and vegetables such as application of fertilizers and pesticides for crop production. Horticulture department has a germplasm center, where fruits and vegetables accessions are screened and maintained. Postharvest research is conducted in crops to extend the shelf life and quality. Also, pond dyke vegetable production is performing to make awareness of the nutritional value.

To continue and strengthening the above mentioned research, BAU need technical assistance in the areas as described in the scope of work for ten volunteer assignments. The ten assignments identified are in areas in high demand from the host institution to deliver training for women's groups, farmers, and faculty to build their capacity in production agriculture, food safety, nutritional awareness, and create opportunities to improve quality of life of the people of Bangladesh.



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FROM THE AMERICAN PEOPLE



John Ogonowski and Doug Bereuter Farmer-to-Farmer Program Asia F2F

End of Assignment Report

Assignment 4: *Preparation, composition and use of organic fertilizers*

USAID-VEGA and Tennessee State University requires a record of your volunteer activities to learn from your work and use that knowledge to develop future assignments. Documenting and learning from completed assignments is critical to the long-term success of the overall program. We are particularly interested in the impact of your work on the people and organizations you interacted with. Therefore, we ask you to answer the following questions to enable us to better understand the activities and impacts that occurred during your assignment.

Typically, you will have 1 or 2 days at the end of your assignment to finalize your end of assignment report. We recommend that you keep a daily journal of your activities, recommendations, and impacts to assist in completing this report.

Please note that in addition to this completed report with specific questions, other assignment deliverables may be required, as stated in your scope of work.

Your assistance in providing this summary report will help us to ensure that your assignment has the maximum impact possible. Your efforts are greatly appreciated!

Volunteer name: Usha R. Palaniswamy

Assignment number: TSU-USAID-VEGA-4

Assignment dates: Dec. 23 – 30, 2015 (inclusive of travel)

Name of host(s): Bangladesh Agricultural University (BAU)

Number of Persons Directly Assisted (*Persons who received face-to-face or hands-on technical assistance, training or advice from the F2F volunteer. This is also considered program direct beneficiaries. "Persons Trained" are ALSO counted as "Persons Directly Assisted" and represent a sub-category of "Persons Directly Assisted."*)

Female: 40

Male: 80

Youth: -

Number of Persons Trained (*Training defined as: formally structured training activities, usually in a classroom, which do not lead to an academic degree, or a learning activity taking place in a classroom or workshop with learning objectives and outcomes*)

Female: 40

Male: 80

Youth: -

Please answer the following questions in as much detail as you think is necessary.

1. What were the **objectives** of your assignment? What assistance did your host request? (*Please note any changes made in your scope of work during your assignment.*)

1. To know how to decompose or be experienced to the formation of organic manures
2. To identify any materials which help to decompose the waste products or the products of organic fertilizer quickly.
3. To introduce different kinds of organic fertilizer with their composition and show the demonstration of the performance of organic fertilizers on vegetables
4. To learn how to prepare and apply the organic fertilizers at the right stage of plant growth
5. To compare the organic and inorganic fertilizers on the quality of the vegetables as well as on the production cost of vegetables

2. What **activities and assistance** were parts of your assignment? Who was involved? What topics were addressed? (*Details regarding any materials that were developed, the number of people trained, the organizations that participated in your programs or that you met with, etc., are all very important.*)

- Met with the scientific team at BAU to identify objectives and learn about their project and long term plans
- Gathered information about the locally available materials that can be used to make compost.
- Provided classroom coverage of basics and followed up with hands-on training on composting with particular reference to:
 - Principles of choice of nitrogen and carbon sources and identified suitable sources locally available from the agro-waste/kitchen waste raw materials from rural areas; at source separation of waste, appropriate pre-processing for use compost beds for rapid composting and good management practices
 - Choice of the right raw material sources for good quality and nutritional status of the final compost yielded

- Provided comparison of yield data from the published literature on selected crops grown using regular compost vs. chemical fertilizers and explained the long term benefits of the use of compost to the soil, crop growth and development, produce quality and nutritional value as well as the environment.
- Reduction in the expenses and increase in revenue to the farmer

I presented 3 workshops, each of which included a classroom session and a hands-on field demonstration. The sessions were well attended. The participants were eager to learn and appreciated the new technology transferred. They were very participatory and I was met with great hospitality, good will and friendship at every point of the visit and training sessions. There is potential for increased capacity building for composting and organic farming in this area. I have benefited significantly from this assignment, on both a personal and professional level. I have an expanded appreciation of the great potential for increased food security and enhancing the economic status of the populations through best practices and engaging in vermiculture and vermicompost. I greatly appreciate the Bangladeshi culture, hospitality and welcoming nature.

3. What **significant recommendations** did you make to the host? (USAID requires that we collect significant recommendations made to the host for reporting purposes. At the time of a follow-up survey with the host, we will collect information as to which recommendations were adopted.)

If you worked with multiple hosts, please list recommendations for each host separately or indicate if all of your recommendations were the same for all hosts.

- Collect the dried leaves and other Waste/Garbage/Kitchen, separate them at source and keep the Carbon and Nitrogen sources to be composted
- Two of the groups I visited had not composted in the past and so did not have any knowledge about composting. Although the third group had received some training in the past, they did not have a standard recipe or best practices for composting. This workshop helped them to learn about the importance of C and N ratios and develop a recipe for the compost and standardize best practices.
- To increase Carbon: Nitrogen ratio, dried leaves, dried water hyacinth that is available in plenty from the local water sources, rice bran, saw dust or other brown materials need to be used as sources of carbon and increase the carbon content of the pile for effective composting and decrease problems of bad smell during decomposition and for carbon, and pests and predators and competitors.
- Include a handful of Neem leaves in the pile as research has shown that use of compost prepared in this manner decreased the pest and pathogen levels on crops in the field.
- Work out appropriate proportions of Carbon and Nitrogen sources and develop a recipe to include easily available material.
- There was no information available to me about the current nutrient analysis of locally prepared compost. Any recommendations made to farmers need to be based on this information. However, I made a recommendation to include C and N layers in suitable

proportions (it can range anywhere from 4:1 to 20:1 depending on the sources) from locally available materials of preprocessed cow dung, kitchen waste, rice bran, Neem leaves, grass clippings, dried banana leaves, dried water hyacinth leaves and stems, and asked them to try it on a trial and error basis to work out the right proportions of these ingredients. This should be possible and completed in about 6 months as composting only takes about 6 to 8 weeks. I demonstrated the layering method for effective composting.

- Teach the farmers and composters to do a squeeze test at the end to ensure that the composting is complete and ready for use.
- Also educate them on how to use the compost for best use by the crop in the field. Quantity, method and time of application was also discussed
- Farmers can be trained to use a thermometer and record the temperature in the compost during the decomposition. They can be trained to turn the pile each week and record the temperature and moisture levels to ensure that it is not too dry or too wet. If the farmers do not have long thermometers, they can be supplied if funding is available and the framers can be trained on how to use the thermometers, record the data and manage the piles in an efficient manner to obtain good quality compost and harvest larger number of worm to get greater income.
- I have recommended them to collect finished compost and get it analyzed in a lab to get the exact nutrient composition of the finished product.
- To promote acceptability and availability of compost as organic fertilizer, it is important to do field demonstrations and awareness among farmers, community, elected bodies, stakeholders, local and government officials
- Additional training is needed for better management, quality control, and record keeping.
- Additional resources are needed for building human resources and technical resources. In this regard external funding may be sought.
- I would recommend additional onsite training in selected homes/farms to demonstrate the layering method, selection of sources, and best practices for composting.
- Model compost piles/pits may be developed and maintained by the host and the community leaders that can provide a good example to the local farmers for best practices

4. Did you observe any **improvements or impacts** with respect to the objectives and expected results outlined in your assignment scope of work? (This can include new attitudes observed, immediate changes put in place, etc.). Please explain.

The participants felt the materials presented were new and useful to them. They did not know the scientific basics, the layering method, the required ratio in the choice of sources or the best management practices for good quality and greater yield. During the demonstration they volunteered to do it by themselves under my supervision. The participants were able to do a thorough recap of the training and had additional questions related to their individual situations in vermicomposting and vermiculture.

5. What **future impacts** do you anticipate as a result of your assignment? *(Please explain and list ways in which you think the results of your assignment can be measured 6 months from now.)*

- Composting is a short duration process lasting about 4 to 8 weeks depending on sources and management practices and six months' time is a good time frame to evaluate the impact of this training effort.
- Within a year, it should be possible to see how the training materials were adapted and used in local training programs, and assess how many additional people were trained.
- In a year a model compost piles may be laid out and in progress to include progressive farmers and community leaders.

6. Drawing on your volunteer experience, please provide us with any **recommendations for follow-up activities** to build on your assignment (e.g., things that USAID-VEGA or TSU can do to further support the host).

As a follow up I would recommend the following:

- **Training.** Develop training programs and conduct training on site at the farm fields.
- **Develop a step by step recipe** for the participants to follow while making a compost pile.
- **Model compost piles/units:** Layout and maintain regional model compost piles/units including the community and other stakeholders.

7. What effect did your assignment have on you personally and/or professionally (for example, new knowledge, contacts, etc.)?

I have been volunteering in the FtF program since 2006. I learn new information from the local populations I interact with during the assignments. It is interesting how the local people are not aware of the new technology developments, but are able to devise some simple solutions suitable for local conditions. There is room for technology transfer in composting. Such information is helpful to me in teaching and research efforts. The stories I carry with me are case studies that address questions in a problem and are answered through a variety of disciplines. Thus the experiences are great case studies in interdisciplinary courses. I am able to explore the farming practices with a Universal commonality as well as regional differences. I have made several professional contacts in this assignment and had the opportunity to connect with a wider audience to include farmers, women groups, students and scientists at BAU.

8. Did you do any **outreach** activities (e.g., blog post, Facebook post, photo sharing, interviews with local media, etc.) while you were in country? If yes, please explain. If no, please explain planned activities for when you return to the US.

I did not do any outreach activities while in the country. I am planning on writing and presenting my experience at my professional society (American Society for Horticultural Sciences)

9. Please also write a **personal letter to your host**. This letter will be translated (if needed) and delivered to your host. *Please use the attached letter template.*

Dr. Ashraful Islam
Associate Professor
Bangladesh Agricultural University
Mymensingh, Bangladesh

Dear Sir,

It was a great pleasure to serve as the facilitator for your training conducted in Mymensingh during this past weeks, attended by 120 participants. I was greatly satisfied by the attitudes and performance of these participants.

I was particularly pleased to see a significant number of women participants. They were very participatory and highly attentive, enthusiastic and eager to learn. I recommend future training to take place closer to the farm homes and on site at the farm homes to include hands-on activities.

In review, these are my specific recommendations:

- Collect the dried leaves and other Waste/Garbage/Kitchen, separate them at source and keep the Carbon and Nitrogen sources to be composted
- Two of the groups I visited had not composted in the past and so did not have any knowledge about composting. Although the third group had received some training in the past, they did not have a standard recipe or best practices for composting. This workshop helped them to learn about the importance of C and N ratios and develop a recipe for the compost and standardize best practices.
- To increase Carbon: Nitrogen ratio, dried leaves, dried water hyacinth that is available in plenty from the local water sources, rice bran, saw dust or other brown materials need to be used as sources of carbon and increase the carbon content of the pile for effective composting and decrease problems of bad smell during decomposition and for carbon, and pests and predators and competitors.
- Include a handful of Neem leaves in the pile as research has shown that use of compost prepared in this manner decreased the pest and pathogen levels on crops in the field.

- Work out appropriate proportions of Carbon and Nitrogen sources and develop a recipe to include easily available material.
- There was no information available to me about the current nutrient analysis of locally prepared compost. Any recommendations made to farmers need to be based on this information. However, I made a recommendation to include C and N layers in suitable proportions (it can range anywhere from 4:1 to 20:1 depending on the sources) from locally available materials of preprocessed cow dung, kitchen waste, rice bran, Neem leaves, grass clippings, dried banana leaves, dried water hyacinth leaves and stems, and asked them to try it on a trial and error basis to work out the right proportions of these ingredients. This should be possible and completed in about 6 months as composting only takes about 6 to 8 weeks. I demonstrated the layering method for effective composting.
- Teach the farmers and composters to do a squeeze test at the end to ensure that the composting is complete and ready for use.
- Also educate them on how to use the compost for best use by the crop in the field. Quantity, method and time of application was also discussed
- Farmers can be trained to use a thermometer and record the temperature in the compost during the decomposition. They can be trained to turn the pile each week and record the temperature and moisture levels to ensure that it is not too dry or too wet. If the farmers do not have long thermometers, they can be supplied if funding is available and the framers can be trained on how to use the thermometers, record the data and manage the piles in an efficient manner to obtain good quality compost and harvest larger number of worm to get greater income.
- I have recommended them to collect finished compost and get it analyzed in a lab to get the exact nutrient composition of the finished product.
- To promote acceptability and availability of compost as organic fertilizer, it is important to do field demonstrations and awareness among farmers, community, elected bodies, stakeholders, local and government officials
- Additional training is needed for better management, quality control, and record keeping.
- Additional resources are needed for building human resources and technical resources. In this regard external funding may be sought.
- I would recommend additional onsite training in selected homes/farms to demonstrate the layering method, selection of sources, and best practices for composting.
- Model compost piles/pits may be developed and maintained by the host and the community leaders that can provide a good example to the local farmers for best practices

There is a huge potential for this project as designated space and resources are available to you at BAU and the administrators are highly supportive of this project since it addresses the importance of organic horticulture in Bangladesh

I thank you sincerely for the warm welcome and great hospitality shown to me during my visit. If you need any further assistance with this study please do not hesitate to contact me by email at usha.palaniswamy@gmail.com

Best regards,

Usha Rani Palaniswamy, M.Ed., Ph.D.
Volunteer, Horticulture Specialist

FOR BAU LOCAL COORDINATOR USE ONLY:

Please provide a total and also list Consolidated Volunteer Recommendations below, by host. (If there are different recommendations for different hosts, please add a separate section for each host).

Host Name: Dr. Md. Ashraful Islam

Total # of Economic Recommendations: 05

Volunteer Recommendations - Economics:

- Plan wise collect the dried leaves (as a carbon source) and other Waste/Garbage/Kitchen (as a Nitrogen) for composting
- A little amount of Neem leaves in the pile of compost can be helpful to control the pest and pathogen levels on crops in the field.
- Work out appropriate proportions of Carbon and Nitrogen sources and develop a recipe to include easily available material.
- Carbon and Nitrogen layers in suitable proportions (it can range anywhere from 4:1 to 20:1 depending on the sources) from locally available materials of preprocessed cow dung, kitchen waste, rice bran, Neem leaves, grass clippings, dried banana leaves, dried water hyacinth leaves and stems etc have to be collected for providing a good amount of nutrients to the crop or vegetables.
- Our training by the volunteer was really new to all the groups. Also, the proportion of composting and vermicomposting will be helpful to supplement the more nutrients to the crops as well as to improve the soil structure.

Total # of Organizational Recommendations: 05

Volunteer Recommendations - Organizational:

- Continuous training is needed for better management, quality control, and record keeping. Farmers can be trained to use a thermometer and record the temperature in the compost during the decomposition. They can be trained to turn the pile each week and record the temperature and moisture levels to ensure that it is not too dry or too wet. If the farmers do not have long thermometers, they can be supplied if funding is available and the framers can be trained on how to use the thermometers, record the data and manage the piles in an efficient manner to obtain good quality compost and harvest larger number of worm to get greater income.
- External fund can be hunt for preparation of model of composting and vermicompsting. It will be used for demonstration. After that, it can be analyzed in a lab to get the exact nutrient composition of the finished product.
- Also educate them on how to use the compost for best use by the crop in the field. Quantity, method and time of application
- Model compost piles/pits may be developed and maintained by the host and the community leaders that can provide a good example to the local farmers for best practices
- Also, it is important to promote acceptability and availability of compost as organic fertilizer, to do field demonstrations and awareness among farmers, community, elected bodies, stakeholders, local and government officials

Total # of Financial Recommendations: 0

Volunteer Recommendations - Financial:

-

Total # of Environmental Recommendations:

Volunteer Recommendations - Environmental:

-



Demonstration on organic manure preparation (cowdung)



Scope of Work

Assignment 5: *Improved Home Gardening Techniques with Organic Farm Emphasis*

Project Title: Issues and Challenges in Sustainable Agricultural Research, Extension and Education for Women Farmers in Bangladesh

Overall Program Objective(s) and expected outcomes

The main objective of this project is to provide technical assistance in sustainable vegetable cultivation to women's groups, extension agents, faculty and small-scale farmers in Bangladesh. This will be achieved in collaboration with host institute (BAU). The information will be disseminated to enhance adoption of new and improved farming practices through training workshops, factsheets and a website.

Volunteer name: Dr. Muamba J. Kabeya

Assignment number: TSU-USAID-VEGA-5

Assignment dates: January. 22-30, 2016

Assignment period and length: January 22-31, 2016

The Objectives of the Assignment –

Bangladesh Agriculture University (BAU)'s objective is to improve the lives of those the program is targeting. One way of achieving this objective is by complementing donor and government support to BAU through self-help efforts such as organic vegetable farming initiative. The expert volunteer is expected to train BAU staff in intensive vegetable farming, crop planning and rotation soil treatment such as the use of manure and compost, and the use of lime to enrich the soil to increase yields. The volunteer has also been requested to help these farmers learn how they can improve crop production, increase income and at the same time attain positive nutritional outcomes for their households.

Assignment Tasks–

- **Before leaving the US:** The volunteer is encouraged to research information on farmland management, intensive farming, rotational cropping, and soil treatment. Photos, slides and videos clips showing rotational cropping, farm layout, etc. would be helpful, keeping in mind that the majority of those who will participate in this training are either semi-illiterate, or illiterate. TSU-VEGA project design assignments with the assumption of some pre-departure preparation by the volunteer. Actual preparation time will vary, based on the experience of the volunteer, as well as access to information or training resources of

the volunteer. TSU relies on the volunteer to assess the tasks outlined in this SOW and to make his or her own judgment about how much and what kind of preparation is needed prior to arriving in Bangladesh.

The use of videos, PowerPoint presentations and hands-on activities to emphasize main points is strongly recommended during the assignment. These should be prepared, as much as possible, in advance of the assignment.

*Please note that if the volunteer identifies any specific materials necessary for the implementation of an assignment, he/she must first receive approval from TSU Project Coordinator prior to departure

In-Country Activities: It is anticipated that the volunteer will train traditional farmers mainly women's group on topics such as farmland management and rotational & mixed cropping, organic certification and pond dyke vegetable production and promoting healthy diets. The volunteer will produce a guide on farmland management, including rotational cropping and intensive farming techniques, organic vegetable production practices along with an end of assignment report which will include recommendations for increased profitability that can be easily adapted.

Post-Assignment Activities: Upon the volunteer's return to the U.S., the volunteer is encouraged to discuss his or her Farmer-to-Farmer (F2F) assignment in Bangladesh and the U.S. government's initiatives in assisting nations in need around the world. At least two outreach events upon returning to the United States are requested, and the results should be communicated to Dr. Dilip Nandwani (dnandwan@tnstate.edu).

Deliverables

- Produce a simple-to-read manual on farmland management that would specifically cover topics on rotational cropping and intensive farming techniques
- Train group of women's farmers on rotational cropping and intensive farming techniques
- Train farmers group on organic vegetable production practices, certification and healthy diets.
- Impart the knowledge regarding pre- and post-harvest management practices of vegetables.
- Focus the maturity index to harvest the products at the optimum stage which will help to extend the shelf life of fruits and vegetables.
- To maintain the quality (appearance, texture, flavor and nutritive value) and protect food safety.
- Reduce the losses of fruits and vegetables between the harvest and consumption
- Write final report including recommendations relevant to the farm project

Indicators for the Evaluation of Impact-

An increase in yields, gross and net income and the adaption rate of volunteer recommendations will be indicators for evaluation of impact. A higher score of the association by the F2F organizational development indicator (ODI) after 30 months, due among others, to their ability to

deliver quality services to its members. Monitoring visits will be made by BAU staff to ensure host implements volunteer recommendations and improvements resulting from such adaptation will be recorded.

Scope of work

In developing countries like Bangladesh, there is a serious lack of infrastructural and marketing facilities. This results in heavy post-harvest losses of fresh produce, and purchase options vary considerably depending on the nature of the commodity. These losses represent a significant food loss to the country and economic loss to the producers particularly. It is sometimes possible to replace these losses in quantity by increasing production. But if the levels of losses remain constant their production must increase at a proportionately higher rate which is generally not possible in the short run. In fact what is more likely to happen is that an increase in production will result in an increase in the losses too due to marketing inadequacies in handling the extra volume leading to price decline and the economic losses to the producers would be still greater.

There are several causes of post-harvest losses, which are primary and secondary in nature. The training component will address post-harvest loss management in minimizing primary and secondary losses. The expected short and long term impacts include; Producers ability to quantify losses at each stage in the supply chain, identify the areas of concern in post-harvest loss management, good quality produce will be available and may be exported to other countries, help in creation of infrastructure to plug the losses, help in fixing standards of grades, packages and other logistics. The producer/consumer share (in rupee) will be more and the returns to the farmers will increase and reduction in post-harvest losses.

There is a wide range technology for production, flowering, maturity, harvesting, handling and packaging, which can have the potential impact for the producers to extend the shelf life of fruits and vegetables. Mostly, women are involved in the postharvest handling and we (BAU) need to improve their knowledge of postharvest handling and maintain the quality of the products. Reducing the losses of products can increase the income for the family. Also, increasing the awareness among the stakeholders or producers to use the optimum amount of hormones or chemicals which will not be health hazards to human body.

Host Organization:

Established in 1961, Bangladesh Agricultural University (BAU) is the oldest and the largest Agricultural University in Bangladesh. The BAU faculty focuses on teaching research and extension. Being a public University, one of BAU's mandates is to generate and help transfer of improved agricultural technologies to the stakeholders. BAU is the country partner in this project implementing the project activities in the country. BAU plays a major role in identifying the farmer needs and organizing the training sessions and evaluating the short term and long term impacts on the participating farmers. There is a dearth of technical manpower with updated knowledge and skill on improved composting by utilizing local materials that are available freely or at low cost. Thus, the volunteer will assist in building capacity for the project technical staff and conduct the participating farmer training sessions.

Participant Profile:

Small farmers with <1 ha land holdings, cultivating vegetables (Okra, eggplant, tomato, cucumber, pumpkin); low literacy level with about 50% of the farmers able to read and write in Bangla.

Tasks to be Performed:

To achieve the objectives identified for this assignment, the volunteer expert will be engaged in the following activities:

- Meeting with BAU project team to learn about their plan on assignment training sessions planned and the profile of the participating farmers
- Assessment of current organic vegetable cultivation, crop rotation and production practices
- Provide on-site technical input and hands-on training on organic vegetable practices on farm with particular reference to:
- Discuss both commercial and household level small scale organic vegetable production
- Discuss plant nutrition, soil health, soil biology, nutrient cycle, manipulation of nutrient in compost and consistent production of compost

This assignment will strengthen organic vegetable farm management, production practices, nutrient and food safety, thus creating opportunities of household income generation and improved employment opportunities in Bangladesh.

Volunteer:

Dr. Kabeya Muamba
International Sustainable Development Program
Washington, DC
Email: kabeya01@live.com

Assignment date: January 22-31, 2016

Host Contact

Dr. Md. Ashraful Islam
Associate Professor and Coordinator
Department of Horticulture, Faculty of Agriculture
Bangladesh Agricultural University
Mymensingh 2202
Bangladesh

Phone (office): +880 91 66401-6 x 6479
Fax: +880-91-61510
E-Mail: ashrafulmi@bau.edu.bd

The host institution of the project is Bangladesh Agriculture University (BAU) and local coordinator is Dr. Ashraf Islam, Associate Professor at Faculty of Agriculture.

Tennessee State University Contact

Dr. Dilip Nandwani
Associate Professor (Organic Agriculture)/Principal Investigator
College of Agriculture, Human and Natural Science,
Tennessee State University, Nashville, TN

Phone: 615-963-1897

E-Mail: dnandwan@tnstate.edu

Volunteers for Economic Growth Alliance (VEGA) Contact

Leia D'Amboise
Program Manager
734 15th Street NW, Eleventh Floor
Washington, DC 20005

Phone: Main: 202-223-7012 | Direct: 202-367-9995

Email: ldamboise@vegalliance.org

Host Institute (Bangladesh Agriculture University) Background

Bangladesh Agricultural University (BAU) will be host institute for the project. Horticulture Professor Dr. Ashraf Islam and his team will assist PI in implementing the project, coordinate training workshops and make logistic arrangements for the US volunteers. BAU will be sub awarded to organize training workshops, provide facilities, field visits, accommodation for the participants (farmers) and demonstration on their Horticulture farm. BAU is planning to establish a demonstration site for young organic entrepreneurs on their farm. The participating farmers would benefit from the training workshops proposed in this proposal. To compensate their time spent and use of facilities, BAU will be contracted to assist and organize ten training workshops for the experts/volunteers. *Bangladesh Agricultural University* (BAU) is the leading agricultural research institution in Bangladesh. Current research program in horticulture is focused on sustainable vegetable production, food security, organic farming practices and training farmers, students and extension agents. Horticulture Department is one of the important departments of the total 43 departments at BAU which offers Masters and PhD degree programs. It conducts applied research and giving emphasis on organic production techniques for safe and healthy produce considering excessive use of chemical fertilizers. Horticulture department is collaborating with Plant Pathology and Entomology departments and conducting research in integrated pest and disease management of fruits and vegetables such as application of fertilizers and pesticides for crop production. Horticulture department has a germplasm center, where fruits and vegetables accessions are screened and maintained. Postharvest research is conducted in

crops to extend the shelf life and quality. Also, pond dyke vegetable production is performing to make awareness of the nutritional value.

To continue and strengthening the above mentioned research, BAU need technical assistance in the areas as described in the scope of work for ten volunteer assignments. The ten assignments identified are in areas in high demand from the host institution to deliver training for women's groups, farmers, and faculty to build their capacity in production agriculture, food safety, nutritional awareness, and create opportunities to improve quality of life of the people of Bangladesh.

Volunteer Qualifications

- Must have a university degree in agronomy or agricultural economics with extensive knowledge in rotation farming and intercropping, organic farming
- Must have at least five years' technical experience in vegetable production and rotational farming.
- Must have previous experience with training groups in developing countries. Experience working with women's groups, or groups of illiterate farmers preferred.
- Must be computer literate, capable of working in MS Word and PowerPoint.

Anticipated Work Schedule-

- Days 1: Volunteer will be picked up from the airport and given a local cellphone for use while in Bangladesh. Meet with BAU office staff and assignment host for briefing.
- Day 2: Travel to Khulna or Mymensingh to meet with host organization and discuss workshop schedule.
- Days 3-7: Conduct training
- Days 8: Completes final report; debriefed and departs for home

Beneficiaries

(Anticipated – To be confirmed by volunteer during assignment)

- a. Direct beneficiaries: female b. Direct beneficiaries: male
- c. Indirect beneficiaries: female d. Indirect beneficiaries: male

Expected Outcomes

- Women's farmer group (20-30 each) will acquire knowledge on crop rotation, intercropping, and techniques used to maintain nutrient balance in intensive farming.
- Increase farm yields and income
- Increase knowledge of BAU project staff and faculty in organic farming

Financial Information for Calculating Volunteer Travel Advance

- a. Lodging: # of days in Dhaka or Mymensingh; 7 x US\$50 or 60.0 for hotel and \$25.0 for guest house
- b. M&IE: # of days in Mymensingh; 7x\$70.0 (US\$490.0)

Above are approx.. numbers and actual will be calculated by Business office, TSU after return and submission of expense report by volunteer. Visa fee (\$160.0) for US Citizens. E-ticket will be provided few days prior to travel.

Assignment Logistics

This assignment will take place in Mymensingh, near Dhaka. The volunteer will be lodged at University guest house or a hotel, few minutes' drive away from the project site. Guest house and has electricity, internet, restaurant and running water available.

Materials recommended for the assignment

- Personal prescriptions (sometimes it is difficult to find certain drugs in country)
- Personal laptop with spare battery
- All weather shoes or boots
- Anti-malaria medication
- Sacs of oral rehydration salt (also available locally)
- Antibiotic
- Disinfectant
- Pain killer (can be purchased in Dhaka)

*Many of these items listed can be purchased in Dhaka but there may be quality and price differences.

Muamba J. Kabeya Farmer-to-Farmer Program Asia F2F

End of Assignment Report

Assignment 5: *Improved Home Gardening Techniques with Organic Farm Emphasis*

Volunteer name: Dr. Muamba J. Kabeya

Assignment number: TSU-USAID-VEGA-5

Assignment dates: January. 22-30, 2016

Name of host(s): - Vangnamari Union Group, Gourpur District
- Chaiz Nilaxmia Group, Gourpur District
- Caritas NGO, Haluaghat District

Number of Persons Directly Assisted

Female: - 48

Male: - 55

Youth: -

Number of Persons Trained

Female: 48

Male: 55

Youth: -

Please answer the following questions in as much detail as you think is necessary.

1. What were the **objectives** of your assignment? What assistance did your host request? *(Please note any changes made in your scope of work during your assignment.)*

Through the partnership with the Bangladesh Agricultural University and by the help of an expert volunteer, the assignment's objective was to improve the livelihoods of farmers in some targeted communities of Mymensingh County including Vatipara, Gouripur District; Muktijoddha Bazar, Gouripur District and the Haluaghat District, all in Bangladesh. This was achieved through training activities on improved techniques on home vegetables gardening with focus to organic farming using the concepts of crop planning, intensive vegetable farming, crop rotation and soil fertilization (through the use of manure and compost) to enrich the soil, and increase both biological and economic yields. These practices will help the farmers prevent the built-up of soil problems including soil nutrients, soil borne diseases, weed suppression and as well pest control, thereby increasing crop production, increase households' income and nutritional outcome.

2. What **activities and assistance** were parts of your assignment? Who was involved? What topics were addressed? (*Details regarding any materials that were developed, the number of people trained, the organizations that participated in your programs or that you met with, etc., are all very important.*)

From each location, my team (comprising of Dr. Ashraful Islam, Dr. Abdul Momen Miah, and Mr. Subrato Kumar Kuri) visited various farms in the communities practiced by these farmers. Dr. Abdul Momen and Mr. Subrato Kuri facilitated in communities farmers mobilization and interpretation, whereas Dr Ashraful Islam assisted in the overall coordination and logistics.

These farmers cultivate range of crops including pepper, tomato, cauliflower, eggplants etc. and usually they rotate these crops from one season to another. However, despite the rotational system and mix-cropping combination practiced, they do not follow the proper principles of improved agricultural techniques such as crop rotation or mix -cropping but relying on their ancestors' or traditional knowledge. This was one of the problems observed during the field visit. In term of home gardens, all communities do not have any form home garden rather have one or two fruit trees at their backyard, which they consider as home garden. This was another issue and I therefore introduced proper home vegetable gardening with emphasis on organic farming by planting array of vegetable crops at the backyards of the homes, rather than having one or two perennial fruit trees. This will help increase their family nutrition and also the household income. The promotion of organic home vegetable gardening were much appreciated and welcomed by the women than men, as it is men in these villages who are exclusively engaged in cultivation and hence income control and total decision-making of the household.

The training activities were similar in all villages but the approaches were a bit different depending on the participants needs and aggressiveness to solve their problems, mostly women and also the training facilities and materials.

Training at Vitipapa (Vangnamari Union group) Gouripur District.

In the absence of vegetables home gardening in this village, the concept of organic vegetable gardening was introduced and the participants were encouraged to adopt and practice home gardening as very good alternative for family nutritional needs and income generating, especially for women. A total of 33 participants attended this one-day training, including 14 women and 19 men.

Activities:

Due to lack of training materials by the host organization, the training activities were limited and modality in this location was exceptional compare to other locations. However, the participants were introduced to basic concepts of organic vegetable home gardening and procedures in order to conserve and maintain soil fertility, control pest and diseases problems, weed suppression, have good vegetable yields every seasons and also income generating.



Fig 1. Field visit in Nalkuna (right) and Vitipapa (left) villages

Crop planning and selection:

This was necessary to the participants because most of them do not plan and prioritize crops based on the family's preference, market demand, production cost etc. As a result to have good vegetable home gardening, number of factors such as planting season, cost of production, labor, pest susceptibility, market, companion planting, crop rotation, water availability, soil fertility, sunlight, lastly family and community demand are very important to put into consideration when planning for home gardening.

Crop Rotation:

The importance of rotating crops based on crop botanical families was emphasized. An illustration on the best way to rotate these crops for 4years was demonstrated on the ground (as shown in the figure below). Crops such as bean, radish, eggplant and cucumber belonging to different botanical families were used to illustrate crop rotation in different plots in a home garden.

Compost:

Utilization of organic compost to improve soil structure and enrich soil fertility was a new thing to all participants in this village. They have been heavily relying on the use of agrochemicals. However, Subrato Kuri and his team have started working on vermi-compost in this village and the work is still in progress. The participants were explained why the use of compost is important in increasing microbial activities, soil fertility, soil structure in clayey soils, water retention in sandy/poor soils, and enhance plant disease suppression. The details on steps and materials require to build a compost pile is explained in the training manual of this training.



Fig 2. Demonstrating crop rotation to the participants in Vivipapa village, Gouripur District



Fig 3. Photo with participants in Vivipapa village, Gouripur District

Training at Muktijoddha Bazar (Chaiz Nilaxmia group), Gouripur District.

Similar training was replicated in this community but with much detail such as having participatory workshop approach among the participants comparing to the first location. This was possible because of minimal training materials improvised at the location (using of classroom chalkboard and pupils tables). Unlike the first location, some families practice home gardening with variety of vegetables growing in the garden. A total of 30 participants attended this one-day training at this location, including 5 women and 25 men.

Activities:

After the field visits on various home gardens and also the demonstration plot on home garden set up by Bangladesh Agricultural University, the participants were ensemble in a classroom of the village elementary school. The participants were asked to share their expectations for this one-day training workshop. Below are some of their expectations:

- Learn the best way to cultivate for their home vegetable garden
- How to manage the problem of pest and diseases in their garden
- How to choose best vegetables to grow in their garden
- How to start a vegetable garden for those do not have home garden

General introduction on the importance of home gardening to family's food security, nutrition and income was explained as in the first location. The emphasizes in excluding the use of any chemicals in the home gardening cultivation, while adopting the organic farming practices through crop rotation, cover crops, intercropping and use of manure and compost was clearly explained.

During the course of the training, we developed vegetables home gardening tool termed '*Vegetables cultivation preference assessment*'. This tool will enable individuals and as well groups in a community to select and planned properly for the vegetable home gardening. The selection criterion for the vegetable is based on a number of evaluation questions linked to both the family and community's demands. However, the demands and prioritizations differ from one family to another and community to another. The detail of this tool can be found in the training manual.

The participants were divided into three groups for participatory group exercises. Each group had a table in the classroom and a chalk for this exercise. Using the guidelines (site specification and evaluation questions) below, each group was asked to decide on what location to place their garden and also choose the best vegetables from the list of vegetables provided following the evaluation questions.

Selection site criteria

- Any location around the house, can be at the back, front or even side
- The site must have good penetration of sunlight at least 8hours/day or better still for half of the day
- Proximity of water source
- Good ground with well-drained soil

Evaluation questions for vegetables selection

- Seed availability
- Local adaptation to climate and soil condition
- Likely or preference to be eaten
- Tolerant to pest and diseases in the locality
- Local market demands
- Diversify nutritional value



Fig 4. Group discussion to decide the suitable location and size of the vegetable home garden Muktijodha Bazar village

To maximize the limited space and assure crop production year round through crop rotation, planning for successful vegetable home garden is highly recommended. After all groups have selected their crops to plant their gardens, one representative from each presented their group results. Scores were given to all crops selected (as shown below) and then they prioritized to four best vegetables according to scores. At this point, the concept of crop rotation was introduced, which is used to control diseases and insect pests, build organic matter and soil fertility, and thereby having an healthy garden.

In order to help participants understand how to rotate crops, the selected vegetables were grouped either base on their botanical families or on edible parts (which is always represent the nutritional value). Using the edible parts to rotate is different plants take different nutrients out of the soil and add back other elements or enhance the soil in other ways. However, rotating crops using botanical families is the best scientific method as it gives high precision for not repeating crops of the same families season after season on the same plot. The participants divided the selected vegetables into four groups based on their nutritional needs (edible parts): leaves/flowers (nitrogen), fruits (phosphorus), legumes (nitrogen fixing) and roots (potassium). A 4 years crop rotation was then planned without repeating crops with same edible parts to be planted on the same plot the following

season. For example, the legume crop (bean) can be planted first, after harvesting the bean, the leafy crop can be planted because it needs large amount of nitrogen, then followed by fruits because they need phosphorus, and not much of nitrogen, then followed by roots because they need potassium and less of nitrogen comparing to fruits, then follow again by legumes to put the nitrogen into the soil. The recommended length for a single crop rotation is 4years and the minimum is 2years. However, because of time we were not able to explain the rotation base on botanical families, I will therefore recommend the BAU research extension group to follow up with this.

After the session, participants were asked for feedback and questions. One woman really appreciated the training on the concept of crop rotation, saying that, this training was specifically for women in the community because they do not engage in the large-scale farming but only men. Applying the crop rotation techniques will help them become to some extent independent from their husbands, as organic vegetable home gardening will enhance the source of their family nutrition and income generating.



Fig 5. Explaining the 'Vegetables cultivation preference assessment' tool.



Fig 6. Photo with participants in Muktijoddha Bazar Gouripur District

Training in Nalkuna, Gazivita, Haluaghat District

This is a Christian base community belonging to an NGO called ‘ Caritas’. The community is well organized and more developed comparing to the last communities visited. They are well engaged in traditional vegetables home gardening. However, the major problem facing agricultural production in Nalkuna both on large-scale and home garden is water limitation, which often result in crop failure and consequently low yield. A total of 40 participants attended this one-day training at this location, including 29 women and 11 men.

Activities:

The same activities as in Muktijoddha Bazar were replicated in this location but little modifications. The vegetables cultivation preference assessment tool developed in Muktijoddha Bazar was validated but with more evaluation questions such as less water requirement, less agro-chemical inputs, easy to harvest, easy to process, aesthetic value and spiritual value. Also participants used cardboards and markers for the participatory group discussion (as shown in the photo) instead of blackboard and chalk.

In addition, compost making was explained and demonstrated as in Vitipapa village. The use of compost in their organic vegetable home garden will not only enrich the soil fertility but also build resistance to drought, as water holding capacity increases due to the result of high organic matter produced from compost application.

At the end of session, participants were asked for feedback and questions. The women leader in the community acknowledged the wrong practice of home gardening without proper rotation. This

was evidenced in most gardens as they were all infested with fungus and bacteria attack and recurrence of same insect-pests. This always resulted in low yields. She will ensure every woman in the community start practicing proper crop rotation as trained.



Fig 7. Group discussion to decide the suitable location and size of the vegetable home garden in Nalkuna village



Fig 8. Group discussion to decide the suitable location and size of the vegetable home garden in Nalkuna village



Fig 10. Photo with participants in Nalkuna, Gazinvita, Haluaghat District

3. What **significant recommendations** did you make to the host? (*USAID requires that we collect significant recommendations made to the host for reporting purposes. At the time of a follow-up survey with the host, we will collect information as to which recommendations were adopted.*)

- **Soil Conservation** – Most farmers in Mymensingh region of Bangladesh have been cultivating the soil using old traditional methods and also do not take into account the proper rotation practice to conserve the soil. This repeatedly practice has lead to loss of the soils deterioration, high incidence of disease and pest pressure, and low crop yields; and thereby making farmers rely heavily on agrochemical inputs. As the farmers do not have many financial resources, the recommendations primarily revolve around cultural practices. Crop rotation was the main focus of the training, and this will help curbing most of the associated problems faced by the farmers. In addition, intercropping and other conservation agricultural practices such as permanent ground cover, mulching and minimal tillage could offer better advantages to the farmers and soil conservation.
- **Record keeping** – None of the farmers from all three communities visited maintain records of their farm activities. This makes it very difficult to track any change in term of investment and profit made from the harvests, and also to see the actual difference when using the improved methods in their cultivation. Keeping records will help them understand the progress of their activities and make changes where necessary.
- **No compost source** – Practically all communities visited are not aware of compost application. Using of compost will greatly increase soil fertility; water conservation and the same reduce the cost of

chemicals inputs. I recommend that every farmer should have a composting site on his or her farms for constant compost production as explained above. Also the use of biological cow dung processed manure in form vermi-compost is highly recommended.

- **Pest and disease pressure** – Mosaic virus (potato, pea, pepper etc.), powdery mildew (radish, beans, carrot etc.) and late blight (tomato) were rampant on the individual farms and pest pressure (aphids, beetles and caterpillars) appears high on a number of crops. High quality disease-free planting materials selection was emphasized. As the women do not have the means to purchase any pesticides, an integrated pest management system was briefly discussed but requires further follow-up (should discuss insect life cycles, traps, trap crops, etc.). The integrated pest management system included the use of fragrant plants such as lemon grass, basil and a variety of flowers as living borders to surround their fields. Additionally, the use of the crop rotations and intercropping are a crucial part of the IPM plan.
- **Farms locations** – Many of the farms, especially in Vitipapa and Muktijoddha communities, are located deep in the village, which makes access to roads (and thus markets) difficult. I recommend that the farmers should explore the possibility of running one or two farms near the road for easy access to market.

* All recommendations are applied to all the communities (hosts) visited.

4. Did you observe any **improvements or impacts** with respect to the objectives and expected results outlined in your assignment scope of work? (This can include new attitudes observed, immediate changes put in place, etc.). Please explain.

Yes, there was great enthusiasm shown by the participants during the training. This was observed at all locations. During the feedback sessions, participants acknowledged how the training was very important and beneficial to them as individual and community as whole. They have been facing with problems of soil nutrition depletion and pest and diseases pressure, and as a result it cost them to invest more capital in agrochemicals inputs such as fertilizers and pesticides. Adopting the principle of crop rotation and the use of compost for their gardens, they said it will help them curb all these problems and save more money, and the same time increase their vegetable yield.

5. What **future impacts** do you anticipate as a result of your assignment? *(Please explain and list ways in which you think the results of your assignment can be measured 6 months from now.)*

The next planting period in these communities will be around May, 2016, if farmers adopt all the recommendations provided to them, they will be an increase in their vegetables home garden yields to meet their family nutritional needs and as well household income for those anticipating to sell the excess from the garden produce.

6. Drawing on your volunteer experience, please provide us with any **recommendations for follow-up activities** to build on your assignment (e.g., things that USAID-VEGA or TSU can do to further support the host).

- Monitoring the farmers' adoption on the skills acquired from the training. There is great enthusiasm and promises from the farmers to adopt the good agricultural practices but if this is not monitoring by the local extension agents, the effort might be forfeited.
- Further training on farm bookkeeping records by an expert. This will enable them track the farm activities, which will help them determine areas to improve and build on the success.
- Promoting the importance of organic vegetables home gardens, especially in Muktijoddha Bazar and Vitipapa communities where there is no vegetable gardens in any of their houses except for one or two tree fruits in the backyards.
- Facilitate in farm-market linkage.
- Integrated Pest Management (IPM) follow-up training.

7. What effect did your assignment have on you personally and/or professionally (for example, new knowledge, contacts, etc.)?

Each time I undertake F2F assignments, it makes me improve on my training capabilities. This assignment enabled me to train three different groups with different reception behaviors; this helped me on how to modified my training techniques to suit their reception behavior and understanding and at the same time I, in collaboration of BAU colleague, was able to develop a training tool on organic vegetables home garden. As individual, I was able to interact with local farmers and see the need of community development in these villages from my site observation.

8. Did you do any **outreach** activities (e.g., blog post, Facebook post, photo sharing, interviews with local media, etc.) while you were in country? If yes, please explain. If no, please explain planned activities for when you return to the US.

No. I plan to write a blog post and photo sharing but I have not yet identify the media for this publication. This information will be conveyed to USAID-VEGA/TSU as soon as possible

FOR BAU LOCAL COORDINATOR USE ONLY:

Please provide a total and also list Consolidated Volunteer Recommendations below, by host. (If there are different recommendations for different hosts, please add a separate section for each host).

Host Name: Bangladesh Agriculture University

*Total # of Economic Recommendations:
Volunteer Recommendations - Economics:*

-

*Total # of Organizational Recommendations:
Volunteer Recommendations - Organizational:*

-

*Total # of Financial Recommendations:
Volunteer Recommendations - Financial:*

-

*Total # of Environmental Recommendations:
Volunteer Recommendations - Environmental:*

- 5



Scope of Work

Assignment 6: *Offseason/year round vegetable production in Bangladesh*

Project Title: Issues and Challenges in Sustainable Agricultural Research, Extension and Education for Women Farmers in Bangladesh

Overall Program Objective(s) and expected outcomes

The main objective of this project is to provide technical assistance in sustainable vegetable cultivation to women's groups, extension agents, faculty and small-scale farmers in Bangladesh. This will be achieved in collaboration with host institute (BAU). The information will be disseminated to enhance adoption of new and improved farming practices through training workshops, factsheets and a website. The purpose of this project is to strengthen the capacity of small vegetable farmers in Bangladesh to produce fresh vegetable crops sustainably and improve production and supply year round. The technology level used by small farmers and the availability of tools and material for protected production systems with potential in the area will be assessed. Then, presentations and workshops to train and demonstrate the benefits of protected production systems will be coordinated. Protected production systems are based on plasticulture (mulch, row cover/low tunnels and passively ventilated high tunnels) used to protect warm season crops against cold temperatures in early spring as well as against insects, diseases, weeds, and water loss in the summer and in tropical areas. This information will be presented to farmers and technology transfer personnel in Bangladesh through meetings and hands-on workshops to experience protected systems. Enhancing the production capacity of farmers is expected to increase production and supply of fresh and healthier vegetables in rural and urban communities. Therefore, this project is expected to improve the economic, environmental and social sustainability of small farmers in Bangladesh.

Volunteer name: Dr. Ramon A. Arancibia

Assignment number: TSU-USAID-VEGA-6

Assignment dates: Nov. 15-27, 2015

Assignment period and length: November 2015

The Objectives of the Assignment –

1. Focus the feasibility of year round vegetable production, their marketing and increase income through sustainable household vegetables.
2. Increase food security – through staff replication of training/consulting to multiply impact to more households.

3. Improve the family nutritional status: awareness of nutritious value of vegetables and available the rich nutrient vegetable production in the homestead area, ultimately increase the habituation to consume more rich nutrient vegetables.

Assignment Tasks–

Before leaving the US: The volunteer is encouraged to research information on vegetable grafting, tomato and eggplant and other crops, production, supplies and materials needed etc. Photos, slides and videos clips showing tomato grafting, eggplant or other vegetables such as watermelon etc. would be helpful, keeping in mind that the majority of those who will participate in this training are either semi-illiterate, or illiterate. TSU-VEGA project design assignments with the assumption of some pre-departure preparation by the volunteer. Actual preparation time will vary, based on the experience of the volunteer, as well as access to information or training resources of the volunteer. TSU relies on the volunteer to assess the tasks outlined in this SOW and to make his or her own judgment about how much and what kind of preparation is needed prior to arriving in Bangladesh.

The use of videos, PowerPoint presentations and hands-on activities to emphasize main points is strongly recommended during the assignment. These should be prepared, as much as possible, in advance of the assignment.

**Please note that if the volunteer identifies any specific materials necessary for the implementation of an assignment, he/she must first receive approval from TSU Project Coordinator prior to departure*

In-Country Activities: It is anticipated that the volunteer will train traditional farmers mainly women's group on topics related to assignment but not limited to tomato and other vegetables grafting techniques, vegetable production and promoting healthy diets.

The volunteer will submit an end of assignment (EOA) report which will include recommendations that can be easily adapted.

Anticipated Timetable

- Days 1: Volunteer will be picked up from the airport and given a local cellphone for use while in Bangladesh. Meet with BAU office staff and assignment host for briefing.
- Day 2: Travel to Mymensingh to meet with host organization and discuss workshop schedule.
- Days 3: Field plan with host
- Day 4-10: Conduct training
- Days 11: Completes final report
- Day 12: Debriefing
- Day 14: Departs for home

Upon arrival

1. Meet with institutional personnel and/or farmers to assess local production practices and available technologies.

Deliverables

1. Presentation and handouts of technologies for season extension and protected production systems to farmers and technology transfer personnel.
2. Hands on workshops and handout for farmers and technology transfer personnel to set up protected systems.

End of assignment

1. Complete assessment of technology transfer and prepare report

Scope of work

The purpose of this project is to strengthen the capacity of small vegetable farmers in Bangladesh to produce fresh vegetable crops sustainably and improve production and supply year round. To achieve this goal, assignment objectives 1, 2 and 3 will be addressed through seminars and workshops to train farmers and to demonstrate the benefits of protected production systems. Selection of production site and nutrient rich vegetables, in particular Fe, Mn, vit A, vit C, to reduce the malnutrition through their consumption will be addressed also. Therefore, strengthening the capacity of participating farmers to supply fresh nutrient rich vegetable crops year round in rural and urban areas is expected to improve the nutritional status of the community in the near future.

Assessment of available technologies

The technology level used by small farmers and the availability of tools and material for protected production systems in the area will be assessed. Information about protected structures and covers currently used by farmers in Bangladesh and their availability and accessibility by small farmers and household gardens will be requested. Seminars and workshops will be based on this information, but new technologies will be introduced also. Information about crops grown under protected production systems will be provided.

Seminars

Information about protected production systems will be presented to participating farmers and technology transfer personnel. These systems are based on plasticulture (mulch, row cover/low tunnels and passively ventilated high tunnels) used mainly to protect warm season crops against cold temperatures in early spring; however, protected production systems can provide other benefits in the summer, as well as in tropical areas. Among this benefits are protection against insects, diseases, weeds, and water loss. Protected systems modify the micro-environment under the tunnel that results in reduced overall plant stress and increase water use efficiency that results in enhanced growth and production. Row covers present advantages over high tunnels since they are less expensive, movable and easier to install. Crops known to respond to protective systems and management strategies will be introduced to participants. This information will improve the knowledge among participating farmers and technology transfer personnel, and is expected to generate interest in protective systems. Additional deliverable: handouts with the presented information will be distributed to attendees.

Tasks to be Performed:

To achieve the objectives identified for this assignment, the volunteer expert will be engaged in the following activities:

- Meeting with BAU project team to learn about their plan on assignment training sessions planned and the profile of the participating farmers
- Assessment of current vegetable cultivation, production and transplant production practices
- Provide on-site technical input and hands-on training on nursery, greenhouse management and practices
- Discuss both commercial and household level small scale vegetable production in row covers
- Discuss plant nutrition, soil health, soil biology, nutrient cycle, manipulation of nutrient in compost and consistent production of compost

This assignment will strengthen off-season vegetable production, greenhouse production and nursery management, production practices, nutrient and food safety, thus creating opportunities of household income generation and improved employment opportunities in Bangladesh.

Hand-on workshops will be conducted to train small-scale farmers, household vegetable garden owners and technology transfer personnel in Bangladesh on setting up low tunnels as protective systems. Materials requested to conduct these workshops are:

- 10 pieces galvanized wire #9 (2.8mm (0.11 inches) diameter), 180cm (6ft) long
- 10 plastic bags filled with 1 kg sand or gravel
- Spun-bonded row cover (0.9-1 oz/sqyd) or white thin cloth/sheet (semi-translucent), 2m (6.7ft) wide, 10m long
- 4 pieces of PVC pipe (½ inch internal diameter), 6m (20ft) long
- 4 pieces rib-bar (½ inch diameter), 60cm (2ft) long

Brochure with information about low tunnels will be distributed. Participants are expected to become proficient in setting up low tunnels as protective systems. Enhancing the production capacity of farmers is expected to increase production and supply of fresh and healthier vegetable crops year round and improve the economic, environmental and social sustainability of small farmers in Bangladesh.

Post-Assignment Activities: Upon the volunteer's return to the U.S., the volunteer is encouraged to discuss his or her Farmer-to-Farmer (F2F) assignment in Bangladesh and the U.S. government's initiatives in assisting nations in need around the world and outreach events upon returning to the United States are requested, and the results should be communicated to Dr. Dilip Nandwani (dnandwan@tnstate.edu).

Participant Profile:

Small farmers with <1 ha land holdings, cultivating vegetables (Okra, eggplant, tomato, cucumber, pumpkin); low literacy level with about 50% of the farmers able to read and write in Bangla.

Beneficiaries: (Anticipated – To be confirmed by volunteer during assignment)

- a. Direct beneficiaries: female b. Direct beneficiaries: male
- c. Indirect beneficiaries: female d. Indirect beneficiaries: male

Host Contact

Dr. Md. Ashraf Islam
Associate Professor and Coordinator
Department of Horticulture, Faculty of Agriculture

Bangladesh Agricultural University
Mymensingh 2202, Bangladesh
Phone (office): +880 91 66401-6 x 6479
Fax: +880-91-61510
E-Mail: ashrafulmi@bau.edu.bd

The host institution of the project is Bangladesh Agriculture University (BAU) and local coordinator is Dr. Ashraf Islam, Associate Professor at Faculty of Agriculture.

Tennessee State University Contact

Dr. Dilip Nandwani
Associate Professor (Organic Agriculture)/Principal Investigator
College of Agriculture, Human and Natural Science,
Tennessee State University, Nashville, TN

Phone: 615-963-1897
E-Mail: dnandwan@tnstate.edu

Volunteers for Economic Growth Alliance (VEGA) Contact

Leia D'Amboise
Program Manager
734 15th Street NW, Eleventh Floor
Washington, DC 20005

Phone: Main: 202-223-7012 | Direct: 202-367-9995
Email: ldamboise@vegalliance.org

Host Institute (Bangladesh Agriculture University) Background

Bangladesh Agricultural University (BAU) will be host institute for the project. Horticulture Professor Dr. Ashraf Islam and his team will assist PI in implementing the project, coordinate training workshops and make logistic arrangements for the US volunteers. BAU will be sub awarded to organize training workshops, provide facilities, field visits, accommodation for the participants (farmers) and demonstration on their Horticulture farm. BAU is planning to establish a demonstration site for young organic entrepreneurs on their farm. The participating farmers would benefit from the training workshops proposed in this proposal. To compensate their time spent and use of facilities, BAU will be contracted to assist and organize ten training workshops for the experts/volunteers. *Bangladesh Agricultural University* (BAU) is the leading agricultural research institution in Bangladesh. Current research program in horticulture is focused on sustainable vegetable production, food security, organic farming practices and training farmers, students and extension agents. Horticulture Department is one of the important departments of the total 43 departments at BAU which offers Masters and PhD degree programs. It conducts applied research and giving emphasis on organic production techniques for safe and healthy produce considering excessive use of chemical fertilizers. Horticulture department is collaborating with Plant Pathology and Entomology departments and conducting research in integrated pest and disease management of fruits and vegetables such as application of fertilizers and pesticides for crop production. Horticulture department has a germplasm center, where fruits

and vegetables accessions are screened and maintained. Postharvest research is conducted in crops to extend the shelf life and quality. Also, pond dyke vegetable production is performing to make awareness of the nutritional value.

To continue and strengthening the above mentioned research, BAU need technical assistance in the areas as described in the scope of work for ten volunteer assignments. The ten assignments identified are in areas in high demand from the host institution to deliver training for women's groups, farmers, and faculty to build their capacity in production agriculture, food safety, nutritional awareness, and create opportunities to improve quality of life of the people of Bangladesh.

Volunteer Qualifications

- Must have a university degree in horticulture or related discipline with extensive knowledge in season extension, greenhouse and nursery management, organic farming
- Must have at least five years' technical experience in crop production, fruits and vegetables, greenhouse and controlled environment agriculture.
- Must have previous experience with training groups in developing countries. Experience working with women's groups, or groups of illiterate farmers preferred.
- Must be computer literate, capable of working in MS Word and PowerPoint.

Expected Outcomes

- Women's farmer group (20-30 each) will acquire knowledge on vegetable grafting techniques.
- Increase farm yields and income from off-season vegetable production
- Increase knowledge of BAU project staff and faculty in season extension

Financial Information for Calculating Volunteer Travel Advance

a. Lodging: # of days in Dhaka or Mymensingh; 9 x US\$80.0 for hotel

b. M&IE: # of days in Mymensingh; 13x\$70.0 (US\$910.0)

Above are approx. numbers and actual will be calculated by Business office, TSU after return and submission of expense report by volunteer. Visa fee (\$160.0) for US Citizens. E-ticket will be provided few days prior to travel.

Assignment Logistics

This assignment will take place in Mymensingh, near Dhaka. The volunteer will be lodged at University guest house or a hotel, few minutes' drive away from the project site. Guest house and has electricity, internet, restaurant and running water available.

Materials recommended for the assignment

- Personal prescriptions (sometimes it is difficult to find certain drugs in country)
- Personal laptop with spare battery
- All weather shoes or boots
- Anti-malaria medication
- Sacs of oral rehydration salt (also available locally)
- Antibiotic, Disinfectant
- Pain killer

- Many of these items listed can be purchased in Dhaka but there may be quality and price differences.



USAID
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John Ogonowski and Doug Bereuter Farmer-to-Farmer Program Asia F2F

End of Assignment Report

Assignment 6: *Offseason/year round vegetable production in Bangladesh*

USAID-VEGA and Tennessee State University requires a record of your volunteer activities to learn from your work and use that knowledge to develop future assignments. Documenting and learning from completed assignments is critical to the long-term success of the overall program. We are particularly interested in the impact of your work on the people and organizations you interacted with. Therefore, we ask you to answer the following questions to enable us to better understand the activities and impacts that occurred during your assignment.

Typically, you will have 1 or 2 days at the end of your assignment to finalize your end of assignment report. We recommend that you keep a daily journal of your activities, recommendations, and impacts to assist in completing this report.

Please note that in addition to this completed report with specific questions, other assignment deliverables may be required, as stated in your scope of work.

Your assistance in providing this summary report will help us to ensure that your assignment has the maximum impact possible. Your efforts are greatly appreciated!

Volunteer name: Dr. Ramon A. Arancibia

Assignment number: TSU-USAID-VEGA-6

Assignment dates: Nov. 15-27, 2015

Name of host(s): BAU, Mymensingh

Number of Persons Directly Assisted (*Persons who received face-to-face or hands-on technical assistance, training or advice from the F2F volunteer. This is also considered program direct beneficiaries. "Persons Trained" are ALSO counted as "Persons Directly Assisted" and represent a sub-category of "Persons Directly Assisted."*)

Female: 11
Male: 72
Youth: -

Number of Persons Trained (*Training defined as: formally structured training activities, usually in a classroom, which do not lead to an academic degree, or a learning activity taking place in a classroom or workshop with learning objectives and outcomes*)

Female: 11
Male: 71
Youth:

Please answer the following questions in as much detail as you think is necessary.

1. What were the **objectives** of your assignment? What assistance did your host request? *(Please note any changes made in your scope of work during your assignment.)*

Objectives

- a. Focus the feasibility of year round vegetable production, their marketing and increase income through sustainable household vegetables.
 - b. Increase food security – through staff replication of training/consulting to multiply impact to more households.
 - c. Improve the family nutritional status: awareness of nutritious value of vegetables and available the rich nutrient vegetable production in the homestead area, ultimately increase the habituation to consume more rich nutrient vegetables.
2. What **activities and assistance** were parts of your assignment? Who was involved? What topics were addressed? *(Details regarding any materials that were developed, the number of people trained, the organizations that participated in your programs or that you met with, etc., are all very important.)*

Bangladesh Agricultural University (BAU) acted as the host institution with Dr. MD. Ashraful Islam, Dr. MD. Abdul Momen Miah and Mr. Subrato Kumar Kuri as active participants in the presentations and discussions with farmers. Also, Mr. Dhires Chiran, Executive Director of APORA Development Organization, was involved in meeting with a group of farmers associated with CARITAS.

In this first visit, activities were focused on:

- a. Classroom type of presentations and discussions with farmers and extension personnel of potential practices and technologies to manage expected adverse conditions when growing off-season vegetable crops for year-round production. Among these expected adverse conditions were rain and flooding, wind, high as well low temperatures, and the incidence of pests and diseases.
- b. Presentations were delivered to three farmer's groups in the Mymensingh surrounding area totaling 83 farmers. Also, a seminar was presented to 17 research and technology transfer personnel at BAU.
- c. Hands on workshop for technology transfer personnel at BAU on protected systems based on row covers.
- d. Topics addressed were:
 - i. Flood management by using drainage system and raised beds.
 - ii. Flood tolerance technologies by grafting on tolerant rootstocks eg tomato grafting on brinjal.
 - iii. Temperature management by mulching, shading and cultivar selection depending on season.
 - iv. Wind management by windbreaks and row covers.
 - v. Pests and diseases management by using tolerant/resistant cultivars, biological control methods and protected production systems (row covers).
 - vi. Emphasis was also given to production of sweet potato since it has been recognized as the most nutritious vegetable available.

3. What **significant recommendations** did you make to the host? (*USAID requires that we collect significant recommendations made to the host for reporting purposes. At the time of a follow-up survey with the host, we will collect information as to which recommendations were adopted.*)
- a. Practices to manage adverse conditions in off season/year-round vegetable production in the tropics
 - i. Flood management and drainage by using raised beds and/or ridged rows and furrows. This practice would promote root development, reduce the risk of soil-borne diseases, and facilitate irrigation as well as cultivation for weed control.
 - ii. Flood tolerance technologies such as grafting on tolerant rootstocks, particularly in tomato on eggplant and pepper on specific pepper rootstocks.
 - iii. Temperature management depending on season by mulching, shading and cultivar selection. Mulching and shading reduce soil temperature and reduce evapotranspiration that results in water conservation. Farmers were engaged and contributed to classify vegetable crops in three distinct groups: moderately heat tolerant, heat sensitive and those with varietal differences that may fit during transition periods between summer rainy season and winter cool/dry season. Selection of the appropriate crop/cultivar is critical in off-season/year-round vegetable production.
 - iv. Wind by windbreaks and the benefits of using row covers in vegetable production. Environmental stresses occur throughout the year and protected production systems modify the crop's micro-environment to less stressful conditions. This enhances growth and productivity resulting in higher yields.
 - v. Pests and diseases by using tolerant/resistant cultivars, biological control methods and protected production systems (row covers). The first approach to manage pests and diseases in with resistant/tolerant cultivars, but when these are not available, a biological control approach for organic production systems should be established. Protected production systems is an alternative for organic systems that uses physical barriers (nets) to protect against insects and virus transmitting insects, so pesticide use may be reduced or avoided.
 - vi. Emphasis was given to heat tolerant crops/cultivars grown on raised ridged rows to improve drainage, reduce nutrient leaching, promote growth, facilitate cultivation and weed management, and reduce soil borne diseases. Also, production of sweet potato in the summer was discussed since it has been recognized as the most nutritious vegetable available.
 - b. *An additional recommendation based on the practices seen during the visit is to evaluate the potential usefulness and adoption of more efficient methods of cultivation in vegetable crops. Currently, it appears that hoe and knife are the only tools used for cultivation that results in high cost of time and labor. Planting in rows will facilitate the use of manpower/push wheel cultivators and weeding tools that may reduce time and labor in vegetable crops production.*

If you worked with multiple hosts, please list recommendations for each host separately or indicate if all of your recommendations were the same for all hosts.

4. Did you observe any **improvements or impacts** with respect to the objectives and expected results outlined in your assignment scope of work? (This can include new attitudes observed, immediate changes put in place, etc.). Please explain.

It is difficult to evaluate impact in a two weeks visit; however, we accomplished most of what was proposed in the scope of work for this visit to strengthen the capacity of vegetable farmers to improve off-season/year-round vegetable production:

a. Change in knowledge.

- i. During field presentations, farmers were engaged and contributed to classify vegetable crops as heat tolerant, heat sensitive and those with varietal differences. This showed interest and a change in knowledge to select crop/cultivar for off-season/year-round vegetable production.
- ii. Farmers learned about practices to reduce the effect of extreme temperatures, mulching and shading.
- iii. Farmers as well as extension personnel learned about vegetable production in ridged rows to facilitate irrigation and drainage, reduce nutrient leaching, facilitate cultivation and weeding, and reduce the incidence of soil-borne diseases.
- iv. Presentations and discussions with farmers as well as research and extension personnel showed mix-feeling about protected production systems for vegetable production mainly due to the economic feasibility of adoption. However, this also demonstrated a change in knowledge, especially for those that learned about the benefits of row covers and the potential reduction or complete avoidance of pesticides. Interests from research and extension personnel to conduct studies also demonstrate a change in knowledge.
- v. Awareness of the nutritional value of vegetables in particular sweet potato was emphasized in the seminars. Although, consumers and farmers are becoming more familiar with this concept, activities in this assignment reassured a change in knowledge about producing and consuming healthy and nutritious vegetable crops.

b. Change in action.

- i. Some of the presented technologies/practices to manage adverse conditions during off-season/year-round vegetable production were already in place. The use of terraces at different levels to avoid flooding is a clever and old practice in Bangladesh. An improvement would be to use raised rows/beds to improve drainage.
- ii. Production of sweet potato appears to be on the rise due its nutritional attributes. To improve year-round supply, production in the summer and during transition periods is recommended.
- iii. Use of mulching is common in vegetable production.

- iv. Selection of heat resistant/susceptible crops for each growing season is well known. The willing to test some crops during transition between both defined season, rainy summer and dry winter, showed a potential change in action.
 - v. The use of protected production systems (netting/shading) in Bangladesh is being limited to production of vegetable transplants. Adoption for crop production depends on economic factors that couldn't be determined at this time. It was encouraging though that two farmers expressed their willing to try protected systems in vegetable crop production for personal consumption to avoid using of pesticides. This attitude showed a potential change in action.
 - vi. As farmers increase off-season vegetable production, consumption is expected to increase as well. This is an expected change in action that would improve the nutritional status of the farmer's family.
- c. ***Change in condition*** is difficult to evaluate at this time; however, an increase in off-season production is expected to improve year-round supply and consumption of nutritious and healthy vegetable crops. Ultimately, it is expected an increase the habituation to consume more vegetables that may improve the quality of life of the community.
5. What **future impacts** do you anticipate as a result of your assignment? *(Please explain and list ways in which you think the results of your assignment can be measured 6 months from now.)*

As indicated above, discussions with farmers as well as with research and extension personnel at BAU suggest potential adoptions of some practices towards off-season/year-round production of vegetable crops. Off-season production of high value nutritious vegetable are expected to improve consumption by the farmer as well improve year-round supply to the market. Therefore, the farmer's families are expected to improve their nutritional status as well as their economic sustainability by the extra income due to the sale of high value vegetable crops. In addition, the increase in year-round supply of vegetables will increase food security for the farmers as well as consumers.

Measurements:

- a. Determine how many farmers and research/extension personnel initiated trials or adopted recommended practices to improve off-season production of vegetable crops.
 - b. Determine the level or proportion of land that trained farmers dedicate to vegetable crops throughout the year.
 - c. Determine the level of consumption of vegetable crops by farmers and their families throughout the year
6. Drawing on your volunteer experience, please provide us with any **recommendations for follow-up activities** to build on your assignment (e.g., things that USAID-VEGA or TSU can do to further support the host).

Follow up is critical in any type of assistance like this. The expected impact depends greatly on the learning process (change in knowledge) to successful adoption (change in action). The

learning process should be supervised continuously by experienced outreach personnel to avoid and manage potential difficulties in the process of trialing by the farmers. The many unpredictable factors that agriculture is exposed to may very well affect the outcome of those trials and the farmers may lose trust and interest in the process and technologies. Therefore, it is recommended that research and outreach personnel experience and become familiar with the technologies first so they will be able to assist farmers during the learning process and follow up with recommendations. One of the technologies introduced in this assignment that may need more training of research and extension personnel is protected production systems.

7. What effect did your assignment have on you personally and/or professionally (for example, new knowledge, contacts, etc.)?

Although I've lived and conducted vegetable crops research in tropical areas before (Virgin Islands), this is my first visit to Bangladesh. I was able to get a brief depiction of the culture, agriculture, resources, and the people of Bangladesh. We engaged the farmers to share their views about the technologies presented and the discussion brought up interesting points of view. Also, interaction with the host and other research and extension personnel made the professional aspect of this visit a positive one. I learned production practices different than the ones I have known, so this visit also enriched my knowledge and professional experience. I realized that agriculture in Bangladesh appears to be in balance with the conditions and resources available. The high population and small land farmers cultivate makes the system very efficient. I saw efficient use of the land in vegetable production by multi-cropping and crop overlapping, appropriate selection of crops according to the growing season and diversity to stabilize household income. This assignment may be able to improve further the farmer's conditions by off-season/year-round production of high value vegetable crops.

8. Did you do any **outreach** activities (e.g., blog post, Facebook post, photo sharing, interviews with local media, etc.) while you were in country? If yes, please explain. If no, please explain planned activities for when you return to the US.

No outreach activities were conducted in Bangladesh. Outreach activities are planned by BAU.

9. Please also write a **personal letter to your host**. This letter will be translated (if needed) and delivered to your host. *Please use the attached letter template.*

FOR BAU LOCAL COORDINATOR USE ONLY:

Please provide a total and also list Consolidated Volunteer Recommendations below, by host. (If there are different recommendations for different hosts, please add a separate section for each host).

Host Name: Dr. Md. Ashraful Islam

Total # of Economic Recommendations: 05

Volunteer Recommendations - Economics:

- *Flood tolerance can be managed by using high level of raised bed*
- *Also, grafting system can be practiced (for example: tomato grafting on indigenous brinjal) in some crops to survive under water logging condition as well as to control some diseases*
- *Mulching and shading can be practiced to avoid high temperature especially in the summer season.*
- *Practice row covers (using net) can be practiced to avoid wind, direct high temperature and somehow to control insects. It can help to reduce the cost through using less times application of insecticide as well as safe food production.*
- *Selection of rich nutrient content vegetables cultivars which can grow in all the year round.*

Total # of Organizational Recommendations: 04

Volunteer Recommendations - Organizational:

Farmers will accept those technologies which will have the feasibility in Bangladesh. So, of Bangladesh Agricultural University (BAU) can hunt some fund for the research. Considering this, the following practice can be done at the Horticulture farm of Bangladesh Agricultural University and then extend it among the farmers.

- *Protection system (row covers/netting system) can be practiced for different crops*
- *Suitability the different types of mulch which are available in Bangladesh*
- *Use of high raised seed bed.*
- *Comparison of different types of cultivars for off season production.*

Total # of Financial Recommendations: 0

Volunteer Recommendations - Financial:

Total # of Environmental Recommendations: 0

Volunteer Recommendations - Environmental:



Scope of Works

Assignment 7: *Pre and post-harvest management of fruits and vegetables*

Project Title: Issues and Challenges in Sustainable Agricultural Research, Extension and Education for Women Farmers in Bangladesh

Overall Program Objective(s) and expected outcomes

The main objective of this project is to provide technical assistance in sustainable vegetable cultivation to women's groups, extension agents, faculty and small-scale farmers in Bangladesh. This will be achieved in collaboration with host institute (BAU). The information will be disseminated to enhance adoption of new and improved farming practices through training workshops, factsheets and a website.

Volunteer name: Sammy L. Comer

Assignment number: TSU-USAID-VEGA-7

Assignment period and length: March 10-18, 2016

The Objectives of the Assignment –

Bangladesh Agriculture University (BAU)'s objective is to improve the lives of those the program is targeting. One way of achieving this objective is by complementing donor and government support to BAU through self-help efforts such as organic vegetable farming initiative. The expert volunteer is expected to train BAU staff in intensive vegetable farming, crop planning and rotation soil treatment such as the use of manure and compost, and the use of lime to enrich the soil to increase yields. The volunteer has also been requested to help these farmers learn how they can improve crop production, increase income and at the same time attain positive nutritional outcomes for their households.

- a) Sustainable approach and production of organic food, which will be safe for the people.
- b) Introduce for the adoption of organic production technology of crops and find out the approach which will be a long term basis for sustainable production and hazard free environment
- c) To build up a network among the safe food producers and build up a stable and improved marketing channel to encourage the producers as well as to get more economic return.

Assignment Tasks–

Before leaving the US: The volunteer is encouraged to research information on farmland management, intensive farming, rotational cropping, and soil treatment. Photos, slides and videos clips showing rotational cropping, farm layout, etc. would be helpful, keeping in mind that the majority of those who will participate in this training are either semi-illiterate, or illiterate. TSU-VEGA project design assignments with the assumption of some pre-departure preparation by the volunteer. Actual preparation time will vary, based on the experience of the volunteer, as well as access to information or training resources of the volunteer. TSU relies on the volunteer to assess the tasks outlined in this SOW and to make his or her own judgment about how much and what kind of preparation is needed prior to arriving in Bangladesh.

The use of videos, PowerPoint presentations and hands-on activities to emphasize main points is strongly recommended during the assignment. These should be prepared, as much as possible, in advance of the assignment.

*Please note that if the volunteer identifies any specific materials necessary for the implementation of an assignment, he/she must first receive approval from TSU Project Coordinator prior to departure

In-Country Activities: It is anticipated that the volunteer will train traditional farmers mainly women's group on assigned topics. The volunteer will produce a guide or fact sheet on marketing, farm business and planning along with an end of assignment report which will include recommendations for increased profitability that can be easily adapted.

Post-Assignment Activities: Upon the volunteer's return to the U.S., the volunteer is encouraged to discuss his or her Farmer-to-Farmer (F2F) assignment in Bangladesh and the U.S. government's initiatives in assisting nations in need around the world. At least two outreach events upon returning to the United States are requested, and the results should be communicated to Dr. Dilip Nandwani (dnandwan@tnstate.edu).

Deliverables

1. Impart the knowledge regarding pre and postharvest management practices of fruits and vegetables.
2. Focus the maturity index to harvest the products at the optimum stage which will help to extend the shelf life of fruits and vegetables.
3. To maintain the quality (appearance, texture, flavor and nutritive value) and protect food safety.
4. Reduce the losses of fruits and vegetables between the harvest and consumption
5. Promote the application of different herbal spray to the stakeholders instead of chemical spray for extending the shelf life of fruits and vegetables, ultimately ensure the consumption of safe food.

Scope of work

There is a wide range technology for production technology, flowering, maturity, harvesting, handling and packaging which can have the potentiality in small scale for the producers to extend the shelf life of fruits and vegetables. Mostly, women are involved in the postharvest works and we need to improve the potentiality of

women and their knowledge for the postharvest handling and maintain the quality of the products. Reduce the losses of products can increase the income for the family. Also, increase the awareness among the stakeholders or producers to use the optimum amount of hormones or chemicals which will not be health hazard to human body.

Indicators for the Evaluation of Impact-

An increase in knowledge in post-harvest management and losses yields, gross and net income and the adaption rate of volunteer recommendations will be indicators for evaluation of impact. A higher score of the association by the F2F organizational development indicator (ODI) after 30 months, due among others, to their ability to deliver quality services to its members. Monitoring visits will be made by BAU staff to ensure host implements volunteer recommendations and improvements resulting from such adaption will be recorded.

Host Organization:

Established in 1961, Bangladesh Agricultural University (BAU) is the oldest and the largest Agricultural University in Bangladesh. The BAU faculty focuses on teaching research and extension. Being a public University, one of BAU's mandates is to generate and help transfer of improved agricultural technologies to the stakeholders. BAU is the country partner in this project implementing the project activities in the country. BAU plays a major role in identifying the farmer needs and organizing the training sessions and evaluating the short term ad long term impacts on the participating farmers. There is a dearth of technical manpower with updated knowledge and skill on improved composting by utilizing local materials that are available freely or at low cost. Thus, the volunteer will assist in building capacity for the project technical staff and conduct the participating farmer training sessions.

Participant Profile:

Small farmers with <1 ha land holdings, cultivating vegetables (Okra, eggplant, tomato, cucumber, pumpkin); low literacy level with about 50% of the farmers able to read and write in Bangla.

Tasks to be Performed:

To achieve the objectives identified for this assignment, the volunteer expert will be engaged in the following activities:

- Meeting with BAU project team to learn about their plan on assignment training sessions planned and the profile of the participating farmers
- Target audience: students, faculty, general public interested in organic agriculture
- Topics to be covered: post-harvest management, food safety
- Exploring markets for organic produce
- Target audience: producers, marketing agents, NGO's
- Developing food safety of organic produce

- Topics include: entrepreneurs, educators, government & non-governmental officers NGO's
- Understanding the challenge
- Set up consideration – factors to be considered in post harvest
- Management of product line: product availability, quality, future product development plans

This assignment will strengthen pre and post-harvest management of vegetables, organic vegetable farm management, production practices, nutrient and food safety, thus creating opportunities of household income generation reducing post-harvest losses and improved employment opportunities in Bangladesh.

Volunteer:

Assignment date: March 9-18, 2016

Host Contact

Dr. Md. Ashraful Islam
Associate Professor and Coordinator
Department of Horticulture, Faculty of Agriculture
Bangladesh Agricultural University
Mymensingh 2202
Bangladesh

Phone (office): +880 91 66401-6 x 6479

Fax: +880-91-61510

E-Mail: ashrafulmi@bau.edu.bd

The host institution of the project is Bangladesh Agriculture University (BAU) and local coordinator is Dr. Ashraf Islam, Associate Professor at Faculty of Agriculture.

Tennessee State University Contact

Dr. Dilip Nandwani
Associate Professor (Organic Agriculture)/Principal Investigator
College of Agriculture, Human and Natural Science,
Tennessee State University, Nashville, TN

Phone: 615-963-1897

E-Mail: dnandwan@tnstate.edu

Host Institute (Bangladesh Agriculture University) Background

Bangladesh Agricultural University (BAU) will be host institute for the project. Horticulture Professor Dr. Ashraf Islam and his team will assist PI in implementing the project, coordinate training workshops and make logistic arrangements for the US volunteers. BAU will be sub awarded to organize training workshops, provide facilities, field visits,

accommodation for the participants (farmers) and demonstration on their Horticulture farm. BAU is planning to establish a demonstration site for young organic entrepreneurs on their farm. The participating farmers would benefit from the training workshops proposed in this proposal. To compensate their time spent and use of facilities, BAU will be contracted to assist and organize ten training workshops for the experts/volunteers. *Bangladesh Agricultural University* (BAU) is the leading agricultural research institution in Bangladesh. Current research program in horticulture is focused on sustainable vegetable production, food security, organic farming practices and training farmers, students and extension agents. Horticulture Department is one of the important departments of the total 43 departments at BAU which offers Masters and PhD degree programs. It conducts applied research and giving emphasis on organic production techniques for safe and healthy produce considering excessive use of chemical fertilizers. Horticulture department is collaborating with Plant Pathology and Entomology departments and conducting research in integrated pest and disease management of fruits and vegetables such as application of fertilizers and pesticides for crop production. Horticulture department has a germplasm center, where fruits and vegetables accessions are screened and maintained. Postharvest research is conducted in crops to extend the shelf life and quality. Also, pond dyke vegetable production is performing to make awareness of the nutritional value.

To continue and strengthening the above mentioned research, BAU need technical assistance in the areas as described in the scope of work for ten volunteer assignments. The ten assignments identified are in areas in high demand from the host institution to deliver training for women's groups, farmers, and faculty to build their capacity in production agriculture, food safety, nutritional awareness, and create opportunities to improve quality of life of the people of Bangladesh.

Volunteer Qualifications

- Must have a university degree in agriculture, ag economics, marketing or related with extensive knowledge in post- harvest management of fruits and vegetables, food safety, marketing.
- Must have at least five years' technical experience in agriculture economics.
- Must have previous experience with training groups in developing countries. Experience working with women's groups, or groups of illiterate farmers preferred.
- Must be computer literate, capable of working in MS Word and PowerPoint.

Anticipated Work Schedule-

- Days 1: Volunteer will be picked up from the airport and given a local cellphone for use while in Bangladesh. Meet with BAU office staff and assignment host for briefing.
- Day 2: Travel to Khulna or Mymensingh to meet with host organization and discuss workshop schedule.
- Days 3-7: Conduct training
- Days 8: Completes final report; debriefed and departs for home

Beneficiaries

(Anticipated – To be confirmed by volunteer during assignment)

- a. Direct beneficiaries: female
- b. Direct beneficiaries: male
- c. Indirect beneficiaries: female
- d. Indirect beneficiaries: male

Expected Outcomes

- Women's farmer group (20-30 each) will acquire knowledge on crop rotation, intercropping, and techniques used to maintain nutrient balance in intensive farming.
- Increase farm yields and income
- Increase knowledge of BAU project staff and faculty in organic farming

Financial Information for Calculating Volunteer Travel Advance

- a. Lodging: # of days in Dhaka or Mymensingh; 7 x US\$50 or 60.0 for hotel and \$25.0 for guest house
- b. M&IE: # of days in Mymensingh; 7x\$70.0 (US\$490.0)

Above are approx.. numbers and actual will be calculated by Business office, TSU after return and submission of expense report by volunteer. Visa fee (\$160.0) for US Citizens. E-ticket will be provided few days prior to travel.

Assignment Logistics

This assignment will take place in Mymensingh, near Dhaka. The volunteer will be lodged at University guest house or a hotel, few minutes' drive away from the project site. Guest house and has electricity, internet, restaurant and running water available.

Materials recommended for the assignment

- Personal prescriptions (sometimes it is difficult to find certain drugs in country)
- Personal laptop with spare battery
- All weather shoes or boots
- Anti-malaria medication
- Sacs of oral rehydration salt (also available locally)
- Antibiotic
- Disinfectant
- Pain killer (can be purchased in Dhaka)

*Many of these items listed can be purchased in Dhaka but there may be quality and price differences.



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Farmer-to-Farmer Program Asia F2F

End of Assignment Report

Assignment 7: *Pre and post-harvest management of fruits and vegetables*

Volunteer name: Sammy L. Comer

Assignment number: TSU-USAID-VEGA-7

Assignment dates: March 10-18, 2016

Name of host(s): -Caritas Bangladesh

Number of Persons Directly Assisted

Female: -5 (3 days)

Male: -16 (days)

Youth: -0

Number of Persons Trained

Female: 5

Male: 16

Youth: -

Please answer the following questions in as much detail as you think is necessary.

1. What were the **objectives** of your assignment? What assistance did your host request?
(Please note any changes made in your scope of work during your assignment.)

-The objective of the assignment was to train BAU staff and others in organic vegetable farming initiatives that will lead to increase the duration of postharvest life, ultimately it will increase the income and attain positive nutritional outcomes for their households. So, I gave more focus on the maturity index to harvest the products at the optimum stage which will help to extend the shelf life of fruits and vegetables to maintain the quality (appearance, texture, flavor and nutritive value) and protect food safety.

Also to discuss sustainable approach and the production of organic food, introduce the adoption of organic production technology of crops and to build up a network among the safe food produces and build up a stable and improved marketing channel to improve their economic returns.

-Changes made was to conduct workshops with the trainers from the area that work directly with the farmers instead of the farmers themselves. It was believed that we could have a greater impact in a training-of-trainer's workshop. It would impact more people in the long run rather than try to bring in some farmers, the trainers could reach a much greater number of farmers when they return to their region. The trainers represented a greater sample of the country.

2. What **activities and assistance** were parts of your assignment? Who was involved? What topics were addressed? *(Details regarding any materials that were developed, the number of people trained, the organizations that participated in your programs or that you met with, etc., are all very important.)*

The topic addressed was that of Pre and Post-harvest Management of Fruits and Vegetables. The participants were from Caritas NGO that work directly with the local farmers on a day-to-day basis. It consisted of 21 trainers, 5 women and 16 men. The workshop was conducted over a three day period, March 13-15, in cooperation with the Marketing and Sustainability of production section. Materials were developed that included; pre and post-harvest management,; what do we know, how to reduce post-harvest losses, what are the post-harvest operations, pre harvest losses, fruit quality and, losses at various stages of production.

3. What **significant recommendations** did you make to the host? *(USAID requires that we collect significant recommendations made to the host for reporting purposes. At the time of a follow-up survey with the host, we will collect information as to which recommendations were adopted.)*
- i. Farmers need education and agricultural knowledge in post-harvest management. This could be arranged in partnership of Department of Agriculture Extension (DAE) and Bangladesh Agriculture University (BAU).
 - ii. It is recommended that growers use mulch or plastic as a cover to keep the fruits from touching the ground. This would help to improve fruit quality and disease infestation.
 - iii. Use of hand tools and sharp instruments to cut the stems uniform, nice and smooth. Current practice is to break them off manually by hand which cause poor cuts and damage the plants.
 - iv. It is recommended that irrigate the fields the day before harvesting to get better weight of harvest. Remove rotten and damaged fruits from the crop to improve and maintain quality.
 - v. Use the proper containers for collecting fruits during harvest and post-harvest storage and grade the products at the field level before going to marketing.

- vi. All waste material from the field collected during pre or post-harvest can be used for making compost rather than throwing it away. This will reduce expenses from buying fertilizers.

Also, it was suggested that DAE and BAU assist the farmers in finding groups of people that have incomes high enough to afford organic grown food because organic products most of the time cost slightly more and the poor cannot afford it and will not purchase it.

4. Did you observe any **improvements or impacts** with respect to the objectives and expected results outlined in your assignment scope of work? (This can include new attitudes observed, immediate changes put in place, etc.). Please explain.

From the reaction of the trainers, they were very excited to take the information back to the farmers. I believe that the impact will be that the trainers will show farmers how to implement better methods of producing their products; how to harvest when they can get the greatest weight and quality from their products; how to better use mulch and get better use from their waste products; how to do a better job of grading and sorting before going to the market. The trainers will also, assist the farmers in selecting the right containers for harvesting and transporting their vegetables to prevent loss.

5. What **future impacts** do you anticipate as a result of your assignment? *(Please explain and list ways in which you think the results of your assignment can be measured 6 months from now.)*

I believe Future impacts will include; a change in the way the trainers present their information, example, show farmers how to stop throwing away so much of their products and find a use for it such as mulch; farmers, through the help of the BAU extension services will seek out small groups of people with higher incomes that can afford to pay the price for organic products.

6. Drawing on your volunteer experience, please provide us with any **recommendations for follow-up activities** to build on your assignment (e.g., things that USAID-VEGA or TSU can do to further support the host).

Tennessee State University (TSU) can stay in touch with the host and seek ways to work with them in the future. Provide any new information that become available to the host to pass along to the trainers when appropriate.

USAID-VEGA can do follow-up with the trainers to see if they are following the recommendations that were discussed in the workshop.

7. What effect did your assignment have on you personally and/or professionally (for example, new knowledge, contacts, etc.)?

The workshop was very satisfying and educational to me. I make a lot of new contacts/friends that I hope will continue for the remainder of my life. I met with several members of the faculty including two deans of faculty at BAU and talked about writing grants to do joint work together. Also, met with Winrock International, Asia Farmer-to-Farmer program personnel and discussed future work. I also had an opportunity to meet with some old friends that I had met on a previous meeting at BAU. I have been in the international programs at Tennessee State University for around 40 years and it is always a pleasure to work with the people in developing countries. My belief is that if you can better the life of one person, you have helped to make the world a better place.

8. Did you do any **outreach** activities (e.g., blog post, Facebook post, photo sharing, interviews with local media, etc.) while you were in country? If yes, please explain. If no, please explain planned activities for when you return to the US.

I did place some pictures on Facebook while in Bangladesh and made some new Facebook friends in and around Mymensingh, Bangladesh. I will place more pictures and statements on Facebook and explain activities when I return home.

9. Please also write a **personal letter to your host**. This letter will be translated (if needed) and delivered to your host. *Please use the attached letter template.*

I would like to thank me for the opportunity to meet with you, learn situation of the farming practice and pre and postharvest management of fruits and vegetables . I really enjoyed the training of trainers (ToT and delighted with your wonderful hospitality. I am very impressed with your current knowledge, analytical thinking, and potential for acquiring more information.

Very happy to hear positive feedback that you found the training very useful. Thank you again for the opportunity to share my knowledge and I wish you the very best in growing healthy vegetables and make a business in the country with a healthy manner.

Sincerely,
Sammy Comer

FOR BAU LOCAL COORDINATOR USE ONLY:

Please provide a total and also list Consolidated Volunteer Recommendations below, by host. (If there are different recommendations for different hosts, please add a separate section for each host).

Host Name: Dr. Md. Ashraful Islam

Total # of Economic Recommendations: 05

Volunteer Recommendations - Economics:

- *Knowledge gathering on pre and postharvest management of fruits and vegetables*
- *Some management practices which will be very effective like mulching materials and irrigation facilities a day before harvesting can help to improve the quality of products and shelf life extension*
- *Use of containers for storage and the use of sharp knife for the harvesting*
- *Grading and labeling of the product can help to improve the quality of products*
- *Low quality product can be usable for the composting to promote the organic farming*

Total # of Organizational Recommendations: 03

Volunteer Recommendations - Organizational:

- *Need more training to the farmers and the trainers for gathering all information to keep the better quality of product*
- *Promote the grading, labeling and marketing assisting from the collaboration of Department of Agricultural Extension (DAE) and Bangladesh Agricultural University (BAU) to the stakeholders*
- *Need to provide more simple techniques which will be suitable for the shelf life extension of fruits and vegetables and the product will be safe for human consumption*

Total # of Financial Recommendations: 0

Volunteer Recommendations - Financial:

-

Total # of Environmental Recommendations: 0

Volunteer Recommendations - Environmental:



Group picture of ToT program held at CARITAS Bangladesh, Mymensingh

Schedule of Training of trainers (ToT)
Conference Room, CARITAS Mymensingh region, Bangladesh
(TSU-VEGA Project)

Date, Day	Time	Lectures	Resource person
13.03.2016 Sunday			
	9.30-10am	Welcome	Director, CARITAS Local Project Coordinator, BAU
	10-11	Introduction of the program	Prof Sammy L Comer
	11 to 11.30	Break	
	11.30 to 1 pm	Agriculture Innovation	Dr Prabode Illukpitiya
	1 to 2 pm	Lunch	
	2 to 3.30 pm	Sharing the experience of field work among the participants	
	3.30 to 4.30 pm	Preharvest operations of vegetables Q&A	Prof Sammy L Comer
14.03.2016 Monday			
	9.30 to 11am	Postharvest operations of vegetables	Prof Sammy L Comer
	11 to 11.30	Break	
	11.30 to 1 pm	Entrepreneurship Development among rural farmers	Dr Prabode Illukpitiya
	1 to 2 pm	Lunch	
	2 to 3 pm	Improvement and obstacles of agribusiness system	Dr Prabode Illukpitiya
	3 to 4.30 pm	Farmer training workshop – Share our experience in USA of Agribusiness -Q&A	Prof Sammy L Comer and Dr Prabode Illukpitiya
15.03.201 Tuesday			
	9.30 to 11 am	Brief introduction to business plan and how to promote organic farming	Dr Prabode Illukpitiya
	11 to 11.30	Break	
	11.30 to 1 pm	Fruit quality for the marketing system	Prof Sammy L Comer
	2 to 3 pm	Lunch	
	3 to 4 pm	Q&Q, Discussion	
	4 pm-	certification and closing ceremony	



Scope of Work

Assignment 8: *Preparation and use of herbal pesticides and biofungicides for vegetable growers*

Project Title: Issues and Challenges in Sustainable Agricultural Research, Extension and Education for Women Farmers in Bangladesh

Overall Program Objective(s) and expected outcomes

The main objective of this project is to provide technical assistance in sustainable vegetable cultivation to women's groups, extension agents, faculty and small-scale farmers in Bangladesh. This will be achieved in collaboration with host institute (BAU). The information will be disseminated to enhance adoption of new and improved farming practices through training workshops, factsheets and a website.

The expected outcomes are as follows:

- i. Improve capabilities, practices or technologies on vegetable production (conventional and organic)
- ii. Improve the knowledge and skills of young faculty and researchers in agriculture education
- iii. Better understanding of economic returns for producers
- iv. Marketing strategies for organic produce

PERSUAP category: Type 1 (Basic)

Volunteer name: Surendra K. Dara

Assignment number: TSU-USAID-VEGA-8

Assignment dates: 14 – 22 January, 2016

Objectives:

1. Document current pest management practices, use of chemical pesticides, and adverse effects on environmental and human health.
 - a. Will speak with farmers in different areas and gather information regarding the crops, pests, current management practices, efficacy of those practices, and use of chemical pesticides.

- b. Assess their knowledge of sustainable agriculture and integrated pest management (IPM).
 - c. Assess the environmental impact of current practices and discuss potential harmful effects.
2. Provide training on the principles of IPM its components and choosing appropriate strategies to meet local crop and pest needs.
 - a. Go over general IPM principles and strategies.
 - b. Test their understanding and ask how they would apply that knowledge to address their pest management needs.
3. Discuss about various botanical and microbial biopesticides.
 - a. Give a general overview of biopesticides based on microbial and botanical compounds.
 - b. Provide a list of commonly used biopesticides and their application doses and intervals.

Scope of work

Biopesticides or herbal pesticides on the form of microorganisms or natural products. Mapping the parts of country where herbal pesticides are used commonly and record the data on the doses of application as well as their preparation and include them in the area of organic certification network. Also, arrange seminar and training to the farmers to disseminate the benefits of herbal pesticides.

Technical task objective – assist small-scale women farmers to improve yield, quality, income, and sustainability of household vegetable gardens, including consulting on: Seed quality and improved yield; Integrated pest management; Plant disease identification and eradication;

Replication task objective – provide capacity building for BAU field staff to be able to replicate training/mentoring to multiple groups of men and women farmers, including consulting on: Integrated farming and related techniques above; Modeling demonstration plots or other research/learning techniques.

Host Organization:

Established in 1961, Bangladesh Agricultural University (BAU) is the oldest and the largest Agricultural University in Bangladesh. The BAU faculty focuses on teaching research and extension. Being a public University, one of BAU's mandates is to generate and help transfer of improved agricultural technologies to the stakeholders. BAU is the country partner in this project implementing the project activities in the country. BAU plays a major role in identifying the farmer needs and organizing the training sessions and evaluating the short term and long term impacts on the participating farmers. There is a dearth of technical manpower with updated knowledge and skill on improved composting by utilizing local materials that are available freely or at low cost. Thus, the volunteer will assist in building capacity for the project technical staff and conduct the participating farmer training sessions.

Participant Profile:

Small farmers with <1 ha land holdings, cultivating vegetables (Okra, eggplant, tomato, cucumber, pumpkin); low literacy level with about 50% of the farmers able to read and write in Bangla.

Tasks to be Performed:

To achieve the objectives identified for this assignment, the volunteer expert will be engaged in the following activities:

- Meeting with BAU project team to learn about their plan on herbal pesticides training sessions planned and the profile of the participating farmers
- Assessment of locally available ingredients for herbal pesticides, biofungicides
- Provide on-site technical input and hands-on training on herbal pesticides with particular reference to neem leaves extracts, biofungicides, home recipes for organic and safe use of insect pest and disease control:
- Provide updated information on botanical/herbal pesticides using materials available on-farm/garden
- Discuss both commercial and household level use and safety of chemical fungicides and herbal pesticides
- Educate the participants in application of effective dosages of herbal pesticides for pests and disease control
- Discuss plant nutrition, soil health, soil biology, nutrient cycle, harvest and production practices of vegetables
- Packaging and marketing of herbal pesticides for storage and sale

This assignment will strengthen compost education, research, production, and marketing, thus creating opportunities of household income generation and improved employment opportunities in Bangladesh.

Volunteer:

Assignment date: Jan. 15-23, 2016

Host Contact

Dr. Md. Ashraful Islam
Associate Professor and Coordinator
Department of Horticulture, Faculty of Agriculture
Bangladesh Agricultural University
Mymensingh 2202
Bangladesh

Phone (office): +880 91 66401-6 x 6479

Fax: +880-91-61510

E-Mail: ashrafulmi@bau.edu.bd

The host institution of the project is Bangladesh Agriculture University (BAU) and local coordinator is Dr. Ashraf Islam, Associate Professor at Faculty of Agriculture.

Tennessee State University Contact

Dr. Dilip Nandwani

Associate Professor (Organic Agriculture)/Principal Investigator

College of Agriculture, Human and Natural Science,

Tennessee State University, Nashville, TN

Phone: 615-963-1897

E-Mail: dnandwan@tnstate.edu

Volunteers for Economic Growth Alliance (VEGA) Contact

Leia D'Amboise

Program Manager

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Email: ldamboise@vegalliance.org

Host Institute (Bangladesh Agriculture University) Background

Bangladesh Agricultural University (BAU) will be host institute for the project. Horticulture Professor Dr. Ashraf Islam and his team will assist PI in implementing the project, coordinate training workshops and make logistic arrangements for the US volunteers. BAU will be sub awarded to organize training workshops, provide facilities, field visits, accommodation for the participants (farmers) and demonstration on their Horticulture farm. BAU is planning to establish a demonstration site for young organic entrepreneurs on their farm. The participating farmers would benefit from the training workshops proposed in this proposal. To compensate their time spent and use of facilities, BAU will be contracted to assist and organize ten training workshops for the experts/volunteers. *Bangladesh Agricultural University* (BAU) is the leading agricultural research institution in Bangladesh. Current research program in horticulture is focused on sustainable vegetable production, food security, organic farming practices and training farmers, students and extension agents. Horticulture Department is one of the important departments of the total 43 departments at BAU which offers Masters and PhD degree programs. It conducts

applied research and giving emphasis on organic production techniques for safe and healthy produce considering excessive use of chemical fertilizers. Horticulture department is collaborating with Plant Pathology and Entomology departments and conducting research in integrated pest and disease management of fruits and vegetables such as application of fertilizers and pesticides for crop production. Horticulture department has a germplasm center, where fruits and vegetables accessions are screened and maintained. Postharvest research is conducted in crops to extend the shelf life and quality. Also, pond dyke vegetable production is performing to make awareness of the nutritional value.

To continue and strengthening the above mentioned research, BAU need technical assistance in the areas as described in the scope of work for ten volunteer assignments. The ten assignments identified are in areas in high demand from the host institution to deliver training for women's groups, farmers, and faculty to build their capacity in production agriculture, food safety, nutritional awareness, and create opportunities to improve quality of life of the people of Bangladesh.



John Ogonowski and Doug Bereuter Farmer-to-Farmer Program Asia F2F

End of Assignment Report

Assignment 8: *Preparation and use of herbal pesticides and biofungicides for vegetable growers*

USAID-VEGA and Tennessee State University requires a record of your volunteer activities to learn from your work and use that knowledge to develop future assignments. Documenting and learning from completed assignments is critical to the long-term success of the overall program. We are particularly interested in the impact of your work on the people and organizations you interacted with. Therefore, we ask you to answer the following questions to enable us to better understand the activities and impacts that occurred during your assignment.

Typically, you will have 1 or 2 days at the end of your assignment to finalize your end of assignment report. We recommend that you keep a daily journal of your activities, recommendations, and impacts to assist in completing this report.

Please note that in addition to this completed report with specific questions, other assignment deliverables may be required, as stated in your scope of work.

Your assistance in providing this summary report will help us to ensure that your assignment has the maximum impact possible. Your efforts are greatly appreciated!

Volunteer name: Surendra K. Dara

Assignment number: TSU-USAID-VEGA-8

Assignment dates: 14 – 22 January, 2016

Name of host(s): 08

Number of Persons Directly Assisted (*Persons who received face-to-face or hands-on technical assistance, training or advice from the F2F volunteer. This is also considered program direct beneficiaries. “Persons Trained” are ALSO counted as “Persons Directly Assisted” and represent a sub-category of “Persons Directly Assisted.”*)

This refers to the total number of persons directly reached out during the assignment

Female: 22

Male: 27

Youth: 4

Number of Persons Trained (*Training defined as: formally structured training activities, usually in a classroom, which do not lead to an academic degree, or a learning activity taking place in a classroom or workshop with learning objectives and outcomes*)

This refers to the number of Hunger Free World farmers and staff who attended the classroom training.

Female: 19

Male: 21

Youth:

Please answer the following questions in as much detail as you think is necessary.

1. What were the **objectives** of your assignment? What assistance did your host request? *(Please note any changes made in your scope of work during your assignment.)*

The following are the overall objectives of the assignment. The main requirement from the host was to train them about biopesticides and demonstrate some preparation techniques.

- i. Document current pest management practices, use of chemical pesticides, and adverse effects on environmental and human health.
 - ii. Provide training on the principles of IPM its components and choosing appropriate strategies to meet local crop and pest needs.
 - iii. Discuss about various botanical and microbial biopesticides.
2. What **activities and assistance** were parts of your assignment? Who was involved? What topics were addressed? *(Details regarding any materials that were developed, the number of people trained, the organizations that participated in your programs or that you met with, etc., are all very important.)*

This assignment had two major activities. The first one involved organic vegetable growers affiliated with Hunger Free World and the program staff in the village of Agmundia, Kaligong, Jhenaidoha district. Activities involved, visiting vegetable fields to identify pests and diseases, classroom training about good agricultural practices, IPM principles and practices, and various biopesticides. Demonstration of a biopesticide preparation based on neem, garlic, and ginger followed the classroom training. There were 19 female and 21 male participants in this training activity. Farmers were very knowledgeable and enthusiastic about all the topics. They are well aware of sustainable agriculture and potential harmful effects of chemical pesticides on the environment and human health. Gathered information about pesticide and fertilizer inputs in their operations. Found out that several of them already use some biopesticide concoctions and some synthetic nutrients and fungicides. Post-training feedback indicated that they gained useful information especially about good agricultural practices and IPM that reduce pest and disease problems from the start.

The second activity was to visit conventional vegetable fields in Shahbazpur in Jessore (FtF zone of Bangladesh) and meet with the farmers. Visited several fields, examined the disease and pest situation and gathered information about their current crop production and protection practices. Provided information about good agricultural practices, IPM, insecticide resistance problems, environmental and human health risk with excessive use of chemical pesticides, and sustainable agriculture. Some important observations from the visit include:

- i. Almost 100% of the fields have one or more disease infections. This will have a significant yield reduction.
- ii. Arthropod pest infestations were none or at a very low level in some fields.

- iii. They obtain propagation material (seed or plant cuttings) from existing infected fields and this is probably why disease is widespread in the area. Suggested that they should start with a clean, disease- and pest-free source.
- iv. It appeared that they different pesticides, fungicides, and growth regulators in their operations. They apply a mixture of organophosphate, neonicotinoid, and other pesticides as foliar sprays. Some of these materials are not recommended close to harvesting. They indicated spraying as many as 52 times during the 9-month duration of brinjal. This is a serious environmental, health, and resistance risk.
- v. There were no pest monitoring or treatment thresholds and sprays were made on calendar basis – twice a week from June to October and thrice a month from November to February.
- vi. Farmers indicated noticing resistance problems with emamectin benzoate as they had to increase the dose year after year and now they find it not effective in controlling their major insect pest, brinjal fruit and shoot borer.
- vii. They are not aware of sustainable agriculture or IPM practices, but did know about potential environmental and human health issues and insecticide resistance. However, they do what they do to stay in the business. Those who are aware of what are good agricultural practices feel alone as they do not find any community support. There is a need for regular training and a support system that encourages sustainable agricultural practices.
- viii. If Bangladesh has multiple chemical and biopesticides, proper labels, and recommendations, farmers will be able to implement sustainable practices.

3. What **significant recommendations** did you make to the host? (*USAID requires that we collect significant recommendations made to the host for reporting purposes. At the time of a follow-up survey with the host, we will collect information as to which recommendations were adopted.*)

The following recommendations were made:

- i. Understand the crop needs, potential pest and disease problems, and everything that is needed to grow healthy crops with minimal impact on the environment.
- ii. Understand and adopt IPM practices which encompass cultural practices such as obtaining clean plant material, modifying irrigation and nutrient management to reduce the risk of pests, regular monitoring, and various management options that include chemical, biological, botanical, microbial, mechanical, and mating disruption tools.
- iii. Spraying pesticides – even if they are biopesticides – should be the last option and good agricultural practices generally ensure good plant health. Different biopesticides or chemical pesticides have different modes of actions and use them appropriately and as needed depending on the pest or disease.
- iv. Develop crop production and pest management guidelines. Understand the pest biology, symptoms of damage or infection, and various management options. Share information within the community and use it to address each other's pest and disease problems.
- v. Symptoms of several plant diseases are similar and proper diagnostic tools are necessary to make appropriate management decisions.
- vi. While vermicompost provides some major nutrients, plants need different micronutrients for good health and yields. They should apply them as needed. Agriculture is an art and science and involves continuous learning and fine tuning. They should experiment with

various production and plant protection strategies and implement what works best for their local situation.

If you worked with multiple hosts, please list recommendations for each host separately or indicate if all of your recommendations were the same for all hosts.

4. Did you observe any **improvements or impacts** with respect to the objectives and expected results outlined in your assignment scope of work? (This can include new attitudes observed, immediate changes put in place, etc.). Please explain.

Since biopesticide use is only a small part of crop production, I have already included IPM and good agricultural practices in the objectives. It was immediately evident that farmers needed that information as various aspects of crop production and protection are interrelated.

5. What **future impacts** do you anticipate as a result of your assignment? *(Please explain and list ways in which you think the results of your assignment can be measured 6 months from now.)*

If my recommendations are properly implemented, I anticipate improved production practices and increased yields. In conventional agriculture, my recommendations can help reduce human health and environmental risk and insecticide resistance problems. For example, spraying dangerous chemicals until harvest in popular vegetables such as brinjal pose serious health risk and my recommendation to use chemicals early in the season and biopesticides during harvest season can improve the health conditions if followed properly.

6. Drawing on your volunteer experience, please provide us with any **recommendations for follow-up activities** to build on your assignment (e.g., things that USAID-VEGA or TSU can do to further support the host).

There are a few major recommendations:

- i. Empower farmers with information and provide continuous support for making appropriate decisions and improving farming practices. This includes development of crop production and pest management guidelines, field research at university and farmer level, demonstration studies, and regular outreach through classroom training and field days.
 - ii. Increase the awareness of harmful impacts of indiscriminate chemical pesticide use and provide means to reduce the use.
 - iii. Focus on good agricultural practices, pest monitoring, and treatment decisions for overall improvement of farming.
7. What effect did your assignment have on you personally and/or professionally (for example, new knowledge, contacts, etc.)?

Having served on multiple assignments, I have anticipated what I would see. I am very impressed with the enthusiasm, knowledge, and openness to learn good practices demonstrated by the Hunger Free World farmers.

Dr. Md. Ashraful Islam (Host coordinator) and Mr. Subrato Kuri have been very cooperative and did their best in carrying out this assignment. They expressed interest in future collaboration to conduct IPM research and outreach.

8. Did you do any **outreach** activities (e.g., blog post, Facebook post, photo sharing, interviews with local media, etc.) while you were in country? If yes, please explain. If no, please explain planned activities for when you return to the US.

I have posted the pictures of the fields and training on personal Facebook page.

9. Please also write a **personal letter to your host**. This letter will be translated (if needed) and delivered to your host. *Please use the attached letter template.*

I would like to thank me for the opportunity to meet with you, learn about your current practices, and provide training about improving field operations and thus yields. I really enjoyed meeting various groups and delighted with your wonderful hospitality. I am very impressed with your current knowledge, analytical thinking, and potential for acquiring more information.

Very happy to hear positive feedback that you found the training very useful. Thank you again for the opportunity to share my knowledge and I wish you the very best in growing healthy vegetables in a healthy manner.

Sincerely,
Surendra Dara
UC Cooperative Extension
2156 Sierra Way,
San Luis Obispo, CA 93401

FOR BAU LOCAL COORDINATOR USE ONLY:

Please provide a total and also list Consolidated Volunteer Recommendations below, by host. (If there are different recommendations for different hosts, please add a separate section for each host).

Host Name: Dr. Md. Ashraful Islam

Total # of Economic Recommendations: 04

Volunteer Recommendations - Economics:

- To know the crop needs especially the demand of plant nutrition, potential pest and disease problems which will be helpful for the higher production of crops
- Follow the good agricultural practice (GAP) which will reduce the input cost and maximize the production of crop.
- Share the knowledge and experience of problem and success for the crop production among the farmers of community
- Application of vermicompost as well as other micronutrient sources of plant nutrients to get healthy and better yield of crop

Total # of Organizational Recommendations: 04

Volunteer Recommendations - Organizational:

- Develop the manual of crop production and pest management practices.
- Improve the efficiency to diagnostic the proper plant diseases which are necessary to make appropriate management decisions.
- Ensure the clean, disease and pest free planting materials, modifying irrigation and nutrient management to reduce the risk of pests and diseases
- Better to do work on experiment with various production and plant protection strategies and implement what works best for the local situation.

Total # of Financial Recommendations: 0

Volunteer Recommendations - Financial:

-

Total # of Environmental Recommendations: 02

Volunteer Recommendations - Environmental:

- Understand the pest biology, mode of action and application of proper management practices to keep better and safe environment
- Follow the GAP and efficient application of biopesticides for safe food production and keep friendly environment.



Scope of Work

Assignment 9: *Record the important pest and diseases of fruits and vegetables and their integrated management*

TSU-VEGA project: 'Issues and Challenges in Sustainable Agricultural Research, Extension and Education for farmers in Bangladesh'

Volunteer: Jose Carlos Verle Rodrigues, Ph.D.

Dates: October 3-12, 2015

Host Information:

Host Organization Name: Bangladesh Agricultural University (BAU)		Address: Department of Horticulture Faculty of Agriculture Bangladesh Agricultural University Mymensingh 2202 Bangladesh	
Email Address:	ashrafulmi@bau.edu.bd	Website:	http://www.bau.edu.bd
Primary Contact Name: Dr M Ashraful Islam		Secondary Contact Name: Subrato Kumar Kuri s_kuri@bau.edu.bd	
Cell phone: +8801716807130 Phone (office): +880 91 66401-6 extn 6479 Fax: +880-91-61510		Cell Phone: 8+80-1716-779829	
Title: Associate Professor		Title: Assistant Professor	
Gender: Male		Gender: Male	
Host Type: Public Sector, Academia, University			
Have we worked with this host before? No			

Objectives

1. Identify and record the important pest and diseases for the commonly cultivated fruits and vegetables in Bangladesh
2. Integrated pest management (IPM) strategy development for promoting information exchanges among the stakeholders and produce safe food production.
3. Also, selections of variety that are resist against diseases and pests and maintain ecosystem and ecological balance for the environment.

Scope of work

Identify the important pests and diseases for the fruits and vegetables, also know the way to reduce their emergence to the crop through identify the host of pests and application of IPM. Awareness of safe food production, reduce the cost of production and free from health hazard due to not application of chemical pesticides, maintain the ecosystem and ecological balance for

the environment.

Duration and Dates of Assignment (including travel):

October 3rd to October 12th 2015

Executive Summary:

Bangladesh economy received an important strength from agriculture sector. The agricultural sector contributes substantially to GDP and employs 50% of the labour force. The crop sub-sector alone accounts for 60.83% share of agricultural GDP. Pests and Diseases have become a major constrains for crop production (Mondal, 2010). This assignment aims to work jointly with Bangladesh Agricultural University (BAU) reaching vegetable and fruits farmers in order to identify main pest & diseases affecting their crops. Considering the crop production system adopted work on suggestion to reach a more economical and sustainable production optimizing local resources, amplifying the resilience of growers, enriching their diets and quality of life.

Reference cited: Mondal, MH. 2010. Crop Agriculture of Bangladesh: Challenges and Opportunities. Bangladesh J. Agril. Res. 35(2): 235-245

Background and Host Organization Profile:

Bangladesh Agricultural University (BAU) is the largest and most important agricultural school in Bangladesh. It is located in the district of Mymensingh approximately two hours drive from the capital Dhaka. BAU is working together with NGOs with unprivileged farmers (indigenous groups) in rural Bangladesh and are seeking a senior scientist in the field of plant health to conduct training sections on pests & diseases affecting vegetables and fruits and support the identification of causal agents. A diverse number of crops have been promoted among the farmers in order to enhance their diet based mostly in rice. Additional surpluses of production could generate an extra income by selling the production on local markets.

In-Country:

1. Meet with local coordinator, host (Bangladesh Agriculture University) and project personnel.
2. Meet with association and farm members to discuss plans for organic production.
3. Review strategy for organic production and provide recommendations.
4. Meet with members of the Ministry of Agriculture, appropriate farming leaders and agricultural institutes who are interested in organic production.
5. Develop topics on organic production.
6. Give advice and recommendations to association members regarding organic production of grapes, potatoes, wheat, orchard fruits and oil seeds.
7. Educate association members in organic pest control and other aspects of organic production systems.
8. Advise association members on marketing techniques for associations.

At the end of the assignment, a volunteer will be required to write a Final Report with recommendations. The Final Reports re extremely important, because they will not only be used by the host organizations to carry on their reform efforts, but will also be used by VEGA to

modify and refine our activities and by USAID to measure the quality of its activities. For this reason it is essential that the Final Reports contain all necessary information and adhere to the appropriate format (to be provided upon volunteer's arrival).

Beneficiaries:

- | | | | |
|----|--------------------------------|----|------------------------------|
| a. | Direct beneficiaries: female | b. | Direct beneficiaries: male |
| c. | Indirect beneficiaries: female | d. | Indirect beneficiaries: male |

Expected results/impact:

Organic producer associations will make progress towards the development of organic systems. Their efforts to produce will be successful and lead to larger and larger volumes. The concept of organic production systems will be better understood by producers and consumers as a result of the assignment. Furthermore, Macedonian producers will be encouraged to produce organically and exploit local and export markets for organic produce.

Host:

Bangladesh Agriculture University (BAU)'s objective is to improve the lives of those the program is targeting. One way of achieving this objective is by complementing donor and government support to BAU through self-help efforts such as organic vegetable farming initiative. The expert volunteer is expected to train BAU staff in intensive vegetable farming, crop planning and rotation soil treatment such as the use of manure and compost, and the use of lime to enrich the soil to increase yields. The volunteer has also been requested to help these farmers learn how they can improve crop production, increase income and at the same time attain positive nutritional outcomes for their households.

Assignment Tasks–

Before leaving the US: The volunteer is encouraged to research information on integrated pest management, insect pests, supplies and materials needed etc. Photos, slides and videos clips showing insect pest and disease in vegetable production would be helpful, keeping in mind that the majority of those who will participate in this training are either semi-illiterate, or illiterate. TSU-VEGA project design assignments with the assumption of some pre-departure preparation by the volunteer. Actual preparation time will vary, based on the experience of the volunteer, as well as access to information or training resources of the volunteer. TSU relies on the volunteer to assess the tasks outlined in this SOW and to make his or her own judgment about how much and what kind of preparation is needed prior to arriving in Bangladesh.

The use of videos, PowerPoint presentations and hands-on activities to emphasize main points is strongly recommended during the assignment. These should be prepared, as much as possible, in advance of the assignment.

**Please note that if the volunteer identifies any specific materials necessary for the implementation of an assignment, he/she must first receive approval from TSU Project Coordinator prior to departure*

Major tasks of the assignment are as follows:

Date	Day	Activities	Place of activities	Night
03 October 2015	Saturday	Leave from, San Juan, PR, USA	-	Boro Hotel
04 October 2015	Sunday/Monday	Process Visa Fee	Bangladesh NYC consulate	Boro Hotel
05 October 2015	Monday	Departure NYC	JFK airport, NYC	
07 October 2015	Wednesday	Arrival on Dhaka at 8.40 am	Dhaka	
07 October 2015	Wednesday	Meeting with BAU	Morning	Mymensingh
		Travel to Mymensingh	Morning	
07 October 2015	Wednesday	Meeting with Dr M Ashraful Islam	BAU	Mymensingh
08 October 2015	Thursday	Training in Dhobaura Upazila, Mymensingh	Dhobaura	Mymensingh
09 October 2015	Friday	Training in Haluaghat Upazila, Mymensingh	Haluaghat	Mymensingh
10 October 2015	Saturday	Visit Horticulture farm and BAU	BAU and leave for Dhaka by the afternoon	Dhaka
11 October 2015	Sunday	Review the activities and Leave for USA	Dhaka	NA
12 October 2015	Monday		USA	NA



End of Assignment Report

Assignment 9: *Record the important pest and diseases of fruits and vegetables and their integrated management*

Volunteer: Jose Carlos Verle Rodrigues, Ph.D.

Dates: October 3-12, 2015

TSU-VEGA project: 'Issues and Challenges in Sustainable Agricultural Research, Extension and Education for farmers in Bangladesh'

Institution: University of Puerto Rico, Agriculture Experimental Station, 1193 Guayacan St, Botanical Garden South, San Juan PR 00926, USA
Host Information:

Host Organization Name: Bangladesh Agricultural University (BAU)		Address: Department of Horticulture Faculty of Agriculture Bangladesh Agricultural University Mymensingh 2202 Bangladesh	
Email Address:	ashrafulmi@bau.edu.bd	Website:	http://www.bau.edu.bd
Primary Contact Name: Dr M Ashraful Islam		Secondary Contact Name: Subrato Kumar Kuri s_kuri@bau.edu.bd	
Cell phone: +8801716807130 Phone (office): +880 91 66401-6 ext. 6479 Fax: +880-91-61510		Cell Phone: +880-1716-779829	
Title: Associate Professor		Title: Assistant Professor	
Gender: Male		Gender: Male	
Host Type: Public Sector, Academia, University			
Have we worked with this host before? No			

Number of Persons Directly Assisted

Location Group 1 (Oct 8th) – Saluatala Village

Directly Assisted:

Female = 17 Male = 6 Total = 23

Location Group 2 (Oct 9th) – Rangrapara Village, Haluaghat

Directly Assisted:

Female = 11 Male = 5 Total=15

Location Group 3 (Oct 10th) – Telki Village, Modhupur, Tangail

Directly Assisted:

Female = 13 Male = 8 Total = 21

Total Farmers = 59

NGO – Caritas – Total = 9

Seminar on Pest and disease of tropical crops on Oct 11th at Depto. Horticulture (BAU) = 34

Total Number of Persons Trained: 102

Objectives

1. Identify and record the important pest and diseases for the commonly cultivated fruits and vegetables in Bangladesh
2. Integrated pest management (IPM) strategy development for promoting information exchanges among the stakeholders and produce safe food production.
3. Also, selections of variety that are resist against diseases and pests and maintain ecosystem and ecological balance for the environment.

During the interaction we were able to develop properly the objectives and in addition were able to discussed at a seminar on Pest & Diseases at BAU- Horticulture Department some aspects of main challenges on working on tropical crops concerning pest and diseases management.

Scope of work

Identify the important pests and diseases for the fruits and vegetables, also know the way to reduce their emergence to the crop through identify the host of pests and application of IPM. Awareness of safe food production, reduce the cost of production and free from health hazard due to not application of chemical pesticides, maintain the ecosystem and ecological balance for the environment.

Duration and Dates of Assignment (including travel):

October 3rd to October 12th 2015

Executive Summary:

Bangladesh economy received an important strength from agriculture sector. The agricultural sector contributes substantially to GDP and employs 50% of the labour force. The crop sub-sector alone accounts for 60.83% share of agricultural GDP. Pests and Diseases have become a major constrains for crop production (Mondal, 2010). This assignment aimed to work jointly with Bangladesh Agricultural University (BAU) reaching vegetable and fruits farmers in order to identify main pest & diseases affecting their crops. Considering the crop production system adopted work on suggestion to reach a more economical and sustainable production optimizing local resources, amplifying the resilience of growers, enriching their diets and quality of life. We were able to reach 59 farmers divided on three groups and working on a hands-on participative approach we were able to help farmers identify the major pest and diseases groups that were limiting their crop production. (SEE APENDICE)

Reference cited: Mondal, MH. 2010. Crop Agriculture of Bangladesh: Challenges and Opportunities. Bangladesh J. Agril. Res. 35(2) : 235-245

Background and Host Organization Profile:

Bangladesh Agricultural University (BAU) is the largest and most important agricultural school in Bangladesh. It is located in the district of Mymensingh approximately two hours drive from the capital Dhaka. BAU is working together with NGOs with unprivileged farmers (indigenous groups) in rural Bangladesh and was seeking a senior scientist in the field of plant health to conduct training sections on pests & diseases affecting vegetables and fruits and support the identification of causal agents. A diverse number of crops have been promoted among the farmers in order to enhance their diet based mostly in rice. Additional surpluses of production could generate an extra income by selling the production on local markets.

Major tasks of the assignment were as follows:

Date	Day	Activities	Place of activities	Night
03 October 2015	Saturday	Leave from, San Juan, PR, USA	-	Boro Hotel
04 October 2015	Sunday/Monday	Process Visa Fee	Bangladesh NYC consulate	Boro Hotel
05 October 2015	Monday	Departure NYC	JFK airport, NYC	
07 October 2015	Wednesday	Arrival on Dhaka at 8.40 am	Dhaka	
07 October 2015	Wednesday	Meeting with BAU	Morning	Mymensingh
		Travel to Mymensingh	Morning	
07 October 2015	Wednesday	Meeting with Dr M Ashraful Islam	BAU	Mymensingh
08 October 2015	Thursday	Training GROUP 1 in Dhobaura	Dhobaura	Mymensingh

		Upazila, Mymensingh		
08 October 2015	Thursday	Training GROUP 2 in Dhobaura Upazila, Mymensingh	Dhobaura	Mymensingh
09 October 2015	Friday	Training GROUP 2 in Haluaghat Upazila, Mymensingh	Haluaghat	Mymensingh
10 October 2015	Saturday	Visit Horticulture farm and BAU Seminar	BAU	Dhaka
11 October 2015	Sunday	Visit WinRock, and Leave for USA	Leave for Dhaka by the afternoon Dhaka	NA
12 October 2015	Monday		USA	NA

Future impacts as anticipate as a result of this assignment.:

Pest and diseases are a major force that can affect negatively the crop production on the region. There is an immediate need to better identification and characterization of pathogens, their vectors and main pest that are already limiting plant yield.

Farmers, extension personal, NGO and students are more aware of the importance of plant pest & diseases now and should consider this awareness when planning their future work.

Recommendations for follow-up activities based on the assignment

1. Development strategies to catalog and characterization of the current main pest and diseases affecting the main fruits and vegetables on the region

2. Develop plant integrated health program for the main potential crops that would have the dual function of improve farmers' diet and local food security as well a reliable source of income.

3. Established a ranking of the main crops that could be promoted on the distinct regions. These efforts should be conducted involving the farmers and based on the ecological potential for each crop, region and marked and logistic facilities.



Scope of Work

Assignment 10: *Sustainable marketing for organic production*

Volunteer name: Dr. Prabode Illukpitiya, Assistant Professor, Tennessee State University

Assignment number: TSU-USAID-VEGA-02

Assignment dates: March 10-19, 2016

Project Title: Issues and Challenges in Sustainable Agricultural Research, Extension and Education for Women Farmers in Bangladesh

Overall Program Objective(s) and expected outcomes

The main objective of this project is to provide technical assistance in sustainable vegetable cultivation to women's groups, extension agents, faculty and small-scale farmers in Bangladesh. This will be achieved in collaboration with host institute (BAU). The information will be disseminated to enhance adoption of new and improved farming practices through training workshops, factsheets and a website.

Assignment period and length: March 10-18, 2016

The Objectives of the Assignment –

Bangladesh Agriculture University (BAU)'s objective is to improve the lives of those the program is targeting. One way of achieving this objective is by complementing donor and government support to BAU through self-help efforts such as organic vegetable farming initiative. The expert volunteer is expected to train BAU staff in intensive vegetable farming, crop planning and rotation soil treatment such as the use of manure and compost, and the use of lime to enrich the soil to increase yields. The volunteer has also been requested to help these farmers learn how they can improve crop production, increase income and at the same time attain positive nutritional outcomes for their households.

- a) Sustainable approach and production of organic food, which will be safe for the people.
- b) To build up a network among the safe food producers and build up a stable and improved marketing channel to encourage the producers as well as to get more economic return.

Assignment Tasks–

Before leaving the US: The volunteer is encouraged to research information on farmland management, intensive farming, rotational cropping, and soil treatment. Photos, slides and videos clips showing rotational cropping, farm layout, etc. would be helpful, keeping in mind that the majority of those who will participate in this training are either semi-illiterate, or illiterate. TSU-VEGA project design assignments with the assumption of some pre-departure preparation by the volunteer. Actual preparation time will vary, based on the experience of the volunteer, as well as access to information or training resources of the volunteer. TSU relies on the volunteer to assess the tasks outlined in this SOW and to make his or her own judgment about how much and what kind of preparation is needed prior to arriving in Bangladesh.

The use of videos, PowerPoint presentations and hands-on activities to emphasize main points is strongly recommended during the assignment. These should be prepared, as much as possible, in advance of the assignment.

*Please note that if the volunteer identifies any specific materials necessary for the implementation of an assignment, he/she must first receive approval from TSU Project Coordinator prior to departure

In-Country Activities: It is anticipated that the volunteer will train traditional farmers mainly women's group on assigned topics. The volunteer will produce a guide or fact sheet on marketing, farm business and planning along with an end of assignment report which will include recommendations for increased profitability that can be easily adapted.

Post-Assignment Activities: Upon the volunteer's return to the U.S., the volunteer is encouraged to discuss his or her Farmer-to-Farmer (F2F) assignment in Bangladesh and the U.S. government's initiatives in assisting nations in need around the world. At least two outreach events upon returning to the United States are requested, and the results should be communicated to Dr. Dilip Nandwani (dnandwan@tnstate.edu).

GENERAL INFORMATION

Volunteer Requested:	Agriculture Economist
Project Name:	Organic vegetable production # 223126
Country:	Bangladesh
Best Dates for Volunteer Visit:	Feb.-March 2016

Scope of work

The Bangladesh Project assists agricultural producer associations across Bangladesh. Over the past years, USAID has helped strengthen small private agricultural associations through small business activity grants and technical assistance. Recently, there has been increased interest in Bangladesh for organically produced food products. Most of the enthusiasm has been generated by the Ministry of Agriculture and a few progressive farms, entrepreneurs and associations. The Government and local farmers believes that the environmental conditions in Bangladesh, the demand for organic produce from in and out of country and the impending economic opportunities of Bangladesh with the neighboring countries represent an export opportunity for producers in the medium to long term.

This volunteer assignment proposes to help some of the first producers of organic products develop and market small crops of orchard fruits, wheat, grapes and potatoes, and develop a strategic plan for the organic production system. This assignment will be hosted by the most advanced of these associations. The volunteer will also meet at least two other associations interested in producing organically. Finally, the volunteer will lead a conference to discuss organic production systems and opportunities to the public.

Large-scale production of organic produce has not occurred because of a lack of market for organic products. While Bangladesh consumers are becoming more and more health conscious, and sensitized to environmental concerns and food safety issues, low purchasing power of consumers and high production costs are a deterrent to large-scale production. Nevertheless, several entrepreneurs are starting small-scale organic production in a number of crops: potatoes, grapes for wine, wheat, sunflower seeds, other oil seeds and orchard fruits. Others are doing organic gathering of mountain herbs and fruits for drying and export.

This project has helped entrepreneurial organic producer associations in the past. Organic production is more complex than most types of farming and frequently involves complex methods of crop rotation, organic pest control and the cultivation of symbiotic crops to fix the soil. The host is one of several small organic producers and entrepreneurs with an interest in organic production, and has a general understanding of organic systems that the volunteer will strengthen.

EXPECTED RESULTS OF THE ASSIGNMENT

- Improved production of vegetable crops cultivated on training farms
- Students and teachers exposed to best practices in agricultural production, organic methods and principles.
- Workshops conducted to share best practices with the farmers and industry
- End of assignment Report with specific recommendations

RELEVANT PROJECT STRATEGY INDICATORS

- Number of participants attending workshops
- Increase in Produce quality
- Increase in Volume of production

Organization plans/goals:

The associations and the Bangladesh public at large will learn more about organic production. The host and other organic producers will develop a strategic plan and system for small-scale organic product. The host and others will learn techniques in organic pest control and other aspects of organic production systems as they pertain to orchard fruits, and vegetables.

1. Meet with appropriate US AID project personnel.
2. Meet with association and farm members to discuss plans for organic production.
3. Review strategy for organic production and provide recommendations.
4. Meet with members of the Ministry of Agriculture, appropriate farming leaders and agricultural institutes who are interested in organic production and marketing.

5. Develop topics on agricultural marketing.
6. Advise association members on marketing techniques for associations.

At the end of the assignment, a volunteer will be required to write a Final Report with recommendations. The Final Reports re extremely important, because they will not only be used by the host organizations to carry on their reform efforts.

Beneficiaries

- | | |
|--------------------------------------|-------------------------------------|
| a. Direct beneficiaries: female 10 | b. Direct beneficiaries: male 20 |
| c. Indirect beneficiaries: female 50 | d. Indirect beneficiaries: male 100 |

Expected results/impact:

Organic producer associations will make progress towards the development of organic systems. Their efforts to produce will be successful and lead to larger and larger volumes. The concept of organic production systems will be better understood by producers and consumers as a result of the assignment. Furthermore, Macedonian producers will be encouraged to produce organically and exploit local and export markets for organic produce.

Volunteer:

Assignment date: March 9-18, 2016

Host Contact

Dr. Md. Ashraful Islam
Associate Professor and Coordinator
Department of Horticulture, Faculty of Agriculture
Bangladesh Agricultural University
Mymensingh 2202
Bangladesh

Phone (office): +880 91 66401-6 x 6479

Fax: +880-91-61510

E-Mail: ashrafulmi@bau.edu.bd

The host institution of the project is Bangladesh Agriculture University (BAU) and local coordinator is Dr. Ashraf Islam, Associate Professor at Faculty of Agriculture.

Tennessee State University Contact

Dr. Dilip Nandwani
Associate Professor (Organic Agriculture)/Principal Investigator
College of Agriculture, Human and Natural Science,
Tennessee State University, Nashville, TN
Phone: 615-963-1897
E-Mail: dnandwan@tnstate.edu

Host Institute (Bangladesh Agriculture University) Background

Bangladesh Agricultural University (BAU) will be host institute for the project. Horticulture Professor Dr. Ashraf Islam and his team will assist PI in implementing the project, coordinate training workshops and make logistic arrangements for the US volunteers. BAU will be sub awarded to organize training workshops, provide facilities, field visits, accommodation for the participants (farmers) and demonstration on their Horticulture farm. BAU is planning to establish a demonstration site for young organic entrepreneurs on their farm. The participating farmers would benefit from the training workshops proposed in this proposal. To compensate their time spent and use of facilities, BAU will be contracted to assist and organize ten training workshops for the experts/volunteers. *Bangladesh Agricultural University* (BAU) is the leading agricultural research institution in Bangladesh. Current research program in horticulture is focused on sustainable vegetable production, food security, organic farming practices and training farmers, students and extension agents. Horticulture Department is one of the important departments of the total 43 departments at BAU which offers Masters and PhD degree programs. It conducts applied research and giving emphasis on organic production techniques for safe and healthy produce considering excessive use of chemical fertilizers. Horticulture department is collaborating with Plant Pathology and Entomology departments and conducting research in integrated pest and disease management of fruits and vegetables such as application of fertilizers and pesticides for crop production. Horticulture department has a germplasm center, where fruits and vegetables accessions are screened and maintained. Postharvest research is conducted in crops to extend the shelf life and quality. Also, pond dyke vegetable production is performing to make awareness of the nutritional value.

To continue and strengthening the above mentioned research, BAU need technical assistance in the areas as described in the scope of work for ten volunteer assignments. The ten assignments identified are in areas in high demand from the host institution to deliver training for women's groups, farmers, and faculty to build their capacity in production agriculture, food safety, nutritional awareness, and create opportunities to improve quality of life of the people of Bangladesh.

Volunteer Qualifications

- Must have a university degree in agriculture, ag economics, marketing or related with extensive knowledge in post- harvest management of fruits and vegetables, food safety, marketing.
- Must have at least five years' technical experience in agriculture economics.
- Must have previous experience with training groups in developing countries. Experience working with women's groups, or groups of illiterate farmers preferred.
- Must be computer literate, capable of working in MS Word and PowerPoint.

Anticipated Work Schedule-

- Days 1: Volunteer will be picked up from the airport and given a local cellphone for use while in Bangladesh. Meet with BAU office staff and assignment host for briefing.
- Day 2: Travel to Mymensingh to meet with host organization and discuss workshop schedule.

- Days 3-7: Conduct training
- Days 8: Completes final report;
- Days 9: Debriefed
- Day 10: Departs for home

Beneficiaries

(Anticipated – To be confirmed by volunteer during assignment)

- a. Direct beneficiaries: female b. Direct beneficiaries: male
- c. Indirect beneficiaries: female d. Indirect beneficiaries: male

Financial Information for Calculating Volunteer Travel Advance

- a. Lodging: # of days in Dhaka or Mymensingh; 9x US\$80.0 for hotel
- b. M&IE: # of days in Mymensingh; 9x\$70.0 (US\$630.0)

Above are approx. numbers and actual will be calculated by Business office, TSU after return and submission of expense report by volunteer. Visa fee (\$160.0) for US Citizens. E-ticket will be provided few days prior to travel.

Assignment Logistics

This assignment will take place in Mymensingh, near Dhaka. The volunteer will be lodged at University guest house or a hotel, few minutes' drive away from the project site. Guest house and has electricity, internet, restaurant and running water available.

Materials recommended for the assignment

- Personal prescriptions (sometimes it is difficult to find certain drugs in country)
- Personal laptop with spare battery
- All weather shoes or boots
- Anti-malaria medication
- Sacs of oral rehydration salt (also available locally)
- Antibiotic
- Disinfectant
- Pain killer (can be purchased in Dhaka)

*Many of these items listed can be purchased in Dhaka but there may be quality and price differences.



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FROM THE AMERICAN PEOPLE



Prabode Illukpitiya Farmer-to-Farmer Program Asia F2F

End of Assignment Report

Assignment 10: *Sustainable marketing for organic production*

Volunteer name: Dr. Prabode Illukpitiya, Assistant Professor, Tennessee State University

Assignment number: TSU-USAID-VEGA-02

Assignment dates: March 10-19, 2016

Name of host(s): - Bangladesh Agricultural University (BAU) and Caritas Bangladesh

Number of Persons Directly Assisted

Female: - 05

Male: - 16

Youth: - 0

Number of Persons Trained

Female: 05 (total of 3 days)

Male: 16 (total of 3 days)

Youth: none

Please answer the following questions in as much detail as you think is necessary.

- What were the **objectives** of your assignment? What assistance did your host request? *(Please note any changes made in your scope of work during your assignment.)*

The objectives of the assignment include: Sustainable approach and production of organic food, which will be safe for the people, introduce for the adoption of organic production technology of crops and find out the approach which will be a long term basis for sustainable production and hazard free environment, to build up a network among the safe food producers and build up a stable and improved marketing channel to encourage the producers as well as to get more economic return.

Under the theme of "Supporting farmer driven organic business ventures", the specific areas covered include agricultural technology in organic farming, entrepreneurship development, business planning & marketing of organic produce and sustainability issues.

- What **activities and assistance** were parts of your assignment? Who was involved? What topics were addressed? *(Details regarding any materials that were developed, the number of people trained, the organizations that participated in your programs or that you met with, etc., are all very important.)*

Activities include formal presentations, group discussions, and individual discussions. Materials used include powerpoint presentations, enterprise budgets, pictures, diagrams. Powerpoint presentations will be shared with participants. Total number of people trained was 21 which include 5 female participants. Participants were from non-governmental organization called Caritas Bangladesh and most of them were field level officers. During the three day long intensive training, topics covered under the above assignment include technology innovations in organic agriculture, entrepreneurship development, issues and trends in agriculture and importance of business planning and marketing issues in organic produce. In order for participants to learn the nature of farmer training conducted in USA, I also presented our experiences in conducting farmer demonstrations. Presentations were translated into Bengali Language. There were live interactive sessions among participants and between participants and the trainer. Certificate was awarded for participants (see below the format of certificate).

- What **significant recommendations** did you make to the host? (*USAID requires that we collect significant recommendations made to the host for reporting purposes. At the time of a follow-up survey with the host, we will collect information as to which recommendations were adopted.*)

The recommendation include: explore opportunities available to build few start-up businesses around organic agriculture sector (organic inputs, marketing channels etc) in Mymensingh, BAU to develop entrepreneurship development for farmers to become leaders that would help adaptation to new technology, assist farmers/trainers with requirements, consumer survey to gather information on consumer attitudes and market potential for organic produce. Continuous training for farmers and field level officials are highly recommended to achieve long term success.

- Did you observe any **improvements or impacts** with respect to the objectives and expected results outlined in your assignment scope of work? (This can include new attitudes observed, immediate changes put in place, etc.). Please explain.

There was an interest and positive attitudes among trainees. Trainees requested to expose them for continuous similar programs in future; there is a motivation to enter into organic business if external support is available.

- What **future impacts** do you anticipate as a result of your assignment? (*Please explain and list ways in which you think the results of your assignment can be measured 6 months from now.*)

Stakeholders will explore opportunities for developing locally based micro-enterprises around organic agriculture, interest in entrepreneurship development, and adaptation to simple technology i.e (planning via enterprise budgets for agricultural operations) think of formal business and marketing plan preparation in agribusinesses (in university courses), action on sustainable agricultural practices.

- Drawing on your volunteer experience, please provide us with any **recommendations for follow-up activities** to build on your assignment (e.g., things that USAID-VEGA or TSU can do to further support the host).

Establishment of demonstration organic farms, provide selected motivated farmers with field

torus to explore them to organic farming (locally and abroad), design long term project to assist farmers, focus on few practically oriented activities related to most important emerging needs for organic farmers or beginner farmers, market survey to identify target markets and potential venues for sale of organic produce.

- What effect did your assignment have on you personally and/or professionally (for example, new knowledge, contacts, etc.)?

Experience in smallholder farming sector in Bangladesh, networking among faculty, researchers and other professionals in Bangladesh, enhance understanding on priority areas in developing agriculture sector in Bangladesh, better understanding of conducting workshops for field level officers.

- Did you do any **outreach** activities (e.g., blog post, Facebook post, photo sharing, interviews with local media, etc.) while you were in country? If yes, please explain. If no, please explain planned activities for when you return to the US.

Yes, photo sharing, reporting and discussing the training workshops conducted in Bangladesh. Planned activities after returning to US include sharing the experience with faculty, students, public etc. Plan to share the Farmer to Farmer program information with other stakeholders in my research projects and publish via newsletters.





9. Please also write a **personal letter to your host**. This letter will be translated (if needed) and delivered to your host. *Please use the attached letter template.*

I would like to thank me for the opportunity to meet with you, learn situation of the farming practice and entrepreneurship . I really enjoyed the training of trainers (ToT and delighted with your wonderful hospitality. I am very impressed with your current knowledge, analytical thinking, and potential for acquiring more information.

Very happy to hear positive feedback that you found the training very useful. Thank you again for the opportunity to share my knowledge and I wish you the very best in growing healthy vegetables and make a business in the country with a healthy manner.

Sincerely,
Prabodh

FOR BAU LOCAL COORDINATOR USE ONLY:

Please provide a total and also list Consolidated Volunteer Recommendations below, by host. (If there are different recommendations for different hosts, please add a separate section for each host).

Host Name: Dr. Md. Ashraful Islam

Total # of Economic Recommendations: 04

Volunteer Recommendations - Economics:

- *Plan to develop the organic farming of vegetables for the safe food production*
- *Make a plan or build up the collaboration with government to get the premier price for the organic production*
- *Build up the capacity for the entrepreneurship of organic products*
- *Influence the society to organic production for the safety and health issue of next generation*

Total # of Organizational Recommendations: 04

Volunteer Recommendations - Organizational:

- *Improve the land for organic production*
- *Let's discuss for the organic certification*
- *Develop the value chain of organic products in Bangladesh*
- *Some institute or organization should be involved to make easy of the whole procedure of business*

Total # of Financial Recommendations: 0

Volunteer Recommendations - Financial:

-

Total # of Environmental Recommendations: 0

Volunteer Recommendations - Environmental:



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3500 John A. Merritt Boulevard, Nashville, TN 37209
Office: (615) 963-1897, Email: dnandwan@tnstate.edu, Fax: (615) 963-5436

04/27/2016

To:

Laura Alexander, Director
USAID-VEGA
Washington DC

Re: Persuap certifications

Dear Ms. Alexander,

Please find attached below Persuap certifications from Tennessee State University for USAID-VEGA project.

M & E CERTIFICATION (STANDARD LANGUAGE)

Tennessee State University (TSU) confirms that we have: a) used established indicators and definitions; b) participated in regular (annual) workshops reviewing indicators and M&E systems; and c) trained field staff on indicators and data collection systems. The above mentioned training sessions include extensive instruction in the collection and reporting of indicators.

BACKGROUND CHECK COMPLIANCE (STANDARD LANGUAGE)

Per GAO recommendation, TSU is conducting reference checks on volunteers. This confirms that TSU:

- Does not engage in transactions with, or provide resources or support to, individuals and organizations associated with terrorism, including those individuals or entities that appear on the Specially Designated Nationals and Blocked Persons List maintained by the U.S. Treasury or the United Nations Security designation list. All potential volunteers are screened against these and other watch lists and this provision is included in all sub-agreements, including sub-awards and contracts issued under the F2F award.
- Carries out at least two reference checks on all potential first time F2F volunteers in addition to other required screening and carries out reference checks on all repeat F2F volunteers with regard to prior F2F assignments, and additional external references if no F2F assignments have been completed within the past 24 months.
- Immediately informs the USAID AOR of any negative F2F volunteer performance or behavior and provides information on such performance or behavior experiences to other F2F implementing organizations when contacted for reference checks on potential volunteers.

PERSUAP COMPLIANCE (TEMAPLE)

I. PERSUAP Implementation Experience – F2F Assignments:



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Over the period covered by this report, the project has had experience in implementing the F2F PERSUAP, as reflected in the PERSUAP table below. This table lists all Type 1, 2, and relevant Type 4 volunteer SOWs that have been completed during the reporting period. Summaries of the volunteer assignment with a general description of activities with pesticides, key findings and recommendations on limitations/successes of F2F PERSUAP, and any recommendations to F2F for additional support needed to improve pest and pesticide management practices are found in the attachment summarizing volunteer assignments during the reporting period. All assignments not listed in this table are Type 3 assignments or Type 4 assignments that fall within the Type 3 category.

PERSUAP Reporting Table

Assignment (Trip) Number	Volunteer Name	Country	Country F2F Project	PERSUAP Assignment Type	Work Directly with USAID Mission or Mission-funded Project (Type 4) – Check for Yes	Training Syllabus Sent to F2F AOR/ Mission Environmental Officer (Type 1) – Check for Yes	Training Attended by USAID (Type 1) – Check for Yes
#4	Usha Palani swamy	Bangladesh	Bangladesh	II	No	No	No
#8	Surendra K. Dara	Bangladesh	Bangladesh	II	No	No	No
#9	Jose Carlos Verle Rodrigues	Bangladesh	Bangladesh	II	No	No	No
Counts	3						

Regional program, country program, or country project area assignments or SOWs in IPM and pesticide safer use: The following volunteer SOWs in IPM and pesticide safer use were undertaken for the F2F regional program, country program, or country project area as a whole. These differ from the individual assignments addressing pesticide use with specific hosts, which should be included in the table above.

(none)

Needs for a PERSUAP amendment: The following needs for a PERSUAP amendment to add pesticides were identified during the reporting period.

(None)

II. Certifications of assignment and office compliance with PERSUAP guidelines:

A. PERSUAP Compliance – F2F Assignments

This certifies that all volunteers have received the F2F Environmental Brochure. For all PERSUAP Type 1, 2 and relevant Type 4 SOWs, and further certifies the following have been provided to and developed by the relevant volunteers:



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	Type 1 SOWs ²	Type 2 SOWs ²
Provided to Volunteer	<ul style="list-style-type: none"> · F2F PERSUAP with Attachments A - H · SUAP briefing with F2F field staff · Implementing Partner F2F PERSUAP Questionnaire · List of any IPM practices and any tools, forms, protocols, plans from previous volunteers · Host country list of approved pesticides · Approved pesticide list from any other applicable PERSUAPs 	<ul style="list-style-type: none"> · F2F PERSUAP with Attachments B, C, F, H · SUAP briefing with F2F field staff · Implementing Partner F2F PERSUAP Questionnaire · List of IPM practices from previous volunteers
Developed/ Provided by Volunteer	<ul style="list-style-type: none"> · Syllabus for training event · Material Safety Data Sheets (filed in field office) · Any pesticides that the F2F program should be able to recommend/use which are included on an approved list · Limitations/successes of F2F PERSUAP · Recommendations for additional support on pesticide management practices · Recommendations/feedback on local IPM practices · Highly Toxic Pesticides (Attachment E)/poor pesticide practices witnessed · Tools, forms, protocols, plans for implementation of pesticide-related recommendations 	<ul style="list-style-type: none"> · Limitations/successes of F2F PERSUAP · Recommendations for additional support on pesticide management practices · Recommendations/feedback on local IPM practices

B. PERSUAP Compliance – F2F Offices

This certifies that all F2F staff have reviewed the F2F Environmental Brochure for staff the fiscal year and that the following have been updated and kept on file:

	Home Office	Field Office
Documents Updated and on File	<ul style="list-style-type: none"> · F2F Environmental Brochure for staff · PERSUAP with Attachments A-I · Any USAID Mission- or sector-wide PERSUAP(s) for relevant country/sector 	<ul style="list-style-type: none"> · F2F Environmental Brochure for staff · PERSUAP with Attachments A-I · USAID Mission- or sector-wide PERSUAP(s) for relevant country/sector · Host country list of approved pesticides³ · Implementing partner F2F PERSUAP Questionnaire, with any volunteer additions · Material Safety Data Sheets for relevant pesticides⁴ · Tools, forms, protocols, plans developed by volunteers

Dilip Nandwani
 Dilip Nandwani, PhD
 Project Coordinator, USAID-VEGA

Farmer-to-Farmer Program Standard Indicator Reporting Tables

Table 2: Host Data (Baseline)

Host	Country	Country F2F Project	Date of Baseline Assessment	Potential Beneficiaries						Economic Indicators			Environmental Indicator	Financial Services Indicators		Organizational Indicator
				Host Gender	Institution Type	Members/Owners	Employees	Clients & Suppliers	Family Members	Total	Area of Potential Production Influence (ha)	Annual Gross Sales (Revenue) (US\$)	Annual Net Income (US\$)	Area Potentially under Improved Environmental/ Natural Resource Management (ha)	Annual Value of Rural/ Agricultural Lending (US\$)	Number of Rural/ Agricultural Loans Issued Annually
Fiscal Year																
Bangladesh Agriculture University	Bangladesh	Organic farming	5/4/2015	N/A	E	-	550	-	1,980	2,530						
CARITAS	Bangladesh	Organic farming	5/4/2015	M	N	-	116	-	418	534						
	2	2	Total:				666		2,398	3,064						

Farmer-to-Farmer Program Standard Indicator Reporting Tables

Table 4: Outreach and Leverage

Implementing Partner Name	Fiscal Year	Number of Press Releases	Number of Media Events	Number of Group Presentations	Total Number of Outreach Activities	Value of Resources Leveraged by Grantee and Volunteers in the U.S. (U.S.\$)
USAID/VEGA/TSU	FY15	10	8	69	87	€ 47,940

Farmer-to-Farmer Program Standard Indicator Reporting Tables

Table 2: Host Data (Baseline)

Host	Country	Country F2F Project	Date of Baseline Assessment	Potential Beneficiaries								Economic Indicators			Environmental Indicator	Financial Services Indicators		Organizational Indicator
				Host Gender	Institution Type	Members/Owners	Employees	Clients & Suppliers	Family Members	Total	Area of Potential Production Influence (ha)	Annual Gross Sales (Revenue) (US\$)	Annual Net Income (US\$)	Area Potentially under Improved Environmental/Natural Resource Management (ha)	Annual Value of Rural/Agricultural Lending (US\$)	Number of Rural/Agricultural Loans Issued Annually	ODI Rating	
Bangladesh Agriculture University	Bangladesh	Organic farming	5/4/2015	N/A	E	-	550	-	1,980	2,530								
CARITAS	Bangladesh	Organic farming	5/4/2015	M	N	-	116	-	418	534								
	2	2	Total:				666		2,398	3,064								