AAEP

Afghanistan Agricultural Extension Project

UC DAVIS UNIVERSITY OF CALIFORNIA | PURDUE UNIVERSITY | WASHINGTON STATE UNIVERSITY | UNIVERSITY OF MARYLAND

Final Report
2011-2014

Prepared for

Prepared by Nicholaus Madden, James Hill, and Michael Whiteman, January 2015

USDA Primary Contact

- Michael McGirr

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ACRONYMS AND ABBREVIATIONS

AAEP	Afghanistan Agricultural Extension Project
AGRED	Afghan Agriculture Research and Extension Development Program
AVI	Herat Agriculture and Veterinary Institute
CBCMP	Capacity Building and Change Management Program
COP	Chief of Party
DAIL	Directorate of Agriculture, Irrigation and Livestock
DCA	Dutch Committee for Afghanistan
DCOP	Deputy Chief of Party
EC	Executive Committee
FFD	Farmer Field Demonstration
FFS	Farmer Field School
HED	Home Economics Department
IPM	Integrated Pest Management
KAVI	Kabul Agricultural and Veterinary Institute
MAIL	Ministry of Agriculture, Irrigation and Livestock
M&E	Monitoring and Evaluation
NGO	Non-Governmental Organization
PHDP	Perennial Horticulture Development Project
PMTF	Provincial Model Teaching Farm
SC	Steering Committee
UC Davis	University of California at Davis
USDA	United States Department of Agriculture
VEGA	Volunteers for Economic Growth Alliance
WIA	Women in Agriculture
WSU	Washington State University

EXECUTIVE SUMMARY

The Afghanistan Agricultural Extension Project (AAEP) was a 3-year, US$14 million program intended to build the capacity of the Afghan Ministry of Agriculture, Irrigation, and Livestock (MAIL) to deliver demand-driven extension services, primarily in four target provinces. The program was funded by the US Agency for International Development (USAID) and administered by the United States Department of Agriculture (USDA), and implemented by a consortium of four universities – the University of California Davis (UC Davis), Washington State University (WSU), Purdue University, and the University of Maryland. UC Davis served as the lead institution of the consortium. The consortium additionally contracted the Dutch Committee for Afghanistan (DCA) to implement the project's livestock programming. AAEP's contract under USDA expired on September 30th, 2014.

AAEP activities implemented by UC Davis took place in Balkh and Kabul, later adding secondary locations in Jowzjan, Samangan, Badakhshan, Panjshir, Parwan, and Kapisa. WSU was responsible for programming in Nangarhar, later adding activities in Laghman and Kunar. Purdue operated out of Herat, and also trained extension workers from Farah, Ghor, and Badghis. Finally, Maryland was responsible for the Women in Agriculture (WIA) program, which had activities in Kabul, Kapisa, and Samangan.

Aside from working in a particular geographic area, the consortium partners each specialized in a particular subject, with the intention of each partner providing trainings on that subject across the entire program. UC Davis focused on postharvest and protected agriculture; WSU focused on Conservation Agriculture; Purdue focused on Integrated Pest Management (IPM) and grain storage and; Maryland focused on Women in Agriculture (WIA). Trainings and demonstrations were provided across programming areas by permanent program staff, as well as, experts brought from abroad.

The project developed an overall model of extension delivery that was adaptable to the Afghan context and capable of reaching a large number of farmers. Furthermore, the program provided a wide variety of trainings for extension workers in both technical skills and extension delivery. While few Afghan extension workers have significant experience with livestock, the program provided basic training in livestock care, and worked to create linkages among communities, extension workers, and private and public veterinary services. AAEP's work with women developed a network of community leaders who are skilled with organizing kitchen gardens that provide households with improved nutrition and supplementary incomes.

Components of the AAEP extension delivery model consisted of the following: thematic workgroups formed to facilitate communication within and across the agricultural community and to implement mini-fund projects; Provincial Model Training Farms (PMTFs) created in each target province where AAEP staff could demonstrate new techniques and technologies for extension workers and farmers, and where extension workers could practice those techniques; and Farmer Field Schools (FFSs) and Farmer Field Demonstrations (FFDs) created so extension workers trained at the PMTFs could provide the same trainings and demonstrations they had received for a group of farmers in the districts, who would then be able to duplicate new techniques themselves.

AAEP's achievements include:

Extension workers trained	355
Trainings provided	344
PMTF established	10
FFS established	185
FFD established	507
Workgroups operating	39
Mini-funds approved	26

In summary, AAEP was successful in building the technical and functional capacity of individual extension workers to operate through AAEP's well-adapted model. The program was also able to reach women in target areas who built sustainable community organizations. AAEP success was reflected in winning the 2014 USDA Secretary's Honor Award for Exceptional Service.

1. INTRODUCTION

1.1 PROGRAM OVERVIEW

AAEP was a 3-year US Agency for International Development (USAID) funded program administered by the US Department of Agriculture (USDA) and started in October 2011. The overall goal of the project was to help establish a functioning extension service in the DAILs and provinces that develops and delivers demand-driven extension programs through participation with farmers. The ultimate goal was to promote positive economic impacts. To work towards this goal, the AAEP strategy revolved around three complementary axes:

1. Developing the technical and outreach skills of extension workers through regular trainings based on the needs of the Directorates of Agriculture, Irrigation and Livestock (DAIL) provincial extension departments. These trainings combined a theoretical component with a practical component which was taught at the Provincial Model Teaching Farms (PMTFs) established in the province centers.
2. Better ensuring that these newly-learned techniques were imparted to farmers by enabling extension workers to set up Farmer Field Schools (FFSs) and Farmer Field Demonstrations (FFDs). With inputs provided by AAEP (seeds, tools, materials), extension workers were able to train and work with farmers, comparing traditional agriculture techniques with newer techniques.
3. Enhancing the communication of the extension department with all the stakeholders that should be involved in extension, such as businesses and universities. Extension workers were encouraged to form workgroups to discuss the needs of specific sectors (industrial crops like saffron or cotton, for example) in their province/districts. These workgroups could and did apply for mini-funds up to $5,000 to set up demonstration plots, organize trainings for farmers, and pilot activities intended to develop the sector.

The project was implemented by a consortium of four US universities – University of California at Davis (UC Davis), Purdue University, Washington State University (WSU) and the University of Maryland. While UC Davis was the consortium lead, each university was directly responsible for implementing activities in specific provinces and for being lead on a selected expertise for the overall program:

1. UC Davis implemented activities primarily in Kabul and Balkh provinces and was expertise lead on postharvest processing and protected agriculture.
2. Purdue University implemented activities primarily in Herat province and was expertise lead on Integrated Pest Management (IPM) and grain storage.
3. WSU implemented activities primarily in Nangarhar province and was expertise lead on Conservation Agriculture.
4. The University of Maryland implemented activities related to Women in Agriculture (WIA) primarily in Kabul.

Each program expanded beyond these primary sites to secondary provinces in their regions. In addition to the University-based expertise, the Dutch Committee for Afghanistan (DCA), contracted by the consortium, implemented activities related to livestock in the four primary provinces covered by the project.

2. PROGRAM ACTIVITIES

2.1 CONSORTIUM

2.1.1 ANNUAL EXTENSION CONFERENCE

AAEP Kabul organized two AAEP Annual Extension Conferences. The objective of these conferences was to showcase AAEP and MAIL/DAIL activities and to improve communication across the national extension community.

The first conference emphasized the concepts behind a demand-driven extension model and workgroups. Sixty participants from Kabul, Balkh, Nangarhar, Kandahar, Paktia, and Kunduz DAILs, as well as representatives from USDA, the US Embassy, Volunteers for Economic Growth Alliance/Capacity Building and Change Management Program (VEGA/CBCMP), Afghan Agriculture Research and Extension Development Program (AGRED), DCA and USAID attended the 3-day conference.

The second conference attracted more than 300 people from DAIL research and extension departments, Non-Governmental Organization (NGO) representatives, and AAEP staff. The conference showcased the work done by AAEP in different provinces and fostered dialogue among extension workers from around the country. Such outreach will be vital to expanding the use of the extension model developed through AAEP, but could be emphasized by providing participating DAIL staff with training materials, such as the conference posters, to ensure that knowledge is shared.

Following the completion of AAEP II, the USAID-funded three year extension of AAEP, MAIL will be unlikely to afford these conferences, especially if no budget line is allocated on-budget. In order to initiate discussion with MAIL in this regard, AAEP II will demonstrate the outcomes and impact of such conferences, starting with pre/post tests and satisfaction surveys at the end. Furthermore, AAEP II will track to what extent the conferences lead to knowledge sharing and collaboration within and outside AAEP provinces.

2.1.2 US STUDY TOUR

AAEP sponsored a study tour that took place from June 1st to June 21st 2014 for 19 participants, including representatives from MAIL, DAILs, and AAEP. The participants were for the most part high-level officials from the Ministry and staff from AAEP. The objective of the tour was for participants to understand the U.S extension system and to interact with extension experts on topics relevant to Afghanistan.

The tour was successful in accomplishing two goals – improving participants' understanding of the US extension system and having MAIL employees develop extension work plans for their respective provinces. While the tour certainly helped participants visualize what a working extension system could accomplish, implementing work plans developed during this program will be difficult for extension workers unless MAIL appropriates the resources necessary to carry them out.

2.1.3 PROJECT EVALUATION

In the fourth quarter of the project, AAEP contracted the services of Altai Consulting to conduct an external review of the project. This final report includes a significant number of observations, recommendations and analyses from the Altai evaluation. This Altai assessment has been and will continue to be invaluable to the design and planning phases of AAEP II. The input provided by Altai will also be critical as baseline data and will provide guidance in developing appropriate Monitoring and Evaluation methodologies in the follow-on phase of AAEP.

2.2 BALKH REGION

2.2.1 PROGRAM SUMMARY

PROGRAM HISTORY

Balkh was established as one of the three original program sites at AAEP's inception, with activities led by UC Davis. AAEP Balkh directly implemented activities in 6 districts out of the 15 in the province. In 2014, the program extended to Samangan, Jowzjan, and Badakhshan provinces.

Figure 1: Balkh Program Map

The Balkh program organized activities primarily through workgroups, who organized FFSs and FFDs in the districts. After the establishment of the PMTF, which came late in Balkh relative to other provinces, workgroups were able to begin to emulate demonstrations done by AAEP at the Dehdadi Farm. By the end of project, 37 extension workers had been trained in Balkh province and 51 additional extension workers had been trained among Samangan, Badakhshan, and Jowzjan provinces.

UC Davis activities included a specialization in postharvest processing. During the implementation of the project, UC Davis focused on wheat, saffron, cotton, viticulture and vegetables, demonstrating for example how to store and package apples, pomegranates and almonds. These specialties were defined after conducting focus group discussions, market surveys and farmer surveys.

(Left) Balkh DCOP David Frey compares the yield of 5 different paddy plots with different concentrations of seeds at the Balkh PMTF; (Right) Haji Fazel Waseq, AAEP's Farm Manager, explains the benefit of inter-cropping.

Figure 2: Balkh PMTF in Dehdadi

KEY ACHIEVEMENTS

The Balkh program encountered several roadblocks near the start of the program, and so was slower to begin some major activities than the program in other regions. While addressing initial issues, the program managed to implement training programs on specific subjects, and eventually overcame challenges and succeeded in setting up a PMTF, FFSs, FFDs, and workgroups in the districts.

AAEP Balkh's major achievement relates to the development of the workgroup structure. The Balkh team put workgroups at the center of activity design and implementation. Through the weekly extension meeting, the workgroup became the primary decision making mechanism, determining trainings for extension workers, choosing plots to be developed in the PMTF, assessing and communicating farm-level demand and determining the trainings and demonstrations that should be conducted in response. In comparison to other provinces, the workgroups

designed in Balkh included substantial input from the Extension Department, which instilled a sense of ownership for the primary beneficiaries. This model was subsequently emulated in the design of the Kabul program.

The Balkh program was particularly strong regarding coordination with other agriculture programs in the region. AAEP Balkh's partnership with the National Horticulture and Livestock Project (NHLP) created strong links between the two programs and allowed a bridge between AAEP's training mandate and NHLP's more implementation-oriented activities.

Finally, AAEP Balkh succeeded in rapidly replicating its model in other provinces to which it expanded. Because the model revolved around workgroups, AAEP Balkh was able to easily expand in other provinces since extension workers were directly involved in the design and implementation of activities.

Table 1: Balkh Region Achievements

Balkh, Samangan, Jowzjan and Badakhshan Provinces	
Balkh Province	
Extension workers trained	37
Trainings provided	42
PMTF established	1
FFS established	8
FFD established	17
Workgroups operating	5
Mini-funds approved	6
Samangan Province	
Extension workers trained	20
Trainings provided	7
PMTF established	1
FFS established	3
FFD established	7
Workgroups operating	4
Mini-funds approved	2
Jowzjan Province	
Extension workers trained	20
Trainings provided	11
PMTF established	1
FFS established	8
FFD established	2
Workgroups operating	5
Mini-funds approved	1
Badakhshan Province	
Extension workers trained	11
Trainings provided	13
PMTF established	1

2.2.2 PROGRAM ACTIVITIES

WORKGROUPS, FFDS AND MINI-FUNDS

From the beginning of the program, the workgroups were the primary activity carried out in Balkh province. Initially, the Balkh team began activities focusing on wheat and saffron. This decision was made following a survey of 22 farmers in Balkh, Dehdadi, and Khulm districts, combined with focus group discussions with extension workers, to understand the most critical agricultural challenges facing farmers. For each of these two activities, AAEP established a thematic workgroup with extension workers to design the activities of the program. The activities started with training of the extension workers. For example, extension workers with a basic knowledge of wheat received wheat production training before joining more experienced extension workers in wheat physiology training.

Through the life of the project, AAEP Balkh created five workgroups: Cereal, Orchard, Vegetable, Industrial Crop and Livestock. In comparison to other provinces, workgroups played a stronger role in the design and implementation of activities. First, while all extension workers expressed their training needs, workgroups were meant to be the final decision-making body to prioritize the trainings and the plots subsequently designed in the PMTF. Second, workgroups were directly involved in the planning, implementation and monitoring of the FFDs. FFDs were funded through the mini-fund program. Over the course of the project, AAEP approved six mini-fund projects in Balkh.

Box 1: Strawberry mini-fund project in Khulm district

Strawberries planted in Khulm district

In 2013, the Horticulture workgroup successfully applied for a mini-fund of $4,800 over the course of 5 months to train farmers on strawberry production best practices. The training covered key topics such as land preparation, strawberry seedling sanitization and seedling transplantation as well as the economic value of strawberries. 50 farmers were trained (25 male and 25 female) in two FFDs, where a total of 10,000 seedlings were planted.

In spite of partially flooding during the implementation of the project, the training was well received by the extension workers and trainees. Both groups acknowledged the value of growing strawberries in the district. Furthermore, AAEP staff designed strawberry plots in the PMTF (see picture on the right) in order to assist the workgroup in charge of the mini-funds.

Figure 3: Strawberry plots in Dehdadi PMTF

Extension workers established FFD locations through the workgroups. Each step of the establishment of the FFD (land preparation, weeding, harvesting, etc.) led to a specific, individual FFS provided to a group of farmers. FFD participants were often, but not necessarily, the same from one training to the next.

PMTF

The Balkh PMTF began operations in 2013, which was late compared to other key program sites. The delays stemmed from disagreement between the DAIL leadership, Research Department, and Extension Department regarding who had responsibility for the DAIL research farm. While the DAIL leadership and Extension Department were supportive of granting AAEP access to the land, the Research Department, which technically was responsible for running the farm but used it rarely, objected to the farm's use. During the period when the establishment of the farm was in doubt, AAEP conducted trainings directly in the FFDs. Once the dispute over the land concluded within the DAIL, the Balkh team took advantage of the assistance of Oumar Badini, Nangarhar DCOP, in the initial design and implementation of the PMTF.

The AAEP farm included 4.5 jeribs, on which the program demonstrated extended season crops, hoop houses, conservation agriculture, orchards, vegetables, and companion crops. The PMTF also included demonstrations related to mini-funds implemented through workgroups, such as strawberry cultivation.

The two stand-out activities demonstrated on the PMTF are the conservation agriculture corn plots and the hoop houses with polystyrene in-ground protection to extend harvest season through the winter. The technique as originally demonstrated, while effective, was considered too costly for most farmers to adopt, which led to trials by the Balkh team intended to investigate lower-cost alternatives that would have similar effect, such as replacing the polystyrene with cardboard.

COORDINATION WITH EXISTING PROGRAMS

A clear success of AAEP Balkh was the emphasis the team put on coordinating its activities with similar programs in the area, thereby mitigating the chance of wasted resources. In a context where farmers have a limited access to DAIL extension workers and to materials and equipment, coordinating and integrating activities with other programs targeting the Extension Department brings about a more important overall impact. It provided trainings to NHLP extension workers along with DAIL extension workers, so that the on-budget NHLP staff could also benefit from the capacity building effort. The rationale behind expanding the training to NHLP was to ensure that NHLP extension workers, who were conducting more outreach activities to farmers than DAIL extension workers on a wider area and included a significant ratio of female extension workers, had access to the trainings, thus increasing the impact of trainings on farmers.

Furthermore, AAEP also purchased 2 tractors similar to those previously provided to the province's farmers by the USAID-funded IDEA-NEW project, in order to train extension workers in use of the machinery and thereby enable them to assist farmers who received or subsequently rented the equipment.

LINKS WITH THE AGRICULTURE FACULTY

In the early phases of the program, AAEP in Balkh built a strong relationship with the Agriculture Faculty at the University of Balkh. First, AAEP invited four to five students and two to three teachers to some of the trainings. Second, AAEP established some FFDs in the PMTF based on the needs of the faculty curricula. Finally, AAEP hired

teachers from the faculty for trainings and AAEP hired a student from the faculty as a part-time intern to work at the PMTF.

EXPANSION INTO SAMANGAN, JOWZJAN AND BADAKHSHAN

The expansion into Jowzjan, Samangan, and Badakhshan first started with inviting extension workers from these provinces to trainings in Mazar-e-Sharif. Later, AAEP rapidly duplicated the approach of the Balkh program in Samangan and Jowzjan. AAEP hired a Provincial Manager in each province who was responsible for organizing training for extension managers and establishing workgroups.

In Samangan, AAEP provided three trainings to 20 extension workers, formed four workgroups (Vegetables, Orchards, Cereals and Livestock) and implemented two mini-fund projects, one of them being a hoop house at the Ayback DAIL. In Jowzjan, AAEP provided four trainings to 20 extension workers, formed five workgroups and established eight FFSs and two FFDs.

In Badakhshan, thirteen trainings were provided to 11 extension workers and the Provincial Manager established a PMTF in the province.

2.2.3 MAJOR CHALLENGES

The main challenge that the Balkh team faced over the course of the project was in setting up the PMTF. The primary reason for the delay reported during this assessment was a conflict over responsibility for the land between DAIL management and the Research Department. In fact, the research farm as well as many aspects of the activities undertaken by AAEP on the PMTF ideally would be under the mandate of the Research Department, which in practice does little research on the farm. While AAEP was eventually given access to the land, the situation demonstrates how important it is to the long-term sustainability of the project's activities that AAEP aid the Research Department and Directorate in developing the capabilities needed to assist in running the PMTF, as well as assist where the project can in developing the relationship between the Research and Extension Departments.

Without the PMTF, AAEP Balkh struggled to back up theoretical trainings with practical exercises. The team developed an alternative strategy in which they substituted FFSs and FFDs set up by the workgroups in districts. However, in the absence of the larger PMTF, the team was not able to perform practical exercises for all trainings provided. As a result, a substantial number of the extension workers did not get the practical experience they would have received through the PMTF.

2.3 HERAT REGION

2.3.1 PROGRAM SUMMARY

PROGRAM HISTORY

Herat was established as one of the three original program sites at AAEP's inception, with activities led by Purdue University. AAEP Herat was primarily active in 6 districts – Injil, Zindajan, Karukh, Gozarah, Gurian, and Robat Sangi – where FFSs and FFDs were established. When induding districts where the Herat team implemented programming related to the Purdue Improved Crop Storage (PICS) bag program, the number rises to 13 districts out of 16 in the province as well as areas of the other two initial provinces covered by the project. In 2014, the program extended its trainings to extension workers of Farah, Badghis, and Ghor, who were brought to Herat for training.

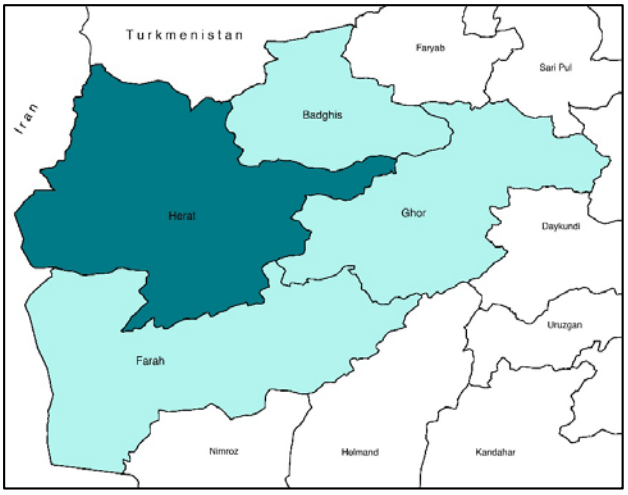


Figure 4: Herat Program Map

The activities undertaken in Herat first centered on trainings delivered to extension workers using the PMTF at Urdo Khan near Herat city. Thirty-eight extension workers were trained over the duration of the program. Extension workers trained at the PMTF replicated what they had learned by establishing FFS courses for farmers at FFD demonstration locations.

Purdue's activities induded a specialization in Integrated Pest Management (IPM) and grain storage. Purdue piloted a PICS bag program in all of the four original provinces of the program. This program aimed to compare traditional grain storage to PICS bags and to demonstrate how the latter prevent grain damage. While farmers and extension workers are generally convinced of the effectiveness of PICs bags, the unit cost of the bags remains a barrier to investment.

Figure 5: Herat PMTF and Grain Storage Research Trial

(Left) AAEP Herat DCOP Joseph Stangl explains the differences between 3 types of hoop houses (metal, wood and mud) set up in Urdo Khan PMTF; (Right) Wasim Hakimi, AAEP Grain Storage Specialist, compares the PICS bags to the traditional bags used in Herat.

KEY ACHIEVEMENTS

AAEP in Herat developed a program that was well-coordinated with DAIL and provided needs-based trainings to extension workers. At every level in the hierarchy, DAIL counterparts felt a part of the decision-making process and that the program reflected the Extension Department's needs.

Another positive feature particular to the program in Herat was the extent to which AAEP involved the Herat University Agriculture Faculty and the Herat Agriculture and Veterinary Institute (AVI) in their extension model. AAEP established student-operated FFSs within the schools with the objective that students and teachers conduct research that ultimately can be used by extension workers in outreach to farmers.

Finally, Purdue University successfully piloted the PICS bags in Nangarhar, Kabul and Herat. The bags have been clearly demonstrated to drastically reduce grain loss from insects and spoilage. However, the program still requires considerable outreach to farmers in order to make benefits well known, and prices must be reduced from current levels in order to make the bags a viable option for Afghan farmers. Aside from the success of the bags themselves, the PICS program was a good example of how the university partners should work across geographic areas to provide specialty services within each program.

Table 2: Herat Region Achievements

Herat Region	
Extension workers trained	43
Trainings provided	48
PMTF established	1
FFS established	17
FFD established	42
Workgroups operating	6
Mini-funds approved	6
Grain storage on-farm trials	135
On-farm insect monitoring trap trials	80

2.3.2 PROGRAM ACTIVITIES

PICS BAGS PROGRAM AND ON-FARM INSECT MONITORING TRAPS

After a first successful test for wheat and corn by the Khost U.S National Guard Agribusiness Development Team, Purdue University decided to pilot PICS bags with farmers in AAEP target provinces. AAEP Herat set up four Grain Storage Research Trials and 135 on-farm grain storage trials, with 45 in each province, in 2012. Ten thousand PICS bags were produced in Herat for the program at a cost of 200 Afs per unit. The pilot aimed to compare traditional grain storage methods versus PICS bags, looking at key parameters such as moisture, number of live and dead insects and germination rate. Every three months, AAEP Herat monitored the conditions of the grains and compared both methods. In addition to the PICS program, AAEP Herat set up 80 on-farm insect monitoring trap trials (20 in each province), in order to collect data on insects.

Results have proven to be conclusive, with considerable improvement in quality of stored products. However, farmers may still be unlikely to adopt this solution because the unit cost of the bag is too high. Even at the subsidized price of 135 Afs, the current initial investment cost remains a barrier to implementation by farmers. Program staff has stated that some solutions may be available for producing lower-cost bags, and the adoption of PICS bags manufacturing by at least one un-associated local company suggests that a market does exist at the correct price level.

PMTF/FFS/FFD MODEL

The Herat program began activities in June 2012 with a participatory planning workshop with extension workers to identify their needs for training. This needs assessment was done over the course of four months and prioritized primarily the needs of the extension workers in the region. The outcome of this participatory planning workshop was a training plan for extension workers. Trainings were provided by international trainers every three to four months and by national trainers approximately every month.

AAEP also invited eight students from the Faculty of Agriculture at Herat University and from the Agriculture and Veterinary Institute, and four farmers who were members of the FFS to trainings. The rationale behind this was to create linkages with extension workers and introduce students to DAIL for potential future employment. Second, AAEP invited farmers to make extension workers accountable when they trained farmers in FFS/FFDs. A total of 48 trainings were delivered primarily to extension workers as well as other stakeholders.

To support the trainings, AAEP Herat set up its PMTF at the Urdo Khan Research Farm. The establishment of the PMTF started in the fall of 2012 with the planting of 48 saffron plants to test different fertilizers and seeding rates. The PMTF was fully operational by May 2013, with plots designed based on the needs of extension workers and trainings.

In addition to the trainings prioritized during the first needs assessment, AAEP conducted trainings as needs arose among extension workers during the bi-monthly extension meetings. For example, in August 2014 following a request of the Extension Department, AAEP organized a training to teach extension workers about the new procedures for agriculture cooperatives.

In order to spread the content of the trainings to the farmers, AAEP Herat organized extension workers who had been trained through the PMTF to establish their own FFSs. An FFS in the Herat region was defined as a dass or course consisting of 20 to 25 farmers who joined on a voluntary basis. The extension agent in charge of the FFS provided thematic trainings usually every week based on the needs expressed by the farmers. To support these trainings and provide a hands-on experience, the FFS set up FFDs.

In total, 17 FFS were established. Over the lifetime of an FFS, AAEP granted a maximum of $750 for activities. Roughly half of the amount was the starting cost of the FFS, mostly tools, which were provided to the group of farmers as an incentive to participate in the FFS. Based on the needs identified, extension workers and farmers could apply to AAEP to get seeds to set up FFDs to compare different techniques. Farmers were then intended to train and assist other farmers with the techniques learned at the PMTF.

Box 2: Gozarah district wheat FFS

Increasing wheat yield from 800 to 1200kg per jerib

In spring 2013, an extension worker approached Abdul Ghadir, derk of a wheat FFS, to become an FFS member. Convinced of the need to get advice from extension workers, he joined the FFS along with 29 other farmers. The objective of the FFS was to compare in-line cultivation with broadcasting.

AAEP provided basic farm tools, seeds, fertilizers and stationery. The FFS met once per week under the supervision of the extension agent, with regular visits from AAEP staff. Instead of the usual 800 to 900 kg per jerib, the new techniques demonstrated a yield of 1200 kg per jerib.

WORKGROUPS AND MINI-FUNDS

Six AAEP workgroups were created in the spring of 2013 in the Herat region: Cereal, Vegetable, Orchard, Industrial Crops, Women in Agriculture and Livestock. The primary objective of the workgroup was to create a forum of discussion and coordination among all of the stakeholders of the extension sector, namely extension workers, universities, NGOs and businesses to discuss the needs of each specific sector. However, workgroups started slowly because extension workers had limited ability to facilitate the meetings and participants had limited motivation to attend meetings without incentives. Workgroups in Herat received six mini-funds: saffron production and quality, capacity building of saffron producers, orchard pest control, livestock management, poultry management (WIA), and introduction of wheat seeds in row cultivation method.

COORDINATION WITH AGRICULTURE UNIVERSITIES

AAEP Herat put a strong focus on coordination with the Herat University Agriculture faculty and AVI. In addition to inviting some students and teachers to every training, AAEP established FFSs within each school. The objective of these FFSs was to enable students to carry out practical exercises and experiments in parallel to their studies and to design research plots. AAEP provided assistance to all students creating FFDs in order to assist them with the plots and provide complementary trainings if needed. Moreover, AAEP set up a PICS bags pilot within the agriculture university facility.

These FFSs were a first step in enabling agriculture faculties and institutes to take part in extension research and dissemination. The FFS model was generally well received and praised by students. The fact that two students from the AVI took the initiative to set up their own FFD in an agriculture high school highlighted the impact and sustainability of the model.

WOMEN IN AGRICULTURE PROGRAM

AAEP Herat developed a WIA component specific to the province. The program trained one extension worker and established two FFS in Injil district with 10 members each. However, participation by the women in the FFS was poor. This was mostly due to the lack of resources within the Home Economics Department (HED) and the absence of a female national staff within AAEP to manage the activities. Additionally, unlike the primary WIA program in Kabul which maintained its own facilities, the WIA program in Herat shared PMTF space with the primary program. The cultural implications of this made it difficult for some women to participate to the extent that they otherwise would have.

EXPANSION OF ACTIVITIES INTO FARAH, BADGHIS AND GHOR

AAEP Herat expanded coverage to Farah, Badghis and Ghor provinces at the end of 2013. While in most other programming regions, expansion took place through opening nearly full-fledged programs in each new province, the program in Herat was advised against working directly in these locations for security reasons by the Herat DAIL office. Instead, AAEP Herat invited extension workers from each of these provinces to attend trainings in Herat itself, with AAEP covering their travel and lodging expenses. AAEP-trained extension workers from the Farah, Ghor, and Badghis DAILs conducted participatory planning workshops intended to prioritize needs, through which subsequent

trainings were designed. In this way, the Herat expansion model could provide a means for the program to rapidly expand into additional locations, including those which are less secure.

2.3.3 MAJOR CHALLENGES

AAEP Herat faced two major challenges over the course of the project: turnover of staff and worsening security in Herat province. First, the turnover of expatriate and national staff resulted in lower efficiency and effectiveness while new staff members were brought up to speed. Some information on the design of the project such as the detailed methodology used to carry out the initial needs assessment was not retained by the AAEP team. Despite this high turnover, the AAEP Herat project team managed to maintain its activities. The exception to this being, with the female Afghan staff member in charge of the WIA program not being replaced, the scope of WIA in Herat was reduced.

Second, the deteriorating security in Herat impacted the coverage and the monitoring of activities. Extension workers established FFSs and FFDs in only six districts because they were the only districts AAEP Herat could reliably access, after having been asked by the Herat DAIL director to limit movements due to worsening security. Even in these districts, the coverage was limited as security impeded activities. As the situation worsened from 2013, the Herat AAEP team reduced the frequency with which it monitored the FFSs and FFDs and did not expand further into the province. The rationale behind the monitoring of FFSs/FFDs was to assess the capacity of the extension workers to train farmers. By decreasing the monitoring, it made it difficult for AAEP to assess extension workers and estimate whether farmers understood the new techniques and were willing to replicate them.

2.4 NANGARHAR REGION

2.4.1 PROGRAM SUMMARY

PROGRAM HISTORY

Nangarhar was established as one of the three original program sites at AAEP's inception, with activities led by WSU. Operations began in six districts in the first year, and have since expanded to all but two of Nangarhar's 22 districts, with additional activities in Kunar and Laghman provinces.

The activities centered on the PMTF at Sheshambagh in Jalalabad, with activities at each FFS and FFD directly based on trainings delivered at the PMTF. Participating trainees were consistent throughout each year, and included all extension workers in the province.

WSU activities included a specialization in Conservation Agriculture. These techniques were demonstrated on the PMTF and replicated at FFS sites by extension workers and FFD sites by farmers. While trainees were initially skeptical of these techniques, application of no-till maize cultivation was demonstrated to have substantial financial benefit in the long term both in terms of time spent and better production, with returns increasing in each year since the demonstration was first planted at the PMTF.

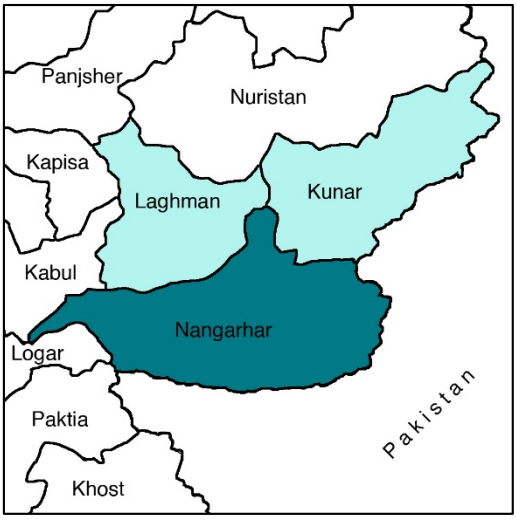


Figure 6: Nangarhar Program Map

Figure 7: AAEP Nangarhar PMTF and FFS

(Left) Nangarhar AAEP Farm Manager Awal Gul demonstrates soil quality of a plot of maize grown using conservation agriculture techniques at the Sheshambagh PMTF; (Right) Ubaidullah, owner of the land used for the Baharabad FFS in Behsood district, shows the same demonstration growing on his own farm.

KEY ACHIEVEMENTS

AAEP in Nangarhar developed a strong program that provided extensive practical training for all extension workers in Nangarhar province. The program developed a good working relationship with DAIL counterparts that enabled them to work with extension workers consistently and over the long term necessary for the types of trainings they delivered.

The structure employed by WSU in Nangarhar to link the PMTF, FFSs, and FFDs, was somewhat different from that used in AAEP's other provinces. The method used in this region provides a clear chain of communication for extension workers from the provincial center to the farm level, and enables access to a large number of farmers at

a relatively low cost. In fact, the strength of this model is demonstrated by the fact that it has been emulated by other donor agencies working in agriculture in the region.

Table 3: Nangarhar Region Achievements

Nangarhar, Kunar, and Laghman Provinces	
Nangarhar Province	
Extension workers trained	40
Trainings provided	48
PMTF established	1
FFS established	68
FFD established	198
Workgroups operating	3
Mini-funds approved	3
Kunar Province	
Extension workers trained	4
Trainings provided	1
PMTF established	1
FFS established	2
Laghman Province	
Extension workers trained	3
FFS established	2

2.4.2 PROGRAM ACTIVITIES

PMTF/FFS/FFD MODEL

The Nangarhar program focused activities primarily on trainings provided through the PMTF at Sheshambagh. AAEP staff provided trainings and demonstrations for extension workers, who were then expected to duplicate these trainings for farmers in the districts at FFS locations. Farmers trained through FFSs then established their own FFDs, where they in turn demonstrated techniques they learned on the FFS for other farmers. This model provides a strongly structured system for passing trainings from the provincial center to the village level. While the number of individuals trained at each FFS and FFD may vary, a typical FFS and FFD will have around 20 to 25 participants. This would mean that the potential indirect impact of one extension agent trained in the center and subsequently training 25 individuals on one FFS would be about 500 farmers at the district and village level, a much greater reach than extension workers would have been able to achieve using individual farm visits.

WORKGROUPS AND MINI-FUNDS

In comparison to AAEP's other regions of operation, workgroups were given a relatively small role in Nangarhar. Three workgroups were created, covering Cereals, Vegetables, and Orchards. Of these, the cereals workgroup received and implemented two mini-fund projects while the vegetables workgroup received and implemented one. The orchards workgroup was established in 2014, so has not yet received a mini-fund project.

The Cereals workgroup's mini-fund project related to line cultivation of wheat and corn was implemented in Khewa, Kama, and Mohmand Dara districts (corn); and Surkhrod and Behsood districts (wheat). Extension workers stated that they would like to expand the program to other districts. The Cereals workgroup also implemented a mini-fund project related to rice cultivation. The mini-funds provided to the Vegetables workgroup dealt with cultivation of lettuce and cauliflower. The funded demonstrations of proper lettuce and cauliflower cultivation were in Khewa, Rodat, and Surkhrod districts. Training included proper planting which decreased the amount of seed used, irrigation, and postharvest practices.

Workgroup membership was intended to include a wide range of actors, but was generally comprised of extension workers and research department members. Membership was also theoretically extended to the greater agricultural community, and included local agriculture faculty, agriculture associations, and input suppliers, among others, but these groups rarely participated. Workgroups met about once per month, generally directly after other trainings provided by AAEP.

As compared to AAEP regions where workgroups were largely responsible for communicating training needs to program staff and even deciding on programming priorities, workgroups in Nangarhar were concerned primarily with providing a means of communication on their subject matter between extension workers and other local stakeholders such as the research department, agricultural education, etc. Beyond this, the workgroups implemented mini-fund projects when such funds were available.

EXPANSION OF ACTIVITIES INTO KUNAR AND LAGHMAN

In the latter period of the program, AAEP Nangarhar expanded activities to include extension workers from Kunar and Laghman in trainings. While Laghman was close enough to allow extension workers to be trained at the Sheshambagh farm, the program established a second PMTF at the Kunar DAIL office for training of extension workers there, as travel time and security made the trip to Jalalabad difficult. All AAEP activities were still covered by the same program staff who traveled regularly among the sites.

2.4.3 MAJOR CHALLENGES

While the Nangarhar program faced a variety of challenges, particularly the difficult security environment in the region, the largest ongoing programmatic challenge may relate to the adoption of conservation agriculture practices. The program has clearly demonstrated the benefits of these practices through the PMTF and subsequent demonstrations. Aside from the fact that the practice is directly contrary to local traditions and difficult for farmers to understand initially, the largest benefits of these practices are long term, and require postharvest waste to be left in the field. Traditionally, local farmers use excess organic matter from their fields as heating and cooking fuel, a commodity that has recently seen an increase in price. It is difficult to convince farm households to adopt practices which may have long-term benefits when short-term costs can cause temporary hardship.

2.5 KABUL REGION

2.5.1 PROGRAM SUMMARY

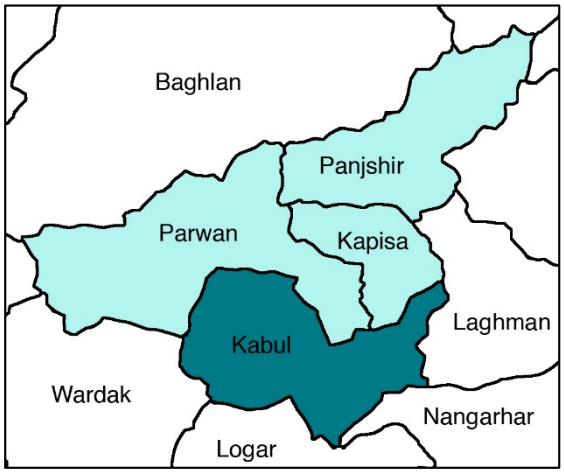
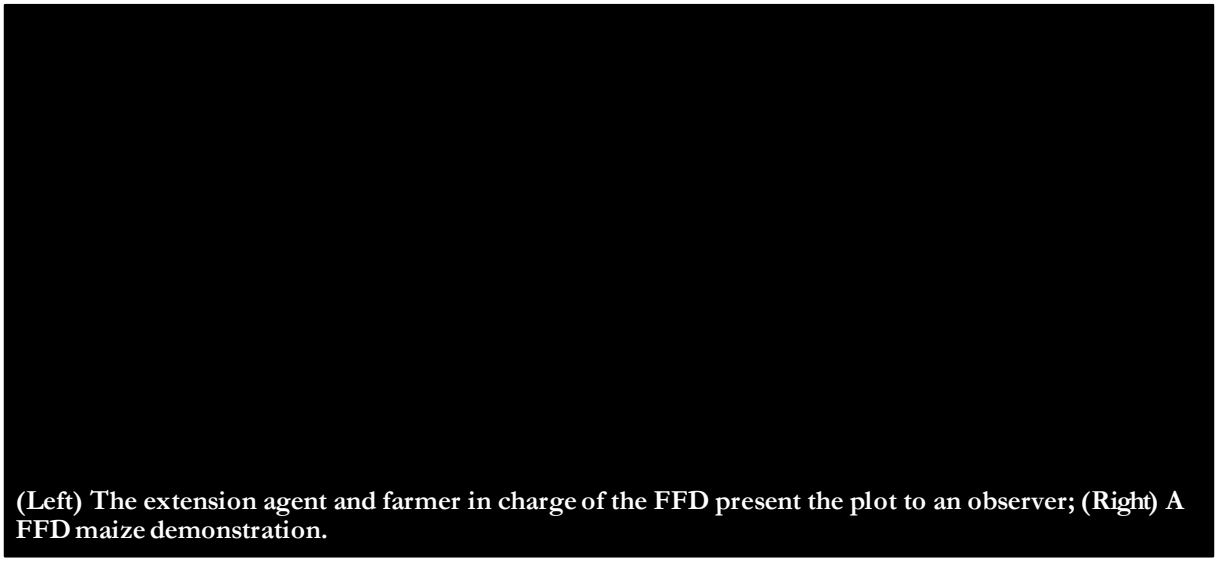


Figure 8: Kabul Program Map

PROGRAM HISTORY

AAEP activity in Kabul was originally intended to be limited to the central managerial coordination of activities for the program's original three areas, with no extension programming taking place in Kabul itself. However, early in the program, opportunities were seen, starting with well-received postharvest grain storage trainings in Kabul to DAIL.

Similar to what was initially planned in the three original program sites, AAEP Kabul opted for a strategy revolving around theoretical trainings and practical trainings done in the PMTF, and the set-up of FFSs and FFDs. The model in Kabul relied more heavily on the establishment of workgroups, which could apply for mini-funds to set up FFDs to train farmers, but unlike other programming areas, the workgroups were also more structurally integrated with the FFS model, taking responsibility for proposing and directing overall work. By the end of the project, 61 extension workers were trained and AAEP Kabul implemented activities in eight districts (Paghman, Farza, Sorobi, Shakar Dara, Merbacha Kot, Deh Sabz, Kabul, and Chahar Asiab) out of fourteen. In early 2014, AAEP Kabul expanded activity to Panjshir, Kapisa, and Parwan provinces.



(Left) The extension agent and farmer in charge of the FFD present the plot to an observer; (Right) A FFD maize demonstration.

Figure 9. Activities in Kabul

KEY ACHIEVEMENTS

Despite a later start, AAEP Kabul rapidly developed a strong program with a wide coverage in the Central Region. The program benefitted from the later start, which allowed site administrators to learn from the structures adopted by each of the original three programs, resulting in a well-organized system that encompasses many of the benefits of those adopted in Balkh, Herat, and Nangarhar.

Another positive feature peculiar to the Kabul program is the degree to which responsibility had early on already been handed over to local staff. Rather than running the region's activities as would the DCOP in the program's other areas, this role was given primarily to Agriculture Extension Specialist Najmudin Najm. This showed a positive trajectory in the sustainability of the program. While MAIL staff themselves were not yet ready to manage such activities, it will be important to transition management roles to national staff, with an eye toward potentially installing them as contractual staff permanently based within the Ministry.

The team in Kabul launched and coordinated the mini-funds for all consortium members, enabling the workgroups nation-wide to implement need-based activities. Finally, AAEP Kabul organized the two AAEP Annual Extension Conferences.

Table 4: Kabul Region Achievements

Kabul, Panjshir, Kapisa and Parwan Provinces	
Kabul	
Extension workers trained	61
Trainings provided	37
PMTF established	1
FFS established	9
FFD established	55
Workgroups operating	3
Mini-funds funded	6
Panjshir	
Extension workers trained	35
Trainings provided	11
FFD established	3
Workgroups operating	4
Parwan	
Extension workers trained	37
Trainings provided	11
FFD established	3
Workgroups operating	4
Kapisa	
Extension workers trained	41
Trainings provided	9
FFS established	14
FFD established	7
Workgroups operating	4

2.5.2 PROGRAM ACTIVITIES

WORKGROUPS, FFS & FFDS, AND MINI-FUNDS

The model adopted in the Kabul region centered on workgroups. All trainees in the region were workgroup members, and the workgroups took responsibility for organizing all FFSs and FFDs. Workgroups were solely responsible for determining the need for particular trainings that they would subsequently implement.

There were three active workgroups in Kabul province: Cereals, Vegetables and Fruits. These workgroups were initially set up in the winter 2013, after 27 extension workers were trained on workgroups.

Each of the workgroups was awarded mini-fund projects to set up FFDs, through which they would train their members and subsequently farmers. Mini-fund projects implemented through the workgroups have included composting, saffron, hoop house production, honey bees, wheat variety trials, and integrated pest management.

Box 3: Cereal Workgroup's Compost Mini-Fund

Cereal Workgroup's Compost Mini-Fund

In June 2014, the Kabul Cereal workgroup began implementing a 3-month program in composting. The $4,950 program involved demonstrations of proper composting in Mir Bacha Kot, Paghman, and Farza districts as well as the Chardi and Deh Sale areas of Kabul center district.

The workgroup was itself responsible for drafting original proposals, with technical assistance and translation to English by AAEP's Najmudin Najm. Three drafts of the proposal were submitted before the program was accepted, with implementation beginning just 15 days after the last draft was submitted.

At each FFD created through the grant, extension workers demonstrated methods for improving soil through composting, with both extension workers and farmers receiving training through the program. The program conduded at the end of August 2014.

All FFSs and FFDs in Kabul were set up and run through workgroups. AAEP Kabul established nine FFSs to complement what was being taught at the PMTF. With the assistance of farmers, extension workers established potato, corn and bean FFDs in Farza, Shakardara, Paghman, Mirbacha Kot, Kalakan, Istalif and Chardi districts. In these FFDs, different growing systems were demonstrated to show farmers which system produced higher yields. AAEP Kabul organized field days at the FFDs to demonstrate to additional farmers how the different growing systems were affecting yield.

PMTF

Land for the PMTF at Badam Bagh was secured in late 2012, with preparation of the site begun in early 2013. The AAEP farm included 12 jeribs, on which the program demonstrated extended season crops, hoop houses, Conservation Agriculture, orchards, vegetables, and companion crops. The PMTF also included demonstrations related to mini-funds implemented through workgroups, who would visit the site for demonstrations 1 to 2 times per week.

Program staff were particularly proud of two activities demonstrated on the PMTF. The first, a high-density apple orchard, included 650 Red Star apple trees per jerib. The first-year yields were particularly high, and led to tagging for certification by the Perennial Horticulture Development Project (PHDP), which also operates at the Badam Bagh facility. The second, a demonstration of tomatoes grown in hoop houses, showed peak production of 400-600 kg of tomatoes per day from a single hoop house.

EXPANSION OF ACTIVITIES INTO PANJSHIR, KAPISA AND PARWAN

The rationale behind expanding activities to Panjshir, Kapisa and Parwan was that extension workers from these three provinces were more in need of trainings than extension workers from Kabul province, who had more opportunities through the variety of programs operating in the regional center. AAEP rapidly duplicated the approach of Kabul in these provinces: AAEP hired a Provincial Extension Specialist in each province, conducted a needs assessment to identify training needs, and established FFSs/FFDs and workgroups.

In Panjshir, AAEP provided 11 trainings, formed four workgroups (Cereal, Fruit, Vegetables and Livestock) and established three FFDs. In Parwan, AAEP provided 11 trainings to extension workers and farmers, and formed four workgroups (Cereal, Fruit, Vegetables and Livestock) who worked within the FFDs. In Kapisa, AAEP provided nine trainings, formed four workgroups (Cereal, Fruit, Vegetables and Livestock) and established 14 FFSs and seven FFDs.

2.5.3 MAJOR CHALLENGES

Beginning later in the program, the Kabul team benefitted from the lessons learned from each of the earlier site programs. However, the organization was also originally structured for a different task. The particular organization of the team around management of the program overall meant that they were not as closely embedded in the Kabul DAIL as was the case in other regions covered by the program. While this did not lead to large challenges, there were conflicts, like access to water at the PMTF that would likely have been more easily solved or would not have occurred at all, if the team had been embedded in the DAIL.

2.6 WOMEN IN AGRICULTURE

2.6.1 PROGRAM SUMMARY

PROGRAM HISTORY

The AAEP-WIA program, while sharing many of the same basic tools of the rest of AAEP, differed slightly from the other pieces of the program. AAEP-WIA did not primarily target extension workers, as there are few female extension workers employed by MAIL. Instead, the program worked mainly with different groups of volunteers, such as students, cooperative leaders and disadvantaged women (often widows). This led to a model involving a variety of different beneficiaries and stakeholders and larger scope of beneficiaries, with women from the community engaging in trainings and activities both at MAIL facilities and in their own homes.

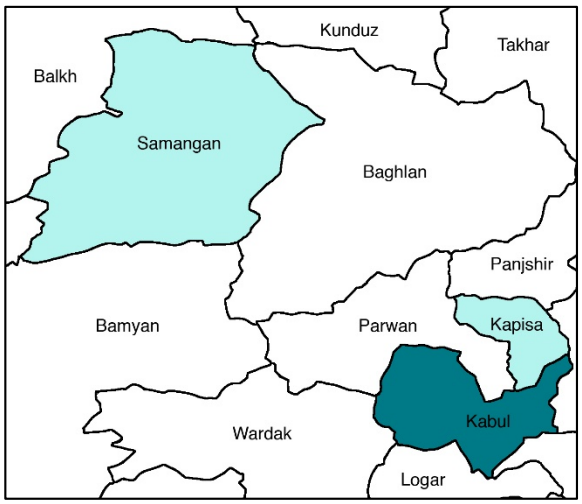


Figure 10: WIA Program Map

Though planned at the outset of the program, the AAEP-WIA component did not effectively start until May 2013, led by the University of Maryland. Initially the women's section of the program was called "Focus on Family Food Security" and administrative structures were set up in 2012 with some trainings conducted by international consultants in the summer of that year. After challenges in finding a DCOP for this component, Sophia Wilcox was hired in early 2013, which marked the beginning of the AAEP-WIA component as a more permanent presence within the program. AAEP-WIA started operating with one cohort of female FFS leaders and a cohort of interns from Kabul University. The subject of trainings conducted weekly at the PMTF was determined based on the feedback of the women leaders and common problems observed to be occurring in the FFS. In the second program year, AAEP-WIA expanded into Kapisa and Samangan provinces and increased agricultural production activities, including postharvest processing and marketing of agricultural products.

Figure 11: FFS Leaders Receiving Instruction at PMTF

Prior to the start of the project, the HED had given a jerib of land each to 80 women (mostly widows) from the surrounding poor neighborhood. Whereas these women received some *ad hoc* training in the program's first year, in the final year a small number voluntarily donated their land to the AAEP-WIA project and worked together in organic vegetable production. The yield is sold at a shop at the entrance to the Darulaman PMTF. Additionally, some women were trained on food processing, such as making chutneys, tomato paste, pickling vegetables, drying tomatoes and other vegetables.

In comparison to other AAEP programming areas, the AAEP-WIA program had few MAIL or DAIL counterparts, as only a very small number of female extension workers were employed by the HED and the Kabul DAIL. As an alternative, the program found a number of interested women who worked as "unofficial" extension workers and received no salary from either the project or the Ministry. In total AAEP-WIA worked with 48 official and unofficial extension workers, out of which three worked directly for the Ministry.

Due to the fact that, especially in urban areas, agricultural production is seen to be an activity reserved for the lower classes, the AAEP-WIA component had to integrate social work elements into their activities, such as family outreach, self-help groups, and advocacy work.

KEY ACHIEVEMENTS

Considering the short time span that the WIA component of AAEP ran (about 18 months), a great number of achievements can be reported, including: setting up two PMTFs, expanding project activities to two additional provinces, setting up a postharvest production facility and a shop to sell agricultural produce.

The greatest achievement, however, was the development of a functioning training infrastructure suitable for women in the Afghan context which, in most cases, led to families implementing practical and efficient kitchen

gardening. Through the selection of students from the participants' immediate neighborhood as FFS leaders, and the prerequisite that all students be female, the trainings were accepted as culturally appropriate for most of the women.

Another significant achievement was development of initial mechanisms to assure sustainability of the program, such as the farm shop and the food processing FFS, through which the women could generate income for their families and sustain their activities at the farm and potentially finance their transportation.

Table 5. WIA Achievements

Kabul, Kapisa, and Samangan Provinces	
Extension workers trained	3
Trainings provided	106
PMTF established	2
FFS established	54
FFD established	173
Workgroups operating	1
Mini-funds approved	2

2.6.2 PROGRAM ACTIVITIES

PMTF

In the first year, the majority of the 100 demonstration plots at the PMTF in Darulaman Farm were designed by the AAEP staff, and a minority of plots were designed by training participants demonstrating traditional agricultural methods. In the second year, most of the plots were designed and observed by either cohort one and two of the FFS leaders, the female interns from Kabul Agricultural and Veterinary Institute (KAVI) or the workgroup at the Ministry with the help of AAEP-WIA management.

Plots were designed by a group of three FFS leaders and were intended to reflect problems that they observed in their students' gardens. FFS leaders would then eventually provide solutions to issues at hand. Additionally, plots designed by interns focused on a particular research question, with a group of up to five interns making detailed observations on the growing process and the yield of the particular method implemented. The work of the women on these plots was constantly monitored and supervised by the AAEP-WIA horticulture expert.

The trainings conducted at the PMTF for FFS leaders and interns could be divided into multiple phases. The first component was usually a theoretical component, subsequently backed with a tour through the PMTF plots, recognizing aspects discussed in the training. Following this, a practical component would be added followed by a discussion of problems either in the FFS or in the student's gardens. While the PMTF is the main location for trainings conducted by AAEP-WIA, it also functions as a showpiece for Ministry and public visits to promote the program's accomplishments.

Figure 12: Container Gardening and Trellising at Darulaman PMTF

FFS

The PMTF/FFS/FFD model used by AAEP-WIA is similar to that used in Nangarhar, with the biggest exception being the lack of formal Ministry involvement. AAEP-WIA trained about 48 FFS leaders, out of which three were Ministry extension workers employed through HED. Each of these FFS leaders trained between 10 and 30 students who then implemented a kitchen garden at home. The only prerequisite for an FFS leader to be selected for training was that they needed to be interested in establishing an FFS with a minimum of 10 students. In addition, three of the FFS leaders trained four sub-leaders who in turn taught another 10 students. In addition to the horticultural training on the PMTF, FFS leaders had livestock training from September 2013 until February 2014, conducted by the DCA. The DCA training took place once a week mostly at the Ministry conference room and focused on small ruminant health.

While all FFS students needed to have a garden in their house where they could implement the new techniques, this was not necessary for the FFS leaders and they were allowed to establish FFSs in their vicinity. These 'selection criteria' led to a very diverse crowd of FFS leaders ranging from entirely illiterate to students at the Kabul University law faculty. A large number of FFS leaders established their school in a neighbor's garden rather than their own, because their own garden was not big enough or their families were uncomfortable with a group of women coming in on a weekly basis. In these cases, the yield from plants in the kitchen garden was retained by the garden's owner. All of the FFS gardens and some of the student's gardens were visited by AAEP-WIA international staff to observe and supervise the implementation of the new techniques taught at the PMTF and provide in-depth explanation and help with the implementation. These regular visits proved to be a central asset in shaping the training curriculum in accordance with the women's understanding and in remedying on-going problems or lack of implementation.

INTERNSHIP PROGRAM

The internship program was designed to provide opportunities for female students, first in the agriculture faculty at Kabul University and later from KAVI. In general, agricultural education at an institute is very theory based and is therefore well supplemented through applied training and practices. While internship and practical work opportunities outside the program are rare generally, they are even less available for female students, which is why the program decided to select female students exclusively. The program provided interns with once-weekly training at the PMTF.

Unlike the FFS students, most interns had prior experience and knowledge of the agricultural sector and therefore could handle a more in-depth level of information. Some of the trainings were conducted in a presentation style with the help of PowerPoint slides, which was not common for the FFS trainings.

AGRICULTURAL PRODUCTION

Prior to the start of the AAEP-WIA component, HED had made their land on Darulaman farm accessible to women. Through public outreach they identified 80 economically vulnerable women and gave each access to lease one jerib of land for around 5,000 Afs per year. These women received some training through HED directly and a number of *ad hoc* trainings in the first programming year, based on their training needs. The trainings focused on planting strategies, irrigation, and food processing.

In the second year of the project (2014), 12 of the women volunteered their land to the PMTF to use as demonstration plots for testing the effectiveness of new planting techniques and irrigation methods. These women were provided with seeds and guidance on how to make their land most profitable. By the close of the project, the group of women were working together for planting, watering and harvesting the crops, which were subsequently sold at the farm shop. In order to have representatives of the women at the farm shop to sell the crops, the farmer women debated over whether to either rotate amongst themselves, or select permanent shop keepers. The group went for the latter and the shop was then run by two of the women who donated land, but who were selected collectively by the group as shop-keepers and paid a monthly salary out of the women's profits.

Figure 13: Women at a Postharvest Training

WORKGROUP AND MINI-FUNDS

The AAEP-WIA component had one workgroup at the Ministry. The AAEP-WIA workgroup was involved in making suggestions for presentations and trainings at the PMTF and for coordinating activities for women in agriculture. The group included Ministry workers, NGO representatives and the AAEP-WIA management, according to the Ministry women interviewed. They met once a month.

Overall the workgroup received two mini-fund projects, one for a food-processing FFS and another for saffron production. In 2014, the first postharvest production activities were implemented, taking crops of low quality and either drying them, or processing them into chutney or paste in order to sell them at the farm shop or the market. The food-processing unit had originally been established as a FFS and was supervised very closely through the international management staff. The saffron project resulted in women receiving funds to purchase saffron bulbs and plant some at the PMTF and the rest in their home gardens. The trainees harvested the saffron independently and brought it to the local bazaar or sold it through the farm-shop which generated some income.

2.6.3 MAJOR CHALLENGES

Water shortage was one of the major constraints that created additional challenges in growing vegetables on the production farm and in the kitchen gardens. The water on the farm was supposed to be provided by the Ministry but, unfortunately, this was not the case. Water provision remained a problem for the PMTF through the end of the project.

Another challenge was the social view of women in agriculture. Though, initially, many women trainees had not considered agricultural production appropriate for women, over the course of the project, they did change their minds. However, their immediate social environment (family, relatives and friends) did not. Husbands, fathers or brothers would not allow trainees to plant using 'new methods' in the household. These male members believed they were better informed on how agricultural methods should be applied in Afghanistan, reverting to traditional methods.

Also, AAEP- WIA's did not receive needed support from HED. Overall, there were seven female extension workers in Kabul, out of which three participated consistently in AAEP. This posed a problem to the project in so far as activities are unlikely to be continued by the Ministry without international support.

2.7 LIVESTOCK AND DCA

2.7.1 PROGRAM SUMMARY

PROGRAM HISTORY

While extension workers are responsible for both agriculture and livestock activities, extension workers in Afghanistan tend to have little experience working with livestock and relatively more experience in agriculture-related areas. Under the original project proposal, Iowa State University was intended to implement the livestock portion of the program. However, shortly after contracting, Iowa State pulled out of the consortium. In order to fill this gap, in late 2012, the consortium contracted the Dutch Committee for Afghanistan (DCA), an organization with substantial previous and ongoing experience in working with livestock in Afghanistan. The DCA contract originally called for programming in Balkh, Herat, and Nangarhar provinces. In 2013 and 2014, AAEP contracted DCA to conduct livestock training in the Kabul region and Samangan province, respectively.

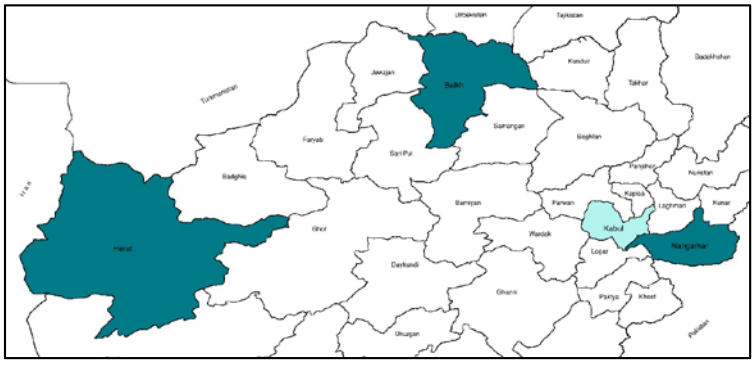


Figure 14: Livestock Program Map

DCA's contract included a more well-defined mandate than the AAEP program overall in terms of a required number of trainees and activities. This component revolved around two complementary axes:

1. Building the capacity in livestock of 90 extension workers split across the three provinces.
2. Enhancing the delivery of demand-driven extension services to farmers in the target areas.

The 90 extension workers were trained on a monthly basis in DCA centers, where materials and livestock were available to conduct theoretical and practical trainings and were encouraged to replicate these trainings in the FFSs they managed. A total of 1295 farmers were trained and provided posters for use in spreading the information to fellow farmers.

DCA established livestock workgroups in the three provinces. The objective of these workgroups was to bring different stakeholders together to share information on livestock and reinforce the capacity of extension workers, who in most cases had limited livestock knowledge.

Figure 15: Instructional Posters Distributed by DCA

KEY ACHIEVEMENTS

DCA fulfilled its mandate for number of extension workers trained in all geographic areas. Considering the low level of knowledge most extension workers have in working with livestock, DCA adopted a training model focused around a series of public-private partnerships. Particularly, DCA used extension workers to link communities to existing Veterinary Field Units (VFUs); and trained extension workers in setting up community-managed feed banks that could be continued in the absence of ongoing extension agent activity.

A positive feature specific to DCA is the role the workgroups had in the capacity building of extension workers. The main objective of the workgroup was to give the opportunity to extension workers to learn from and tap into the expertise of the other members (Livestock department, VFUs staff, DCA) in order to be able to answer farmers' requests. Furthermore, a majority of the extension workers established FFSs, enabling them to put into practice what they learned in trainings and to spread the knowledge to farmers.

2.7.2 PROGRAM ACTIVITIES

CAPACITY BUILDING

DCA selected 30 extension workers in coordination with AAEP and the target DAILs. As extension workers usually have an agriculture background or have been trained in agriculture through existing capacity building programs

for MAIL/DAIL, DCA conducted a training needs assessment to assess the knowledge of the 90 extension workers within the DAILs and organize trainings accordingly. Moreover, DCA conducted a baseline survey in each of the three provinces to assess the needs of farmers.

Combining the baseline survey findings with the training needs assessment, DCA designed a training plan consisting of 16 trainings (small ruminants, large ruminants, poultry, livestock extension and extension, as well as value-chains such as Cashmere wool or Karakol). Although the curriculum was identical in the three provinces, the trainers adapted the content of the trainings to the specificities of the province when required. In total, 16 trainings per province were provided to extension workers.

FFS Model

Each extension agent was meant to establish a FFS composed of 25 farmers across two villages and to train the members twice a month on practical topics, such as deworming. Farmers were provided with lunch and transportation and with posters to replicate the trainings to other farmers. In total, extension workers established 66 FFSs (25 in Balkh, 25 in Herat, and 16 in Nangarhar), which led to the training of 1285 farmers.

Workgroups

DCA established and managed the livestock workgroup in Balkh, Herat and Nangarhar DAILs. These workgroups were comprised of DAIL livestock department members, extension workers and VFUs members.

The workgroups were a forum for discussion to exchange information on livestock. Extension workers could get the answers to the questions asked by farmers during the workgroup meetings. As such, the workgroups also served as a channel for communicating demand for training and services in the field to extension workers. The workgroups complemented the monthly trainings provided by DCA and took advantage of the opportunity to ask follow-up questions after trainings.

(Left) the extension agent conducts training using the livestock of members; (Right) Members are trained on how to process milk into yogurt using a churner.

Figure 16: DCA FFS in Nangarhar Province

Feed Banks

Although the initial contract was for six feed banks, DCA established 12 feed banks (four in each province) with the budget initially allocated for this activity. Feed banks were established in remote areas with limited or no access to feed markets for certain period of times due to the insecurity or the weather conditions. Farmers can purchase feed from the bank in order to feed their animals during these periods.

Feed banks were established as farmer cooperative, with members of the FFS chosen to operate them. While feed banks were community initiatives, extension workers were involved by providing advice to farmers on how to properly store the feed and feed animals. Feed banks were an activity which linked agriculture to livestock.

2.7.3 Major Challenges

The major challenge faced by DCA was the lack of knowledge of extension workers about livestock in general. Therefore, DCA had to focus on training in the first year of the program and increase the monitoring of the FFSs.

The second challenge faced by DCA was that DCA was not a consortium member. This weakened the integration of livestock activities with other agriculture activities taking place in the provinces. For example, very few of the PMTFs had livestock to conduct training for extension workers.

3. PROGRAM CONCLUSIONS

3.1 COMPARISON OF ACHIEVEMENTS AGAINST PROJECT INDICATORS

The following table contains a list of AAEP project indicators and their following outputs. The output numbers reflect those mentioned through this document and show the level of success the project has had using the AAEP extension delivery model, especially in getting information to farmers and alleviating household hunger.

Table 6. AAEP Progress Against Indicators

Number of demand-driven activities reflected in MAIL/DAIL work plans	**14 out of 16 total**
Number of extension workers who acquired knowledge and skills in specific technical areas as measured by an appropriate post training test	**355**
Number of MAIL/DAIL management, research and extension professionals, extension workers, and field technicians who benefited from USG specialized trainings, workshops and seminars	**473**
Number of extension workers using new methods in the field	**355**
Number of locally relevant extension materials/resources developed by extension workers	**490**
Number of village trainings conducted by extension workers on AAEP technical areas	**1267**
Number of on-farm demonstrations initiated by extension workers	**3191**
Number of farmers accessing public sector extension services	**3405**
Percent change in postharvest losses among farmers participating in AAEP postharvest storage programs	**22%**
Number of Provincial Model Teaching Farms (PMTFs) used as focal point for demonstration and training established	**10**
Number of independently operated Farmer Field Schools (FFSs)	**185**
Number of Farmer Field Demos (FFDs) established	**507**
Number of workgroups established	**39**
Number of proposals submitted through workgroups and extension workers	**36**
Annual conferences established	**2**
Number of women who increased the types of vegetables grown	**534**

Household Hunger Scale

Household Hunger Scale	Non-Beneficiary	Beneficiary
0 = never	81%	87%
1 = rarely	7%	7%
2 = sometimes	3%	3%
3 = often	9%	3%

Women's Dietary Diversity Scale

Dietary Diversity Scale	Non-Beneficiary	Beneficiary
1 = lowest	2%	1%
2	4%	1%
3	5%	2%
4	4%	3%
5	9%	4%
6	8%	6%
7	10%	7%
8	11%	10%

	9	12%	9%
	10	15%	11%
	11	13%	14%
	12 = highest	7%	32%

3.2 COMPARISON OF ACHIEVEMENTS AGAINST GOALS

[redacted]

Goal: A functioning extension service in the DAILs and provinces that develops and delivers demand-driven extension programs through participation with farmers to have a positive economic impact.

Objective #1: Training – Develop technical and management skills with appropriate delivery approaches within the DAILs in three targeted provinces.

Objective #2: Communicating – Establish an integrative communication model for demand-driven extension policy development, management, training and information exchange with project stakeholders.

Objective #3: Replicating – Scale up the most successful and effective projects beyond the three initial provinces with consultation and in cooperation with MAIL leadership beginning at the end of the first project year and to the end of the project

In relation to the stated objectives, AAEP focused on and had the most success with Objective #1, training. AAEP delivered numerous, positively reviewed trainings to extension workers and other agriculture professionals. The program developed approaches to delivery of training and extension in general that allow skills to be efficiently transmitted from the provincial center to the village level. The models developed include methods for reaching vulnerable and difficult-to-access populations, particularly women, and to engage them over a long term. In general, the program activities focused on hands-on practice and practical delivery methods were the most successful in all regions and dealing with all populations.

For Objectives #2 and #3, the program established structures, particularly the workgroups, intended to foster communication within the agriculture community and direct extension policy based on demand expressed through these workgroups. The program expanded into 17 provinces from the original three provinces, including a fourth primary location in Kabul as well as secondary satellite locations surrounding each of the primary provinces. In addition, AAEP introduced the AAEP-WIA program in Kabul, Kapisa, and Samangan. However, the central success story of AAEP has been the development of a training and delivery structure with the potential to transform Afghan extension delivery.