

AGRICULTURAL LINKAGES PLUS PROJECT (ALP)

FY 2013 ANNUAL REPORT

OCTOBER 2012 – SEPTEMBER 2013

NOVEMBER 2013

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LIST OF ACRONYMS

ALP	AgriLinkages Plus
BEO	Bureau Environmental Officer
BFU	Business Forum of Uzbekistan
CCI	Chamber of Commerce and Industry
CE	Categorical Exclusion
CEO	Chief Executive Officer
DAI	Development Alternative Inc.
FtF	Farmer to Farmer
FY	Fiscal Year
G&A	General and Administrative
GCCA	Global Cold Chain Alliance
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GOU	Government of Uzbekistan
GSB	Growing Sustainable Businesses Initiative (UNDP)
Ha	hectare (10,000 square meters, 100 meters by 100 meters, 2.47 acres)
HACCP	Hazard Analysis and Critical Control Points
HEP	Horticulture Exchange Program
HO	Home Office
IARW	International Association of Refrigerated Warehouses
IEE	Initial Environmental Examination
IPM	Integrated Pest Management
IWMI	International Water Management Institute
JICA	Japan International Cooperation Agency
JSC	Joint Stock Company
LLC	Limited Liability Company
LOP	Life of Project
LSP	Local Service Provider
MASHAV	Agency for International Development Cooperation (Israel)
MAWR	Ministry of Agriculture and Water Resources of Uzbekistan
M&E	Monitoring and Evaluation
MFERIT	Ministry of Foreign Economic Relations, Investment & Trade
MOU	Memorandum of Understanding
NDC	Negative Determination with Conditions
NGO	Non-Governmental Organization
ODC	Other Direct Costs
OH	Overhead
PD	Positive Determination
P&D	Pest and Disease
PERSUAP	Pesticide Evaluation Report and Safe Use Action Plan
PPS	Plant Protection Services
TA	Technical Assistance
TCN	Third Country National
UC-Davis	University of California-Davis
UNDP	United Nations Development Program
USG	United States Government
USAID	US Agency for International Development
VAT	Value Added Tax
WCA	Water Consumers' Association (replacement for WUA)
WFLO	World Food Logistics Organization
WUA	Water User's Association
WUASP	Water User's Association Support Project

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EXECUTIVE SUMMARY

This fourth quarter report serves as the AgLinks Plus (ALP) project FY 2013 Annual Report for the period 01 October 2012 through 30 September 2013 for the USAID Raise Plus IQC No. EDH-I-00-05-00004-00, Task Order No. AID-176-TO-11-00002-00. The activities and accomplishments are summarized for the second full agricultural season of the ALP project which follows previous seasons of USAID development support to the Uzbekistan horticulture sector under the predecessor project, AgLinks Uzbekistan. This year the ALP project expanded its' scope of activities to six provinces and twenty-six districts, an increase of 3 provinces and 20 districts. The project continued to build and enhance upon the competitiveness of the strategic value chains of table grapes, stone and pome fruits, sub-tropical fruits, and nuts as more clients understand and implement the value of the lessons learned from past participation in the ALP program activities.

As will be shown in the performance monitoring and evaluation section (PMEP) of this report, the project achieved notable qualitative and quantitative results which positively impacted project clients' livelihoods and sustainability which include fruit tree nursery firms, farm enterprises, consolidators, processors, exporters, agri-firms, cold store operators, and personnel of various government institutions. Nine of ten indicators (90 percent) of the PMEP indicators were met, and most of them exceeded, some quite dramatically, as described in Chapter One.

The ALP project FY 2013 Annual Report documents progress against the ALP FY 2013 Annual Work Plan and the project's Performance and Monitoring Evaluation Plan (PMEP) and draws on the experience of all AgLinks Plus team members and implementing partners over the course of the last 12 months. Eight (8) monthly reports and three (3) quarterly reports were submitted during the year and this report draws upon the observations made in those reports while offering additional information on issues which impacted overall project results aimed at increasing employment and incomes of project clients.

This report presents the ALP project achievements and lessons learned using descriptive text, tables, testimonials, photos, and success stories to highlight the most important accomplishments of the year, summarizing the monthly and quarterly reports previously submitted during FY2013.

CHAPTER ONE: CONTEXT

SITUATIONAL BACKGROUND INFORMATION

The AgLinks Plus project began in October 2011 following the highly successful USAID AgLinks Uzbekistan project which operated from July 2007 to January 2012. Project interventions consist mainly of targeted technical assistance and training programs, supplemented by targeted procurements to demonstrate improved technologies and/or management practices. The implementation of project interventions are designed around the Uzbekistan horticultural cropping season and have strong seasonal activities which offer unique and singular opportunities during the year to impact the targeted crops production cycles: pre-season preparations (winter); in-season production (spring-summer); and harvesting and post-harvest (late summer-fall). Effective work planning is critical to the prompt delivery of project activities and resulting impact at the appropriate points in the respective crop cycles.

ALP project builds on prior years' lessons learned, strengthens relationships with clients and partners, and pinpoints necessary improvements in horticultural practices to improved competitiveness in this sector of the Uzbek economy. The evaluation of the predecessor USAID AgLinks Uzbekistan project conducted in summer 2013 provided useful guidance for the preparation of the AgLinks Plus project FY 2014 Work Plan. Many of the recommendations in this evaluation report are followed as the project begins its 3rd season of activities. Of particular focus will be improved attention to gender issues and strengthening the sustainable capacity of project clients to continue practicing and promoting the valuable lessons learned beyond the project life that have created significant impact.

This section also provides background information on the geographic, crop, and client choices that impact ALP's contractually mandated objective.

The AgLinks Plus central objective is *to increase employment and incomes through improved competitiveness* of selected agriculture value chains as measured by the following illustrative indicators:

1. Increased income measured by sales
2. Increased productivity measured by yield per hectare
3. Improved on-farm water efficiency measured by water used per hectare
4. Increased international competitiveness measured by increased exports of fresh and processed grapes and horticultural products
5. Increased capacity of national and local organizations and beneficiaries to sustain the USG investments, measured by the number of firms certified to export, number of people trained who are applying skills and teaching others on good agricultural practices and use of modern agriculture technology.

The ALP project strategic approach to improved competitiveness is to identify, analyze, and quantify the constraints to horticulture industry competitiveness in Uzbekistan using the value chain model, and then to determine and implement the best set of technical interventions to address and resolve the reasons for low productivity and unsuitable product quality that prevent Uzbekistan fresh and processed produce from accessing better markets and increasing incomes.

Geographic Focus – The AgLinks Plus project substantially expanded the geographic scope of its technical assistance program in FY 2013 as a result of an amendment to the Memorandum of Understanding signed between USAID and the Uzbek Ministry of Agriculture and Water Resources (MAWR) on December 12, 2012. This expansion enabled many more Uzbekistan farmers, processors, nurserymen, cold store operators, consolidators, and government institutions to avail the array of technical assistance and training activities the ALP program has become renowned for. The list of approved areas for the ALP project to conduct activities in is summarized in Table 1 below:

As a result of the amended Memorandum of Understanding signed at the end of the first quarter of FY2013 between the USAID and MAWR, the list of approved areas for ALP operations now covers the six provinces of Namangan, Ferghana, Samarkand, Andijan, Bukhara and Tashkent with a total of twenty-six districts. Districts bolded and underlined in Table 1 were the only areas approved for project operations under the predecessor AgLinks Uzbekistan project.

Table 1 Provinces and Districts Assisted by the ALP Project

Provinces	Samarkand	Namangan	Ferghana	Tashkent	Andijan	Bukhara	Totals
Districts	Tayloq	Pop	Quvasoy	Ohangaron	Andijan	Jondor	
	Payarik	Turakurgon	Ferghana	Bustonlik	Bulokboshi		
	Samarkand	Uychi	Quva	Zangiota	Hujaobad		
	Urgut	Konsonov	Oltarik	Parkent	Marhamat		
	Bulungur	Chortok		Kibray	Jalakuduk		
		Yangikurgan					
AgLinks (old)	3	2	1	0	0	0	6
ALP (new)	2	4	3	5	5	1	20
Sub-totals	5	6	4	5	5	1	
Total	26						26
Other	plus Tashkent City						

Commodity Focus – The targeted commodities under ALP remain stone and pome fruits, grapes, sub-tropical fruits and nuts. Specifically, the project will work in the following specific crops for a potential total of more than a dozen:

- Stone fruits - peaches, nectarines, cherries, apricots and plums
- Pome fruits - apples, pears and quince
- Sub-tropical - pomegranate and persimmon
- Nuts - almonds and walnuts
- Vineyards - table grapes

AgLinks Plus works closely with various implementing partners to deliver technical assistance, training, and other goods and services via an array of planned interventions with the goal of achieving a sustainable increase in incomes and employment through improved competitiveness technologies and management practices. While the major client/partner groups for the project consist of orchard and vineyard farm enterprises, ALP also extends considerable assistance to private firms, Government institutions, and other value chain actors. Examples of these implementing clients/partners are presented below:

- Farm Enterprises and Farmer Organizations
- Nursery operators
- Cold Store operators
- Consolidators (gather and aggregate farm production for onward sales)
- Exporters
- Agri-Firms
- Ministry of Agriculture and Water Resources
- Shreder Horticultural Institute (now renamed “Mirzaev”)
- Republican Center for Plant Protection and Agrochemistry Services
- Uzbekistan Chamber of Commerce of Industry
- Water Consumers (Users) Associations

Through planned interventions, the ALP project has made substantial progress in delivering targeted assistance to producers and exporters, via intermediaries such as consolidators, processors, and cold store operators to increase the share of production that is exported as documented in this report. This was achieved by paying close attention to increased yields to lower unit costs, improved post-harvest management, packaging, and standards such as food safety that pay off in terms of accessing better markets.

SUMMARY OF CUMULATIVE ACCOMPLISHMENTS FOR THE YEAR

Project Management PMP

Monitoring and Evaluation

The following progress was made against the ten indicators for the AgLinks Plus project that have been approved by USAID:

1. *Change in income for the AgLinks Plus assisted farmers and agribusiness, as measured by sales*

In 2013, the percent increase in income of assisted farmers changed from 18% in FY 2012 to 24% in FY 2013 an increase of 33%, exceeding the FY 2013 target of 20 percent by 20 percent. This was a result of higher farm yields and production, as well as improved pricing from increased export sales.

2. *Change in annual farm yields for all targeted crop commodities for all AgLinks Plus farm clients; yield per hectare*

In 2013, the yield per hectare increased from 24% in FY 2012 to 33% in FY 2013, a 37.5 percent increase achieved through introduction of better agricultural practices such as pruning, trellising, irrigation, and pest and disease management.

3. *Change in production volume for targeted commodities in AgLinks Plus targeted districts*

In 2013, the change in production volume increased from 19 percent in FY 2012 to 330 percent in FY 2013, an increase of 1,636 percent, achieved mainly through an expansion of assistance to 26 districts, but also from increased yields at the farm level.

4. *Change in share of total production that is exported for targeted commodities from AgLinks Plus clients*

In 2013, the change in share of exported production increased from 7 percent in FY 2012 to 31 percent in FY 2013, an increase of 342 percent, supported by a 12% share from producers; 11% share from consolidators and exporters; and an 8% share from cold store operators. Favorable changes to lower costs and improve quality, assisted by greatly improved post-harvest handling practices in the supply chain, aided in increased exportable volumes for increased export sales.

5. *Number of hectares under improved technologies or management practices as a result of U.S. Government assistance*

In FY 2013 ALP reported 24,422 hectares under improved technologies, an increase of 21,822 hectares from FY 2012, an 839 percent increase. This increase is mainly due to an expansion of assisted clients in newly added provinces and districts from December 2012.

6. *Number of firms receiving USG assistance to invest in improved technologies*

In FY 2013, 2,234 firms invested in improved technologies as a result of expanded ALP interventions, an increase of 291 percent from FY2012. Investments included improved plant material, pruning, irrigation, pest and diseased management, cold storage and nutrition practices.

7. Number of farmers, processors, and others who have adopted new technologies or management practices as a result of U.S. Government assistance

In FY 2013, 3,538 ALP clients adapted new technologies or management practices, an increase of 203 percent. This increase was due to the additional number of clients participating in ALP project trainings and technical assistance programs, implementing lessons learned.

8. Total number of producers' organizations, cooperatives, WUA's, trade and business associations, and community based-organizations receiving USG assistance.

During FY 2013, 86 client organizations received ALP assistance, an increase of 616 percent from FY 2012. Once again, the expansion of the ALP geographic focus has resulted in more organizations directly benefiting from program activities.

9. Number of vulnerable households benefiting directly from U.S. Government interventions

In 2013, the number of benefited households increased from 5,900 in FY 2012 to 12,635 in FY 2013, a 114 percent increase due to implementation of new technologies or management practices delivered by project interventions, resulting in higher yields, improved quality, and access to better markets.

10. Person hours of training completed in private sector productive capacity supported by USG assistance

ALP conducts training programs to provide knowledge on best horticultural practices to improve local production and harvesting capacity to meet international standards at the farm enterprise level. In 2013, 20,454 person-hours of enterprise level training were delivered (18,194 men-hours (89%) and 2,260 women-hours (11%)). In FY 2013, the person hours of training increased by 125 percent for men and 216 percent for women, and 133% overall. Training resulted in improved overall yields and post-harvest handling practices, increased quality, and increased sales as illustrated in many sections of this report. The absolute number and percentage of female training hours in ALP project activities increased significantly.

Strengthening Client and Partner Capacity for Improved Competitiveness

The ALP project made considerable progress during FY 2013 in conducting various activities that have led to a notable improvement in the willingness and ability of project clients and partners to implement good horticultural and business practices. Among private sector clients this has resulted in improved their capacity to compete in the production, processing, storage, and sales of fresh and processed horticultural products. Examples include the introduction and placement of improved plant material that is disease and/or pest resistant, introduction of new trellising methods, pest and disease management training including IPM practices, advanced irrigation systems, innovative pruning methods, and post-harvest practices including establishment of additional and modern packing, pre-cooling, and cold storage facilities.

One interesting example involves the relationship of ALP project personnel with an important project beneficiary group, the Water Users (Consumers) Associations in all of the provinces assisted. When funds for procuring and installing improvements to the intra-farm and on-farm water distribution systems (ALP-66) did not materialize due to lack of USAID sufficient funding in FY 2013, the project implemented a drainage and irrigation assessment activity in 6 districts with 10 water user associations with the aim of identifying needed improvements to the water distribution system infrastructure. Follow-up training sessions focused on motivating the WUA's to improve their collection of water use fees which in turn were used to fund the rehabilitation of various water distribution systems.

In the public sector, multiple government partners received various forms of assistance exposing them to modern agriculture technology and information to replicate and disseminate to the broader horticultural business community. These medium to long-term interventions, completed and/or underway, have more structural and sustainable impact on the horticulture sector through introduction and provision of new and improved planting material, a tissue culture laboratory under construction, plant pest and disease control knowledge, and tools for pruning, grafting, and budding training by government trainers. ALP actions have strengthened the Plant Protection Service (PPS) and Plant Protection Institute (PPI) capacity by thoroughly integrating their specialists in the project's pest and disease identification and control activities.



Water Users Association meeting ratifying ALP project drainage and irrigation assessment findings and recommendations

One very popular example of collaboration with the MAWR is the selection and participation of government officers in the various Horticultural Exchange Program (HEP) visits to selected sites in the United States. These programs expose government officials and technicians to modern horticultural practices which are then adapted to Uzbekistan horticultural production. The assimilation of new technology and/or management practices witnessed during HEP visits, and disseminated locally through the project's National Exchange Program (NEP), provide everlasting valuable lessons learned.

FY 2013 TECHNICAL ACHIEVEMENT HIGHLIGHTS

The projects many technical activities and achievements are presented in detail in Chapter Two of this report. However, several FY2013 technical activities deserve particular attention:

Improved vineyard management practices: In spring 2013 early-adopter vineyard owners in 6 provinces opted to experiment with the “lyre” type trellising system, introduced by the ALP project. The “lyre” trellising system, although more expensive, improves upon the “I” type trellises previously promoted by ALP through opening the vines and grapes to more sun and air. Compared to the traditional method of producing grapes on the ground (“bush” grapes) the “I” type trellises increased grape yields by 60%. The “lyre” system further improves on the “I” by an additional 67% yield increase. Overall, ALP has introduced five types of trellises for seven fruit crops in six provinces in Uzbekistan. Each trellis type is targeted for optimum output and quality of the crop for which it was designed. The results of these interventions can be summarized as leading to *increased production, improved quality, and access to better markets, resulting in increased household incomes.*

Improved cold store capacity: Uzbekistan is traditionally famous among the former USSR republics for the variety and quality of its fruits. However, consumer tastes are not static and a transformation of purchasing habits in the CIS countries, notably Russia, has resulted in demand for better quality and longer shelf-life in the supply of horticultural products. In response ALP assists producers, processors, cold store operators, and exporters to improve their post-harvest management practices. One of the prevailing constraints in the supply chain was improper and/or insufficient cooling of produce following harvest. In order to solve this constraint the project introduced and demonstrated the use of hand-held data loggers (“hobos”) that record temperature and humidity in both fixed and mobile cold store settings. These devices determine what happened behind closed doors during storage and shipment. Once the data is collected, analyzed and appropriate best practice identified the cold store produce losses were reduced by 20 percent among participants using this new technology. The main problems identified were insufficient insulation and absence of humidifiers to regulate the proper temperature and humidity for the commodity being handled.

Exposure to this technology, and the resulting reduction in post-harvest losses led to the participation of 20 cold store operators in a study tour to the United States to learn best practices for the operation of cold store facilities. The outcome of this series of demonstrations and training activities prompted the 20 cold store operators, representing a total of 6,000 metric tons of quality storage capacity, to install humidifiers, ethylene vents and data loggers during 2013. These stores increased their revenues through reduced losses and increased profits from higher prices for quality produce, motivating them to expand their facilities by adding an additional 21% to their capacity in FY2013.

Improved post-harvest management practices: Table grapes play an important role in the lives of Uzbek people: almost all homes have grapevines for shade and fruit. Additionally, no Uzbek national festival takes place without the presence of this sweet and attractive fruit. Table grapes do not ripen following harvest, so care must be taken to harvest them at optimum maturity, usually in September. They are refrigerated for storage and transport to domestic and international markets later in the year. Value chain participants always try to prolong the shelf life of the grapes because they are highly prized for New Year's celebrations. While many vineyard entrepreneurs have invested in cold rooms to extend the shelf life of their grapes in order to sell them when prices are higher, many of them are unaware of modern post-harvest technology that can dramatically extend the shelf life.

Working with an Uzbek firm that imports in-package sulfur dioxide generating pads, the ALP project introduced the use of these pads, a technique used in California since the 1920's to control mold spores that can cause grape rot. These pads have a dual release system triggered by moisture levels that emits a quick dose (within 24 hours) followed by a slower and longer release (over 8 to 12 weeks). In 2013, the project sponsored multiple training sessions and domestic exchange visits to disseminate these results, employing cooperating cold store owners as spokespersons. The resulting uptake in 2013 was remarkable. The Uzbek collaborating company reported that it sold 1 million pads, compared with 60,000 in 2012, enabling the producers, retailers, and consumers to enjoy grapes throughout the off-season, and increasing the income from table grape sales.

Increased sales and exports of Uzbek fresh produce: The ALP project reached an all-time high of registered fresh produce exports during FY2013. According to data obtained from a survey of 479 ALP client firms consisting of 477 farm enterprises, 4 consolidators, and 16 cold store operators, the export value of fresh fruit exports more than tripled in FY13 as the project's two year effort to upgrade cold storage practices began to have significant impact. All three ALP client groups which export fresh fruits (farm enterprises, consolidators and cold stores) demonstrated large increases in export values in 2013. The total value of fresh fruit exports from the 497 clients sampled was valued at \$5.84 million compared to \$1.64 million in FY 2012. Fresh export volumes increased one and a half time in FY 2013, from 1,972 metric tons in FY 2012 to 4,906 metric tons in FY 2013. The tripling of value with a one and a half time increase in volumes speaks to the higher export prices received for quality fresh fruit. Cold stores showed the greatest growth in export sales and volumes, from 120 tons in FY 2012 to 1,216 metric tons in FY 2013, a ten-fold increase.

An interesting result from these figures, again reflecting the structural change underway in the fresh fruit horticultural industry in Uzbekistan, is the change in relative shares of domestic to export sales and volumes among ALP clients. From 2012 to 2013 the volume share of domestic sales decreased by 10 percentage points while their value shares decreased 23 points. Conversely the export volumes increased 10 points while their value shares increased 23 percentage points, again reflecting the pronounced impact of higher export prices for quality fresh produce. Among the ALP sample of clients surveyed the value share of exports is now greater than the value share of their domestic sales (58% vs. 42%). These results are most notable in the data from consolidators and cold stores reflecting the transformational change underway in the export of fresh fruit from Uzbekistan. Fresh fruit exports, almost exclusively sent to Russia and Kazakhstan, are moving from farmgate sales to consolidators and cold stores. It must be mentioned that the important interventions delivered by both the predecessor AgLinks Uzbekistan project and now AgLinks Plus are definitely "paying off". Implementation of better agricultural practices such as improved plant material, better pruning practices, and improved post-harvest management including a much better cold chain, all contribute to the capacity of the Uzbekistan horticulture value chain to add value to their production and export earnings.

CHAPTER TWO: FY 2013 PROGRESS

PROGRESS, ACCOMPLISHMENTS, AND DEVIATIONS – FY 2013 WORK PLAN

Deviations – The AgLinks Plus project experienced two significant deviations in the reported indicators for FY 2013. They were :

- (1) an excessively large positive result for indicator No. 3; Change in production volume for targeted crop commodities in AgLinks Plus targeted districts clients which increased by 1,636 percent, and
- (2) a shortfall for indicator No. 7; Number of farmers, processors, and others who have adopted new technologies or management practices as a result of U.S. Government assistance.

Indicator No. 3 was over-achieved as a result of the increase of farm enterprises assisted due to the expansion of the geographic focus of assistance resulting from the amended MOU agreement of 12 December 2012.

Indicator No. 7 was under-achieved because the amended MOU signature date at the end of Quarter #1, followed by mandatory project introductory meetings to the 20 new districts in Quarter 2 resulted in technical activities commencing in earnest in the new areas in Quarter 3. Seasonally specific technical activities (i.e., pruning, grafting, trellising, etc.) would have to await a full horticultural season in calendar 2014 in the new areas.

The progress and accomplishments resulting from the FY 2013 Work Plan are described below by components and activities.

COMPONENT 1: IMPROVING FARM LEVEL PRODUCTIVITY

A. Improving On-Farm Water Management

Advanced Irrigation Systems – Water management activities under ALP include both advanced irrigation systems and working with Water User Associations (now known as Water Consumer Associations) to improve basic water infrastructure that supplies water between and among farmer's fields. ALP analyzed the piloted farm-level advanced irrigation system activities under the AgLinks project and determined the most cost effective systems are being adopted by tree nurseries and small farms or larger commercial operations. The medium-sized farms are not ideal for drip irrigation because of the cost-benefit of current water access for their size of farms with the corresponding levels of production. Because water provided through canals and furrowed to fields is free it provides a more attractive cost structure to farmers than investing in drip irrigation systems. No new advanced irrigation systems were installed by ALP project in FY2013.

During FY2013 two drip irrigation systems installed under the predecessor AgLinks project were dismantled and transported by ALP to new sites where more interest was shown to utilize the technology. One system was moved from Ferghana to Andijan where the farmer Mr. Mamurjon has planted 1.0 ha of intensive apples. The second system was moved within Samarkand Province to Mr. Fayzulla, a new farmer with 0.5 ha of grapes. The remaining 7 drip irrigation systems built prior to ALP remain in use by farmers. ALP project staff continue to provide training and follow-up visits with the participants in the predecessor project's advanced irrigation assessment begun in 2010. Special attention is paid in these follow-up visits to the process of laying-out and reeling-in irrigation tubes in the field according to seasonal requirements. Farmers were provided definitive and site specific recommendations on maintenance operations, irrigation system conservation for the winter and re-activation in the spring.

Irrigation & Drainage Systems - ALP focused FY 2013 water management activities on rehabilitation of targeted irrigation and drainage systems. Projected funding for this activity (ALP-66) did not materialize in the form of additional obligated funds in FY 2013. In lieu of this intended assistance, an assessment of the WCAs in the original 6 districts was undertaken in Q1 prior to the approval of the MOU amendment. These WCA's were subsequently targeted for 30 different training sessions intended to improve their institutional governance. The intended result was to increase collection of water consumption fees from their members to settle arrears, maintain and repair the water distribution networks and make new investments. Fee collection rates among the targeted WCAs increased from 4% to 67% with an average increase of 20% as presented in Table 2 below.

Table 2: Location and Increase Percentage of WCAs Fee Collections in FY 2013

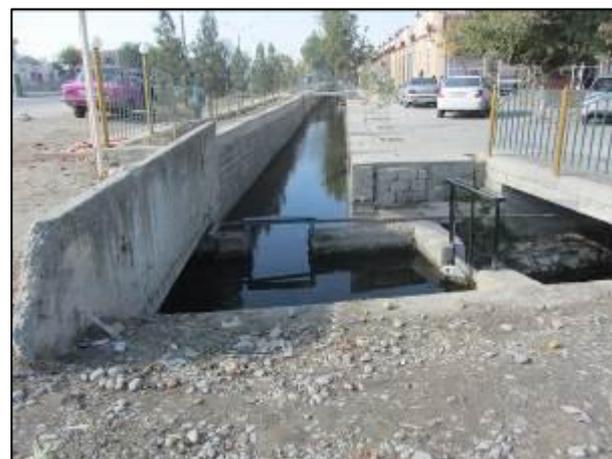
Strengthening the capacity of the WCAs as institutions led to: a) WCA members - farmers' understanding that if they don't care of their own irrigation and drainage network, nobody else will; b) the WCA executing body learnt what administrative tools to employ in order to accelerate fee collection from WCA members and how to use legal procedures to punish undisciplined ones. As a result the rate of WCA membership fee collection increased by 20% and 324.4 million UZS were collected by October 1, 2013 compared to 193.1 million UZS for the entire 2012 calendar year. Under the design and guidance of ALP water consultants 25 new structures were built and 67 were rehabilitated. Total capital investment into construction materials and transportation

#	Province	Water Consumer's Association (formerly "Users")	Membership fee collection, %		
			2012	2013	Increase
1	Namangan	Shirinsuv yangier	60	80	33%
2		Turakurgan	70	78	12%
3		Pungon	55	60	9%
4	Ferghana	Chashmai Sufon	60	65	8%
5		Kuvasay Yangier obi khayot	50	52	4%
6	Samarkand	Toyloq zarafshan	30	50	67%
7		Samarkand	20	30	50%
8		Khujabuston suv tarmogi	50	70	40%
9		Damkhasa arigi	60	70	17%
10		Sohibkorlar suvchisi	70	75	7%
Total			53	63	20%

for all structures consisted of 19 million UZS. The majority of executed hydraulic works were water distribution points with 2 to 3 sluice gates and fixed flumes to measure water flows. Improved structures allowed to improve water supply on 3,000 hectares and benefited more than 9 thousand villagers. Many farmers have applied new methods of water conservation, saving as much as up to 20% in water consumption.

Table 3: Impact of Support to WCA's during FY 2013

#	Province	Water Consumer's Association (formerly "Users")	Improved		Impacting in Respective		
			New	Rehab.	Farms	Fields (ha)	Rural Citizens
1	Namangan	Shirinsuv yangier	2	4	6	521	360
2		Pungon	na	4	15	120	720
3		Turakurgan	na	clear 600 m	4	40	240
4	Ferghana	Chashmai Sufon	na	2	2	81	74
5		Kuvasay Yangier obi khayot	na	1	8	76	240
6	Samarkand	Khujabuston suv tarmogi	4	15	21	1,000	1,029
7		Damkhasa arigi	2	2	4	52	160
8		Sohibkorlar suvchisi	na	2	5	69	248
9		Toyloq zarafshan	12	22	55	600	3,528
10		Samarkand	5	15	45	450	2,700
Total			25	67	165	3,009	9,299



Before (Left) and After (Right) water distribution point repairs done in April/May 2013 by the Taylak District WUA in Samarkand Province after the ALP drainage and irrigation assessment and training programs

B. Improving Plant Material and Agronomic Practices



Asror Mallaev, ALP client in Taylak District of Samarkand Province, prunes his fruit tree nursery

New Seeds and Plant Material.

Rootstocks of virus free dwarf and semi-dwarf apples such as M-9 and MM106 (which is wooly apple aphid resistant) and cherry varieties Gisela and Colt (phytophthora resistant) were imported from the Netherlands in previous years and were disseminated to 4 private nurseries. They were also propagated at the M. Mirzayev Horticulture, Viticulture and Winemaking Research Institute located in Tashkent. As a result of this previous activity a total of 3,500 dwarfing apple saplings and 15,000 rootstocks, 500 semi-dwarf apple saplings, and 7,000 rootstocks have been propagated during the 2013 growing season. This is the first time that virus free rootstock has been propagated in Uzbekistan. Virus free

rootstock is faster and easy to propagate and thus more economical. It was also the first time to work with apple propagation that employed the “bed layering” method to accelerate sapling production. Six (6) private nurseries located in Namangan (2), Ferghana (1), Tashkent (1), and Samarkand (2) propagated these apple saplings. They also tested 11 new varieties for apple (11), cherry (15), plum (5) and almond (2) varieties to determine their suitability for field conditions in Uzbekistan.

Improved Agronomic Practices



Asad Saydullaev of Payarik District, Samarkand Province with new “lyre” trellising system for grapes.

Advanced Grape Production Techniques

– Following the recommendation of international grape consultant Andrew Tuebes from last season, ALP provided trainings throughout the vegetative growing season on grape production and grape nursery techniques. The first set of trainings were focused on planting, pruning and irrigating. Pruning, fertilization and pest and disease management were of particular interest to farmers due to their lack of knowledge on advanced technologies. The second set of trainings, in addition to previous topics, focused on thinning, and topping. The third and final set of trainings were on postharvest and winter practices of grape production such as fall pruning, pest and disease control, irrigation and covering the grapes for winter protection.

A new pruning method for bush vine grapes was introduced entitled “basket pruning” for those farmers still reluctant to trellis their vines. For the early adopters ALP introduced a new variety of trellising in FY2013 (“lyre” rather than “T” or “I”) for both raisin and table grape varieties. Three demonstration plots with lyre shaped trellises for vineyards in Samarkand Province and one “Oltiarik method” roof trellis in Namangan Province were established. By increasing the height from the soil these trellises reduced physical damage, dust and disease, increased grape quality and decreased losses. According to local farmers “lyre” type trellises doubled the yield with better quality produce compared to vertical “I” trellises. Overall a total of 260 grape producers were trained in eight (8) locales in Samarkand, Bukhara and Tashkent provinces.

Grape Variety Identification Research –ALP project hired a local grape specialist – Bahtiyar Mirzahidov, from the Samarkand branch of the Horticultural Research Institute (Shreder) with more than 20 years’ experience to undertake a grape variety identification program. The purpose of the activity is to scientifically identify and catalogue the various indigenous grape varieties in Uzbekistan which can be promulgated to improve future production and access new markets. Research activities were held in June – for early yielding varieties, in July – for mid early varieties, and in August – September – for mid and late varieties. There were about 60 varieties identified and 10 of them classified as new or hybrid to Uzbekistan. This activity is ongoing and will be finalized by March 2014.



International Cherry Consultant, Joseph Grant, demonstrates pruning techniques in Ferghana Province

Cherry Production Consultations – The cherry yield in recent years has been dropping dramatically for this high value crop in most of the cherry growing areas of Uzbekistan. Consultant Joseph Grant, a California extension officer met during HEP programs, was brought in specifically to identify the main cause of the cherry yield drop and provide recommendations to growers. According to the consultant, one of the main causes for cherry yield drop is high temperature during the pollination period, lack or absence of compatible pollinizer varieties and pollinators, like bees. Many growers underestimate the importance of pollination and most do not have a clear idea or information about compatible pollinizer varieties. The consultant conducted a series of training programs in all ALP project provinces on Best Cherry Production Practices which stressed the following topics:

- Primacy of pollination and pollinizer identification once solved can triple production in 3 years
- Importance of proper spring and summer pruning and tree training methods
- Irrigation practices and proper fertilizer type and application
- Pest and disease identification and control

Determination of the proper pollinizers for Uzbek cherry varieties will require a scientifically based pairing of pollinizer and producer trees called s-allele testing. To this end, ALP performed a cherry mapping exercise in during the harvest season of FY2013 to determine which varieties were present in a sample of 8 orchards. Plant budding samples from the cherry trees in these mapped orchards will be sent in spring 2014 for testing to identify the best pollinizer-producer combinations. The s-allele testing will be complemented with leaf analysis of mapped orchards for multiple tree crops to inform project fertilizer recommendations.

New Intensive Orchard Demonstration Plots – During the 2013 fiscal year the AgLinks Plus project procured semi-dwarfing apple saplings worth \$4,750 from Norchontol Farm, a local nursery,



"I" Trellises for intensive apple orchards at Shokir Faraev's Farm Enterprise in Ferghana Province

for the purpose of testing for resistance to fire blight, sunburn, and drought. The ALP project established 4 demonstration plots in Namangan, Andijan and Samarkand provinces with 4 farms. The purpose of the demonstration plots was to establish semi-dwarf apple orchards at a higher density to show the advantages of semi-dwarfing trees over dwarfing trees. As expected, semi-dwarf trees proved to be two times more vigorous in the hot climate of Uzbekistan compared to dwarfing apples, less susceptible to bacterial diseases, more drought, insect and sunburn resistant, and more economical to establish.

Intensive orchard systems – is a set of agricultural practices, including a higher density planting scheme, innovative pruning techniques, modern irrigation

methods (both local drip irrigation and micro sprinkler irrigation), and the installation of new trellis systems for all tree fruits and grape production. ALP experts have adapted the Californian intensive orchards experience to local conditions. Wire installation, tensioning, and trellis anchoring were made under supervision of AgLinks Plus Project specialists. For example, at the A. Aripov site in Tashkent a V-type trellis system was installed to reduce sunburn and increase production by 150 percent. This technology had not previously been applied in Uzbekistan on a large scale.

Provision of tools and testing equipment – More than a hundred tools such as pruning loppers and shears, sprayers, grafting and budding knives, and testing equipment for sugar (Brix), humidity (moisture), ripeness (pressure), soil pH (alkalinity/acidity), and digital temperature recording thermometers were distributed during training and variety contests among farmers and experts including the M.Mirzayev's Horticulture, Viticulture and Winemaking branches in the regions. The provision of tools and testing equipment promotes the understanding and importance of new

technology to increase production, improve quality, and to access better markets leading to increased incomes.



Shreder/Mirzaev and ALP staff provide motorized sprayer to winners at the Grape Variety Contest in Tashkent Province, September 2013.

Walnut assessment – 20 different walnut seeds were planted for identification of vigorous rootstocks in the fall of 2012 and grown during the 2013 season. The purpose is to find varieties with the best attributes in order to establish walnut plantations for increased production and sales. Typical of walnuts grown from seed, the first year's growth was not sufficiently vigorous to bud during August, 2013. These walnut rootstocks will be budded in the spring of 2014 with local and U.S. varieties.

Three new light color walnut varieties were selected from Namangan Province to propagate in the 2014 growing season.

Two widely grown high yielding U.S. walnut varieties were grafted in the spring of 2013. These varieties will also be propagated in 2014. All the walnut variety work is done in cooperation with the M. Mirzayev Institute (formerly Shreder) in Tashkent to assist the move of walnut orchards from the wild to managed orchards. Managed walnut orchards will increase the supply of high quality walnuts for existing high value demand, which will increase employment opportunities and increase domestic and export sales income.

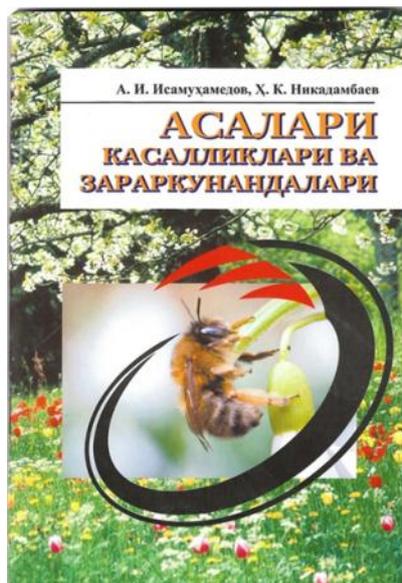
Trellising – The project installed and/or provided more than 4,900 trellises on 23 demo plots during FY 2013 located in Samarkand, Namangan, Andijan, Tashkent and Ferghana provinces with the total area of 11.1 ha. Four different types of trellises: I, Lyre, T, and V were used on six crops including apple, grapes, persimmon, plum, pear and cherry with the majority of those being intensive vineyards and orchards newly introduced in Uzbekistan. It is too soon to determine the impact from the demonstration plots except for grapes, which has been mentioned in this report in the success story of the “lyre” trellising technology adaptation. For grapes, by the end of the season of installation, farmers reported significant yields increases and much improved quality, being able to sell more volume of the improved grapes for 2200 – 2600 UZs per kilogram, an improvement from 1200 – 1600 UZS per kilogram.

Bee pollination –As a follow-up from the bee pollination assessment of FY 2012, and in cooperation with the National Beekeepers Association, two manuals – Basics of Beekeeping and Bees Diseases and Pests, were developed and printed in 2013, each in 2,000 copies. These will be distributed to private beekeepers and farmers interested to incorporate beekeeping into their orchards and vineyards to improve pollination and fruit set. They were also given to association members and to local colleges with beekeeping curriculum. Farmers

“Top grafting” – technology to change an existing variety to another without uprooting and replanting. Example from “Umarova Mayramxon” Farm Enterprise owned & operated by Xojiakbar Umarov.

“I was skeptical of the idea of changing my 5 year old peach variety, which could not command high prices in the export market, into the more highly demanded nectarine, suggested by ALP consultants, in one year. Instead of pulling and replanting the orchard we just changed the top part – the variety. Because it is unheard of being successful to graft peach trees, in general, due to death of the tree the same year, it was shocking to see the growth after 6 months. New growth from a new nectarine variety looks like a three year old tree! As a result I saved a lot of money and time. I will harvest this new nectarine variety in the summer of 2014 and plan to “top work” another hectare in the spring of 2014. I am thankful to the ALP technical staff and their consultant for introducing me to this new technology.”

are purchasing hives now from the three existing beekeeper associations and the manuals will be distributed at specific trainings in spring 2014 when pollination is a timely topic.



Pests and Diseases of Bees



Basics of Beekeeping

Bio saline Demonstration Plots – During FY2013 the ALP project continued to oversee the bio saline demonstration plot in Turakurgan District of Namangan Province, in collaboration with the International Center for Biosaline Agriculture. Among the tested three halophytic crops - sorghum, flax, and alfalfa, it was determined that alfalfa demonstrated the best result. In addition to the direct impact of decreasing soil salinity through uptake of salt by the plant, there was the important additional benefit that the halophytic alfalfa was harvested 5-6 times during the year and is being used as forage for livestock.

Other noted results from the Bio saline demonstration plot include the following:

- Pomegranate plant and fruit quality has significantly improved according to the grower
- Neighboring farmers have replicated the demonstrated method to mitigate soil salinity through planting of halophytic crops
- The method will be demonstrated in other targeted districts, especially in Bukhara Province where saline soils are prevalent

C. Pest and Disease Management

IPM Consultations – During the 2013 growing season the main pest and disease yield losses were due to apple worm and fire blight in pome fruit orchards, and oriental fruit worm and powdery mildew in stone fruit orchards. The ALP project established 9 IPM-based, codling moth control demonstration plots in Ferghana, Namangan and Samarkand provinces using pheromone traps with the required accessory equipment in spring 2013. Only one plot in Namangan province was successful in controlling codling moth. The other plot owners did not follow the recommended practices because they considered it too much work to properly utilize the technology. When queried, most farmers preferred to pay someone to do the IPM pest control for them rather than implement the technology themselves.

ALP project then turned to one of the project trained Pruning Group in Namangan to train him on IPM-based control methods for codling moth, the cause of apple worm. He was successful in using this newly gained knowledge for controlling codling moth for other farmers for a fee. Next year more consultants like Tojiddin will be trained and equipped with traps and min/max thermometers rather than targeting farmers themselves. These groups will add IPM pest and disease control to the growing array of services they can offer to farmers on a fee basis. Training of Trainers workshops will be used to promote this new approach.

Grape, pome and stone fruit disease management one-page fact sheets were in high demand during the 2013 growing season and AgriFirms in Andijan and Samarkand provinces multiplied the fact sheets and distributed them to their member farmers. Additionally, a new fact sheet was prepared and disseminated for control of Fire Blight, the devastating bacterial infection of intensive apple orchards.

Revised PERSUAP – Based on the revised and approved PERSUAP of FY 2012, the ALP project conducted IPM training sessions based on PERSUAP recommendations for each crop. Trainings were conducted for all pome and stone fruits as well as grapes on fruit worm control and diseases. The ALP project developed a Persimmon Production Manual in collaboration with the M. Mirzayev Horticultural Research Institute with a pest and disease management section based on the updated PERSUAP. All production manuals and fact sheets prepared and released by the ALP project are based on the PERSUAP criteria.

D. Post-Harvest Storage and Losses (Prevention)

Apple Harvesting Guidelines for Improved Cold Storage Life – Recognizing the inter-relationship between various criteria for selecting the optimum harvest time for apples, ALP prepared and presented the information for apple growers during training sessions as presented in Table 4 below. The application of the knowledge is expected to significantly improve the quality and storage life of properly harvested apples, leading to increased sales and income for the practicing beneficiaries – growers and cold store operators.

Table 4: Key Criteria for Determining Optimal Apple Harvest

Optimal Apple Harvest Determination.					
Apple Variety	Measure and Units				
	Brix	Firmness	Blossom to Harvest	Acidity	Cold Storage
	%	kg-force	days	pH	days
Jonagold	12-13.5	5.9-6.6	144	3.7-5.6	150
Idared	10.5-11.5	5.9-6.8	155	5.4-7.0	130
Elstar	11.5-12.5	6.3-6.6	132	5.8-7.8	135
Fuji	13-14	6.5-7.5	178	4-4.5	180
Golden Delicious	11.5-13	6.6-7.0	140	3.8-5.7	165
Red Delicious	11-12	6.6-7.5	145	2.3-3.8	120
Granny Smith	10-11	6.8-7.7	170	6.3-9.5	120
Gala	11.5-12.5	7.0-7.5	115	3.4-4.4	130
Pinova	12-12.5	7.0-8.0	142	4.5-5.5	-
Braeburn	11.5-12.5	8.6-9.5	168	6.0-6.7	150

Iodine testing for apple maturity – More than 20 new apple varieties have been imported from Eastern European countries to Uzbekistan. Lack of knowledge about ripening and best harvest time of apples is leading to poor storage quality and product wastage. The ALP technical staff trained intensive apple growers in identifying best harvest time for longer cold storage of apples. In addition to the criteria shown in Table 2, a new technology for maturity indices like the iodine test (starch-sugar ratio), brix (% sugar) and firmness identification was demonstrated. Based on the newly acquired skills, partner

farmers harvested their apples and are storing them to gain higher prices in winter months. ALP trained trainers received brix testers to further assist in identifying best harvest times for apples. Training programs were conducted in Ferghana, Andijan, Tashkent, Namangan and Samarkand provinces.

Cold Chain and Storage – The improvement of the cold chain in Uzbekistan, in targeted regions, was greatly enhanced by implementation of well-established industry best practices. Beginning at the field level, 5 trials were introduced in Andijan, Ferghana, Namangan, and Samarkand using mobile packing stations with the purpose of retaining early morning cooler temperatures by using the “swamp cooler” technology which circulates cold water/ice over a fan to improve fruit quality and shelf life at the harvesting and packing site by maintaining the ambient air temperature at 20-22 degrees centigrade.

Pre-Cooling. Using pre-cooling methods before packing fruit for export was introduced and implemented in Ferghana and Namangan regional cold stores. In the past fresh produce entered the distribution system by-passing any pre-cooling or cold storage, thereby reducing product quality and

shelf life. Training was conducted to demonstrate the added value of proper cooling of fresh produce. Many consolidators and/or exporters did not understand that produce was not sufficiently cooled inside refrigerated containers on the way to the marketplace. The ALP project stressed the importance of pre-cooling and then demonstrated forced air cooling inside cold rooms or chambers especially designed for pre-cooling. Twenty-eight cold store operators and exporters participated in the NEP 3 exchange program to witness modern cooling practices. In Samarkand, Ferghana, and Andijan five new facilities of 550 tons capacity were installed employing technical recommendations from ALP technical experts.

Cold Storage Trainings. The ALP project promoted exchanges of experiences among participants during NEP and CEP programs. For the CEP program, 10 persons traveled to Georgia and Florida to see modern cold chain practices in the US to share with their colleagues in the industry through the domestic NEP program. A micro-NEP, within-region, program was also introduced. An example cold room in one province was utilized to bring ALP clients from the same area in smaller groups of 4 to 6 people to maximize the training effort. By seeing technology used successfully in the same region, there is broader acceptance of the technology. The cost was born by the participants.

In response to requests from multiple cold store owner/operators to organize a training for refrigeration technicians, ALP sought a trainer via subcontractor Global Cold Chain Alliance. Cold store owners stated they had great difficulty finding competent local refrigeration technicians. To meet this need the international consultant Jerry Meyer provided training for 135 persons on maintenance of cold store refrigeration equipment in the Tashkent, Samarkand, Ferghana, and Namangan provinces during April, 2013.

Instructions and information were given to inform cold store operators on the importance of separating products by their required temperature, humidity, ethylene release, and odor requirements to prevent improper storage practices. This has helped to reduce the harmful cross-contamination among fruit products which are not compatible in common storage. Demonstration of ethylene vents and humidifiers in cold rooms were also tested and the results presented to industry members through NEP and mini-NEP site visits. In 4 cold stores, ALP introduced technology to remove excess ethylene in cold rooms by installing tubes connected to the fresh air return to remove the gas. Cold store operators installed electric or manual humidifying equipment to reduce drying and shrinkage of stored produce. Much improved product quality was noted and the operators were anxious to implement the new technologies and management practices.

Storage for Shipping to Market. New methods to store highly perishable fruits were introduced in targeted cold stores using various atmospheric-modification packaging such as sulfur dioxide pads for grapes and vented plastic packaging for stone fruits to control the ripening process, especially for cherries, apricots, peaches, nectarines, and persimmon. This technology was well accepted by the export market with the fresh produce arriving at the sales market with minimal weight loss and improved appearance and quality. Lesser acceptance was achieved in the local market handling chain and this will be addressed in FY 2014 through training programs for buyers.

Fresh produce behavior during transportation to local and foreign markets was also investigated by ALP during FY2013. The project monitored products sent to Russian markets to compare traditional handling methods vs. improved practices for cherries. The difference between open (traditional) packaging methods and improved (modern) packaging showed brown stems on cherries compared to fresher looking cherries with new packaging concepts. The resultant better quality fruit commanded higher prices for the exporting clients.

Industry Trends. Expansion of cold stores in Andijan, Bukhara, Ferghana, and Samarkand provinces took place as a result of the lessons learned by ALP project cold store operator clients from the various training and demonstration activities. About \$US 400,000 was invested during the year by ALP cold store clients. Entrepreneurs also started investing in small refrigerated trucks for improved transport of fresh produce to the marketplace, ensuring better quality and shelf life upon arrival at the destination. Two refrigerated trucks were purchased by an ALP Bukhara client and brought into service representing a total investment of \$50,000. The cold store association (LLC) signed the Protocol of Formation in 2013 and cold store operators began meeting with each other on a semi-regular basis. During the off season in 2014 a follow-up activity will be conducted to formally establish the LLC.



Peach variety contest in Andijan Province

E. Agri-firm Production and Marketing Support

Variety Contests – Variety contests were conducted in three different provinces to reach more new people and find out about new fruit varieties exhibited by the farmers for possible adaptation to other production areas or of interest to local and export markets. Fruit variety contests on apricots were organized in Bukhara, peaches in Andijan, table grapes in Tashkent and apples in Samarkand. During variety contests the following activities were conducted with the participants:

- Household processing training of the particular fruit
- Demonstration of best post-harvest

practices and technologies like packaging materials, pre-cooling equipment, packing sheds and necessary tools and testers

- Demonstration of new fruit drying techniques and technologies

Capacity building – Managers and key staff members of cooperating AgriFirms are always invited to ALP project training programs and exchange visits for both local and international venues. AgriFirms management representatives attended a Pome Fruit IPM intensive training course in Kazakhstan. They were similarly represented as part of the delegation that attended the 2013 Golden Bunch of Grapes Conference and Exhibition in Ukraine. ALP involves AgriFirms in collection and aggregation of preliminary production and economic data from their member farmers cooperating with the ALP project. Thus it strengthens the capacity of AgriFirms management to develop questionnaires, conduct interviews, aggregate and disaggregate data, and analyze it for better utilization among their farmer members. The newly hired in FY2013 ALP Project Marketing advisor worked closely with various Tashkent Province AgriFirms to assist in the development and facilitation of local sales among AgriFirms members to both local and foreign markets. The results of this assistance are shown in Table 5 below:

Table 5: ALP Marketing Assistance (Tashkent Province Facilitation – bringing people together)

Province	District	# of Producers	Produce	Market Destination	Amount to-date (USD)
Tashkent	Parkent	3	Grapes	Export	104,707
	Bustonlik	1	Fruits, grapes, vegetable	Export	27,857
	Ohangaron	1	Sweet cherry and apricots	Export	12,000
	Kibray	2	Strawberry, sweet cherry	Domestic	1,440
	Zangiata	1	Plums, onion, potatoes	Domestic	7,685
	Kibray	1	Fruits, vegetables, seasonal	Domestic	N/A
Total		9			153,689

COMPONENT 2: PUBLIC AND PRIVATE SECTOR SUPPORT

Public Sector Support

Establishment of a Tissue Culture Lab at the Shreder Institute – Activities were underway throughout FY2013 to design, scope, prepare, tender and procure the necessary materials to rehabilitate the tissue culture laboratory at the Shreder Horticultural Research Institute in Tashkent. Once completed, the laboratory will be capable of producing 5,000 virus-free, high-yielding and pest-



Tissue Culture Laboratory floor rehabilitation work in progress



Tissue Culture Laboratory floors, walls, and doors after rehabilitation

resistant seedling plants per week in its first year of operation. For its part and during FY2013, Shreder rehabilitated the physical facilities which will house the laboratory. In turn, ALP completed the final design, prepared the technical specifications for the required laboratory equipment, tendered to suppliers for the materials needed, evaluated and awarded the tender, received the materials and prepared them for shipment. ALP and Shreder staff worked hand-in-hand to determine the best means of importing these materials duty-free to Uzbekistan and by the end of FY2013 succeeded in obtaining a special dispensation from the Cabinet of Ministers to import. The materials will be shipped once the USAID funding obligation status for FY2014 is clarified and non-training technical activities begin again.

Advanced Irrigation Demo Site – Technical Assistance and Winterization Work.

ALP provided technical assistance to the Tashkent and Regional Mirzayev (Shreder) Horticultural Institute sites with advanced irrigation systems during FY 2013. Project staff and the project engineer provided leadership on irrigation designs, locations, installation and management on a recurring basis throughout FY 2013. During the 2013 growing period, monitoring of system performance and maintenance focused on these demonstration sites at the Mirzayev Institute. The Ferghana Branch Manager of the Mirzayev Institute explained the equipment was having a positive impact on his operations as the system freed labor for other needed activities on the station.

The Tashkent pilot site located at the Mirzayev Institute has shown positive results in 2013. The advanced irrigation and micro sprinkler irrigation systems were used 100 % from April to October.



Advanced irrigation system demonstration plot in nursery at M. Mirzayev ("Shreder") Institute in

Inefficient furrow irrigation and water discharges from the field have been completely eliminated. By means of an installed fertilizer injector (fertigation) system, the practice of measured fertilizing doses was introduced reducing wastage. The head control system has additional capacity which was used in 2013 to expand the area under irrigation by 0.2 hectares. All watering control is now performed by only one person on the basis of a recommended irrigation schedule. Demonstrations of the system were made at the Institute with experienced local growers.

The Mirzayev Institute has now two seasons of experience in the use, management and maintenance of the advanced irrigation system which provides demonstration of drip, mist and sprinkle techniques in different settings. They have used the system to support nursery production of virus-free and true-to-type plant material, as well as testing of other new intensive technologies such as potted planting of fruit trees for use in urban environments and saline soils. Different trellising systems, both of traditional and new types, have been added to the site to increase the technologies demonstrated. The Institute added an adjoining classroom to facilitate the use of the demonstration areas for training purposes. The Institute regularly holds training sessions for farmers and hosts multiple international delegations at this experimental site. The Mirzaev Institute's management intends the next step to be addition of a collection orchard to the nursery that will draw upon planting material produced in the latter to populate the former. The resulting orchard will then demonstrate the production potential of the different varieties produced in the nursery.

Private Sector Support

The majority of the support provided by the ALP project is to improve the competitiveness of the Uzbekistan private horticulture sector. In order of support provided, the following private sector beneficiary groups are the main recipients of project activities: (1) Farm Enterprises, (2) Cold Store owner/operators and exporters, and (3) Nursery owner/operators.

Additionally, the project is working with a private sector provider of information technology services for design and establishment of the pest and disease control mobile application – MEVA. In conjunction with this, the ALP project established relations with Namuna Services, a local representative of a Turkish agro-chemical firm interested in providing technical information for the MEVA application.

As reported elsewhere in this report, collaboration was started with the Beekeepers Association to strengthen their ability to provide advice and assistance to farm enterprises to improve pollination and fruit set on the many fruit crops, especially cherries. This collaboration resulted in the publishing of two beekeeping related books in FY2013 which will be used by both apiary and horticultural enterprises.

With the April 2013 hiring of Elbek Suleymanov, Produce Marketing Manager and regional area manager for the newly opened Tashkent Province, the ALP project has begun market development assistance and training with local retail and supermarket chains for improving the supply, quality, and packaging of fresh produce from farm enterprises, consolidators, and cold store operators. Contacts and initial shipments were made with the Korzinka chain of grocery stores.

One major achievement in the private sector is the development of private groups beginning to offer business services for various value chains. A good example of this

is the formation of a Pruners Group in the Turakurgan District of Namangan Province that was formed as a result of the ALP project as described in the above right box.

Pruning Group Testimonial

by Tojiddin Toshpulatov

“My friend introduced me to AgLinks Plus a couple of years ago. I, with my 4 other pruning group members, have been pruning cherry trees for many years in Turakurgan District of Namangan Province. I started attending ALP organized training programs on tree training and pruning. After attending their practical training sessions, I understood what we have been doing wrong in the time of year we prune cherries. I not only expanded my group members to 8 but also we prune all fruit trees each with their own requirements. ALP provided pruning tools which are invaluable in what we do and increased our pruning capacity 3 times. Since 2010, thousands of hectares of intensive orchards have been established in Uzbekistan. I always wanted to see my group pruning intensive orchards, because it helps to increase the incomes of pruners significantly, as no trained competition exists in this area. In spring 2013, ALP technical staff trained pruner groups like mine in intensive orchard pruning. Since then we are not only pruning in spring but in summer and fall seasons, because of the new skills we have been taught. As a result, more pruners are working and more than doubled their incomes.”

COMPONENT 3: AGRO-PROCESSING AND EXPORTS



Household processing training by Marifat Nazarova

Household processing – The ALP project hired two consultants to conduct household processing training programs in FY2013 - Marifat Nazarova – Chief food technologist with the Turakurgan Shirinlik Processing Plant to cover mainly the Fergana Valley area and Sharof Mirzakhidov – Processing specialist at Shreder Institute’s Samarkand branch, to cover the Samarkand and Bukhara provinces. Both consultants focused on food safety and hygienically clean processing practices for food preservation and preparation methods. Most of the trainings programs were conducted in the newly authorized districts.

A total of 479 people were trained on various topics, attended by 398 women and 81 men. The majority of the topics covered in the trainings were:

- 1) Candied fruit from peach, plum, melon, pumpkins
- 2) Compote and jam from all types of locally grown fresh fruits.
- 3) Fresh and fried salads from fruits and vegetables.
- 4) Pies from apple, peaches, apricots and,
- 5) Cookies from fruits

Fruit drying and processing trainings – From June to September, Sharofiddin Mirzakhidov, Fruit Drying and Processing Specialist at the Shreder Research Institute – Samarkand Branch, conducted training programs for men and women in five (5) districts of Samarkand including Samarkand, Taylak, Payarik, Bulungur and Urgut, and one (1) authorized district of Bukhara Province, Jondor District. As with previous household processing training programs, these programs were conducted at one of the participant’s home. One-hundred-fifty-eight (158) participants, mainly women, were taught household fruit drying and preparation methods of candied fruits from apricot, plum, sour cherry, peach and apple; and sixty-four (64) participants, mostly men were taught raisin drying methods in Payarik, Taylak, and Samarkand districts, as well as at the Samarkand branch of the Shreder Institute.



ALP Processing Consultant Sharofiddin Mirzakhidov conducting training on fruit drying in Tashkent Province during August 2013



Raisin drying using solar technology (Thompson model)

Advanced on-farm processing and post-harvest technology – Two types of solar dryers originally developed in California at UC Davis were designed with local material availability in mind. These dryers and their US designers were first encountered during HEP program visits to California. Multiple tests in different locales and using different fruits were held throughout the 2013 post-harvest season to assess the productivity and cost efficiency of these prototype dryers. In total, 21 prototypes including 18 “Thompson” types (photo at left) were built and assessed in collaboration with farm enterprise owners in Andijan, Fergana, Namangan, Samarkand, Bukhara, and Tashkent provinces.

Fergana, Namangan, Samarkand, Bukhara, and Tashkent provinces.

The drying characteristics of apricot, apples, grapes, plums, peaches, and some vegetables, such as tomatoes and eggplants, were assessed. While all three prototypes proved efficient at drying fruits, the prototype “Thompson” was most preferred by local farmers due to its cost efficiency and higher output within a shorter time period. Apricot drying time by traditional methods in Uzbekistan is about 10-14 days while the “Thompson” technology test resulted in 3-5 days drying time in Andijan, Fergana, and Namangan. Raisin processing under traditional open-air, sun drying requires 20 days or more while the tests conducted in Samarkand confirmed the second prototype (nicknamed “Epica”) took only 10 to 12 days. First tests with the “Thompson” model indicated that this can be reduced to 5 to 8 days to dry grapes and produce raisins. Both prototype solar dryers were appreciated for being more hygienic and posing less food safety issues than the traditional open-air-ground-drying method which absorbs dust and exposure to insects.

Final evaluation of the 2013 season’s solar fruit dryer technologies and field test results was held during the National Exchange Program (NEP-7) in Hojaobod District, Andijan Province on August 6, 2013. This program served to exchange knowledge and new dryer use technology skills amongst 24 farm participants. Feedback from this season’s experience to inform future technology improvements was shared among the attendees, as well as lessons learned for each fruit crop. Based on the results of this program, ALP staff member, Gholib Mahmudov, and the farmer Fayzullo Holboyev from Payarik District, Samarkand jointly developed and tested a third generation or modified version of the “Thompson” dryer to produce raisins as the end of FY2013 and the raisin producing season came to a close. The improvement introduces a dryer modification in response to local market demand for “elongated raisins” which sell at twice the price of other raisins in local bazaars and are preferred by Uzbek consumers. Gholib Mahmudov shared this modification with Mr. Thompson of UC-Davis during the HEP08 visit to California and they will collaborate in 2014 to document the results of this modification.



ALP Assisted AgroFood 2012 Exhibition and

Trade Exhibitions – No international trade exhibitions were conducted in FY 2013 as these were removed from the FY13 work plan at the request of the USAID/UCO. ALP project was requested by the Uzbek Chamber of Commerce and Industry to provide both technical and financial assistance to their first agriculture and food conference, AgroFood 2012, held in Tashkent from 28-30 November. ALP provided the workshop with 3 international presenters on the importance of a national cold chain linked to international markets to promote fresh produce exports and imports.

Fresh Fruit Sales –Fresh fruit export values doubled in FY13 among ALP assisted clients as the project’s two year effort to upgrade cold chain practices at the farmgate, consolidator and cold store levels began to have significant impact with these partners. All three ALP client groups which export fresh fruits (i.e., farm enterprises, consolidators and cold stores) demonstrated large growth in export values in 2013 (139%, 264% and 869%, respectively). Total value of fresh fruit exports from the 497 clients sampled was valued at \$5.84 million versus \$4.21 million for domestic sales indicating that ALP clients are, generating, for the first time, a greater portion of their incomes from export sales than domestic sales. This is the first time in the experience of the project’s local staff that fresh fruit exports exceeded the value of domestic sales among the assisted value chain clients. Greatest growth was seen in consolidators and cold stores who continue to focus their efforts on export markets over the domestic markets (note the negative growth in these two clients’ sales values to the domestic market). Farmgate sales to the domestic market remain important contributors to farm household income but exports are increasingly demonstrating larger percentage growth. The limited interest that consolidators and cold stores have in the domestic market relative to exports is evident in the negative growth figures for the values they report selling to the local market.

Table 6: Change in Export Value of Fresh Fruits (2012-13)

Fresh Fruit Sales Point	Value of Fresh Fruit Sales (USD)						% Change Year-to-Year		
	2012			2013			2013 to 2012		
	Export	Domestic	Total	Export	Domestic	Total	Export	Domestic	Total
Farmgate	781,076	2,728,993	3,510,069	1,864,296	4,163,992	6,028,289	139%	53%	72%
Consolidators	726,405	290,032	1,016,437	2,643,132	0	2,643,132	264%	-100%	160%
Cold Stores	137,858	77,996	215,854	1,335,303	47,070	1,382,373	869%	-40%	540%
Total	1,645,339	3,097,020	4,742,359	5,842,731	4,211,062	10,053,793	255%	36%	112%

Fresh export volumes also reflected this significant increase in fresh fruit exports compared to domestic market sales. As with sales, the only negative growth was seen in the quantities sold by consolidators and cold stores to the local market as these two ALP clients focus on the export market. The cold stores showed the greatest growth, followed by the consolidators and then the farmgate, although the farmgate continues to account for the largest share of both quantities and values sold of fresh fruit. ALP staff interpret this greater growth among the cold stores and consolidators as indicative of the structural change underway in the fresh fruit value chain in Uzbekistan as it takes into account the increasingly sophisticated and competitive market in its major importer, Russia. Domestic sales of fresh fruit are also undergoing structural change as the consolidators and cold stores become more export oriented leaving the growth of domestic fresh fruit sales at the farm gate. This is reflected in the data for both domestic fresh fruit values and volumes. Volumes of domestic sales decreased for both consolidators and cold stores while the only growth was at the farm gate.

Table 7: Change in Export Volume of Fresh Fruits (2012-13)

Fresh Fruit Sales Point	Volume of Fresh Fruit Sales (mt)						% Change Year-to-Year		
	2012			2013			2013 to 2012		
	Export	Domestic	Total	Export	Domestic	Total	Export	Domestic	Total
Farmgate	1,472	5,812	7,284	2,370	9,461	11,831	61%	63%	62%
Consolidators	380	330	710	1,320	0	1,320	247%	-100%	86%
Cold Stores	120	147	267	1,216	91	1,307	913%	-38%	390%
Total	1,972	6,289	8,261	4,906	9,552	14,458	149%	52%	75%

An interesting result from these figures, again reflecting the structural change underway in the fresh fruit horticultural industry in Uzbekistan, is the change in relative shares of exports and domestic sales and volumes among ALP clients from 2012 to 2013. The share of export sales by volume and value decreased at the farmgate level (from 75% to 48% and 47% to 32%, respectively) while both these farmgate shares on the domestic market increased (92% to 99% and 88% to 99%). This indicates the primacy of farmgate sales for the domestic market and the increasingly important role played by other value chain actors in the export markets, even though the farmgate still accounts for the greatest absolute amounts and values exported among ALP clients.

Transformational change is underway in the fresh fruit export industry in Uzbekistan. Consolidators volume shares increased by 8 percentage points from 2012 to 2013 but their value shares had no significant change (44% to 45%). This reflects the fact that consolidators deal in turnover and generate higher incomes by moving greater amounts of produce. Cold stores, on the other hand, are the new entrant into this marketplace. The volume share of cold stores increased by a factor of 4 (25% vs. 6%) while their value share increased threefold (23% vs. 8%). Cold stores are not only moving more produce to generate higher incomes but they are also engaging in temporal arbitrage to generate capture higher produce prices later in the season.

Table 8: Change in Export Volume & Value Shares (2012-13)

Comparative Exports by Fresh

Fruit Type – Comparative volumes and values of sales for all three value chain actors by fruit type is also informative of the change underway in the fruit sector in Uzbekistan. This preliminary data is presented in

Fresh Fruit Sales Point	Volume Shares				Value Shares			
	2012	2013	2012	2013	2012	2013	2012	2013
	Export		Domestic		Export		Domestic	
Farmgate	75%	48%	92%	99%	47%	32%	88%	99%
Consolidators	19%	27%	5%	0%	44%	45%	9%	0%
Cold Stores	6%	25%	2%	1%	8%	23%	3%	1%
Total	100%							

Table 9 which indicates phenomenal growth in cherry volumes and values

sold for export from 2012 to 2013. Part of this growth is an anomaly due to the low base from 2012 due to the weather induced problems in cherries that ALP reported in that year. Essentially, fruit set for cherries was disrupted in the 2012 season due to a severe period of high heat for one week which happened to coincide with the cherry bloom. In 2013 the cherry sector rebounded significantly, boosted by increasing numbers of training held by ALP on cherry best management practices including pruning, fertilization, pollinization and post-harvest handling. Cherry sales by value were greater than those of grapes among ALP clients and their lower volumes sold speak to the price premium paid for cherries.

Table 9: Comparative Export Volumes & Values by Crop (2012-13)

The apple data in Table 9 is not completely accurate because the data were collected at the start of the apple selling season to match with the USG's fiscal year reporting requirement. Apples are also stored for longer periods than the stone fruits with their sales smoothed out over the season. The apple

Fruit	Comparative Export Volumes and Values (2012 to 2013)					
	Volume (mt)			Value (USD)		
	2012	2013	% change	2012	2013	% change
Cherry	60	609	912%	381,760	2,154,179	464%
Grape	719	2,138	197%	533,083	2,097,241	293%
Apricot	303	777	157%	226,800	708,014	212%
Peach	693	844	22%	421,660	621,040	47%
Other	83	422	406%	33,759	216,412	541%
Apple	115	118	3%	48,277	45,845	-5%

figures will certainly be much higher once the 2013 selling season is completed in spring 2014.

COMPONENT 4: TRAINING AND HUMAN RESOURCE DEVELOPMENT

Table 12 at right provides a summary overview of all AgLinks Plus training activities conducted during FY 2013.

HEP Programs. A total of 4 horticultural exchange program (HEP) visits to the US were organized for a total of 39 Uzbek nationals involved in the horticultural industry to examine US best practices with their American counterparts. A total of 13 were from the public sector and the remainder (26) from the private sector with 37 men and 2 women. All of the women were from the private sector. All of the public sector trainees were from the Ministry of Agriculture and Water Resources and Plant Protection Service except for one from the Ministry of Foreign Affairs. Attendees were from all 6 provinces with Tashkent (15) and Samarkand (7) the largest contributors followed by Ferghana (4), Namangan (6), Andijan (6) and Bukhara (1). The HEP program has generated significant support for USAID's "vision" of the future of Uzbek horticulture as participants witness what is possible by implementing best practices.

Training Subject	Province	Female	Male	Total
Production	Fergana	12	365	377
	Samarkand	23	392	415
	Namangan	7	445	452
	Tashkent	5	88	93
	Andijan	4	207	211
	Bukhara	4	44	48
Post-harvest technologies	Fergana	16	37	53
	Samarkand	74	39	113
	Namangan	258	41	299
	Tashkent	6	128	134
	Andijan	17	0	17
	Bukhara	35	2	37
8 NEPs		14	284	298
4 HEPs + CEP		2	47	49
HEP Alumni		5	52	57
Total		482	2,171	2,653
Share of Total		18%	82%	100%

Table 10: Overview of ALP FY13 Trainings

HEP 5 – Under the theme of Intensive Orchard and Vineyard Management a total of 10 Uzbek delegates participated in the 3 week visit, with 5 from the public sector and 5 from the private sector. The public sector participants included staff from the Shreder Horticultural Research Institute, Plant Science Institute, MAWR, and the MFA. Four of the private sector participants were intensive orchard farmers and the other operates an intensive grape vineyard. All of the delegates were exposed to owner-operators in the Davis, Modesto, and Fresno areas of California's intensive stone fruit orchards and vineyards, accompanied by leading academic and practical experts. Highlights of the visit were mechanical and hand pruning of high density stone fruit and walnut orchards.

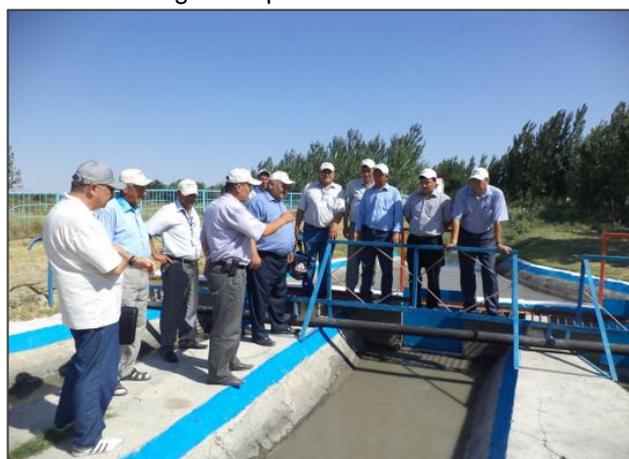
Table 11: List of HEP Visits to the USA in FY 2013

HEP 6 – IPM - Pests and diseases have no borders and their control is the most important part of any agricultural production. Since the complex IPM program in the US is one of the leading examples in the world, this topic was chosen as a new input for a regular exchange program. A group of 10 Uzbek horticulturalists visited California focusing on best Integrated Pest Management practices (IPM). The majority of HEP 06 representatives were from the public sector (8) including attendees from the Plant Protection Research Institute and the Plant Protection and Agrochemistry Center, both structures under the tutelage of the Ministry of Agriculture and Water Resources (MAWR). Two private sector participants were employees of AgriFirms cooperating with ALP.

#	Dates	HEP #	Topic
1	January 17 - February 11, 2013	5	Intensive Orchard Management
2	April 25 - May 20, 2013	6	Integrated Pest Management
3	July 25 - August 16, 2013	7	Post-harvest and Cold Storage
4	September 19 - October 14, 2013	8	Grape and Raisin Production and Processing

HEP 7 – Participants for this Post-Harvest Management at the Farm Level: Harvesting, Processing, and Storage were 7 farmers from the private sector and 2 persons from the MAWR. The group visited California during July/August. Important lessons were learned by the participants on the three main topics.

HEP 8 – Participants in the 4th and final HEP of FY 2013 held during 19 September – 15 October 2012 learned “Best Production Practices for Grapes”. The ten participants came from the public sector (Shreder and MAWR) while the private sector participants were all grape producers. Viewing modern production practices and the resultant increase in yields and quality were much appreciated, and implemented by participants upon their return to Uzbekistan, especially as it pertained to trellising systems.



NEP Managers Training in Samarkand at water distribution point

National Exchange Program –NEP
During FY 2013, the ALP project conducted 8 National Exchange Program visits within Uzbekistan to disseminate lessons learned from the international HEP and promote technical dialogue among sector actors across a variety of subjects. Table #14 below provides a list of the NEP’s conducted with dates, topics, and locales.

Table 12: List of NEP Visits during FY 2013

#	Date(s)	NEP #	Topic	Locale
1	21-22 November 2012	1	Best Grape practices (original districts)	Ferghana
2	18-19 February 2013	2	Intensive orchards	Samarkand
3	10-Apr-2013	3	Cold chain	Ferghana
4	29-May-2013	4	Summer Pruning	Ferghana
5	12-Jun-2013	5	WUA Accounting	Bukhara
6	18-Jul-2013	6	WUA Management	Samarkand
7	6-Aug-2013	7	Solar Dryers	Andijan
8	4-Sep-2013	8	Best Grape Practices (new districts)	Ferghana



CEP aroup visits fresh produce cold store in USA

Cold Store Exchange Program – CEP. The ALP project conducted one cold store exchange program to the United States during May 2013. The program visited the states of Florida and Georgia with the purpose of viewing all aspects of a modern cold chain.

Provision of Printed Technical Material – An important aspect of the ALP project is to prepare printed technical materials for dissemination to project beneficiaries. This practice allows permanent retention of information on important production, processing, and post-harvest management practices and principles at the farm enterprise and other value chain actor level for present and future reference. Table 15 below provides a list of the printed technical material prepared and provided by the ALP project in FY2013.

#	Publication Type	Title	Content
1	Manual	Persimmon Production	Better agricultural practices for persimmon
2	Manual	Pests & Diseases of Bees	How to identify and control pests and diseases of bees
3	Manual	Apiculture	Basics of bee & honey production
4	Laminated Handout	Apple & Pear Fire Blight	Description of the disease and control methods

Table 13: List of ALP Manuals

Special project - Mobile Extension Value Added Application (MEVA) – This innovative approach to providing useful, pertinent, and easily accessible technical information and details

involves the preparation of pictures and description of prominent pest and disease problems common in Uzbekistan orchards and vineyards with control methods, provided in an “app” format. The ALP project has performed the following activities in the development of the “app” to date with a functional prototype expected in early FY2014:

- Conducted research about various applications and User Interfaces (UI) to inform preferred architecture construction
- Drafted a scope of work and produced the technical specifications for the application
- Agreed on the application design and began the tender process to contract a local company to design and develop the application
- Identified the local company capable of designing and developing the application

ALP in the Local Press. ALP also encourages publication by local partners regarding project activities and new technologies to reach a larger audience. Table 15 below presents a list of the known articles published by exchange program participants and other partners during FY 2013.

Table 14: Publicity of ALP project activities disseminated by partners

#	Level	Newspaper or Journal Title	Date	Article	Content
1	District	DAVR	5-Oct-12	Mahalladoshlariga iyun oyida anor yedirgan yigit	Cold storage techniques
2	Online			Cold storage: A vision for the future of fresh fruits and vegetables in Uzbekistan	CEP
3	District	DAVR	21-Mar-13	Daraxt tanasiga bolta urishga oshiqmang	Bee pollination
4	District	BULOQBOSHI	21-Mar-13	Asl bog'bon bog'ni bo'ston qiladi	Spring pruning of fruit trees
5	National	O'ZBEKISTON QISHLOQ	Mar-13	Samaradorlik - ilm va amal uyg'unligida	HEP - Intensive orchard
6	National	QISHLOQ HAYOTI	18-Jun-13	Maqsad - Suvdan oqilona foydalanish	Water management
7	District	DAVR	2-Aug-13	Serquyosh diyorning serharakat farzandi	New technologies

PROGRESS AND DEVIATIONS – PROJECT PERFORMANCE MONITORING AND EVALUATION PLAN (PMEP)

Table #17 below presents the ALP project indicators, targets, and values for the period FY2012 and FY2013. In spite of the delay in approval to expand work to 3 additional provinces and 20 additional districts, ALP project was able to meet or exceed 90% of the target indicators for the year. Indicator No. 3 substantially increased due to the expansion into the new provinces and districts. Indicator No. 7 was low because of the delay in implementing interventions in the expanded geographic focus areas at the appropriate time for adoption in the 2013 cropping cycle.

Table 15: FY 2013 ACTUALS vs. TARGETS FOR the ALP PROJECT PME P INDICATORS

#	Indicator	2012		2013		
		Target	Actual	Target	Actual	
1	Change in income for the AgLinks Plus-assisted farmers and agribusiness, as measured by sales	15%	18%	20%	24%	
2	Change in annual farm yields for all targeted crop commodities for all AgLinks Plus farm clients; yield per hectare	15%	24%	20%	33%	
3	Change in production volume for targeted commodities in AgLinks Plus-targeted districts	20%	19%	25%	330%	
4	Change in share of total production that is exported for targeted commodities from AgLinks Plus clients	10%	7%	25%	31%	
5	Number of hectares under improved technologies or management practices as a result of U.S. Government assistance	10,000	2,600	22,000	24,422	
6	Number of firms receiving USG assistance to invest in improved technologies	800	571	1,500	2,234	
7	Number of farmers, processors and others who have adopted new technologies or management practices as a result of U.S. Government assistance	2,000	1,166	5,000	3,538	
8	Total number of producers' organizations, cooperatives, WUAs, trade and business associations and community-based organizations receiving USG assistance	40	12	80	86	
9	Number of vulnerable households benefiting directly from U.S. Government interventions	6,000	5,900	12,000	12,635	
10	Person hours of training completed in private sector productive capacity supported by USG assistance	M	9,000	8,076	11,700	18,194
		F	1,000	715	1,300	2,260
		T	10,000	8,791	13,000	20,454

COORDINATION WITH THE GOVERNMENT OF UZBEKISTAN, DONORS, USAID PROJECTS AND PARTNERS

Government of Uzbekistan

Ministry of Agriculture and Water Resources (MAWR) – It is highly notable that cooperation and coordination between the ALP project and the MAWR has been strengthening year by year. Conrad Fitch, chief evaluator for the AgLinks Uzbekistan project stated that after meeting with the Dr. Mukhammadjon Kasimov, National Coordinator for ALP and its predecessor AgLinks projects, “Kasimov lectured his evaluation team at least 20 minutes about the project; he is aware about every single activity and fully supports the project”. ALP has built the same level of trust and relations with the MAWR’s key departments: International Relations (Mr. R. Ibragimov), Horticulture and Processing (Mr. Z. Artikov), and the Foreign Investments and Projects’ Monitoring Unit (Mr. Sh. Umarov). Because of the good working relations established with the MAWR there was not any case of refusal when the ALP project on behalf of USAID requested meetings or travel of their officials with MAWR or USAID representatives to visit project field sites.

The ALP project was not able to start its expansion to new districts until January 2013 because of the absence of USAID’s formal agreement with the GOU. As soon as the document was signed the MAWR started to arrange meetings with Hakims (Mayors or Governors) of all 6 targeted provinces to introduce the project and with horticulturalists from all new districts to select potential partners. All these meetings were coordinated and then facilitated personally by Mr. Kasimov. This assistance helped the ALP project to start activities in all new districts already in late winter 2013 to allow impact during the harvest of the new agricultural season.

Many recognize the success of the HEP activity and some donors have already started to replicate it (GIZ). Considerable credit should be paid to the MAWR for achievements of the HEP activity. The MAWR helped ALP to disseminate announcements about upcoming HEP programs among potential candidates, collect application documents, screen forms, select candidates for interview, conduct interviews and develop the final list of participants. The MAWR also assigns a top level official from the Ministry to lead the group and conducts a pre-departure orientation session to provide detailed instructions to HEP participants on what to expect and what is expected of them.

M. Mirzayev (formerly Shreder) Horticultural Research Institute – is the key institution predetermining the future of Uzbekistan horticulture. The Institute is responsible for breeding of new fruit varieties; developing new efficient orchard management and post-harvest techniques and technologies; and transferring technology to nurserymen and farmers. The importance of the Institute for Uzbekistan was recognized at the highest level as Mr. Sh. Mirziyoev, Prime Minister of the Republic of Uzbekistan, approved on August 25, 2013 a complex of measures to strengthen the capacity of the Institute. Particularly it was decided to invest 4 billion UZS (about \$1.85 million) to build & rehabilitate buildings, procure modern equipment and means of transport.

2013 marked a peak of cooperation between ALP and the Institute: farm manuals on Persimmons and Apples were developed and submitted to printing house and the former published while the latter will be published in early FY2014; the Institute researchers actively participated in all variety contests and the Grape Contest was held at the Institute’s headquarters in Tashkent while the Cherry Contest was held at their branch in Kuva, Ferghana; the Institute organized and hosted a National Horticulture Conference and ALP supported it by publishing the conference’s proceedings; the project continued advising the Institute’s staff on optimal utilization of an Advanced Irrigation System established at the Institute’s nursery; a tissue culture lab was designed and procurement organized; an ampelography expedition was initiated to identify and classify modern grapevines in Uzbekistan in cooperation with the Samarkand branch of the Institute which specializes in viticulture production; and Institute researchers were involved in HEP programs and attended the Golden Bunch-2013 conference and exhibition in Ukraine.

Plant Protection Services (PPS) – cooperation with the PPS and its research arm- Plant Protection Institute (PPI) was continued. ALP has been strengthening PPS and PPI capacity by involving their specialists in the project’s pest and disease identification and control activities: these organizations’ experts helped to amend the PERSUAP, they developed and/or reviewed the pest and disease

control section of crop specific farm manuals, are working on the second edition of the Pest and Disease Manual and the respective content for the MEVA application; they also conduct tailor made pest and disease control training programs. PPI's leading specialist – Zarip Pulatov was sent to the Intensive Apple IPM training in Kazakhstan. PPS and PPI experts have also been targeted for participation in the HEP programs to California. PPI is continuing tests with ALP on the efficiency and effectiveness of pheromone traps for optimizing pest control in orchards.

Uzbekistan Chamber of Commerce and Industry (UCCI) – ALP has continued cooperation with UCCI especially its Business Forum Uzbekistan (BFU) joint project with UNDP. ALP management held several meetings with BFU project staff to share experience and lessons learnt. During these meetings BFU expressed interest in supporting creation of a cold store business group. ALP's cold chain consultant was tasked to meet with Mr. Narzullo Oblomuradov, BFU manager and develop an action plan for creation of such a group potentially under UCCI's umbrella. After several consultations it became clear that formal registration of an association would be a very time consuming process requiring coordination with multiple local authorities. ALP and the cold store owner/operators are now exploring another legal status - creation of an LLC, which will provide services for its founders. Recognizing ALP activities to promote fruit export, the UCCI invited ALP to make presentations in a conference devoted to export support held in Fergana on July 16, 2013.

“Uzvinsanoat-holding” Holding Company – The President of the Republic of Uzbekistan issued Decree #PP-1937 on March 13, 2013 entitled “On measures for further development of viticulture in the country for the period 2013-2015”. According to this document the area under grapes should increase from 127,100 hectares in 2012 to 140,800 hectares in 2015 and reach 152,000 hectares in 2020. The same document assigns “Uzvinsanoat-holding” as the organization responsible for creating new vineyards. ALP has been cooperating with Uzvinsanoat-holding since 2010 and the new Decree gave additional impulse to lift the partnership to another level. Particularly “Uzvinsanoat-holding” actively participated at the 2013 Grape Variety Contest and hired a professional cameraman to film the entire event, especially unique grape varieties displayed by ALP project farmers. “Uzvinsanoat-holding” plans to use the film during their training sessions and as guidance for organizing similar events for their farmers. The Holding also approached ALP project seeking permission to reprint its Grape Manual and solely financed the publication of the second printing of the Manual in 1,000 copies. This is an excellent example of implementing partner's replication of ALP project outputs.

National Beekeepers Association – The ALP project conducted research on the impact of bee pollination to increase fruit set for targeted crops which confirmed the significant impact on increasing orchard yields. The project linked partnering farmers with beekeepers to use their beehives during the respective orchard flowering periods. Many farmers realized the bee's impact and decided to keep bees, especially as the Government started to encourage orchard farmers to have beehives – 10 per farmer is recommended. ALP expanded its cooperation with the National Beekeepers Association and collaborated on the publication of two manuals – Basics of Beekeeping and Bee Pests and Diseases, each in 2000 copies. Many donors and other sector actors have requested copies of these valuable documents.

Other Donors

German Development Agency (GIZ) – Cooperation with GIZ continued with regular information exchange and expanded in 2013 to include project implementation impacts. In 2013 GIZ launched its own horticultural project based upon design discussions held with ALP in previous years. They established three intensive orchard demonstration plots in collaboration with GOU institutions in three regions of Uzbekistan: Surkhandarya, Khoresm and Karakalpakstan. Throughout 2013 GIZ approached ALP project seeking specific information and assistance to establish demonstration plots based upon ALP experience. Specifically, they sought ALP experience on equipping orchards with appropriate components such as: saplings, trellises and advanced irrigation systems. GIZ also replicated ALP's HEP program and contracted iHouse (the host of the HEP) to organize an exchange visit to California for its' trainees and meeting with the same US sector actors as identified by ALP. GIZ also hired one of ALP's local partner on a full-time basis to manage their plots and contracted ALP's international consultants – John Driver and Tim Mitchell, recognizing their roles and achievement within the ALP project.

International Finance Corporation – The IFC has been consulting with the ALP project on the status and trends of cold chain development in Uzbekistan for the last two years. The ALP project has shared its experience on supporting small scale (less than 100 metric ton capacity), medium scale (100-1000 mt) and large scale (greater than 1000 mt) cold stores along with a database of cooperating stores. IFC's Cold Store Project Feasibility Study was reviewed by the ALP project upon their request and appropriate feedback provided. It is also notable that IFC met with and employed ALP's consulting partners, Global Cold Chain Alliance (GCCA), as part of their design team.

The IFC recently signed a Financial Advisory Services Agreements with two state-owned companies (Uzmarkazimpex and Uzprommashimpex) under the Ministry of Foreign Economic Relations, Investment and Trade (MFERIT) to attract investors/operators to finance, build, own and operate a portfolio of six (6) refrigerated warehouses in Uzbekistan. The total planned capacity of these warehouses is 21,100 MT. Appropriate sites have been identified in Djizzak, Samarkand, Fergana, Bukhara, Kashkadarya and Surkhandarya regions (Samarkand, Ferghana and Buhara are ALP authorized provinces). The investment requirement is estimated at about USD 31 million. The proposed project private beneficiaries can benefit from the IFC initiated cold storage services in the same project areas. Also, IFC intends to sign an agreement with Hamkorbank to help build its capacity to finance agricultural investments. Under the agreement, IFC will provide training on agricultural lending, assist in developing a client database, and help the bank expand agro-lending through on-the-job training. The Participating Financial Institutions of the proposed project can benefit from the IFC Advisory Services project to provide better services to horticultural sector beneficiaries.

International Fund for Agricultural Development (IFAD) – The IFAD project design team continued to visit the ALP project office during FY 2013 to learn about the project activities and lessons learned. Recently IFAD finished the design of the Horticulture Support Project (HSP). HSP outcomes would be: (i) creation of a viable horticultural sub-sector with modern farming techniques, backward linkages to poor rural smallholders, and improved access to domestic and international markets; (ii) increased investments by producers, processors and service providers into productive assets in horticulture; and (iii) improved farming efficiency and mobility of productive assets and produce. The period of HSP implementation would be 2014 to 2017 and geographic target is - Surkhandarya and Kashkadarya provinces; provinces not authorized for ALP activities.

World Bank (WB) – ALP continued its on-going consultations with the Uzbekistan World Bank representation about current status and development trends in Uzbekistan's horticultural sector by meeting with project design team members and local staff. Mr. Dilshod Khidirov, Rural Development Specialist of the WB Uzbekistan office, visited ALP project offices several times in 2013 to interview the project COP and technical staff. Upon his request copies of all farm manuals published by the project, recent reports and a list of international consultants were provided. ALP staff have openly shared the project's experience with the Bank's staff and consultants, even offering to host field trips for site visits to see and talk directly with project clients.

Recently the Bank shared information that their Horticulture Development Project design was being finalized. The objective of the proposed project is to realize the potential for greater economic returns from the fruit and vegetable value chain through an improved policy enabling environment, better access to credit, enhanced post-harvest handling and processing, strengthened research and outreach, and improved quality & food safety to penetrate new, higher value markets. This objective would be achieved through (i) introduction of new varieties, growing, storage, post-harvest handling, packing and marketing technologies for fruits and vegetables (ii) improving farmers' and other value chain participants' access to credit via a credit line initiative; (iii) improving market participants' access to market information and technological information via knowledge management and market information systems as well as via capacity development initiatives, which would include trainings and demonstration fields; (iv) upgrading the quality and safety of the locally grown produced and processed fruits and vegetables via introduction and adaptation of internationally recognized food safety and quality standards; and (v) review of current policies in the horticultural sub-sector and facilitation of improvements to them. The area to be covered by the project includes the following five regions: Tashkent, Jizzak, Samarkand, Kashkadarya, and Namangan. Two of the three are ALP provinces (Tashkent, Samarkand and Namangan).

United Nations Development Program (UNDP) – The ALP project regularly cooperates with two UNDP projects in Uzbekistan. During 2013 the ALP project and the Business Forum of Uzbekistan had a series of consultations to assess pros and cons of supporting creation of a cold chain business organization under association legal status. Another UNDP project, Aid for Trade, works in Namangan Province (one of ALP's target provinces) to help to increase provincial exports from multiple sectors. ALP project shares its training program schedule with the Aid for Trade project and they always send their partners to attend the trainings. Upon their request, Mr. Myer, ALP's cold store refrigeration equipment expert, visited several cold stores in Namangan Province, cooperating with the Aid for Trade project to provide on-site consultations to their clients.

Other USAID Projects

Local Development Initiative (LDI) – no activity, but the ALP project did provide administrative advice for the project close down consistent with Uzbek law, rules and regulations.

Regional Economic Cooperation (REC) – during 2013 ALP continued a series of consultations with REC such as meetings for assisting company registration in Uzbekistan (administrative) and also shared a contact list of known organic exporters.

Farmer to Farmer program – Two FtF volunteers were received in the ALP office to brief them about the present situation of horticulture sector development in Uzbekistan. Farmers from ALP targeted districts were informed of and invited to FtF volunteer trainings.

Public-Private Partnerships (PPP) – The ALP project has not developed any Global Development Alliances. Nor has the project reported any public-private partnerships. However, the project has financially and technically assisted several private firms such as cold stores, packing plants, and nurseries who also made their own investments. Some of these could be considered as Public-Private Partnerships under that definition.

FY 2013 TECHNICAL ACHIEVEMENT HIGHLIGHTS

The projects many technical activities and achievements are presented in other sections of this report. However, six (6) technical activities deserve particular attention as they pertain to the key principles of the USAID AgLinks Plus project. They are:

1. Perhaps the most important achievement in terms of value chain assistance, sustainability, and scalability was the signing of the MOU amendment on December 12, 2012 to massively and technically expand the geographic focus of the project to six provinces and twenty-six districts. As a consequence of this expansion to new areas, many additional actors in the Uzbekistan horticulture sector were incorporated into project activities and a considerable increase in impact was noted, as seen in the Table 8: FY2013 ACTUALS vs. TARGETS FOR ALP PROJECT PMP INDICATORS.
2. The increase in export value among sampled clients from USD 1.64 million in FY 2012 to USD 5.84 in FY 2013, an increase of 256%, was achieved through integrated interventions between farm enterprises, consolidators, cold store operators, and exporters. The acceptance and implementation of the best horticultural practices taught by the ALP project technical team over the past two years is beginning to pay off in real measurable terms of income, and demonstrates great strides in improving the competitiveness of the Uzbekistan horticultural sector assisted by the ALP project.
3. Training and Human Resource Development via the HEP Program. A total of 6 exchange visits to the US were organized for a total of 59 Uzbek nationals involved in the horticultural industry to examine US best practices with their American counterparts. Of these 59, a total of 22 were from the public sector and the remainder (37) from the private sector with 55 men and 4 women. All of the women were from the private sector. All of the public sector trainees were from the Ministry of Agriculture and Water Resources except for one from the Ministry of Foreign Affairs. Attendees were from all 6 provinces with Tashkent (20) and Samarkand (15) the largest contributors followed by Ferghana (9), Namangan (8), Andijan

(6) and Bukhara (1). The HEP program has generated significant support for USAID's "vision" of the future of Uzbek horticulture as participants witness what is possible by improving practices.

4. Improvements in the post-harvest management of fresh produce were greatly advanced during FY 2013. Ensuring elimination of spoilage at the farm level was a new activity in FY 2013 that demonstrated the importance of proper handling of produce immediately following harvest. Harvested produce if left on the field for a long time loses 7.5 % due to moisture evaporation. ALP introduced a packing shade concept that allows reducing these losses by one-third.
5. For example, if a farmer harvests 4 tons in the morning and leaves it in the sun they can lose 0.2 tons (200 kg * 1,000 UZS each = 200,000 UZS). That is almost a \$100 loss a day! With the Uzbek harvest season being a few months long – this is a significant amount.

6. Creation of new and sustainable business service providers. Four (4) prototype pruning groups have been formed, trained, and equipped by the ALP project and are providing fee based services to other farm enterprises. Six (6) nurseries and one (1) spraying group have also been assisted to provide specialized services to the Uzbekistan horticulture sector. All of the above business service providers are profitable and provide services beyond their home provinces.



Field packing shade to reduce heat of harvested fruit and moisture loss.

7. New and improved plant material. The GOU demonstrated its commitment to the expansion of the horticulture industry by reduced import fees on imported pome and stone fruit saplings. However, farmers buying this planting material are experiencing production problems such as fire blight, sunburn, heat intolerance, etc. ALP selected about 15 new varieties of each pome and stone fruits within the farmers' orchards and tested them for yield, pest and disease resistance in Uzbekistan's hot climate and for market acceptance in traditional export markets. In collaboration with partner nurseries the best storable/transportable and disease resistant varieties have been selected and will be propagated in the 2014 growing season.

Mother blocks of all new varieties have been established at partner nurseries. Unique varieties like a plum-apricot hybrid were tested for local market acceptance and received excellent feedback. Varieties like these will be propagated and produced. To better disseminate intensive orchard best practices in new provinces AgLinks Plus trained Pruner groups to become full time consultants at the orchards where they provided pruning services. As a result Pruner groups pruned 150 hectares of orchards in new pruning methods. Additionally, 45 hectares of intensive orchards have been consulted in new production, IPM and tree training techniques. The above activities are at the heart of improving competitiveness in the Uzbekistan horticulture sector in the medium and long term.

CHAPTER THREE: ADDITIONAL INFORMATION

COMPLIANCE WITH “IMPLEMENTATION PRINCIPLES AND KEY ISSUES”

The guiding principles for implementing the ALP project are the value chain model (a market demand approach), sustainability (local partnerships to build capacity and continuation) and scalability (replicating successful models from AgLinks, the predecessor project) to increase the impact and the number of beneficiaries.

VALUE CHAIN APPROACH

The project employs a value chain approach to identify and prioritize project interventions with the highest impact in terms of improved competitiveness that increases incomes for beneficiaries. Value chains are defined as the sequence of productive processes from the provision of specific inputs for a particular product to its primary production, transformation (added value), marketing and distribution, and final consumption. A value chain approach examines all steps of a production-to-consumption process, identifies binding constraints, and then systematically addresses those weaknesses first. By definition, a value chain approach allocates resources and focuses efforts on specific portions of the chain over others. In the present Uzbek environment this results in a focus on reviving the fruit tree nursery sub-sector and targeted water management interventions at the input level, a focus on increasing the yield of existing orchards while promoting migration to higher yielding varieties, and post-harvest activities centered on assembling a viable cold chain in Uzbekistan to support the preservation of fresh fruit as well as household level processing to increase incomes.

SUSTAINABILITY

As the contract stipulates, full sustainability of activities by the end of the project is a key objective but depends upon the level and commitment of all beneficiaries, GOU support as well as local capacity. The ALP project focuses energies in increasing GOU interest and support for the fruit value chains and deepening local capacity to service the needs of these sectors. Specifically in FY 2013 the ALP project strengthened and enhanced its relationship with various GOU institutions, particularly the Mirzaev (Shreder) Horticulture Research Institute and the Plant Protection Service (PPS), two key public institutions that will provide services in the post-project period to existing and new horticulture industry actors. Commercial interest is also a strong motivator for sustainable activities so the ALP project also targeted increased activities in FY 2013 to private nurseries by dedicating a HEP session to nurseries, providing new plant material and introducing new budding and grafting techniques.

The ALP project strategy to optimize sustainability includes incorporating specialists and experts from these Uzbek institutions as partners in project activities. On a per-training-hour basis, the ALP project employs mostly Uzbek nationals, with international experts used only in those instances where suitable technical skills and experience are not locally available. In all cases of international consultants, the project insists they provide training to Uzbek nationals sufficient to allow them to assume an increasing technical leadership over the life of the project. Similarly, local staff gain additional insights and knowledge because they accompany the international experts while in-country and during their support to the HEP visits.

As mentioned elsewhere in this report, the ALP project has developed an excellent track record of stimulating interest of other donors who are interested to replicate ALP type activities in other geographic areas which also result in an expansion and intensification of new services and assistance to the Uzbekistan horticulture sector beyond the life of the project.

SCALABILITY

Scalability refers to the expected broader impact of the ALP project over that of the predecessor AgLinks Uzbekistan project. As the contract points out, and the recently conducted AgLinks Uzbekistan project evaluation reveals, scalability will be achieved by expanding the scope of geographic focus to 3 additional provinces and 20 additional districts focusing on the lessons learned in the predecessor project, especially related to including more women in project activities, involving more service providers, and reaching thousands of new project participants. Due to the MOU amendment signed December 12, 2012 expanding the geographic scope of the project, additional growers, nurserymen, processors, cold store operators, and consolidators/exporters were and will be

exposed to and included in project interventions. This broader scalability will also directly involve additional GOU institutions over time.

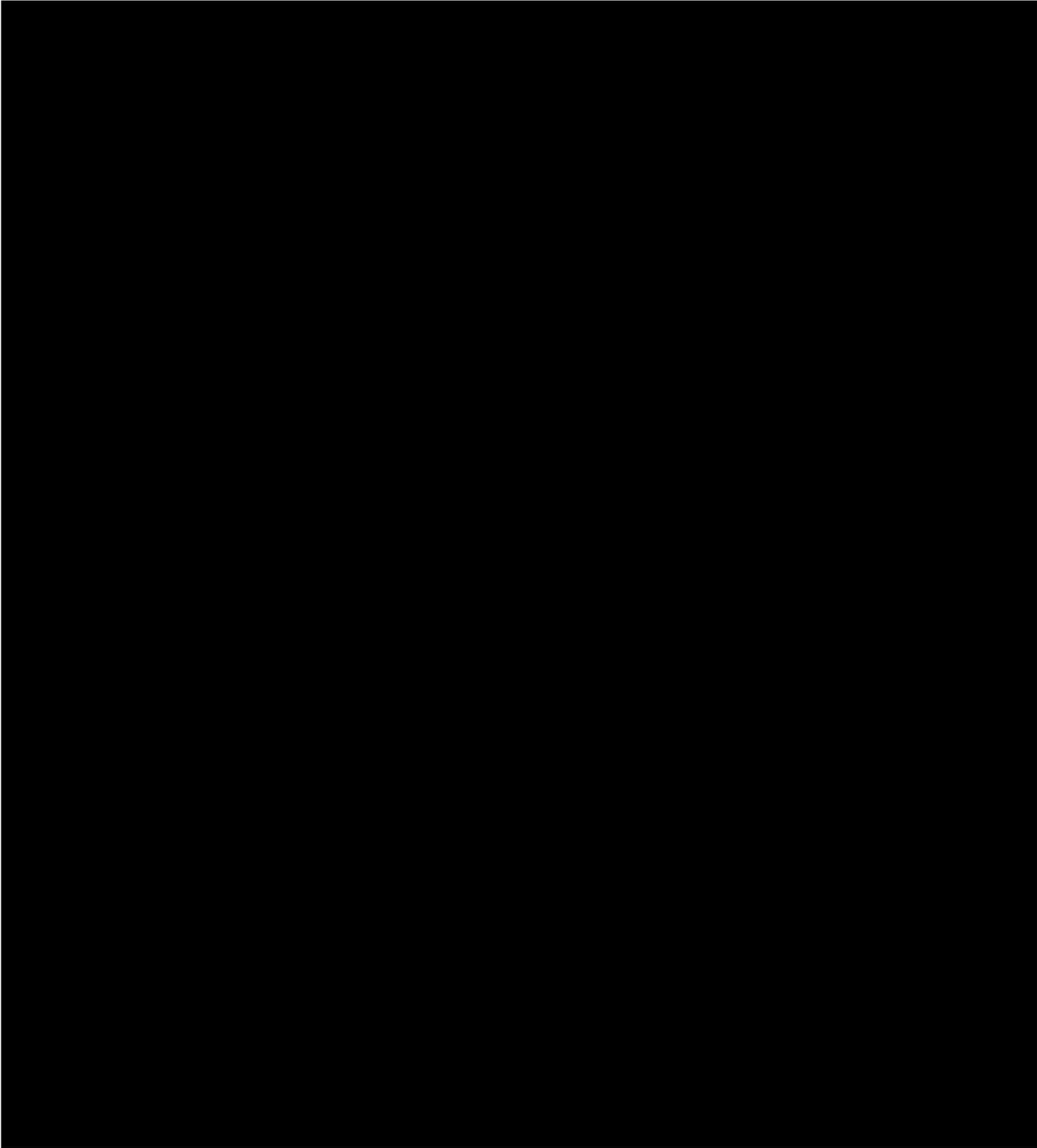
ENVIRONMENTAL COMPLIANCE

Benefiting from the training of ALP project staff in FY 2012 on environmental compliance issues, and the updating of the project PERSUAP, also in FY2012, and the creation of a project Environmental Manual and Framework Mitigation and Monitoring Plan (EMFFP), the designated Project Environmental Officer (PEO) was able to attend “The Original Environmental Compliance Boot Camp” in December, 2012 organized by the Archer Institute of Environmental Management in Annapolis, Maryland, a recognized leader in environmental compliance training.

Initial environmental screenings were developed for all ALP project technical activities implemented during FY 2013 (see Annex F: FY 2013 Environmental Screens per Technical Activity). Once again, as in FY 2012, no FY 2013 activities were identified as Risk Level 4 (highly risky). According to the Risk Categories utilized by the project, 38.2% of activities were of no risk (Risk Category 1; 21 activities); 45.5 % were of no significant risk of negative environmental risk (Risk Category 2; 25 activities); and 16.3% were of possible impact but can be mitigated (Risk Category 3; 11 activities). The number of project activities monitored in FY 2013 (55) doubled from the number in FY 2012 (28), and the percentage of Risk Categories 1 and 2 was increased from 82% in FY 2012 to 83.7% in FY 2013.

GENDER

As reported previously, and most recently in the submittal of the FY 2014 Work Plan, the gender balance in Uzbekistan is skewed, as in most other countries of the world (ex., the USDA reports 14% of the 2.2 million U.S. farmers are female). Uzbekistan reported 7.2% of the 235,000 registered farmers in 2008 as female prior to the consolidations of 2009 and 2010. However, the project’s data collection system does disaggregate by gender and roughly 5% of the projects legally registered farmers are female. The preliminary number of female ALP trainees (farmer and non-farmer) is higher (17%) due to the household processing activities described in this report. The ALP project increased the number of female training hours by 246 percent in FY 2013, from 715 to 2,260. Additionally, review of project survey data reveals that female farmer yields improved by 15 percent compared to their male peers, indicating that female adoption of new technologies and management practices provided by the ALP project were readily assimilated, helping to raise household incomes and improve rural livelihoods.



3. PLANNED ACTIVITIES FOR FY 2014

The AgLinks Plus project submitted the second version of the proposed FY 2014 work plan to USAID on November 8 in detail with timeline, prioritized activities, and budget. The ALP project will continue working in the 4 components of the original contract by planning activities to improve farm level productivity, increase the capacity of the public and private sector service support, improve agro-processing and export growth, and provide training and human resource development interventions. The activity scope will be significantly increased due to the expansion of the project geographic focus which has increased to six provinces from three and to twenty-six districts from six.

7. Provide assistance to the pest and disease identification laboratories of the Uzbek plant protection services to strengthen their capability beyond field crops (principally cotton and wheat) to horticulture.
8. Conduct training for women in agro-processing techniques, food safety standards, and retailing strategies.
9. Plan and conduct additional Horticulture Exchange Program visits, at least four (4) to the United States with emphasis on involvement of more women.

ANNEX B: LIST OF FY 2013 REPORTS, ANALYSES, PRESENTATIONS AND KEY DOCUMENTS

Annex B: List of FY 2013 Reports, Analyses, Presentations and Key Documents

#	Type	Time	CY	Descriptive
1	Monthly Reports	Oct	2012	Report #09
2		Nov	2012	Report #10
3		Jan	2013	Report #11
4		Feb	2013	Report #12
5		Apr	2013	Report #13
6		May	2013	Report #14
7		Jul	2013	Report #15
8		Aug	2013	Report #16
9	Quarterly Reports	Q1	2012	October- December
10		Q2	2013	January - March
11		Q3	2013	April - June
12	Horticultural Exchange Program Reports	Oct	2012	HEP04 - Grape Best Practices
13		Feb	2013	HEP05 - Intensive Orchards
14		May	2013	HEP06 - Integrated Pest Management
15		Aug	2013	HEP07 - Post Harvest Techniques
16	Cold Chain and Fresh Export Reports	Apr	2013	Report #1
17		May	2013	Report #2
18		Jun	2013	Report #3
19		Jul	2013	Report #4
20		Aug	2013	Report #5
21		Sep	2013	Report #6
22	Technical Reports	Nov	2012	Cold Chain CEO & Investor Seminar
23		Dec	2012	Testing New Precooling Methods in Uzbekistan Developed by USAID's AgLinksPlus Project
24		Dec	2012	Nursery Assessment & Training
25		Feb	2013	Intensive Orchards - Samarkand
26		Feb	2013	Intensive Orchards - Ferghana Valley
27		May	2013	Improving the Sweet Cherry Production Enterprise in Uzbekistan
28		May	2013	Refrigeration Training Report
29		Jun	2013	Irrigation & Drainage Assessment Report
30		Jul	2013	Implementation of the Assessment of Field Sort, Pack and Process Techniques developed by USAID's AgLinksPlus Project
31		Sep	2013	USAID Performance Evaluation of AgLinks Project

ANNEX E: STATUS REPORT OF PROGRESS DELAYS

While the project received signed authorization from USAID and the Uzbek MAWR to expand activities to the new provinces and districts on 12/12/12 the process of introducing the project to the administrative and local authorities took the better part of the next quarter. The expansion went from 3 provinces to 6 and 6 districts to 26 which necessitated visits to both provincial and district level authorities. These introductory visits had to be coordinated to include representatives from MAWR, USAID and ALP.

With the authorization to expand occurring in late Q1 of FY13 and the introductory meetings with local authorities taking most of Q2, technical activities in the new provinces and districts mostly began in Q3. The project made good progress in catching up by emphasizing activities in the new provinces and districts but seasonally specific technical activities (i.e., pruning, grafting, trellising, etc.) would have to await a full horticultural season in calendar 2014 in the new areas.

The only other major progress delay in FY13 was the need to slow down overall activities as the end of the fiscal year approached and it became likely the gridlock in Washington would lead to no FY13 obligation occurring within FY13. This proved to be the case and the gradual slowdown that began in the summer of calendar 2013 became a full-fledged official slowdown order at the end of the first week of FY14.

ANNEX F: LIST OF FY2013 ENVIRONMENTAL SCREENS PER ACTIVITY

Annex F : FY 2013 Environmental Screens per Technical Activity

#	Activity	Type	QTR	DESCRIPTION	Risk category	ER needed	Completed	Potential Adverse Effect(s)	Comments
1	ALP-31	Goods	1	Pre-Cooling Assessment	3	Yes	Yes	Very low risk or insignificant risk of negative impact	Consultant followed all safety measures during construction and operation of pre coolers
2	ALP-32	TA	1	Assess Tissue Culture Lab	1	Yes	No	No adverse effect	N/A
3	ALP-33	TA	1	GCCA CEO/Investor Workshop & AgroFood 2012 Participation	1	No	Yes	No adverse effect	Conference provided only environmentally friendly technologies and practices
4	ALP-34	TA	1	NEP01 - Ferghana	1	No	Yes	No adverse effect	N/A
5	ALP-35	TA	1	DAI Reorganization	1	No	Yes	N/A	N/A
6	ALP-35a	TA	1	DAI Reorganization	1	No	Yes	N/A	N/A
7	ALP-36	TA	1	HEP05 - Intensive Orchards	1	No	Yes	Very low risk or insignificant risk of negative impact	Participants were exposed to EPA accepted and environmentally friendly practices
8	ALP-37	TA	1	Farm Manual Printing	1	No	Yes	No adverse effect	N/A
9	ALP-38	TA	1	Intensive Stone Fruit Training	2	No	Yes	Infection of healthy trees with infected pruning loppers	Training addressed the importance of disinfection of pruning tools
10	ALP-39	TA	2	Cold Chain Advisor	2	No	Yes	Very low risk or insignificant risk of negative impact	Only environmentally good practices were provided
11	ALP-40	TA	2	Post-Harvest Technologies	2	No	No	N/A	N/A
12	ALP-41	Goods	2	TC Lab 1 of 3 - Supplies	3	No	No	Minor noise, dust and other negative impacts during the constructions, Workers' safety operation of the tissue lab, chemical spill at lab	The lab equipment and tools haven't arrived yet. All mitigation measures will be followed
13	ALP-42	Goods	2	Trellises - 2013	3	No	Yes	Poor quality construction materials, inexperienced worker will lead to poor quality posts	ALP staff members monitored the construction process of trellis posts. The trellis posts were delivered safely and in good condition
14	ALP-43	TA	2	NEP02 - Samarkand	2	No	Yes	Very low risk or insignificant risk of negative impact	Only environmentally good practices were provided
15	ALP-44	TA	2	Cherry Training - 2013	1	No	Yes	Very low risk or insignificant risk of negative impact	Besides main topics, consultant talked about best environmentally friendly practices
16	ALP-45	TA	2	TraiNet VCS Training	1	No	Yes	N/A	N/A
17	ALP-46	TA	2	Walnuts - 2013	1	No	No	N/A	N/A
18	ALP-47	Goods	2	Dwarf Apple Saplings - 2013	3	No	Yes	Disease transmission, physical damage to the plants, infected plants might cause infection of nearby plants/orchards	Virus free, true-to-type plants were procured, and delivered following all recommended practices
19	ALP-48	TA	2	CS Refrigeration Training - Jerry	2	No	Yes	Very low risk or insignificant risk of negative impact	Consultant addressed all environmental issues associated with refrigeration systems and cold storage.
20	ALP-49	TA	2	Deliverables Support	1	No	No	No adverse effect	N/A
21	ALP-50	TA	2	NEP03 - Cold Store	2	No	Yes	Very low risk or insignificant risk of negative impact	Cold storages with good environmental practices
22	ALP-51	TA	3	HEP06 - IPM	2	No	Yes	Very low risk or insignificant risk of negative impact	Participants were exposed to Integrated Pest Management practices, and only environmentally friendly and EPA approved practices
23	ALP-52	Goods	3	Field Sort, Pack & Process	2	No	Yes	Food safety	All food safety practices were followed
24	ALP-53	TA	3	CEP01 - FL & GA	2	No	Yes	Very low risk or insignificant risk of negative impact	Participants were exposed only to good environmental practices
25	ALP-54	TA	3	I&D Assess & Training	2	No	Yes	No adverse effect	N/A
26	ALP-55	TA	3	iHouse to Uzbekistan & HEP Alumni	1	No	Yes	No adverse effect	N/A

ANNEX G: SUCCESS STORIES (SNAPSHOTS)



USAID | **UZBEKISTAN**
FROM THE AMERICAN PEOPLE

SNAPSHOT Cool Deal

Support to Cold Store Enterprises in Uzbekistan



"USAID's project inspired and taught me how to build a modern cold store. Following their recommendations enabled me to return my entire investment capital within three years. We are very lucky to be part of this project!"

—Gholib
Cold Store Owner/Operator
Samarkand Province, Uzbekistan

Photo: Elena Abdramanova

*USAID technical assistance
boosts the cold store industry in
Uzbekistan*

Telling Our Story

U.S. Agency for International Development
Washington, DC 20523-1000
<http://stories.usaid.gov>

Until recently, the cold storage system for food products in Uzbekistan had been left to deteriorate, with equipment and practices dating to before the collapse of the Soviet Union. New storage had not been built and old facilities were left abandoned. Uzbekistan is one of the major fresh fruit exporters in the post-Soviet space, but the absence of a reliable, efficient, and profitable Uzbek cold store limited produce sales to the immediate post-harvest period when prices are lowest.

The Government of Uzbekistan, realizing the importance of a national cold storage industry, has created a favorable policy environment for growth, including preferential financing through local banks. Financing the construction of cold store facilities must be complemented with up-to-date information on technical specifications and effective harvesting, packing, storage, and maintenance regimes. USAID's support focuses on this information and knowledge transfer—allowing local investors to realize optimal returns on their capital. For example, USAID's Aglinks Plus project strengthens the local capacity of cold chain actors through training on and procurement of limited temperature and humidity monitoring equipment.

Olim is a nascent cold store entrepreneur from a district in Bukhara, a province newly targeted for Aglinks Plus support in 2013. Olim participated in project-supported site visits, through the national Exchange Program, to other project partners who had experience implementing the technical recommendations. He sought and obtained a US\$100,000 bank loan to construct a 100-metric ton cold store just three months after his training and site visits. "I realized how profitable it is to operate a cold store if you know exactly what you are doing. I followed all the technical recommendations of the project staff and am sure results will not take long," reported Olim.

Next season Olim and another cold store owner will plant an orchard and a vineyard. "We want to produce our own fruits to place in our cold stores to control the whole cycle—from production to market. I want to make the most of USAID's advice and assistance." USAID has improved operations, increased profits, and expanded employment of almost 50 cold stores in six targeted provinces. The extended produce shelf-life and retained quality from an improved cold chain will benefit both producers and consumers.



SNAPSHOT Pre-Cool for Profits

Improving the Uzbekistan Cold Chain



"USAID project specialists taught me that pre-cooling fresh fruit within the first eight hours after harvest reduces weight loss by 20 percent and extends shelf life by one month. Following their recommendations allowed my fruits to reach market in perfect condition with minimal losses."

*Erkin Shorahimov
Cold Store Owner/Operator
Ferghana Province, Uzbekistan*

Photo: Elena Abdramanova

USAID introduced pre-cooling to improve fruit quality for consumers and increase income for producers in Uzbekistan.

Telling Our Story
U.S. Agency for International Development
Washington, DC 20523-1000
<http://stories.usaid.gov>

Most Uzbek market brokers and exporters ship fresh fruit to buyers directly from farmers' fields. Placing freshly harvested, warm fruit directly into a refrigerated truck leads to weight loss, as much as 5 to 10 percent, because moisture evaporation occurs during the first few hours and accelerates until the produce is cooled. The end result is that the volume of the produce arriving at market is significantly less than it was when harvested, and the quality is much poorer—leading to lower prices. The need to pre-cool fresh fruit produce immediately after harvest is especially urgent in Central Asia, where harvest season for the major fruits falls in the extremely hot summer months.

USAID's Agricultural Linkages Plus project trains orchardists, brokers, and exporters to ensure that post-harvest handling and storage of fresh produce increase—rather than decrease—profits. A critical link in the cold chain is the need for immediate post-harvest pre-cooling of fresh produce. In 2013, the project introduced pre-cooling techniques both in the orchards at harvest and in cold storage facilities. Orchard owners were instructed to harvest in the early morning hours to allow natural pre-cooling from lower overnight temperatures. A shade tent with misting fan was used at harvest to lower the initial temperature of the fresh fruit. Only 20 percent of project participants' fruits were cooled before shipping or placing in storage in 2012; that figure increased to 90 percent in 2013.

A cold store owner who rents space within his facility noted: "Last year people only placed fresh fruit for long-term storage. It is incredible what I witnessed this year: all exporters pre-cooled their fruit and I was busy the entire season with produce coming in and going out every day.... The profit I made this year I used to build additional cold storage and pre-cooling rooms. I was also able to buy a car, which made my entire family happy!"

The "cold chain" is a new concept in Uzbekistan, and its actors—farmers, assemblers, brokers, cold chain operators, exporters, and retail outlets—are learning by doing. Horticulture depends on the seasons, and changes are introduced annually. By sharing best world practices, USAID helps to significantly shorten the learning period, thereby improving the lives of a large number of Uzbek producers and consumers.



SNAPSHOT Hi-Tech Pad for Grapes

Introducing Advanced Storage Technology in Uzbekistan



"This new packaging introduced to us by the USAID Agricultural Linkages Plus project increases grape storage life from two months up to six. I was able to sell my grapes in May for a price 10 times higher than in winter."

*Isokjon Boymatov
Cold Store Owner
Ferghana Province, Uzbekistan*

Photo: Elena Abdramanova

USAID promotes modern grape storage packaging to improve the quality of fruits and entrepreneurs' incomes in Uzbekistan.

Telling Our Story

U.S. Agency for International Development
Washington, DC 20523-1000
<http://stories.usaid.gov>

Table grapes play a special role in the lives of the Uzbek people: almost all homes have grapevines to provide abundant shade during the hot summer months, while the plant yields fruit full of vitamins in the early fall. No Uzbek national festival takes place without this sweet, attractive, and healthful fruit.

Table grapes do not continue to ripen after harvest, so they are picked at their optimal maturity in September and are refrigerated for storage and transport to domestic and international markets later in the year. Value chain participants always try to prolong the shelf life of grapes because they are highly prized for New Year's celebrations.

Isokjon is typical of vineyard entrepreneurs who have invested in cold rooms so they can store their grapes and sell them during the off-season, when prices are higher. During the 2012 horticultural season, he was among the cold store owners who tested the use of sulfur dioxide in grape storage. These tests were implemented under USAID's Agricultural Linkage Plus project with the aim of strengthening the fruit value chain "from field to fork." As a result of the test, Isokjon found that his grapes in May "looked like they were taken from the vine just a few minutes ago!"

All post-harvest diseases in table grapes are caused by fungal infections, and sulfur dioxide has been used in California since the 1920s to control for mold spores. The project partnered with a local company that imports in-package sulfur dioxide generating pads for mold control to provide the materials and training. These pads have a dual-release system triggered by moisture levels that emits a quick dose (within 24 hours) followed by a slower and longer release (over eight to 12 weeks).

In 2013, the project sponsored multiple training sessions and domestic exchange visits to disseminate these results—employing the cooperating cold storage owners as spokespersons. The resulting uptake in 2013 was remarkable. The collaborating company's representative, Umed Suleymanov, stated that it sold 1 million pads, compared with 60,000 in 2012. "This is a big turnover for input suppliers to the grape and cold storage industries. Producers, retailers and consumers will make more money and consumers will enjoy grapes throughout the off-season."



SNAPSHOT “Hobos” Find a Home

Improving Fresh Produce Cold Chain in Uzbekistan



“Such a small device helped me to solve a very big problem! Now I not only increased my income by reducing maintenance costs and extending shelf life of the fruits, but also supply fresh, high-quality produce to consumers’ tables. And for me—that is the most important thing”

*Isokjon Boymatov
Cold Store Owner
Ferghana Province, Uzbekistan*

Photo: Elena Abdramanova

USAID introduced post-harvest techniques to improve cold storage practices for fresh fruit produce in Uzbekistan.

Telling Our Story
U.S. Agency for International Development
Washington, DC 20523-1000
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Uzbekistan is traditionally famous among the former USSR republics for the variety and quality of its fruits. However, transformed consumer habits in the former Soviet Union have resulted in people requiring fresh fruits year-round, not only during the harvest season. USAID’s Agricultural Linkages Plus project assists farmers to not only produce better fruits in bigger quantities, but to also implement activities to improve post-harvest handling, particularly through cold storage facilities.

A major problem in fresh fruit storage under cold room conditions is maintaining stable temperature and humidity levels that are correct for each crop type stored. USAID procured and installed data loggers to record temperature and humidity levels in 15 cold stores in six Uzbek provinces during 2013. The data allowed objective identification of problems related to storage of fresh fruits and vegetables on a case-by-case basis. “I often thought of the reasons why my stored produce spoiled more quickly than my competitors’. It seemed to me that we had the same facilities and stored at the same temperatures,” said Isokjon Boymatov from Ferghana Province. “I was happy to participate in this data collection experiment to learn exactly what my problem was.”

USAID introduced to these Uzbek entrepreneurs a palm-sized device, called a “Hobo,” that records temperature and moisture data in both fixed and mobile cold storage settings. The Hobos allowed entrepreneurs to see what happened behind the closed doors of their facilities or transport and to adjust and control their conditions. Produce losses were reduced by 20 percent among the participants who could regularly monitor their data. Further investigation of the data by project experts identified poor insulation and absence of humidifiers as the principal causes of highly fluctuating temperature and humidity in certain cold stores.

Project expert recommendations, reinforced through direct observation of best international practices during study tours to the United States, prompted 20 cold store owners—representing 6,000 metric tons of quality storage capacity—to install humidifiers and/or ethylene venting units in 2013. These 20 cold stores sufficiently increased their revenues, through reduced losses and increased profits, to expand their facilities by adding an additional 21 percent to their capacity in 2013.



SNAPSHOT “Lyres” Play Sweet Tune in Uzbekistan

Increasing Fruit Production, Incomes, and Profits in Uzbekistan



“I installed the new lyre trellises in spring. This fall I received 10 tons from 0.5 hectares, compared to 6 tons from my neighboring plot of the same size using another trellis type; and to me it means more income”

*Asad Saydullaev
Farmer
Samarkand Province, Uzbekistan*

Photo: Elena Abdramanova

USAID introduced to Uzbekistan a new type of trellis for vineyards to improve the quality and quantity of fruit and increase farmers’ income.

Telling Our Story
U.S. Agency for International Development
Washington, DC 20523-1000
<http://stories.usaid.gov>

In the spring of 2013, vineyard owners in six provinces opted to experiment with a new-to-Uzbekistan trellising system called “lyre.” “Lyre” refers to the shape of the trellising system, which resembles the ancient Greek musical instrument. This system opens the vine, allowing for better aeration and more sunlight to reduce disease and increase photosynthesis. USAID’s Agricultural Linkages Project introduced this method to stimulate vines to yield premium-quality fruits that attract higher prices and are in greater demand on both local and international markets.

One farmer employing the lyre technique is Asad Saydullaev, a grape farmer from Payarik District of Samarkand Province. Like many farmers in the province, and throughout the country, he is always on the lookout for new techniques to increase his income by minimizing losses and improving fruit quality. “If you compare grapes grown using different types of trellises, you can easily see the difference: this new method allows the grape berries to get more sun and air, which means more fruits with a better look!” notes Asad. Other farmers who witnessed Asad’s success immediately started to reform their traditional vineyards to the lyre system.

Traditionally, grapes are grown on the ground with no structural support from trellises—exposing the produce to pests and diseases while making it harder to harvest. USAID initially introduced the lower-cost and lower-maintenance “I”-type trellises to Uzbekistan, which resulted in a 60 percent increase in output over the traditional methods. The more sophisticated and costly lyre system is yielding an additional 67 percent increase over the “I” trellis.

USAID has introduced five types of trellises for seven fruit crops in six provinces of Uzbekistan. Each trellis type is targeted for optimum output and quality for the crop for which it was designed. The project conducts regular training sessions on established demo plots in participating farmers’ fields to ensure correct implementation of all farming activities throughout the season—from field preparation to planting to harvesting to post-harvest handling and sales. These training programs ensure that the best-quality produce results in higher farmer incomes and improved livelihoods for rural populations.



SNAPSHOT Dividends for Dilnora

Supporting housewives in Uzbekistan



Photo: Sunnat Jalalov

"USAID's project not only taught me new ways of preserving fruits and vegetables for winter but also created additional income for me and my family"

*Dilnoza Murodova
Housewife
Namangan Province, Uzbekistan*

USAID technical assistance improves family nutrition and creates additional income sources for rural women in Uzbekistan.

Telling Our Story

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Dilnoza Murodova is a young woman from a small village in Namangan Province. Like the majority of housewives in Uzbekistan she preserves fruits and vegetables for her family's consumption during the harsh winter months. Food preservation methods are limited to 2-3 main recipes passed from generation to generation; mothers to daughters.

USAID introduces to rural Uzbek women new fruit processing techniques to provide greater variety, quantities, quality and food safety at the household level. Local professional food technologists are hired to conduct practical, hands-on training on such topics as fruit and vegetable drying, pickling, and salting techniques as well as baking. These training programs are organized in one of the trainee's homes to reduce participant travel time, assure support material are available (ex., water, gas, plates, cooking pots, electricity, etc.) and reassure female trainees in a familiar environment rather than a more formal training premises.

"I participated in all these trainings conducted in my village," says Dilnoza. "I learned new ways of making jams and salads, as well as baking which is very much appreciated by my family. It is very convenient for me and other women that trainings are conducted during the harvest period when fruits are plentiful. This way we go home and try out what we've just learnt immediately." Every woman also disseminates her newly gained knowledge among other members of her extended family bringing multiplication effects to USAID's efforts.

USAID's program not only reduces food spoilage and improves nutrition, through more fruit in the household diet, but also generates income for rural women. Dilnoza previously bought her processed fruit products in the local market. After she learned how to make them herself she no longer buys but instead sells. "Previous to the training I would spend around 20,000 Uzbek soum per market visit 20 times a year on such products. Now I can produce the same product at one-quarter the price and I sell my excess. This not only brings additional income to my family but also gives me a great feeling making money".

In FY2013 USAID's household food processing program trained 400 women in 6 different provinces of Uzbekistan.



SNAPSHOT ALP's Exports Climb New Heights

Supporting fruit exports in Uzbekistan



*Photo: Mumin Isamiddinov
"I received 20% higher prices for my premium produce on the Moscow market after following USAID's recommendations."*

Alisher

Cold store owner

Samarkand Province, Uzbekistan

USAID technical assistance boosts fruit exports in Uzbekistan.

Telling Our Story
U.S. Agency for International Development
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Uzbekistan is historically one of the main fresh fruit exporters to Russia. In recent years, European and South American countries are competing with Uzbek produce. To meet this new competition USAID promotes application of sorting, grading and advanced packaging, as well as improved cold storage and transportation technologies, by Uzbek fruit exporters to assure excellent quality fruits arrive on the Moscow market.

USAID's Aglinks Plus (ALP) Project informs sector actors of new, advanced technologies all along the fruit value chain to improve people's livelihoods. In its second season, ALP assisted value chain actors in 6 provinces of the country – from tree nursery businesses to farm enterprises to cold store operators and exporters – to introduce best international practices within the Uzbek cold chain for fresh produce.

Alisher and Ikhtiyor, cold store owners and exporters from Samarkand Province, are among the project clients. Provided technical assistance and training throughout the storage and selling season, they both implemented new fruit packaging techniques involving plastic wraps that assure a hygienic atmosphere around the produce and allow a product life of one month for soft fruits. Early morning harvesting, proper sorting, grading, pre-cooling and packaging were the new techniques employed by these two entrepreneurs on the season's first harvest, cherries to Russia. A data recorder was installed in the refrigerated transport vehicle to monitor the temperature development in transit.

Spoilage was reduced to 0.1% compared to 3% using traditional methods but the main improvement was fruit quality arriving at market. "I was amazed with the results. Cherries in the project introduced wraps did not lose any weight; the stems were fresh and green, and looked like they were just picked from the trees. The stems of cherries packed in the traditional way and included in the shipment showed browning and dehydration. Along with 3% saving of the produce due to minimized product loss, the price I received was 20% higher" exclaimed a clearly pleased Alisher.

In 2013 Uzbek cherry exports to Russia increased 17% and their prices increased 46%, the most expensive cherry on the Russian market.