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**TAJIKISTAN**

# PRODUCTIVE AGRICULTURE PROJECT

## ANNUAL PROGRESS REPORT

YEAR II, OCTOBER 2010 – SEPTEMBER 2011



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## Introduction

The objective of the USAID Productive Agriculture Project in Tajikistan is to leverage private sector incentives and relationships to enable investment in productive technologies that make it possible for farms to participate in higher-profitability value chains. At the production level, the project is strengthening the agro-input sector to supply “technology packages” of high-quality, certified inputs with embedded technical assistance. This strategy simultaneously addresses supply and demand constraints for agricultural inputs that have resulted in a weak input industry and limited commercial agricultural development. At the market demand level, the project is linking input dealers and lead farms to launch demonstration plots which convey the potential yields and returns resulting from use of best practice inputs and production practices. To help overcome the risk of the farm in adopting a new technology, the project implements a voucher program which covers the difference in cost between the new technology and current practices. At the input supply level, the project is strengthening the distribution network of agro-input businesses by supporting linkages between retailers, wholesalers, importers and international input dealers through trade fairs and study tours.

The project utilizes a value chain approach to engaging agricultural small and mediums enterprises (AgSMEs) to identify key upgrades required to improve value added processing, storage and transport of agricultural production to markets. The project has recently engaged lead firms in the dried apricot sector to establish Tajikistan Foods Association, the first of its kind industry export association which stands to become a major driver of value chain competitiveness. Tajikistan Foods Association is seeking to implement quality controls to improve the Tajikistan Brand, solidify linkages with export markets (primarily in Russia through migrant community) and promote industry policy interests. The project is also working with key processor and exporters to link farms with domestic and international markets. Through Open Field Days, the project is bringing wholesalers and exporters to the farm gate to buy onions during seasonal windows when there are premium prices. This is creating long-term commercial relationships which will allow Tajikistan farms to expand sales to the Russian market. The project has also initiated important steps to building trust and supply relationships between tomato processors and farms. Tomato processors are for the first time considering more formalized contract purchases with farms, including possibly advances for purchase, to improve supply which is vital for their own profitability.

The project is also facilitating the financing necessary for farms and agribusinesses to make critical investments required for commercial production. The project helped to establish Apricot and Company, a joint-stock company comprising of a lead exporter and supplying farmers, to raise partial equity capital and access commercial financing needed for investment in a cold storage facility to stock fresh apricots for export to Russia. Farm investors not only benefit from a secured market to sell their production but also future dividend payments from sales. The project also piloted a tractor loan product which leveraged grant funds and worked with financial institutions into extending the term and lowering the collateral requirements of financing to help farms purchase tractor equipment. This was highly successful and the potential scale for replication is substantial given the need to replace aging equipment. The project is currently building off these successes to provide comprehensive training to financial institutions and input dealers on farm cash flow analysis and assistance on loan product piloting and development.

## Executive Summary

The Project has seen important shifts in the actions and investments of key value chain actors. While the emphasis varies by importance in the specific value chain, project interventions are contributing significantly to improved competitiveness and increased incomes due to more and better use of improved inputs, improved Post Harvest Handling practices, and improved ability to take advantage of highly profitable market windows and opportunities.

The first category of farm income improvements – seen in tomatoes and watermelons - is increased yields due to use of improved inputs and better production technology. The second category of income improvements was achieved through improved quality based on post harvest handling technology. In fresh apricots, improved project-facilitated market linkages allowed farmers to sell a larger portion of their total production. Finally, the project achieved an important change among farmers in early and late onions which allowed them sustainable access to local providers of improved inputs in particular high quality seed. Results of this linkage will be seen in 2012.

The project's success in encouraging (through vouchers, training, and marketing) greater use of improved inputs reached beyond the impact on farms. Inputs dealers correspondingly increased their sales, were linked with new farm customers and with new wholesale suppliers, resulting in a more robust and profitable input sector that will now be more likely to drive further long-term improvements and progress in the agricultural sector. This was done for watermelon, tomato, lemon, apricots, and onions.

Also in terms of investments in the long term efficiency and competitiveness of many of the target value chains, the project made important progress through its pilot tractor loan program, which assisted farms working with tomatoes, onions, and watermelon to receive credit to invest in the purchase of much needed Belarus tractors.

Finally, the project saw significant improvements on the end market, as dried Apricot exporters and processors used project support to address the business environment, the quality of Tajikistan products, and the image of Tajikistan products, while opening new markets for Tajikistan agribusiness. To achieve this, the project supported the launch of a Tajikistan Food Association, and supported firms in key export value chains to substantially increase exports. In early onions, exporters expanded sales through linkages facilitate by the project. Tomato processors invested in their facilities and set the foundations for future purchase agreements with those farmers benefiting from the technological package, and value added beef processors invested in their facilities through a mixture of cash and credit. A lemon growers association was formed, with the goal of aggregating production and selling to export markets.

## PROJECT VALUE CHAINS

### **1. Apricots**

The project worked at several different channels of the apricot value chain, including export dried apricots, export fresh, and processed, with a focus on post harvest handling and farm-buyer value chain linkages. Initial data on incomes and yields for the recent 2011 season has been collected and is currently being validated against control group data so as to report for the first quarterly report of FY 2012. To note that the apricot for drying harvest begins in June month, and in particular for dried apricots, farms sales extend throughout the year.

#### **1.1 Dried Apricots for Export**

The two priorities for exported dried apricots, according to interviews with exporters<sup>1</sup> are first improving local production volumes of high quality dried apricots available (i.e. supply constraint), and second expanding market opportunities, which includes protecting existing market channels to Russia (a need highlighted recently by Russia's temporary closing of their market to Tajikistan dried fruits and nuts) as well as diversifying into new export markets. In recognition of these priorities, the project dedicated its attention on improving quality supply and supporting an industry initiative to improve Tajikistan's market recognition and branding.

##### **1.1.1 Interventions**

To address the quality supply issue, the project has engaged with input dealers to promote technologies to apricot producers. This intervention is tied to important upgrades within dried, fresh and processed apricot value chains as the production technology requirements for apricots are constant. The project



supported field testing of improved inputs (including complex fertilizers, pesticides and use of backpack sprayers) through demonstration plots organized with lead farms. The project provided X trainings in X locations reaching X farmers. Open Field Days were organized with attendance by farmers, input dealers, and buyers highlighting potential improvements technologies could provide. The results of the demonstration plots indicated potential yields up to 20 tons, with noticeable reduction in pests and mold blemishes. With quality the primary obstacle to industry growth, the apricot voucher program addressed this issue through the voucher program. Nevertheless, the project did assist farms in linking with input dealers to purchase inputs

and backpack sprayers.

The project Post Harvest Handling (PHH) demonstration and voucher programs targeting important gaps in apricot value chains which result in reduced yields and quality, limiting farm profitability. Using a

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<sup>1</sup> Including the two largest, Natur Foods and AB, both headquartered in Moscow.

training of trainers methodology, the project with the assistance of a local service provider trained local NGO partners, who then provided training to 70 interested apricot producers in Asht, Isfara, Konibodom, and B. Gafurov regions. Farms that participated in the training program were also eligible to participate in a PHH voucher program that provided a discount for purchase of wooden boxes and trays needed for effective drying. The drying trays were produced by a local manufacturer and then sold through local retail input providers, establishing a commercial supply chain which will help ensure sustained access to this technology in the future. As mentioned above, initial data on farm-level indicators are currently being validated and will be reported in the subsequent quarterly report. Again, to note, dried apricots are sold throughout the year so actual sales and income data may be annualized and/or collected and reported on ongoing basis.

A vital element of the second value chain objective to solidify and diversify market channels for apricots is the need to establish a reliable and quality Tajikistan brand. This is important for a number of reasons. The first is that when Russia temporarily closed imports of dried fruits and nuts the industry did not have quality standards or certifications to combat the perception that the polio outbreak could reach Russia via imports. The second is that alternative export markets have higher quality requirements and standards which Tajikistan must meet before it can reach those markets. In order to put forth a consistent Tajikistan brand, there is a need for coordination among players to set standards, controls, market and lobby for its product. The project achieved cornerstone success in this goal through its support to Tajikistan Foods Association, which submitted its documents for registration this November 2011. The Association which includes all major apricot industry processors and exporters has the mission to establish a “branded” quality standard and lobby for improvements business environment to support long-term sector growth. Building on over a year’s work in developing relationships with these players, the project fielded an industry consultant to facilitate their formation meeting, consult on their bylaws and provide legal support for registration<sup>2</sup>. The attached letter by the Tajikistan Food Associations to the President of Tajikistan reflects these ambitions and potential.

### **1.1.2 Adjustments and Future Opportunities**

The potential for the export dried apricot value chain to increase farm income and industry investment remains huge. An estimated 80% of production is still sold as lowest quality. With targeted production and PHH technology interventions, farms could reach high quality benchmark and price differential that would enable them to vastly improve their incomes. Already, Tajikistan possesses a strong production base to build on constituting approximately 10% of the world’s apricot production. An indication of this potential is groups of both established and new to the market processors and exporters investing significant resources in new equipment (ex. sorting machinery) to further expand on and capitalize on the Russian market. There are technologies, and suppliers, for improved production and post harvest handling equipment which are well positioned to help foster this change. The constraint remains farms’ realization and knowledge of applying this best technology, without which they continue to lose yields to pests and miss out on premium prices due to poor quality. These facts reinforce the need to continue to focus on the complementary objectives of improved quality and market opportunities.

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<sup>2</sup> Appendix 1 Association letter to Tajikistan President

The signals at the processor level reinforce the project's vision for the future of the apricot industry. This is evidenced by exporter's support for the association and their investment of time and money into its creation. This is a positive sign indeed, and one that reflects the promise of this group as an influential change driver worth continued engagement. The project will thus engage with the Association as the counterpart for work on the creation of an apricot nursery, laboratory, development of quality post harvest handling support and additional production knowledge. These efforts will support the group to establish their governance and other management improvements to ensure sustainability. Input dealers will also be linked with the association, as a way to expand technical assistance and access to inputs to more apricot farms.

## **1.2 Fresh Apricot for Export**

The project worked with exporters to increase volumes sold to export market. Domestic prices for fresh apricots are low, providing limited incentive for farms to invest in fresh apricot variety orchards. However, demand in the Russian market is strong during a early market window. The ability of farms and agribusiness to organize the logistics and export of large volumes of quality fresh apricots during this window is a critical point for value chain competitiveness. Together, an emphasis on aggregation of quality fresh apricots and improved access to the Russian market offer fresh apricot producers a real potential to expand their income.

### **1.2.1 Interventions**

The project supported the apricot farm/apricot exporter joint venture Apricot and Company, providing management consulting support to the organization and helping them access \$10,000 in bank financing for the export of fresh apricot. Due to a surprisingly strong market this year, Apricot and Company Exporter, Pulod Ashurov, exported 540 tons of fresh product compared with 350 tons the previous year. The increase in volumes with higher prices ( average 3 TJS/kg in 2011 vs 2.2 TJS/kg in 2010) resulted in a 105% increase in value of exports (\$165,000 to \$337,000) between 2010 and 2011. The exporter takes a fee on top of these prices from the buyer, so the increase relates directly to increased income for fresh apricot farms in 2011. Apricot and Company laid the foundation for the new refrigerated pack house facility this year. The project assisted farm investors in the joint-stock company to access financing necessary to contribute their shares, resulting over \$30,000 in loans received. The project also facilitated the bank to evaluate the project's viability and risk profile and ultimately approve the loan.

### **1.2.2 Adjustments and Future Opportunities**

The project will continue support to Apricot and Company in ensuring successful construction of the cold storage facilities. With the facilities constructed, it is anticipated that Apricot and Company will have increased leverage to negotiate buyers' contracts with Russian importers. This should increase volumes in exports in the following year.

## **1.3 Processed Apricot**

The work with the processed apricot value chain overlaps with tomatoes, in particular with support to processors to improve standards and efficiency (see tomato section for information on this). However,

unique to apricots, the project worked to facilitate backward linkages with farmers, in order to expand this market channel for processed apricots.

### 1.3.1 Interventions

The Project conducted awareness training on HACCP and management quality standards to Obi Zulol, a well known water and juice bottler. After attending this training and considering options of GIZ and BAS supported consultants or regional consultants, Obi Zulol informed the project they are hiring HACCP consultants from Kazakhstan.

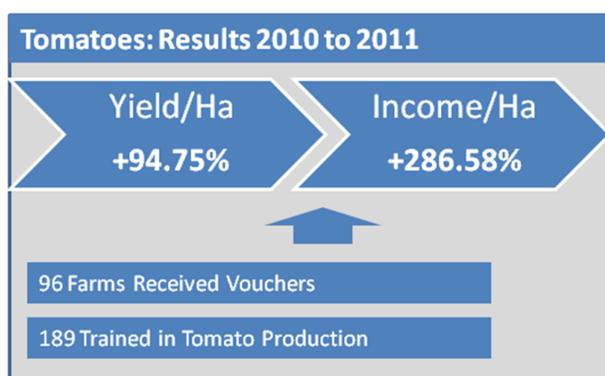
The project provided support to Obi Zulol, a large and established processor, to source materials from local farms. Obi Zulol had recently invested in a new multimillion dollar processing line in their factory that uses raw produce instead of concentrate. This could potentially result in new opportunities for farms producing fresh apricots to directly supply processors. The project worked with Obi Zulol on farm outreach this year, assist them in making contact with government agencies and aggregators involved in fresh apricot supply. While Obi Zulol established their processing line too late to source fresh apricots, they did gain valuable experience on which to build next season.

### 1.3.2 Adjustments and Future Opportunities

The project will facilitate meetings between Obi Zulol and beneficiary farms of technical and grant assistance. With the new processing line established, the processed apricot value chain offers an alternative to piloting supply linkages between farms and processors. The growth of the processed vegetable and fruit industry in Tajikistan depends on such reliable linkages.

## 2. Tomatoes

### 2.1 Open-Field Tomatoes



The project surveyed 85 farms change in yield and income from 2010 to 2011. Data revealed significant increases in yields as a result of technology adoption. This information is corroborated by a small control sampling which indicated that client farms in 2011 also achieved approximately 182.31% better yields than their neighbors and 94.75% better yield than in 2010. Low tomato volumes on the market in 2011 were caused by a variety of factors. The first is an ongoing trend of farms to plant less and less area in tomatoes. The second is low yields caused by

disease, poor quality seed with poor resistance to disease, use of only nitrogen based fertilizers instead of complex fertilizers, and poor integrated pest management systems used by farms to identify and address pest problems. The project voucher approach required a commercial level of tomato production of 1 hectare, which is much more than farmers supplying the fresh market typically plant.

Added to this were high quality disease resistant seed, quality complex fertilizer, and quality pesticides to address pest issues. This enabled voucher recipient farms to take advantage of historically high prices with large areas planted in tomato and strong yields. These yields were achieved on an average of only .88 hectares of tomatoes, and as a result of adoption of new inputs. Similarly high percentage increases in larger scale horticultural production yields or continued increases of this magnitude beyond the first “bump” will require continued commitment to proper technology. While several farms achieved 100 tons per hectare, high level tomato production is at the level of 125 tons/hectare, a level achieved by only one partner farm. With an average yield of 75 tons, farms still have room to improve their technology and yields.

Income also increased significantly. The increase in income is driven in roughly equal parts by higher yields on one hand, and a favorable price fluctuation that resulted in windfall earnings on the other. It does not indicate a stronger market channel per se, as 100% of farms surveyed sold to the fresh market, where prices nearly doubled from 1.02 TJS/Kg to 1.83 TJS/Kg. This price level is largely due to low market supply with crop failures and shrinking hectarage devoted to tomatoes and is unlikely to be sustained in the next season. Total income from 2011 sales of tomatoes was 11,264,672.73 TJS for 96 farms. With an average income increase per hectare of 286.58%, it is estimated that client tomato farms earned an additional 7,333,889 TJS in income which is attributable to project impact. This is an approximate increase of 16,083 USD in income per average farm.

### **2.1.1 Interventions**

#### **Farm Productivity**

The project established a demonstration plot in Isfara with the aim of connecting farmers in this region with local processing plants Badr and Kulkand. The project also established a demonstration plot in Istaravshan to encourage local farms to sell to Obi Zulol, which had invested in a new tomato processing line, “Elita.” Through these demonstrations, 189 participants were trained and prepared for improved production next year in Sughd. The plots tested 3 seed varieties as well as three different fertilizer options. Demonstration results show that the use of complex fertilizer, integrated pest management, and high quality seed, it is possible to achieve yields of 92 tons per hectare. Tested seed ranged from 82 tons to 92 tons, all significantly higher than the typical yield levels of 20-30 tons.



The project provided vouchers for 96 tomato farmers to purchase a package of improved inputs at a discount with accompanying training on input application and. The results of this voucher program highlight the success of the project’s model in achieving substantial increases in yields and productivity. This upgrade to best practice inputs offers significant opportunities to increase incomes.

#### **Processing Capacity**

At the processor level, the project organized and conducted trainings on Kaizen, HACCP and other management improvement efforts for tomato processing companies, in order to open up new,

dependable market channels in the tomato value chain. These interventions are highlighted by particular agribusiness:

**Badr** is a firm located in Isfara region and involved in processing tomatoes and apricots. The project worked with this firm as they have potential to create a strong value chain, increasing sales in exported tomato products and creating a mutually profitable relationship with tomato farms. Badr participated in trainings on both Kaizen and HACCP expressing high interest to inculcate both systems at their enterprise. They have also begun to apply this knowledge in redesigning their factory located in Isfara around a new aseptic packaging line. Applying Kaizen best practices, the old technological line was sold for 50,000 somoni, generating much needed working capital. Management freed up 537 square meters of factory floor space for installation of new boilers according to the Kaizen principal of production cell development. This decreased the distance to the filling line by 50 meters; reducing time of unit product production, increasing production capacity by 2% and reducing labor costs by \$1,000 a season. Badr is also pursuing qualification of HACCP certification. They invited in a HACCP consulting team for risk analysis, identification of critical control points, trainings on sanitation, hygiene, and production safety, and establishment of a monitoring system for critical control points. A HACCP audit was conducted, identifying corrective measures required to achieve HACCP certification. The project is working with Badr to repair their roof, a key element in receiving HACCP certification.



With project support, **Kulkand LLC**, a processing plant constructed in 1992, took HACCP introductory training. They are now engaging HACCP consultants and actively working towards full certification. The project is also assisting Kulkand to establish improved packaging using twist off glass jars. The main incentive of the company in purchasing such equipment is to use small 200-500 ml twist off jars instead of 1-2 liter jars. This should help them to increase their profit as consumers prefer more attractive and suitable packaging in a smaller volume. The project is linking this agribusiness with a new glass jar manufacturer located in Sughd also supporting local production of twist off glass jars.

**LLS “Safovat”**, a Dushanbe processor with a bottling operation is interested in adding tomato processing to their facility. The Company owner, Mr. Rakhmonov, is a trained food technician and sees opportunities to sell a quality product both in Tajikistan as well as export to Russia. He is finalizing financing arrangements, including project support, to purchase and establish a tomato processing line in Dushanbe, sourcing raw materials from the regions around Dushanbe.

### **Farm-Processor Linkages**

The Project facilitated numerous value chain meetings between farms and Badr with the goal of identifying mutually beneficial relationships. These linkages involved support to both producers and buyers, and was focused on highlighting opportunities for long-term, mutually beneficial relationships.

A recent \$2.3 million investment by Obi Zulol in processing equipment has moved them into the fruit and vegetable processing sector. As the company’s previous products used concentrate, Obi Zulol needs to establish systems for sourcing raw materials (tomatoes as well as apricots and other fruits and

vegetables) from farms. The Project worked with the department responsible for supply on the development of their systems and farm linkages. The Project also facilitated agreements for supply of 3000 tons of tomato by the Production Cooperative “Mukaramov” from Isfara. However, when disease caused yields to decrease significantly (among the general farmers (though project supported farmers were better protected due to pesticide use) and thus supply to fall and prices to rise<sup>3</sup>, farmers chose the much more attractive option of selling to local markets. As a result, from the planned 3000 tons, only 670 tons of fresh tomatoes were delivered. Similarly, BADR signed contracts for supply of 880 tons of fresh tomato. Due to low yields and high fresh market prices, actual sales to the factory were 205 tons.

**Geha Foods** is a large processing facility outside Dushanbe facing a supply challenge. Initiating processing operations requires a minimum supply of 35,000 tons. The Project has been in discussions with Geha foods about the establishment of their farm supply model. To ensure a steady supply, Geha plans include a modern seedling greenhouse facility, use of tomato harvesting combines, and fixed price contracting with supplier farms.

### 2.1.2 Adjustments and Future Opportunities

Project intervention increased yields and provided expanded marketing options for farmers: this year, due to unexpected price in the fresh market, they were able to take advantage of the high fresh price; in the future they may take advantage of the stability of the processed chain, which will be more efficient and competitive thanks in part to project interventions. At the same time, the dialog that was facilitated between buyers and farms this season has set the foundations for both sides agreeing to work together this year. Processors are recognizing the constricted supply market and have committed to provide a portion of the input costs on credit in cooperation with our voucher program.

## 2.2 Open-Field Tomatoes



The project supported a pilot activity with Ismoilov Hoji Mirzo. A grant was provided to assist with completion of a trench “Chinese” style greenhouse and a demonstration plot was established in the greenhouse showing an increase of 35.5% over traditional growing methods. Follow on consulting was provided to greenhouse farms through a technical expert.

## 3. Onions

### 3.1 Early Onions

Activities in early onions this year revealed a strong and growing export market. The market, similar to the apricot export markets, is based on the traditional close ties between Tajikistan and Russia. Both leverage climatic advantages. While apricots leverages a product Russia can't produce, early onions leverages early production climatic conditions in southern Tajikistan to supply Russia with onions during

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<sup>3</sup> The price fluctuation was from 0,35 dirams for processing plants up to 2,5 somoni per kg for the fresh market.

a period when Russian produced onions held in storage are of lower quality and before domestic Russia produced onions are available. The project is finalizing a follow on market study on the early onion market, available in the first quarter of Year III. For the current season, yields and income changes will be reported for the third quarterly report of FY 2012.

## **Marketing**

Tajikistan based buyer research into early onion exports revealed that the largest exporters to Russia are from Istaravshan and Khujand. In addition, most early onion producers for export are in Tursunzade, but farms in Khatlon enjoy the best climatic conditions to meet market demand with harvest 2-3 weeks ahead of Tursunzade. Khatlon farms, however do not have stable relations with buyers and experience problems with sales. The project worked with farmers in Kumsangir, Shahritus, and Kobodiyon districts to link them with export buyers. With this goal, the project organized a meeting of onion farmers April 20th, 2011 in Kobodiyon and Kumsangir and arranged for some of the largest onion exporters from Istaravshan, (Dodoyev Bakhodur), and Khujand, (Pulotov Shamsibou, and Burkhonov Gafor), to attend. Mr Dodoyev exported 600 tons of winter onions in 2010 including onions from 9 hectares he grew himself in Tursunzade. Mr. Pulotov and Mr. Burkhonov together exported 1000 tons of winter onions to Russia. They are one of the largest wholesalers in Tajikistan, possessing a warehouse in Spitamen, and they are involved in exporting winter onions in the spring, and importing onions from Russia during the winter. These and other buyers were identified by the project during value chain outreach and research.

What the buyers learned was that 99% of the farms had planted the local May, Express, or Elita varieties. These are the varieties traditionally grown in the area, as these varieties are ready for harvest early. However, due to high sugar content the onions do not store or ship well and therefore cannot be exported. The buyers provided feedback directly to the farmers, that the local varieties are not in demand in Russia. They recommended to the farmers that they plant "Aldava" variety because of the high demand in Russia. Farmers were aware of this variety, and knew it was grown in Tursunzade. The buyers also explained that if they would grow this variety, their harvest would be ready a month earlier, increasing their value for the export market.

The project identified a large buyer from Ufa, Aleksandr Kulakov. Mr. Kulakov is a wholesale fruit and vegetable trader with storage facilities in Ufa. Linking together this importer with the Tajik exporters from Khujand, the project facilitated the sale of 60 tons of onions.

In early May, the project organized onion commodity meetings in Kobodiyon and Kumsangir districts, involving farmers, input suppliers, and credit providers. Appropriate onion sorting technology was demonstrated to farmers at these meetings. Farmers were interested in planting Aldava seed, but there was not an established reliable source for Aldava in Khatlon. The project worked with a wholesale seed input dealer in J. Rasulov to supply farmers through a local input dealer. Likewise the project linked the local input supplier with a wholesale importer of fertilizer and pesticides. Together this voucher program supplied 72 farms with access to improved seed for onions in high demand in the market, as well as fertilizer and pesticides.

The project also established new demonstration plots in Kobodiyon, Kumsangir, Bokhtar, Tursunzade, and Shahrinav to test additional onion varieties. These demonstrations will not only test the production

potential of the seed varieties, but the harvest will be shipped through onion exporter partners to Russia to test the capacity of the varieties to handle the demands of shipping as well as market interest in the varieties in Russia.

### 3.2 Late Onions

Data on incomes and yields for voucher farms in the 2011 season show higher yields and income than among neighboring farms. Unfortunately, both yields and income were very low. This was caused by a severe access to water during critical times of the growing season. 10 farms among the voucher recipients had better access to water, and correspondingly above average yields. This experience shows the high risk of agriculture in areas with unstable water access. Inadequate access to water came as a surprise to the farms (And the project). In the previous season, when the irrigation infrastructure was controlled by the water use associations established with USAID assistance, access to water was not a problem and farms had average yields. This season the control for the infrastructure was given back to the local government agency. Farms complained of insufficient water, and farms at the end of the canal received no water. The water user associations are confident that a planned change to return irrigation control to the association will reverse the situation.

Work with late onions is focused on increasing farm income by enabling farms to increase their yield and storage capacity. Later sales allow farms to sell during the winter, when Tajikistan imports onion. Late onion work focused in the Sughd districts of Zafarabod and J. Rasulov districts.

In 2010 the project established a demo plot in Spitamen district with the aim of promoting best practices of late onion growing among farms through the use of high quality seed and fertilizer. The demonstration showed Halsedon and Bangkok seed varieties to have disease resistant with strong yield. In October of 2010, the Project organized a voucher program to sell high quality certified seeds, fertilizers and pesticides through partner input dealers SAS (with whom the demonstration field was established in 2010) and FAVZ to 84 target farms. Results show an increase in yield over neighboring farms not using the technology and increase in income on average among participating farms, but still significantly below average yields due to the water issue.



#### Demo Plot establishment and Onion voucher program



Demonstrations were organized in Zafarabad and in J.Rasulov districts with the support of input dealer Mr. Samiev to show the impact of using high quality seed, complex fertilizers, high quality crop protection products, and a hand planter. The results showed that the hand planter increased yield by 30% and increased the number of onions meeting market minimum requirements for size to 95%, while reducing the amount of seed required from 15 kgs to 6 kg. The demonstrations achieved yields of 100 tons per hectare. Economic results of demo plots showed that cost per ton is less growing onions of Banko variety, because of its high disease

and drought-resisting combined with a higher market price. Based on this, a voucher program is scheduled for year III in these districts using the promoted technology.

### **Value Chain**

Onion Voucher Program participants (2010) from Zafarabad were linked with onion buyers from Istaravshan and Spitamen. The project has identified several buyers and wholesalers who are engaged in the export of late onions to Russia. Project initiated several negotiations with the potential buyers such as Hoji Mirjalil (Istaravshan); Umarov Naim (Istaravshan), and Pulotov Shamsiboy (Spitamen) who was interested to buy onions from Zafarabad.

In July the project arranged for onion exporters to participate in the Zafarabad onion demonstration Open Field Day and meet with onion growers, such as DF Hijimuradov, DF Rahimov and others. During the event, an exporter explained his requirements to farms in terms of the size, minimum volumes and prices for different varieties. This year the prices for late onion Halsedon variety was 0,80 dirams, and purchase price for Bangkok was 1,20 dirams in July.

During the harvest period the exporter bought 350 tons of onions from Zafarabad voucher recipients. The exporter, Shamsiboy Pulov, has shipped 1200 tons of late onions to Orenburg and Chelyabinsk in Russia.

### **Consultancy expertise**

In April 2011 the project assisted partner farms to request a US consultant on growing and storage onions provided by the USAID Farmer to Farmer program. The Project organized Commodity Meeting Groups with farmers, input dealers, and buyers. The consultant, Mike Acher, provided expertise on proper growing, sorting and storing techniques. He emphasized that maximizing profit required proper technology at every level starting from seed variety selection, planting, field production support through the season, post harvest handling and storing. Working with buyers, the consultant explained onion storage requirements, sorting, packing, and proper warehouse management.

### **Storage**

Marketing analysis of the late onion value chain shows peak prices in winter and early spring, until April/May when early onions are harvested. From late November through late April prices rise up to 150%. All onion voucher program participants are members of Water User Associations, and each Association possesses warehouse space. The project worked with the associations on how they could utilize existing buildings to set up association owned/managed onion storage in order to access late season premium prices.

## 4. Beef

Initial project work training Dushanbe butchers to improve their quality and offer high end cuts of meat,



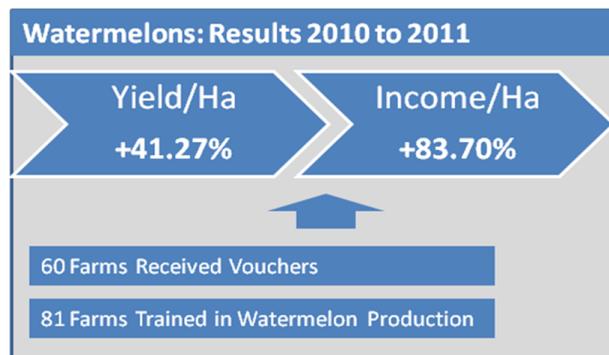
coupled with two marketing events reaching out to the foreign community demonstrated to the butchers the available untapped market. Several months following the last marketing event, a chain of high end butcher stores were opened. Project work identified two value added beef businesses. Alisher Ganiev is a Dushanbe based butcher offering premium products in most of Dushanbe's large supermarkets, and currently working on a custom butchering business. Training in new cuts of meat, individual packaging and presentation, and marketing has resulted in increased sales of 94%. Davron is a livestock feed lot, who received assistance in butchering, marketing and improving their production technology. The project worked with Davron to

develop a vertically integrated plan currently being implemented to establish expanded production and a slaughter facility supplying high end retail businesses in Khujand. Sales increases have been slow as the organization is sells stock to finance their investment, with plans to realize greater margins once their slaughter facility is built.

A feed supplement demonstration was also established with the Dekhan farm Davron and a second farmer Abdurab Khakimov, showing significant weight gain possible with minimal cost. Improved feed with a mineral and vitamin supplement outperformed traditional feeding methods by 52.8% and outperformed improved feed without minerals and vitamins by 24.5%

## 5. Watermelon

Project efforts in watermelon focused on introducing the technological packet of improved inputs and associated training, and use of demonstration farm plots, to increase yields.



The project surveyed 42 farms' change in yield and income from 2010 to 2011. On average, farms experienced increased yields and income. The data set, however, revealed some results that will require more targeted follow-up and validation. Of the 42 farms reporting 2010 and 2011 information, yield increased on average 41.27%. Of these, 23 reported an increase (on average, an increase of 163.21%) while 16 reported a decrease

(on average, a decrease of 53.07%). The average area of land planted was 1.01 hectares.

Upon submission of documentation by the partner input dealer, the Project learned that the input dealer did not follow project instructions. In place of selling all seed and pesticides as a package, requiring purchase of the entire package, the input dealer allowed farms to purchase components and amounts, including allowing farms to purchase varieties of seed other than those recommended and

less than recommended amounts of pesticides. Farmers exercised this ability and did not purchase the full package. Examination of impact results indicated that those farms with lower yields are farmers that did not purchase the entire input package. The project will investigate this further to clarify the exact causes. With some partners showing strong results, and others showing poor results, if further research confirms the cause to be partial use of the input package, this will provide farms with strong evidence of the advantages of why use of the all aspects of the technical package are necessary for success.

Income also increased significantly, by an average of 83.7%, but with similar variation between those farms experiencing an increase and those reporting a decrease. Average prices increased from .60 TJS to .72 TJS per kilogram, and interestingly, those farmers who reported increases in yields also reported fetching a higher price. Follow-up qualitative surveys will be conducted to ascertain the explanation for these trends and their implications for the project.

## **6. Lemons**

Investigation into the lemon market identified that while most of the trade was done at a micro level, there are opportunities to export lemons immediately after harvest when the price is the lowest and Tajikistan lemons can compete regionally. A buyer from Almaty Kazakhstan was identified, Керим Бекке, interested in purchasing 60 tons of lemons. The project organized a meeting between the buyer and lemon farmers to investigate the possibility of a sale. A sale of this volume would require the cooperation of over 30 farmers. The meeting was helpful for farmers to understand that they would need to organize themselves so they could collectively negotiate a price with the buyer. The buyer also educated them on the need for improved cardboard packaging, as the existing wooden boxers are not desired by this market. The project worked with the 60 farmers to organize themselves into an association, which was registered in March, with the goal of organizing group sales and storage.

### **LLS “Safovat”**

With the goal of diversifying markets for lemon farmers, the project worked with Safovat on the creation of a fresh lemon juice based drink. Company owner Mr. Rakhmonov is a food technician and developed several lemon juice based drinks, which were taste tested in Dushanbe. While consumers gave favorable feedback on the taste of the drinks, Mr. Rakhmonov determined that the price of lemons is too high to create a marketable fresh lemon juice based product.

### **Demonstration**

The price of lemons rises from a low post-harvest point of 3 somoni/kg to a high of roughly 20 somoni/kg. To assist farmers in determining the storage methods that have the lowest loss and highest profit, the project conducted a lemon storage demonstration.

## **7. Input Industry Development**

The inputs dealers and the nascent wholesale inputs market are crucial change drivers for all of the project’s target value chains. By supporting a commercially viable inputs sector capable of providing the higher quality inputs needed to sustain increased yields, the project is following a sustainable path to value chain growth.

The key aspects of this support are the voucher program which buys down a part of the risk to producers of making the change to improved inputs, while also reducing risk to dealers of stocking

them; the accompanying training on proper use of inputs; the demonstration plots for farmers to see the improvements over time with their own eyes; and assistance in securing the financing needed to ensure liquidity at both the producer level (to buy sufficient inputs) and the retail level (to stock sufficient inputs).

61 input dealers were trained through a series of training sessions. Training in marketing and imbedded services resulted in 3 early adopter partner input dealers conducting outreach for farms in apricots, early onion, and late onions. Through the project's voucher programs, retail dealers established relationships with new farmers, and new suppliers for apricot drying wooden trays, as well as business relationships with wholesalers of high quality onion seed, high quality fertilizer, and high quality plant protection products. Input dealer partners working with the project increased their income on average by 93.4 %

The project worked to link wholesaler partners with input retailer dealers. In addition to project voucher programs, linkages between wholesalers and retailers were facilitated through organization of a trip for input dealers to attend the International Input fair in Osh, Kyrgyzstan. In the transactions, financing became a factor and the program worked with several of our input dealers to assist them in accessing the financing necessary for these deals. (See below).

## **8. Access to Finance**

Access to finance activities catalyzed investment at multiple levels throughout the project's target value chains. Project facilitation increased sustainable access to financial services for agribusinesses to purchase assets, farmers to purchase inputs and assets, and input dealers to increase stocks.

This was done in an environment in which financial institutions do not typically finance agriculture, and in particular asset investments. In addition to assisting farms to access credit for investment in the apricot cool storage facility, the project piloted a tractor loan product, enabling farms to use credit to purchase much needed tractors. Work has expanded from the initial partnership with two financial institutions to include five financial institutions.

The project worked with input dealers to finance the supply of inputs for farmers. Loans, a bank guarantee, and a project buy-back guarantee were used to facilitate the purchase of trays for Post Harvest handling work, as well as the import and distribution of high quality onion seed from Uzbekistan through a wholesaler, for sale to farms.

The pilot tractor loan product – 13 loans for a total of \$115,000 with grant funding supporting 25% of the cost and a 30% down payment, with 45% being finance by a bank loan -- has proven a very effective way of addressing the severe shortage of tractors in Tajikistan. Prior to this pilot, the only people who could purchase tractors were those who could pay up-front in cash. Demonstrating to the financial sector the viability (with proper analysis and risk mitigation) of using the tractor as collateral has had a strong demonstration effect. Since our pilot project, IMON has developed a tractor product that requires a minimum of 30% down payment and uses the tractor as collateral (the same model, but now without the grant); while IFC has signed a contract with a major bank, TSB, to assist TSB identify qualified farms and create a tractor financial product to work with the project.

In addition to the demonstration effect of the program, the tractor loans have had a multiplication effect in terms of access to tractor service. Farmers who have purchased tractors through the program are renting out their services, contributing to multiplication of efficiency gains for the agricultural sector.

## **9. Conclusions/Lessons Learned**

### **Export Dried Apricots**

There is great potential to use the exporters' association as a force for major improvements and investments that could lead to significantly improved value chain competitiveness, with benefits shared throughout the different levels.

### **Export Fresh Apricots**

Although a late frost impacted yields, the 2011 early apricot export window was sustained for almost quadruple the usual time. Tajikistan's fresh apricot production base far outstrips current value chain ability to export and meet demand in major Russian cities. Additional investment is needed for Tajikistan to capitalize on this development and build a fresh apricot export industry. This can come in the form of technical or grant support for entrepreneur exporters that are committed to establishing refrigerated pack houses to address the export bottleneck.

### **Processed Apricots**

Even with a large production base, when yields are low it is difficult for processors to access fresh apricots at any price. Focused technical support will be provided to those apricot processors interested in developing a solid farm supply system. It is clearly necessary to work on both the production side (yields) and the end markets side (to make processing a more viable, efficient and mutually profitable option)

### **Processed Tomato**

Low yields and shrinking hectareage is creating low supply, a huge challenge for processors. As a result, interest on the part of processors in collaborating with farms has increased. If mutually beneficial arrangements can be facilitated, there is opportunity for further development of this channel as a stable, predictable end market.

For example, with large tomato processors based in Istaravshan, an area with little tomato production, the project worked with processors, inputs suppliers, and farmers to create a local supply for processors, as well as facilitate negotiations between the two groups to develop a mutually beneficial relationship that allows all sides to make a profit.

The processed tomato industry around Dushanbe requires more sustained support, as partners in this area face greater supply obstacles having to compete with the high priced Dushanbe fresh market for materials. Due to the project refocusing production activities in Khatlon, the project will not support processed tomatoes in the RRP.

As discussed previously, the unexpected spike of fresh tomato prices represented a success (allowing farmers to take advantage of high prices) but also posed a challenge for future facilitation efforts, which will need to continue to build trust in the value chain and dependable, stable channels for off-taking.

### **Greenhouse Tomato**

The tomato greenhouse value chain has significant challenges, including technical knowledge and access to inputs similar to most value chains. Critical development timing for greenhouses occurs at the same time as the project's primary value chains of apricots and early (winter) onions. While apricots and onions reach thousands of farmers, work with greenhouses only reaches tens of farmers. For this reason, the project is discontinuing work with the greenhouse tomato value chain.

### **Export Early (Winter) Onions**

Early onions greatly expanded this year as buyers moved outside core supply bases outside Dushanbe and looked further south. The project's market study on Early Onions shows a strong market in Russia with limited competition and strong pricing during the April – May critical window. Project voucher activities showed strong interest from farmers and growing knowledge of the variety desired by exporters.

The project will introduce improved technology (planters, laser leveling) to farms, providing technical outreach and access to improved inputs vital to increasing yields and farm incomes. Project partner farms will be linked directly with onion exporters.

### **Late Onions**

Gains through use of complex fertilizer, improved seed, and proper production technology were demonstrated to increase yields. Onions store easily, but storing onions for later sale remains underutilized by farms.

The project will provide support to access high quality seed and fertilizer for the 2012 harvest through project input partners. Due to the likely refocusing of project production base to Khatlon, the project will not have a late onion demonstration in the North and will phase out support for farms in the late onion value chain.

### **Beef**

While most farmers engage at some level in beef production, the value chain faces a significant problem of government involvement. Due to government retail price ceilings, followed by the arrest of butchers, and the closing of a chain of high end butcher shops in the capital, the project made the decision to limit activities related to the beef value chain. In Year III, work will be limited to 1.) Introduction of feed supplements to a broader group of farmers supplying the Davron farm, 2.) Technical support to Davron and Alisher to establish their new businesses.

### **Watermelon**

Watermelon is an important cash crop, providing needed cash flow for farmers during the summer months. The watermelon value chain from farms to shippers to retailers is short and currently the only value added opportunity is for early watermelons. The project investigated the potential for higher quality melons, grown using less nitrogen fertilizer under the assumption that excessive use of nitrogen based fertilizers is causing high nitrate concentrations in melons and that voucher recipients, using complex fertilizer, will have lower nitrate levels. The project conducted nitrate level tests on all voucher recipients and their neighbors. The result was that most watermelon producers have low nitrate levels, both those participating in the voucher program, and their neighbors using traditional production technology.

Activity in Year III will support watermelon as an important cash crop. This work will include outreach from dealers to grower, access improved seed, fertilizer, and technical knowledge.

## **Lemons**

Lemons are a weak value chain, with very small production, a very small domestic market and a value chain dominated by small traders. While lemon growers have shown initiative to organize an association, their efforts in the beginning of year III to aggregate and sell product will be key to value chain success.

The project will work with the association through the end of 2011 to determine their interest. In the absence of strong farm interest, support for lemons will focus on dealer outreach as a supplemental input market for input dealers supporting onion farms.

## **Input Industry Development**

Year II saw input dealers applying project best practices and beginning to conduct extension outreach to farm clients. Project efforts to facilitate access to finance and linkages between wholesalers and retailers resulted in increased sales. Access to finance remains a pressing need for input dealers, particularly as relates to financing planting seasons for various crops.

The project will build on established momentum, working with input dealers on increasing outreach systems of imbedded services to farms. To address finance needs, the project will work with input dealers on accessing supplier credit from wholesalers and providing inputs on credit to worthy customers. To achieve this, the project will work with input providers on improving their business systems for accounting, inventory, marketing and client tracking.

## **Access to finance**

The pilot tractor loan product had a successful test with strong demand and repayment. Targeted support enabled agribusiness processors, exporters, and input suppliers to access needed credit. Credit, like any component of the market, is impacted by supply and demand. With the current supply of unsubsidized credit provided at roughly 36% and higher, demand for credit is low. This is particularly true for longer term credit for investment in assets or even six to nine month credit for production.

In Year III, the project plans to expand the tractor loan program to include all farm equipment (tractors, planters, sprayers) associated with target commodities. Access to finance work will assist input dealers develop relationships with wholesale suppliers and client farms to provide input credit, and input dealer business systems to accurately support this system.

## 10. Indicators

Farm Income target of 3% increase and Yield target of 3% increase.

Tomatoes: Farm Income earned from tomatoes increased 548% with an average income from tomatoes of 115,717 somoni or \$24,108 among voucher farms with an increase in yield of 181.53% with an average yield of over 75 tons. Improved inputs allowed farms to resist pest problems and achieve high yields during a season of high prices.

							Controls vs. Farm Survey		
		Men		Women		Total		Totals	
		2010	2011	2010	2011	2010	2011	Control	Clients
Yield	Total		4,199,000.00		1,907,000.00		6,106,000.00		
	Average	23,880.33	66,327.87	25,954.17	76,041.67	24,465.88	69,070.59	26,250.00	69,070.59
	% Change		177.75%		192.98%		182.31%		163.13%
Yield/Ha	Total								
	Average	38,130.37	73,608.63	39,975.00	79,501.91	38,651.20	75,272.62	26,736.84	75,272.62
	% Change		93.04%		98.88%		94.75%		181.53%
Income	Total		7,033,500.00		3,292,450.00		10,325,950.00		
	Average	18,324.59	110,057.38	16,647.92	130,102.08	17,851.18	115,717.06	39,416.67	115,717.06
	% Change		500.60%		681.49%		548.23%		193.57%
Income/Ha	Total								
	Average	33,017.21	121,312.88	30,915.97	135,586.29	32,423.92	125,343.02	40,406.80	125,343.02
	% Change		267.42%		338.56%		286.58%		210.20%
# Reporting		Men	Women	Total					
2011 Totals		63	25	88					
2010/2011 Change		61	24	85					

Watermelon: Farm Income earned from watermelon increased 83.7% with an average income from watermelon of 17,026 somoni or \$3,547 among voucher farms with an increase in yield of 60.46% with an average yield of over 30.8 tons. While averages are positive, negative results among farms seem to reflect farms' incomplete application of the production package and require additional research.

							Totals		
		Men		Women		Total		Control	Clients
		2010	2011	2010	2011	2010	2011		
Yield	Total		1,674,100.00		75,000.00		1,749,100.00		
	Average	34,851.35	33,156.41	25,200.00	15,000.00	33,702.38	31,093.18	26,200.00	31,093.18
	% Change		-4.86%		-40.48%		-7.74%		18.68%
Yield/Ha	Total								
	Average	21,890.39	32,835.90	21,200.00	15,000.00	21,808.20	30,809.09	19,200.00	30,809.09
	% Change		50.00%		-29.25%		41.27%		60.46%
Income	Total		900,180.00		30,500.00		930,680.00		
	Average	13,591.89	18,466.15	10,000.00	6,100.00	13,164.29	17,060.91	21,800.00	17,060.91
	% Change		35.86%		-39.00%		29.60%		-21.74%
Income/Ha	Total								
	Average	9,321.47	18,427.69	8,880.00	6,100.00	9,268.92	17,026.82	16,300.00	17,026.82
	% Change		97.69%		-31.31%		83.70%		4.46%
# Reporting		Men	Women	Total					
2011 Totals		48	5	53					
2010/2011 Change		37	5	42					

## Early Onion

Monitoring of the early onion voucher program showed that the inputs were not distributed as planned, with farms not receiving all the inputs. Increased income for partner farms on average of 15,954, USD \$3,324, reflect increases in market prices this year. The limited application of the recommended technology is reflected in the small reduction in yield as compared to the previous year, and slightly higher yield, 8.51% than neighbors.

	Totals	
	Control	Clients
Yield	13,214.29	24,015.87
		81.74%
Yield/Ha	27,261.90	29,582.80
		8.51%

		Men		Women		Total	
		2010	2011	2010	2011	2010	2011
Yield	Total		1,118,500		21,500		1,140,000
	Average	37,194	18,641	10,333	7,166	33,357	18,095
	% Change		-49.88%		-30.65%		-45.75%
Yield/Ha	Total						
	Average	20,485	18,236	18,000	4,222	20,130	17,787
	% Change		-10.98%		-76.54%		-11.64%
Income	Total		961,785		19,920		981,705
	Average	17,066	16,029	4,090	6,640	8,326	15,582
	% Change		-6.08%		62.35%		87.15%
Income/Ha	Total						
	Average	8,465.57	16,361	7,490.00	3,284	8,326.20	15,954
	% Change		93.27%		-56.15%		91.62%

# Reporting	Men	Women	Total
2011 Totals	60	3	63

## Late Onion

Yields for late Onion farms in Zafarobod appear high as farms were better able to withstand poor access to water than similar neighboring farms. Yields 341% higher than neighbors are caused by exceptionally low yields amongst neighbors. Roughly 10% of voucher farms had access to water and were able to achieve above average yields, but the majority of farms had poor yields caused by water access issues. This is also reflected when comparing farm yields as lower than their harvest for 2010. Increased income is the result of higher prices this season, and not due to strong yields.

	Totals	
	Control	Clients
Yield	2,591.67	18,095.24
		598.21%
Yield/Ha	4,031.00	17,787.41
		341.27%

		Men		Women		Total	
		2010	2011	2010	2011	2010	2011
Yield	Total		1,118,500		21,500		1,140,000
	Average	37,194	18,641.67	10,333	7,166.67	33,357	18,095.24
	% Change		-49.88%		-30.65%		-45.75%
Yield/Ha	Total						
	Average	20,486	18,236	18,000.00	4,222	20,130	17,787
	% Change		-10.98%		-76.54%		-11.64%
Income	Total		961,785.00		19,920		981,705
	Average	17,067	16,030	4,090	6,640	8,326	15,583
	% Change		-6.08%		62.35%		87.15%
Income/ Ha	Total						
	Average	8,466	16,361	7,490	3,284	8,326	15,955
	% Change		93.27%		-56.15%		91.62%

### AgSME sales target of 3% increase

Project partners experienced strong sales growth in year II of the project. AgSMEs involved, primarily involved in export, averages 103% increase in sales, 92% when factoring in inflation. Input dealers working with the project experienced growth in sales of 93.4% and when factoring in inflation show growth of 83%. In total, commercial partners achieved increased sales of 86% after inflation

	2010	2011	increase	USD	%
<b>AgSMEs</b>	2,388,400	4,852,800	2,464,400	\$513,417	103.2%
<b>Input Dealers</b>	5,231,610	10,118,444	4,886,834	\$1,018,090	93.4%
<b>Total</b>	7,620,010	14,971,244	7,351,234	\$1,531,507	96.5%

	Input Dealer			AgSMEs				AgSME Total	Total
	Female	Male	Total	Male	Male	Male	Male		
<b>gender</b>	multiple	multiple	multiple	Tomato	Onions	Beef	apricot		
<b>commodity</b>	multiple	multiple	multiple	Tomato	Onions	Beef	apricot		
<b>Income 2010</b>	580,340	4,651,270	5,231,610	630,000	436,800	385,600	936,000	2,388,400	7,620,010
<b>5.8% inflation</b>	614,000	4,921,044	5,535,043	666,540	462,134	407,965	990,288	2,526,927	8,061,971
<b>Income 2011</b>	1,997,624	8,120,820	10,118,444	904,800	1,611,000	717,000	1,620,000	4,852,800	14,971,244
<b>monetary change</b>	225%	65%	<b>83%</b>	36%	249%	76%	64%	<b>92%</b>	<b>86%</b>

### Access to Finance

The project results of \$766,744 is behind the access to finance targets for year II of \$1,750,000. The foundation established with the input industry and key input partners, coupled with additional consulting resources in Year III will aggressively address this indicator.

Type of partner	Farms								
<b>gender of owner</b>	Male	Male	Male	female	Male	male	female	Male	Male
<b>commodity</b>	Apricot	tomato	late onion		early onion	PHH		Beef	Watermelon
<b>Finance</b>	101,754	133,200	256,828	27,500	201,385	490,275	78,500	42,600	102,230
<b>USD</b>	\$ 21,199	\$ 27,750	\$ 53,506	\$ 5,729	\$ 41,955	\$ 102,141	\$ 16,354	\$ 8,875	\$ 21,298
<b>Farms Subtotal</b>	\$ 298,807								
Type of partner	Input Dealer		AgSME						
<b>gender of owner</b>	Female	Male	Male	Male	Male				

<b>commodity</b>	Multiple.		Apricot	Beef	onion
<b>Finance</b>	65,800	1,510,500	144,900	130,000	60,000
<b>USD</b>	\$ 13,708	\$ 314,688	\$ 30,188	\$ 27,083	\$ 12,500
<b>Input Dealer Subtotal</b>	\$ 398,167	<b>AgSME Subtotal</b>	\$ 69,771		
<b>Total</b>	<b>\$ 766,744</b>				

### Investment

Partners invested an additional \$649,135 in their operations. This is slightly below Year II targets of \$750,000. A few investment projects with AgSME partners were delayed but will clear in the first quarter of Year III and achieve this target.

Type of partner	Farm						
gender of owner	Female	Male	Female	Male	Male	Female	Male
commodity	Watermelon		Late onion		Early onion	Tomato	
<b>Investment</b>	1,000	145,100	16,200	439,585	12,500	56,090	240,625
<b>Total</b>	146,100		455,785		12,500	296,715	
<b>USD</b>	\$	30,438	\$	94,955	\$ 2,604	\$	61,816
<b>Farm Subtotal</b>	\$ 189,813						

Type of partner	AgSME			Input Dealer	
gender of owner	Male	Male	Male	Female	Male
commodity	Apricot	Beef	tomato	Multiple	Multiple
<b>Investment</b>	126,500	138,000	1,640,050	86,200	214,000
<b>USD</b>	\$ 26,354	\$ 28,750	\$ 341,677	\$ 17,958	\$ 44,583
<b>AgSME Subtotal</b>	\$ 459,323				
<b>Total</b>	\$ 649,135				

### Best Practices Adopted target of 12. 23 adopted

**Value Chain members with Improved quality target of 1,224.** Actual documented are 352. The project anticipates this number greatly increasing in year III as farms adopt quality practices. In particular, Post Harvest Handling through the Tajikistan food association and quality seed genetics through dealer outreach will engage large numbers of producer based on the success of project partner farms during year II.

Region	Name Best Practice	type of organization	Commodity	#	District
Sughd	Use of NPK on Apricots	Farm	Apricot	24	B.Gafurov
	Use of New Improved Crop Protection Product				
	Farmer pruning of Apricot trees			61	Konibodom

	Use of Improved seed and quality field protection techniques will lead to best yields				
	Sulfuring the apricots (PHH)			45	Isfara
	Harvesting of Apricot (PHH)				
	Drying the apricot (PHH)				
	Use of NPK of Improved Fertiliser				
	Use of New Improved Crop Protection Product				
	Use of Improved seed and quality field protection techniques will lead to best yields.		<b>Onion</b>		
<b>RRS</b>	Use of NPK			47	Shahrinav
	Use of New and Improved Crop Protection Products			21	Hissor
	Use of quality seed			28	Vahdat
<b>Khatlon</b>	Used of new and Improved certified onion seed/onions Input Supplier		<b>Onion</b>	37	Qumsangir
	Use of NPK			35	Qubodiyon
	Use of New and Improved Crop Protection Products				
	Use of New Improved Crop Protection Product (watermelon)		<b>Watermelon</b>	14	Shahrirus
	Use of Improved seed and black Plastic (watermelon)			12	Qubodiyon
	Use of NPK (watermelon)			28	N.Khusrav
					<b>352</b>
	BADR Kaizen/HACCP	<b>AgSME</b>	Tomato	1	
	Apricot and Company/Governance		Apricot	1	
	Taji food association/Governance	<b>Association</b>	apricot	1	
	Imbedded extension services	<b>Input Dealer</b>	multiple	3	
<b>Total</b>				<b>358</b>	
<b>* Quality Practice</b>		<b>Total</b>		<b>352</b>	

### Additional Output Indicators

<b>Output</b>	<b>A</b>	Number of Agriculturally Related AgSMEs and Farms Assisted	759
	<b>B</b>	Number of people trained	2,071
	<b>C</b>	Number of best practices/new technologies under field testing	17
	<b>D</b>	Number of Global Development Alliances	0

<b>Impact</b>		Return on Investment	
	<b>E</b>	Total project budget expenditure as denominator; Sum of partner financial income, increased financial partner capital, partner AgSME revenue as numerator	
Increased Farm Sales			\$ 2,069,261
Increased AgSME Sales			\$ 1,531,507
Investment			\$ 649,135
Total Return			\$ 4,249,903
Budget Expenditures through Sept 2011			\$ 2,937,882
ROI (As described in the PMP)			1.4
Actual ROI (importance is that this is positive)			0.4

The project shows a strong return on investment, already achieving a positive return in year II of the project.

<b>F</b>	Value of Inputs used with the support of the Project Voucher Program	\$/year
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	Farm investment	Project Voucher	Total
Late Onion 2010	\$ 40,451	\$ 13,482	\$ 53,933
Watermelon	\$ 13,476	\$ 6,281	\$ 19,757
Tomato	\$ 43,946	\$ 19,483	\$ 63,429
Apricot Production	\$ 25,533	\$ 31,947	\$ 57,480
PHH	\$ 24,758	\$ 16,505	\$ 41,263
Early Onion 2011	\$ 61,560	\$ 84,735	\$ 146,295
	<b>\$ 209,724</b>	<b>\$ 172,432</b>	<b>\$ 382,156</b>

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