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TAJIKISTAN

PRODUCTIVE AGRICULTURE PROJECT FINAL REPORT

SEPTEMBER 29, 2009 – SEPTEMBER 29, 2014



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FINAL REPORT

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INTRODUCTION

Agriculture is a key component of Tajikistan's economy, accounting for 21.1 percent of GDP and employing 46.5 percent of the labor force¹. There remain a number of challenges that limit productivity and market potential, which in turn have resulted in low farm incomes, indebtedness, and food insecurity. There are, however, strategic opportunities to improve agricultural competitiveness through economic liberalization and crop diversification, moving away from excessive dependence on cotton. In particular, high-value crops that take advantage of Tajikistan's climatic advantages allow production that can serve export markets before peak production. Opportunities to increase farm income exist with domestic production as well, serving off-season markets either before peak production through early production technology or after production through investment in storage infrastructure.

On April 6, 2009, the United States Agency for International Development Regional Mission to Central Asia (USAID/CAR) issued Request for Proposals (RFP) No. 119-09-006 for the USAID Productive Agriculture Project (ProAPT) in Tajikistan. The purpose of the RFP was to procure technical assistance, training, equipment, and commodities to assist the development of the agricultural sector in Tajikistan. The project's activities were to focus on increasing the productivity of traditional agricultural crops, expanding agricultural profitability in food-insecure areas, and supporting post-harvest processing wherever needed and feasible. The project's activities were to be focused in western Khatlon, Sughd Province, and districts in proximity of Dushanbe known as Districts of Republican Subordination (DRS). The project was to provide a platform for working with the private sector to expand and improve production and to add value for local and regional markets through:

- Improved access of farmers to new technologies; inputs such as fertilizer, seeds, equipment, and livestock; and improved techniques
- Increased income through establishment of strong market linkages between farmers and consumers
- Improved access of farmers, support service providers, and processors to finance
- Improved practices for grading and sorting, improved packaging, and more-effective branding
- Improved processing techniques
- Improved support services such as warehousing, processing, and transport
- Improved knowledge and implementation of quality standards and certifications

ACDI/VOCA and its subcontractors International Fertilizer Development Center (IFDC), Mennonite Economic Development Associates (MEDA), and E-NOETEC Consulting (E-NOETEC) were awarded the contract for this activity with a performance period from September 29, 2009, through September 29, 2014. The project had the overall goal of **increasing income opportunities for farms** and the following expected results:

- Improved access to agricultural inputs
- Improved access to credit (including leasing and inputs)
- Expanded sales
- Increased production
- Increased investment
- Adoption of productivity-enhancing technologies and techniques
- Implementation of quality standards and certifications

¹ The World Factbook, Central Intelligence Agency, <https://www.cia.gov/library/publications/the-world-factbook/geos/ti.html>

ACDI/VOCA was the prime contractor providing overall management, technical direction, grant management, logistics services, and reporting to USAID. IFDC worked with farmers and input suppliers to expand farmers' access to inputs and with key service providers and trade associations to enhance their effectiveness in supporting increased agricultural production and sales. MEDA's role was to deliver technical assistance in new product development to financial institutions drawing upon its experience in Khujand. E-NOETEC Consulting's role was to conduct environmental screening of project activities to ensure implementation of sound environmental practices. IFDC's subcontract ended in May 2014. MEDA was phased out in October 2010, and E-NOETEC's engagement ended in September 2012.

From inception through mid-2012, the project worked in western Khatlon, Sughd, and DRS to help farms transition into commercial production through three interrelated components: intensified agriculture productivity, improved access to financial services, and increased private sector capacity. Target value chains included beef, stone fruits, lemon, watermelon, early and late onion, and greenhouse and open-field tomato. Following the announcement of the USAID/Tajikistan Feed the Future (FtF) strategy in March 2012, the project realigned its activities to reflect the new priorities and objectives established under FtF: increased income and food production by household and small commercial farms for home consumption and improved nutrition and health outcomes. The geographic focus of the new strategy was on 12 districts in western Khatlon, a major agriculture producing region with the highest rates of undernutrition and the largest number of people living below the poverty line.

Project activities in western Khatlon concentrated on orchard (mainly stone fruit), early onion, and greenhouse tomato value chains. Khatlon, with large numbers of poorer and more food-insecure households, less-developed commercial linkages, but strong preconditions for agricultural growth, presented many new challenges but also an exciting opportunity to focus USAID resources where need was greatest and impact could be strongest.

As a result of this shift to western Khatlon in mid-2012 and a change of the Chief of Party in early 2013, several infrastructure investments were delayed. To capture the impact of these investments, as well as yield and sales of late orchard crops, the project requested a no-additional-cost extension through the end of 2014, which was denied. Instead USAID/Tajikistan conducted a post-project survey to collect these indicators. The current report contains updated indicators collected in this survey.

The following sections present the project's integrated and results-driven approach to the development of target value chains, which focused on increasing income-generating opportunities for Tajik farmers and rural households and supporting a more dynamic and competitive agriculture sector.

VALUE CHAIN OVERVIEW

MARKET ISSUES/OPPORTUNITIES, ACCESS TO SERVICES, ACCESS TO INPUTS

Tajikistan's strongest market opportunities include both domestic and international buyers. Russia is by far the largest market, with Kazakhstan a distant second; there is potential to access Europe if high quality standards can be met. Transportation plays a deciding role in any value chain strategy. Fresh produce serving high-end market windows can command a price that makes the use of refrigerated International Road Transport (TIR) shipping profitable. In addition, early onions utilize both low-cost rail shipping and target an early-market window to command a high price. Domestic production can be divided into two groups: off-season production targeting winter/spring markets delivers a premium price (tomatoes) and storage to serve post-harvest markets.

PRODUCTION/PRODUCTIVITY

Most farms and rural households are currently locked in low-investment, low-yield, and low-margin production models. This has a systemic impact on the competitiveness of the entire agriculture sector, limiting commercial incentives for exporters to pursue new markets, processors to invest in value-addition, dealers to stock quality inputs, and financial institutions to pursue agricultural lending. In order to meet the development objectives of the FtF program, all three elements (limited investment, low productivity, and weak market linkages) must be addressed to increase farm incomes. The project worked through support service providers creating a commercial incentive to respond to value chain demands that would sustain the continued transfer of technologies, trade promotion, and investment needed for firms to remain competitive.

To convey the appropriate market signals that would shift productivity models, the project used a mix of smart subsidies, technical assistance, and direct facilitation of marketing. This included voucher programs to cost-share agro-inputs to drive demand for certified inputs, and machinery grants to cost-share in-farm investments as a complement to commercial equipment loans; stakeholder meetings to bring together farms and buyers; and international supplier-supported demonstrations to convey best practices. Second, to sustain the services that help farms continue to benefit from intensive production models, the project supported strategic private sector actors. This included a mix of cost- and risk-sharing arrangements with exporters, processors, input dealers, equipment suppliers, and financial institutions to provide new products or services.

INPUTS INDUSTRY

Input industry development strategy focused on support for those crops identified as serving strong markets, both domestic and international. Input dealers supplying farms with inputs for these crops received support to increase their management capacity, including accounting and marketing systems. Marketing support included demonstration plots, voucher discounts, and assistance in assessing the risk of providing inputs on credit. Market information related to quality, timing, and variety was provided by the project to international and domestic input businesses. Demonstrations targeted certified inputs for crops supplying identified markets.

INFRASTRUCTURE AND END MARKETS

Infrastructure investment was supported in value chains with strong markets. This included investment in production and infrastructure facilities, both led by majority local partner investment. The project worked with the financial sector and the investors to provide debt financing of the investment where needed. Meetings between buyers and producers of targeted value chains were organized by the project prior to purchasing season to facilitate value chain linkages. The project also established sales points in Dushanbe and Bokhtar (Khatlon) for the project farmers to sell their produce.

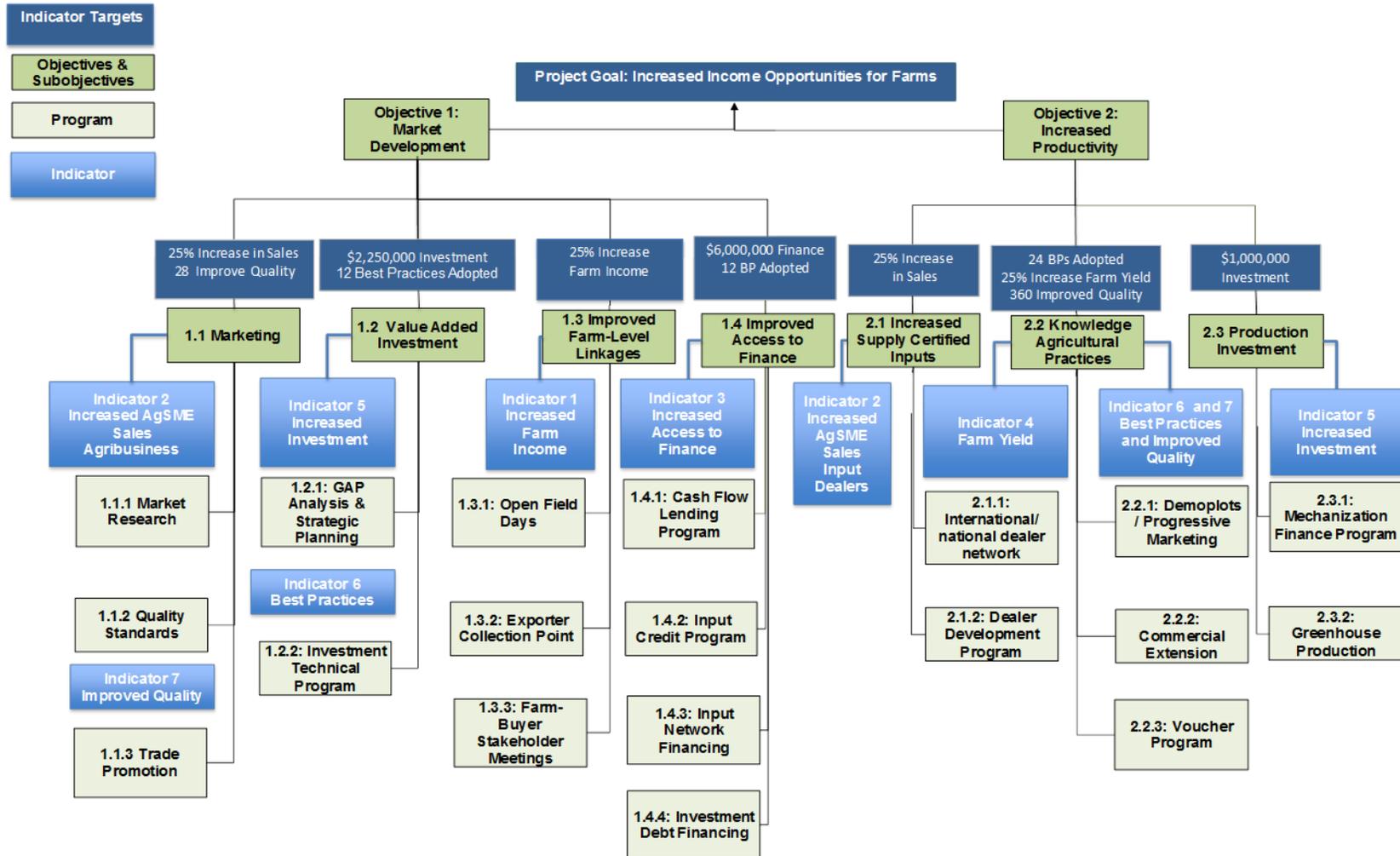
The project worked with financial institutions to increase and improve their lending to agriculture for inputs and production, as well as machinery. This included financing production of those crops needed for identified value

chains, using a holistic approach based on risk mitigation through use of cash-flow analysis and value chain relationships.

The following section illustrates the project's logical framework as adopted in 2012 based on the USAID/Tajikistan FtF Strategy.

LOGICAL FRAMEWORK

Figure 1. Project Goal: Increased Income Opportunities for Farms



PROJECT HIGHLIGHTS

PERFORMANCE AGAINST KEY INDICATORS

USAID’s Productive Agriculture Project has achieved its goal of **increased income opportunities for farmers**. The project’s beneficiary farmers generated almost \$3.6 million in incremental sales attributed to the project or 65 percent increase in their collective income level —well above the target 25 percent increase. This was done by identifying market opportunities and addressing gaps in the target value chains to increase farmers’ access to these markets.

Figure 2. Farm Incremental Sales, USD

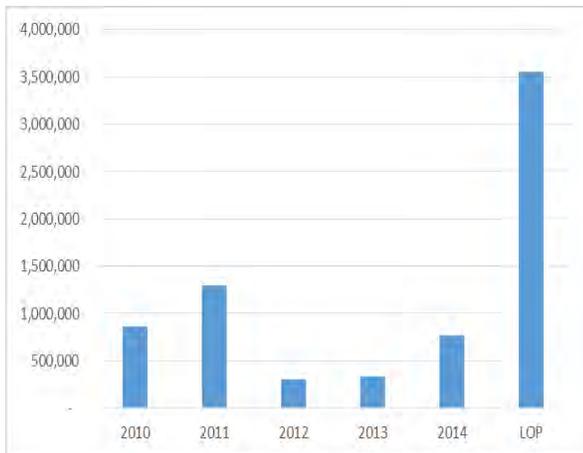
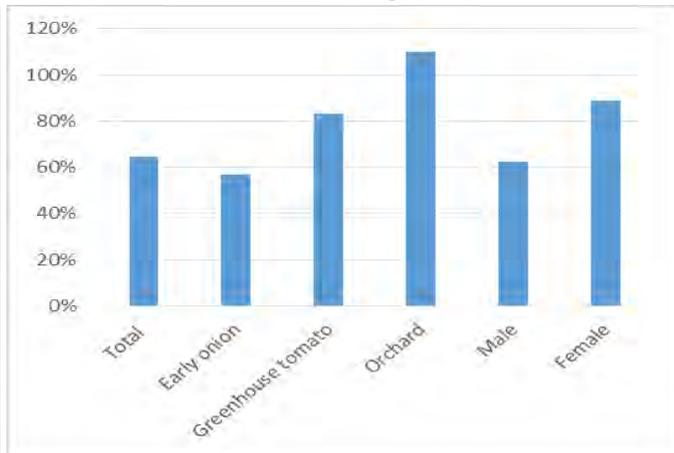
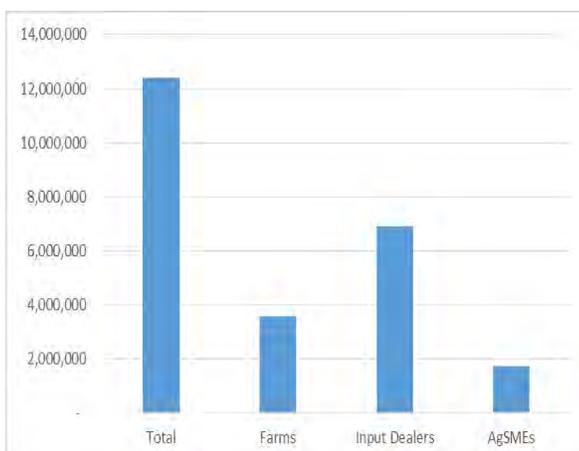


Figure 3. Percentage Change in Income Life of Project



The project facilitated \$1.2 million of private sector investment in critical upgrades in storage and processing, which were badly needed in Tajikistan, especially in less-developed Khatlon. As a result of project facilitation, 22 agriculture SMEs (processors, storage operators, and buyers) supported by the project reported increases in sales of over \$1.7 million.

Figure 4. Life of Project Incremental Sales, USD



The project worked on increasing farmers’ productivity in order to reduce production costs, increase margins for farms, and increase the availability of needed product to drive market expansion. The project’s 1,860 farmer beneficiaries reported increases in yield by an average of 33 percent and in gross margin by an average of \$1,935 per hectare. This came as a result of using certified inputs and improved farming practices. As indicated in an August 2014 survey, most farmers continued to use certified inputs and apply best agricultural practices even when these inputs were no longer subsidized by the project (Annex 1). The project’s farmers applied new farming technologies and management practices to over 2,000 hectares

of land. They invested over \$2.1 million in new machinery, other equipment, and facilities, which helped increase their productivity and, ultimately, incomes.

The project expanded the network of certified input dealers by creating demand for improved inputs. The input dealer network grew to 45 input dealers, including 23 dealers in Khatlon—at least one dealer in each of the 12 FtF districts. Prior to this, farmers in remote districts of Khatlon had to travel up to 150 km to major input markets, often to buy counterfeit and low-quality inputs. As a result of market growth, the dealer network reported a \$6.9 million increase in sales and \$1.1 million in investment in infrastructure.

The project facilitated \$6.1 million in loans from financial institutions by the value chain actors, to fuel investments into these value chains. The project supported the development of a sustainable private-sector-based and an NGO-based agricultural extension service, which continues providing these critical services to the farmers beyond the end of the project.

To achieve these results, the project used a variety of interventions, including open field days (OFDs), demonstrations, trainings, fairs, marketing materials, voucher programs, and other “smart” subsidies. It improved linkages among producers, input suppliers of all levels, buyers, extension service providers, and financial institutions, which lead to better-functioning and more-profitable value chains.

DETAILED ACTIVITIES

Goal: Increase Income Opportunities for Farms

To achieve this goal, the project started with identifying market opportunities and attempting to address gaps in the value chain with the first objective of **increasing access to these markets**. **Increased productivity** was the second objective and was essential, as work in this area reduces production costs, increases margins for farms, and increases the availability of needed product to drive market expansion.

OBJECTIVE 1: MARKET DEVELOPMENT

Market access is key to the growth of core value chains that target both domestic and export markets with the potential to engage households and small farms as suppliers. Tajikistan, and especially Khatlon Province, desperately need new markets. With insufficient storage and essentially no processing facilities, prices drop at harvest time as the limited domestic markets are overwhelmed by production surpluses, and then prices rise sharply during off-season periods. Farmers and other value chain actors often lack necessary timely information about markets to take advantage of higher income opportunities.

The project focused on four strategic areas of intervention to better position farms to take advantage of profitable market channels. Fundamentally, these interventions sought to shift the way in which firms collaborate to promote recognition of the shared mutual benefit of working for the good of the sector. This in turn has altered equations of risk and return, as actors recognized commercial interests that previously were unseen, due to the highly fragmented nature of agricultural value chains. The facilitative work of the project is expected to continue to multiply benefits as market access broadens income opportunities for greater numbers of commercial farms, as well as small farms and rural households.

The following were the four major strategic elements of the project’s market development approach:

1. Investigating market opportunities to determine gaps and necessary upgrades in the links from market to farm
2. Facilitating investment in storage and processing infrastructure as points of aggregation, and increasing marketing efficiencies needed to take advantage of competitive market windows
3. Improving linkages between buyers (processors, wholesalers, and exporters) and commercial farms that were making productivity investments to serve as reliable suppliers
4. Promoting financial linkages to supply needed liquidity for both working capital needs and investments at the farm and trade/processing level.

The project’s market development approach was based on the SWOT analysis as presented in Table 1 below.

Table 1. SWOT Analysis of Market Access

Strengths	Weaknesses
<ul style="list-style-type: none"> - Sales to Russian market is organized by Tajiks, providing an established market presence - Companies recognize mutual interest to improve quality (Export Association) - Companies positioned and interested in production and quality investments 	<ul style="list-style-type: none"> - Low supply volumes due to poor productivity - Dated infrastructure/insufficient processing - No established quality standards or uniformity - Land-locked/distance from buyers - Weak transport infrastructure - Lack of finance that supports investment needs
Opportunities	Threats
<ul style="list-style-type: none"> - Wide market demand for competitive products with premiums on both quality and quantity - Seasonal advantage to sales associated with 	<ul style="list-style-type: none"> - Imports and exports can be unexpectedly cut off due to politics, and require market diversification - Customs and tax laws make equipment imports and

early growing season	leasing difficult and expensive - Tax laws not uniform, do not encourage transparency - Government direct production - Limitation to expanding production areas - Electricity outages impact access to water for refrigeration and production for some land
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Marketing needs were defined by the particular value chain and market opportunity, as shown in Table 2 below. Common strategic themes, however, were the need for more-efficient, and recurrent, transactions between parties; increased storage and processing capacity; improved quality; and increased volumes. The project has been successful at addressing all these needs.

Table 2. Market Opportunity and Needs

	Value Chain	Market Opportunity	Marketing Needs
Export Market	Export early onion	Market window in Russia (timing and efficiency)	Low-cost rail shipping organized through key aggregation points
	Export processed apricots	Supply as input to processors. Demand is not meeting supply.	Efficient processing of quality product
	Export dried apricots	Tajikistan wholesalers with existing marketing channels (dried fruit & nuts mixes)	Linkages between producers and exporters
	Export fresh apricots, grapes, lemons, and cherries	Niche first-to-market windows in Russia	Investment in cold storage to maintain quality from field to market
Domestic Market	Domestic off-season production of tomatoes	Import substitution (Uzbekistan)	Investment in hothouses/greenhouses to increase production. Market linkages between new producer groups and buyers. Improved quality
	Domestic apples, grapes, pomegranates, lemons	Store and sell at off-season price premium	Improved storage infrastructure
	Domestic onions	Store and sell at off-season price premium	Improved storage infrastructure
	Domestic beef	High-end stores in Dushanbe	Improved quality, linkages between producers and butchers

1.1 MARKETING

1.1.1 MARKET RESEARCH

Tajikistan products tend to occupy lower-quality segments of the market, both domestically and in the export market. As a result, they command lower prices. The project invested in significant market research for all target value chains to help firms understand market requirements, gaps, and bottlenecks. Annex 2 presents market research conducted by the project and conclusions reached.

1.1.2 QUALITY STANDARDS

Market research included quality standards for products produced by partners for existing markets and the markets into which they wished to expand. The results of the research were shared with the partners to inform them about

quality upgrades to be made. The project worked with AgSME partners and farmers who wanted to improve their quality standards to access new markets or comply with the increased quality standards of the current markets.

As a result of project work on introducing best practices in grading, sorting, processing, packaging, branding, quality standards, and certification, 79 value chain actors including 28 AgSMEs, 45 input dealers, 3 associations and 3 water user associations improved technologies or management practices, which in turn improved the quality of their products and services (FtF indicator 4.5.2-42). The following quality improvements have been made in each target commodity:

Beef:	Linking high-quality beef from butchers to producers
Apricots (fresh, dried, and processed):	Focused production/post-harvest handling training program
Apricots (processed):	HACCP and Kaizen training
Lemon:	Sorting
Watermelon:	Input use, safe food, and quality control program
Tomato (processed open field):	Input use, safe food, and quality control program
Onion (early, late):	Seed variety, sorting

Beef. The project identified a strong market in Dushanbe willing to pay premium prices for high-end cuts of beef. The project worked with 20 butchers and farmers in DRS on herd management and feeding, as well as meat cutting demonstrations to improve the quality of beef to access the expat market in Dushanbe. Trainings covered sanitation, food safety, tools, and proper equipment. The project carried out two marketing events reaching out to the foreign community, which demonstrated to the butchers the available untapped market. Several months following the marketing events, a chain of high-end butcher stores were opened. The butchers reported 94 percent sales increases as a result of project interventions. The project also established a feed supplement demonstration, which showed significant weight gain possible with minimal cost. Improved feed with a mineral and vitamin supplement outperformed traditional feeding methods by 52.8 percent and outperformed improved feed without minerals and vitamins by 24.5 percent.



Dried apricot for export. Processors and exporters of dried apricots (mainly to Russia) saw increased profit opportunities from improving the quality of their products. Interviews with exporters² established two priorities for exported dried apricots: 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 related to Russia’s temporary closing of their market to dried fruits and nuts from Tajikistan) and diversifying into new export markets. In recognition of these priorities, the project dedicated its attention to improving quality supply and supporting an industry initiative to improve Tajikistan’s market recognition and branding.

To address the quality supply issue, the project 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, through local partners, provided 31 trainings and demonstrations on apricot orchard management, tree pruning, pest management and use of complex fertilizers reaching 1,489 participants including 1,377 farmers. OFDs highlighting potential improvements technologies could provide were organized, with

² Including the two largest, Natur Foods and AB, both headquartered in Moscow.

attendance by farmers, input dealers, and buyers. The results of the demonstration plots indicated potential yields up to 20 tons per hectare, with noticeable reduction in pests and mold blemishes. Because low quality is the primary obstacle to industry growth, the project addressed this issue through the voucher program.

The project's post-harvest handling (PHH) demonstration and voucher programs targeted important gaps in apricot value chains that result in reduced yields and quality and limit farm profitability. Using a training-of-trainer methodology, the project, with the assistance of a local service provider, trained local NGO partners, who then provided training in best PHH practices to 160 interested value chain actors including 109 apricot producers. 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 that will help ensure sustained access to this technology in the future.

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 stopped 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 and controls, and to market and lobby for its product. To achieve this goal, the project supported the creation of the International Association of Producers and Exporters of Agriproducts of Tajikistan³ (**IAPEAT**). The association, which includes all major apricot industry processors and exporters, aims to establish a "branded" quality standard and lobby for improvements business environment to support long-term sector growth. More detail on the Association is provided in Section 1.1.3 Trade Promotion.

In Year 5 the project had planned to procure moisture-testing equipment for the Association of Agribusinesses of Tajikistan (AAT) so it could provide moisture-testing services to its members engaged in dry apricots and other dried fruit value chains. Unfortunately, this did not happen due to funding limitations. Currently no processors in Khatlon have adequate moisture-testing equipment, and there is growing demand for such equipment from farmers and AgSMEs engaged in dry apricots and other dried fruit value chains.

Processed apricot. The work with the processed apricot value chain overlapped 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. The project conducted awareness training on HACCP and management quality standards to Obi Zulol, a water and juice bottler. After attending this training, the firm hired HACCP consultants from Kazakhstan.

Processed open field tomato. 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 illustrated by the following example:



Badr is a firm located in Isfara region that is involved in processing tomatoes and apricots. The project worked with this firm because they have the potential to create a strong value chain, increase sales in exported tomato products,

³ The name in Russian "Международная Ассоциация Производителей и Экспортеров Агропродукции Таджикистана" (МАПЭАТ), often referred to as Association of Exporters of Tajikistan (AET)

and create a mutually profitable relationship with tomato farms. Badr participated in trainings on both Kaizen and HACCP, expressing a high level of interest in introducing both systems at their enterprise. They have also begun to apply this knowledge to redesign their factory located in Isfara around a new aseptic packaging line. Applying Kaizen best practices, the old technological line was sold for TJS 50,000, 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; reduced time of unit product production; increased production capacity by 2 percent; and reduced labor costs by \$1,000 a season. Badr also 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 worked 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 introductory training in HACCP. They engaged HACCP consultants and worked toward full certification. The project also assisted Kulkand in establishing improved packaging using twist-off glass jars. The main incentive of the company in purchasing such equipment was to use small 200–500 ml twist-off jars instead of 1–2 liter jars. This was to help them increase their profit as consumers prefer more attractive and suitable packaging in a smaller volume. The project linked this business with a new glass jar manufacturer located in Sughd, thereby also supporting local production of twist-off glass jars.

The project worked with LLS Safovat, a Dushanbe processor with a bottling operation that was interested in adding tomato processing to their facility. The processor saw an opportunity to sell a quality product both in Tajikistan as well as for export to Russia. The project helped Safovat purchase a tomato-processing line in Dushanbe and source raw materials from the regions around Dushanbe.

Early onions. The project learned from the buyers supplying the Russian market that 99 percent of Khatlon farms planted local “May,” “Express,” or “Elita” varieties of early onions. These varieties were traditionally grown in the province, as they were 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 that the farmers plant “Aldava” variety because of the high demand in Russia and because it can be harvested a month earlier, increasing their value for the export market. There was no reliable source of “Aldava” in Khatlon and the project linked the farmers with a local input dealer to supply “Aldava” seeds. The project also demonstrated to the farmers appropriate onion sorting technology.

Lemons. Investigation into the lemon market revealed 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 that Tajikistan lemons can compete regionally. The project identified a buyer from Almaty, Kazakhstan, who was 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, which 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 helped the 60 farmers to organize themselves into an association, which was registered in March, with the goal of organizing group sales and storage.

1.1.3 TRADE PROMOTION

The project worked on identifying diversified domestic and export market opportunities for target commodities and helping the value chain actors formulate appropriate market entry and penetration strategies. Russia is Tajikistan’s major trading partner for agriculture exports. At the same time, Russia occasionally disrupts trade due to issues unrelated to trade. In this environment, the risk of investment to serve the Russian market is high. Stable growth requires Tajikistan to explore diversification of markets to identify new buyers for their products. Diversified markets reduce risk, supporting the increased investment necessary to create demand capable of reaching small farm and rural household produce. The project’s work on trade promotion included the following activities:

- Conducting regular **market research** and surveys as discussed in Section 1.1.1 Market Research
- Collecting, storing, analyzing, and **disseminating market information** to the value chain actors. This information was disseminated through print media and orally at stakeholder meetings and conferences. The project developed and distributed a directory of fruit and vegetable buyers serving the Russian market. This document provided to exporters useful contact information to market their produce.
- **Organizing trips** by project staff and value chain actors to explore international and regional trade opportunities including the World Food Exposition-2012 in Moscow. This event helped identify sources and pricing of processing equipment, as well as information on buyers, market demand, and competition in the Russian market.

The project organized **buyer/seller meetings, trade fairs, and exhibitions** as discussed in Section 1.3 Improved Farm-level Linkages. In 2010 the project presented at the Northern Supply Network **conference** on opportunities for selling agricultural products from Tajikistan to defense contractors in Afghanistan and reached out to defense contractors.

In Year 1 the project organized a **roundtable discussion** in Dushanbe in partnership with the National Association of Small and Medium Enterprises of Tajikistan (NASMB) and Hilfswerk Austria. This roundtable brought together agriculture processors from Khatlon, DRS, and Sughd to discuss the challenges faced by the agroprocessing sector. The roundtable confirmed the findings of the market study that processors suffer from inconsistent supply of raw material, low quality packaging, difficulty accessing markets, and high finance costs. The discussion also confirmed the finding that for processors in general these issues vary in importance. Through this work the project established contacts for further work with processors in Sughd, western Khatlon, and DRS.

The project worked to link value chain actors in a sustainable way where they see mutual benefits of their relationships. Below are a few examples of the project's **market facilitation work**.

In 2010 the project assessed **tomato and apricot canning factories** and identified five tomato processor partners: LLC Badr (Isfara), LLC Kulkand (Isfara), LLC Elita Istaravshan (Istaravshan), CJSC Obi Zulol (Istaravshan), and OJSC Parviz (Khujand), all of which lacked and desired long-term links with farms. The majority of processing companies suffered varying degrees of difficulty with raw material supply and quality, price fluctuation, and timely delivery. Farms around the factories were identified for developing linkages. Most farms sold product via intermediaries and supported the development of direct relationships with buyers to increase their income. The project organized farmer/processor round tables and helped the factories with outreach to the farmers to develop long-term linkages. It also assisted the firms with making contact with government agencies and aggregators involved in fresh apricot and tomato supply.

In 2010 the project worked with over 50 **tomato greenhouses** in Sughd, Khatlon, and DRS and with major tomato wholesalers to strengthen the supply chain for off-season fresh tomatoes. The supply chain suffered from inferior greenhouse production technology, marketing, and promotion, as well as lack of pricing strategy. The project provided training in marketing and greenhouse tomato production and linked the farmers to tomato wholesalers.

The project identified **apricot kernels** as a profitable value chain for domestic and export markets and assisted cooperative Negmati Meva in Konibodom, Sughd Province, in developing a kernel-processing project.

The project worked with exporters of **fresh apricots** 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 an early market window. The ability of farms and agribusinesses 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. The project supported the OJSC Apricot and Company owned by a lead exporter and a group of supplying farmers to increase their exports of fresh apricots to Russia by providing management consulting, help with accessing a bank loan, and a matching grant for the construction of a new cold storage. More detail about this investment is provided in Section 1.2 Increasing Value Added Investments.

The analysis of the **lemon** value chain indicated lack of storage, farms' resistance to contracts, poor packaging materials, quality control, and small volumes as major constraints to accessing the lucrative Kazakh market. The project linked lemon growers in Khatlon with a major buyer from Kazakhstan interested in buying 60 tons of lemons and with four middlemen in Qumsangir, Khatlon Province. The project worked with the lemon growers through demonstrations, training, a voucher program, and investment grants to build their capacity to access this market.

In Year 1 the project worked on improving butcher access to premium **beef** markets in Dushanbe, which were paying premium prices for higher quality beef. The project trained 20 butchers and farmers on improved sanitation, grading, and packing of beef, which resulted in higher quality meat and increased income from the sales to mainly expatriate clients.

The project supported the development of **trade associations** to enable various sectors to regulate themselves and respond to the dynamics of domestic and international markets. In 2011 the project helped establish **IAPEAT**, the first-of-its-kind industry export association. IAPEAT was established on the initiative of 12 major firms processing and exporting fresh and processed fruits and vegetables, nuts, and spices and is based in the town of Isfara, Sughd Province. The mission of the association is to “improve the business environment for the industry within Tajikistan, to improve the quality and production of food products in Tajikistan, and to improve the reputation and marketing of Tajikistan’s food products around the globe in order to assure a strong future for the industry.”



Meat Expert Ryan Murphy trains butchers in making T-bone steaks for the market in Dushanbe

The project assisted the group with strategic planning, creating a governance structure, and providing a road map for the registration process. As a result, the association was officially registered and a director hired, funded by member dues. The project attracted the support of Hilfswerk Austria to establish a brand symbol, print brochures, and establish a website, www.foodexport.tj. The members of the association participated in the agricultural fairs and stakeholder meetings organized by the project in order to link them to producers and other value chain actors, including those in Khatlon. The project contributed limited funds to cover the association’s operating expenses in its first and second year. Today the association has four staff members, 13 members (including six exporters and seven processors), and two sales points, and it covers its own expenses through membership fees.

Together with IAPEAT the project carried out a market research, which identified gaps between apricot varieties that are in high demand by export markets and those currently grown in Tajikistan. Based on the results of this research, the project worked with IAPEAT to support the development of an industry-led nursery focused on varieties of apricots with high export potential.

In 2014 the project awarded a contract, on a competitive basis, to the **Association of Agribusinesses of Tajikistan (AAT)** to provide marketing services to project farmers. AAT is an association of input dealers, processors, farmer

associations, and dehkan farms of Sughd, Khatlon, and DRS Provinces and the city of Dushanbe, with headquarters in Khujand, Sughd. It protects the rights and interests of its members and promotes linkages between agribusinesses. AAT has been the project's partner since 2010. It supported the project by organizing fairs, conducting market studies, and carrying out monitoring and surveys of the voucher program beneficiaries. By the end of the project AAT achieved the following results⁴:

- On a weekly basis, distributed via SMS to 280 project beneficiaries targeted commodity prices in the wholesale markets in Qurgonteppa (Khatlon), Dushanbe, Hisor (DRS), and Khujand (Sughd). This service helped Khatlon farmers to monitor the trends in prices for agricultural products and to sell their products at best prices. As a result, this year not a single farmer complained about not being able to sell onions. When the buyers came, the farmers knew the wholesale market prices and did not keep the “ceiling” price.
- Promoted products of project farmers to potential buyers in Dushanbe, Hisor, and Sughd markets.
- Provided trainings on marketing, market planning, contract negotiation, quality standards, PHH, sorting, grading, packaging, customs, and transportation to domestic and international markets. Farmers are very eager to attend these trainings. This information influenced the farmers' choices of onion varieties to grow, so that they are more suitable for export.
- Provided free individual consultations on the same subjects.
- Developed a website, <http://agrobusiness.tj>, to promote its members and attract domestic and international buyers. The website provides information on member products, production volumes, and standards (quality, size, packaging, and hygiene).⁵
- Developed a database of buyers and sellers. Upon receiving crop data from a seller, informed potential buyers about crop condition and availability for sale. Terms of the sale were negotiated by farmers and buyers with assistance of AAT.

AAT is committed to providing these services to the farmers and identifying market opportunities for them. A survey carried out by AAT in 2014 indicated that farmers are willing to pay for help selling their produce and for SMS on market prices. Even in 2014 the farmers were paying a full or partial price for these services with cash or crops.

1.2 INCREASING VALUE ADDED INVESTMENT

Market research described in Section 1.1 Marketing included identification of obstacles to growth and analysis and recommendations to overcome obstacles and enable growth. Market research conducted by the project identified lack of storage and processing— especially in Khatlon—as a significant impediment to growth of the target value chains. With insufficient storage and essentially no processing facilities, prices drop at harvest time as the limited domestic markets are overwhelmed by production surpluses, and then prices rise sharply during off season periods. The project identified groups interested in investing in these critical infrastructure upgrades to access offseason markets that offer higher prices, and lessen price fluctuations as demand expands through diversification. The project engaged farms



Cold storage in Qurgonteppa supported by the project

⁴ These results are related to marketing only. AAT's work related to stakeholder meetings and points of sale is featured in Section 1.3 Improved Farm Linkages, and distribution of production information is in Section 2.2.2 Commercial Extension.

⁵ Several pages are under construction.

as investors in the infrastructure projects, so that they could vertically integrate further in the value chain and earn an increased share of the profit by sharing in the risk of investment.

If there was an identified need for such investments, the project would evaluate those needs and co-invest with agribusinesses through the grant program at a level of 30–40 percent and up to \$250,000 for projects with dehqan farm investment in targeted value chains. The project had a two-step review process. First, investors had to submit their concept with basic information regarding markets, investment participants, facility details, and raw material sourcing. Those applicants approved received consulting support in legal registration of the investment group (utilizing land reform legal aid centers); business and market plan development through in-kind services using a local service provider⁶; access to finance support through project staff; and construction consulting through in-kind services. Construction work initially used international engineering consultants and transitioned to use of local consultants who were trained by the project staff in environmental compliance. At the end of the consulting support, the investment proposal would go through final review for approval.

The project organized study tours for representatives from the investor groups in Khatlon to visit processing and storage facilities in Sughd. This was essential for the sustainability of these groups, as their investments were new for them and for the industry in Khatlon. These entrepreneurs had to have a vision for growth, and without seeing functioning systems and the potential for growth, their ability to establish a sustainable business would be compromised. These study tours were vital to the project strategy of catalyzing industry growth in a geographic area in which such industry was absent.



Cold storage in Asht district of Sughd region

The project's interventions led to over \$4.7 million of new private sector investment in the agriculture sector (FtF Outcome Indicator 4.5.2-38). This includes at least⁷ \$2.1 million invested by farms, \$1.1 million by input dealers and \$1.2 million by AgSMEs (processors, storage operators and buyers). Over 53 percent of the total investments were made in Khatlon. Additionally, the project facilitated \$6.1 million in loans from financial institutions, which were used to invest in the agriculture sector (FtF Outcome Indicator 4.5.2-29). This includes \$1.9 million in loans taken by farmers, \$2.7 million by input dealers, and \$1.5 million by AgSMEs. More than 41 percent of all loans by value was borrowed by project partners in Khatlon. More detail on agricultural loans is provided in Section 1.4 Improved Access to Finance.

According to the project's monitoring reports, almost 41 percent of **farmers** invested in their farms; of these, 63.4 percent invested in tractors and other farm machinery. Investment by farmers in post-harvest and marketing infrastructure and equipment amounted to 22.4 percent. Analysis of farms' investments across the regions indicates that 76 percent of farmers in DRS, 66.8 percent of farmers in Sughd, and 21.8 percent of farmers in Khatlon made investments in their farms. Furthermore, farmers in DRS mainly invested in post-harvest handling or marketing facilities and equipment (58.7 percent) and greenhouses (28.3 percent). Farmers in Sughd Province invested 48.5

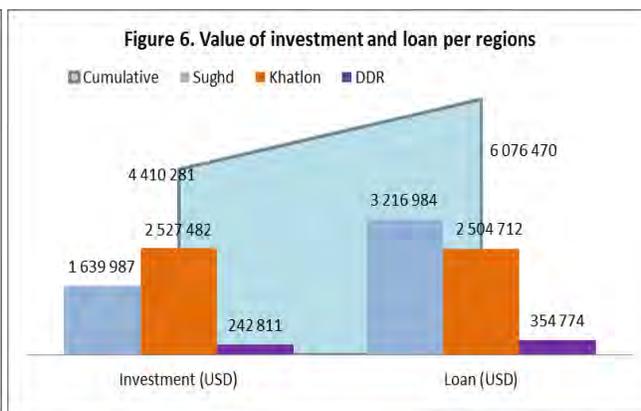
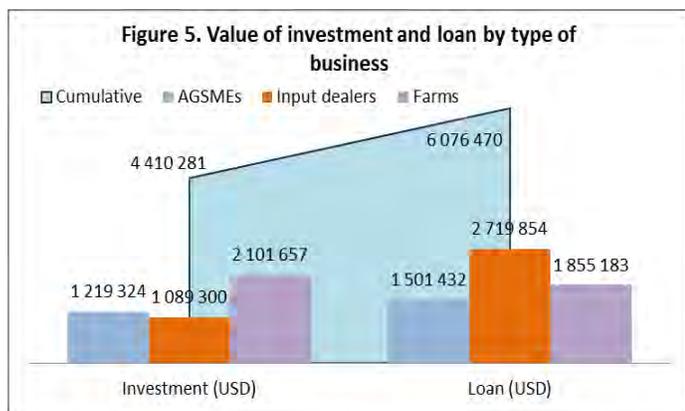
⁶ NGO Fidokor was used for training and coaching of investment partners in Khatlon.

⁷ No breakdown of total investment between AgSMEs, farmers, and input dealers is available for Year 1. This is the reason for \$331,153 difference between the sum of these three groups (\$4,410,281) and total life-of-project investment of \$4,741,434. For the same reason Figures 5 and 6 do not include investments made in 2009-2010 (\$331,153).

percent PHH or marketing facilities and equipment; and 22.6 percent in tractors or other farm vehicles. Meanwhile, 89.2 percent of farmers from Khatlon Province made investments in tractors or other farm vehicles.

The project's 45 **input dealers** mainly invested in renovating or constructing storage facilities (22 percent of total investments by this group) or agroshops (44 percent of investment) and to purchase a vehicle/transport equipment (34 percent). The value of investments by input dealers in Khatlon (\$877,209) represents 81 percent of total investments (\$1,089,300) by input dealers in the project's areas of operation. To catalyze these investments, the project introduced a small grant product (under \$5,000 each) for upgrading input dealers' stores. Grant funds were used for cosmetic repairs, procuring building signs, purchasing shelves to display products, and purchasing scales and other equipment.

The project's 22 partner **AgSMEs** invested over \$1.2 million in their businesses. Nineteen of these AgSMEs invested in renovating or constructing a warehouse. Investments in warehouses represent 43 percent of the total investments by this group by value. Fourteen AgSMEs invested in equipment or other infrastructure. These investments represent 57 percent of the total investments by value. The largest share (54 percent) of the total investment falls on Sughd Province with investments in Khatlon representing 35 percent of the total. This is understandable given that 15 out of the total 22 AgSMEs (68 percent of total) were in Sughd and only three AgSMEs⁸ (15 percent of total) were in Khatlon.



Below is the description of major investments facilitated by the project.

In **Khatlon** the project catalyzed investments in the following critical upgrades:

- Six cold storages for fruits and vegetables in Bokhtar, Vakhsh and Jilikul districts and the city of Qurgonteppa with storage capacity of 60-900 MT each. Total project contribution is \$191,344. Total value of investments is about \$722,000.
- Two fruit and vegetable processing facilities in Bokhtar and Shahrtuz districts with processing capacity of 1,200 MT per year each. Total project contribution is \$94,908 and total investment is about \$360,000.
- Two mobile refrigerated units (MRU) for precooling fruits and vegetables in Qumsangir and Bokhtar districts. Total project contribution \$27,158.

⁸ The project facilitated investments in eight AgSMEs in Khatlon, however only three were captured in this survey.

The project launched a pilot grant program for MRU for precooling perishable fruits and vegetables in the field at harvest. Precooling fruits and vegetables at harvest extends their shelf life. These MRUs can be also used as collection points to aggregate produce for buyers. Right now it takes buyers several days to collect 20 tons of produce from a large number of small farms. The MRUs are intended to be used by small and medium-sized farms, which make up a significant portion of the farming pool in Khatlon. They can be more easily built



Mobile refrigerated unit in Qumsangir district of Khatlon

from locally available materials and financed by smaller groups of farmers using their own resources and loans from financial institutions. If proven successful, this idea can be easily replicated by a large number of farmers. The project paid a local manufacturer—selected on a competitive basis—to construct two 20-MT MRUs for about \$14,000 each. The MRUs were built out of used 20-ft shipping containers. The MRUs were granted—also on a competitive basis—to two farmers in Qumsangir and Bokhtar districts. These farmers agreed to use the MRUs in demonstrations to producers, exporters, agrodealers, and other value chain actors of best practice technology for storing and precooling perishable fruits and vegetables at harvest. The MRUs were demonstrated at two OFDs in 2014 at which the project explained the purpose and price of these MRUs and introduced the manufacturer. The manufacturer received two more orders for these MRUs at the OFDs. The project’s contribution was 80 percent (\$11,200) of the cost of the MRU and the farmer’s contribution was 20 percent (\$2,800).

In **Sughd** Province the project supported investments in:

- Three cold storage facilities: Forex Plus (Isfara), JSC Apricot and Company (Asht), and Water Users Association (Zafarobod). The total project contribution was \$46,794, the total value of investment was over \$156,000.
- One tomato and apricot processing facility: LLC Badr & Co in Isfara for facility upgrades to receive HACCP certification. The total project contribution was \$29,253, the total value of investment was about \$131,000.

In 2010 the project helped establish OJSC Apricot and Company in Asht district of Sughd Province, which is owned by a lead exporter and nine supplying farmers. The company’s registration was facilitated by the USAID Land Reform Project through their office in Khujand and the legal aid center in Asht. The project provided management consulting and helped farmer investors access bank loans to buy their shares in the company and to build a cold storage/pack house for over 200 MT to stock fresh apricots for export to Russia. The project helped the bank evaluate the project’s viability and risk, which helped with the loan approval. To finance the storage the project provided a grant of \$30,688 and the investors contributed \$69,521 including \$55,000 borrowed from a financial institution. Farm investors not only benefited from a secured market to sell their production but also from future dividend payments from sales of fresh apricots. Improved project-facilitated market linkages allowed farmers to sell a larger portion of their total production. In 2011 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 TJS 3/kg in 2011 vs TJS 2.2/kg in 2010) resulted in a 105 percent 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.

In **DRS** the project supported investments in a tomato processing line by LLC Safovat, fruit and vegetable processing facility which has a bottling operation. The total project contribution was \$28,952, and the total value of investment was about \$110,000 including a loan from a financial institution of about \$14,000.

1.3 IMPROVED FARM-LEVEL LINKAGES

Value chains in Tajikistan are crippled. Traders and farmers look at each sale as a onetime event between strangers, creating an incentive for dishonesty that handicaps the industry. Market demand is not communicated down to producers, and buyers must support quality verification systems that absorb profits. In this environment, the agribusinesses serving markets are unable to effectively communicate their quality needs, and farms are ignorant of what the market wants or what they could earn by meeting market needs. As the size of their production operation decrease, producers become more isolated and are more likely to become price takers. The project addressed the gap between buyers and farms by organizing OFDs related to demonstration plots as well as farm-buyer stakeholder meetings, and by working on creating a sales point for farmers.

OFDs are necessary to demonstrate the results of new productive technologies to and establish linkages between the farmers and other value chain actors. The project conducted 38 OFDs, which were organized in partnership with international suppliers of certified seed and pesticides. More information on demo plots is provided under Section 2.2.1 Demonstration Plots/Progressive Marketing. The OFDs brought together farms, buyers, input suppliers, financial institutions, government officials, local service providers, donors, machinery dealers, and—through the USAID Family Farming Program (FFP) and other donor projects—small farms and households. They viewed demonstration results, heard feedback from buyers on product quality and quantity, and met with input suppliers of inputs and other stakeholders. This gave farms the information they need to make informed choices about production. The events also provided critical value chain actors like input suppliers and financial institutions an opportunity to market their products.



Stakeholder Meeting in Vakhsh district of Khatlon in 2014



Khatlon farmers signing contracts with fruit and vegetable processor CJSC Obi Zulol from Khujand (2014)

The project organized **stakeholder meetings** between buyers (processors, exporters, wholesalers) and sellers to link farms with domestic and international markets. These meetings were similar to OFDs in the sense that they brought together various value chain actors (inputs, credit, buyers, service providers, etc.) as well as government officials and donors. Current conditions in Tajikistan are such that there are traders operating in every district, but these traders may not be involved with the specific value chain targeted in the district by the project. These meetings were needed to establish relationships between the farms and the buyers in these areas. They were also important for engaging the stakeholders, soliciting their input, and educating potential partners on opportunities for project collaboration. While OFDs took place at harvest time, the stakeholder meetings took place in advance of harvest. The meetings created a forum for farms and buyers to negotiate sales of the coming harvest and have agreements in place ahead of time to take advantage of premium prices during the seasonal window. This helped create long-term commercial relationships that will allow Tajikistan farms to expand sales.



Project facilitated export of early onions (2014)

In 2014 AAT was awarded a contract for organizing monthly stakeholder meetings and providing marketing services to the project farmers. AAT brought to these meetings exporters from Sughd and buyers from Dushanbe's wholesale Dehkonbozor market. Prior to harvest, the buyers informed the farmers about their standards for early onions, and their pricing and contracting mechanisms. AAT developed a contract template stipulating rights and responsibilities of both parties. These meetings resulted in 15 formal forward sale contracts valued at TJS 563,000 (over \$112,000) for 368 tons of early onions.

One of the biggest success factors is that the project linked AAT with the partner NGOs and agoshops in Khatlon. The NGO and agoshop agronomists informed AAT about varieties and volume of early onions grown by project farmers, as well as harvest times and field prices in their respective districts. Collectively they put a lot of effort in visiting each field and making yield projections, which helped with attracting buyers.

In addition to organizing the stakeholder meetings, the project sponsored participation of its voucher program participants in the regional agofairs where they displayed their produce grown using the seeds and inputs acquired through the project's voucher program. These meetings and fairs resulted in a number of sales transactions.



Sales point in Bokhtar district of Khatlon

In the second quarter of 2014, through AAT, the project opened two **points of sale** for project farmers in the wholesale markets Dehqonbozor in Dushanbe and Zargar market in Bokhtar district of Khatlon.⁹ More than 5 MT of

⁹ Located about 12.7 km southwest of Qurgonteppa.

fresh produce—mainly tomatoes, plums, onions, apples, and melons—were sold through these sales points as of mid-July 2014. Prior to this, the farmers could not access these markets due to cut-throat competition for market space with local vendors. According to a survey conducted by AAT in 2014, farmers' biggest complaint was about not being able to sell their produce at profitable prices. AAT's sales points now allow farmers to sell directly to buyers, which helps raise their profit. These sales points also provide an effective venue to advertise high-quality products to wholesale buyers. As a result of these efforts, in 2014 no project farmers complained about not being able to sell their onions.

1.4 IMPROVED ACCESS TO FINANCE

Financial markets in Tajikistan are supply driven. Credit resources cannot meet demand, resulting in high interest rates. As farm profits are affected by highly volatile variables of weather and markets, the high interest rates depress demand. On the supply side, financial institutions cannot meet market demand for credit in the lower risk trade sector, so opportunity costs for entering the sector are high. Financial institutions attempt to address this risk through high collateral requirements, but the assets of most agriculture enterprises are limited due to their remote locations and the poor condition of buildings. Expanding credit into agriculture, where financial institutions are less knowledgeable and risk is higher, requires three elements of risk mitigation: staff and systems capacity to analyze loan repayment capacity; development of new loan products that meet the unique needs associated with agriculture; and additional strategies to reduce risk, such as partnering with value chain actors who can assist in the identification of creditworthy clients.

The project's activities catalyzed investment at multiple levels throughout the target value chains. The project's facilitation increased sustainable access to financial services for agribusinesses to purchase assets, farmers to purchase inputs and assets, and input dealers to increase stocks. As stated in Section 1.2, the project's interventions led to over \$4.7 million of new private sector investment in the agriculture sector. This investment was leveraged by \$6.1 million in loans (FtF Outcome Indicator 4.5.2-29), which were facilitated by the project. This amount includes \$1.9 million worth of loans taken by farmers, \$2.7 million by input dealers, and \$1.5 million by AgSMEs.

These achievements were made in an environment in which financial institutions do not typically finance agriculture, and in particular asset investments. In addition to helping AgSMEs, input dealers, and farms access credit for investments in their businesses, the project piloted a tractor loan product, enabling farms to use credit to purchase much-needed tractors. More detail on the tractor loan program is provided in Section 2.3 Production Investment.

Realizing that recordkeeping and basic knowledge of accounting are critical (but often absent) for good business management and access to credit, the project offered free training in accounting and recordkeeping to its partner input dealers and farmers participating in voucher and grant programs. The project used a variety of interventions to increase access to finance for its partners. Some of these interventions are listed below.

1.4.1 CASH-FLOW LENDING PROGRAM

In its first year, the project analyzed profit margins for the target commodities and concluded that many of these commodities (especially apricot and lemon) had high margins well above interest rates charged by financial institutions, which would justify the use of credit. Tomato, onion, and watermelon showed margins about 10 percent above prevailing interest rates, but use of credit for these crops was high-risk because of weather and market volatility. Borrowing for beef production at prevailing market rates would not be profitable for most producers. Many farmers grow multiple crops with various profit margins and risk profiles. Many have non-farm sources of income. Analyzing their repayment capacity under these circumstances is a challenge for loan officers, especially if they have limited experience in lending to agriculture. To overcome this challenge, the project worked with the following nine financial

institutions¹⁰ on expanding their lending to agriculture through better understanding of farm cash flows using ACDI/VOCA's Profit Planner cash-flow tool (Profit Planner)¹¹:

1. Imon International
2. FINCA Tajikistan
3. MLF Kiropol
4. MLF Vakhsh Microfin
5. Furuz
6. MLO Mehnatobod
7. MDO Arvand
8. First Microfinance Bank
9. Agroinvest Bank

Profit Planner was developed to assist 1) financial institutions developing agricultural lending portfolios that need to design financial products and establish a systematic framework for loan analysis and 2) agribusinesses seeking to understand their supply base, including financial constraints and incentives that impact suppliers' productivity.

The project collected budget data on 30 crops to populate the tool, developed case studies (for larger and smaller farmers) and questionnaires, and translated Profit Planner, user guides, and other training materials. In 2011 and 2013 ACDI/VOCA consultant Lorna Grace held individual meetings with the partner financial institutions and then conducted two-day training sessions focused on the use of Profit Planner. The training included practical application of Profit Planner on the farms with real clients to determine the clients' repayment capacity. The project staff also delivered these trainings on the use of Profit Planner to the value chain actors. The trainings were also attended by the staff of the Tajik Agricultural Finance Framework (TAFF) project and International Finance Corporation (IFC).

The training participants liked the tool and the fact that it presented standard costs and timing that could only be changed by a tool administrator thus mitigating the risk of using incorrect data provided by a farmer or manipulation of data by a loan officer. Several FIs commented that Profit Planner would make their work easier. However, other institutions did not have products to which Profit Planner could conform. Five of the six FIs in Khatlon got an approval from their management to pilot Profit Planner in their institutions to facilitate agricultural credit.

1.4.2 INPUT CREDIT PROGRAM

In Year 4 the project conducted a survey of four input dealers in Khatlon to assess their systems for providing inputs on credit. The survey indicated that all dealers were providing inputs on credit, albeit a very small percentage (about 5 percent) of total sales and to clients they knew well, such as neighbors, relatives, and friends. Credit is normally extended from 15 days to up until harvest¹² and without interest, although some of them take loans from financial institutions to finance their inventory. The dealers do not require, and have no experience with, collateral. The only security they take is a letter from the farmer acknowledging that he received inputs on credit and promising to pay on time. The dealers do not conduct any analysis of the farmer's repayment capacity prior to extending credit. Sometimes they visit the farmer's field and householder, but generally they trust the farmer's word. Repayments are tracked in a notebook. Dealers have issues with timely payments. Some have loans in arrears for more than one year. To collect on delinquent loans they get assistance from mullahs or sell farmers' movable property, if agreed with the

¹⁰ All but MDO Arvand have outlets in Khatlon.

¹¹ The tool is now licensed by ACDI/VOCA. See more about Profit Planner on <http://www.acdivoca.org/site/ID/our-approach-Profit-Planner>.

¹² Survey indicated that 16 percent of input dealers extend inputs on credit up to 15 days, 17 percent of dealers extend up to 30 days, 17 percent extend up to three months, and 50 percent extend up until harvest.

farmer. If all else fails, the dealer will not extend any more credit to the farmer. The dealers can buy inputs from wholesalers on 30–60 day credit without interest. Following the survey, three dealers expressed interest in developing a credit pilot for the following season. The project developed a draft credit policy and procedures for providing agroinputs on credit for use by input dealers. However, this initiative did not gain traction with the dealers.

In an interview in July 2014, Sughdagroserv (SAS)¹³ indicated that it sells inputs on credit to farmers if the farmer signs a purchase contract. The terms depend on the farmer's credit history and the length of the commercial relationship. With good client relations, SAS provides interest-free credit for 5–6 months. However, only 10–15 percent of its clients would qualify, since credit terms would require a relationship of at least 3–4 years. With less than that length of relationship, SAS might provide 50 percent of inputs on credit. No credit is extended during the first year. SAS is an exclusive Tajikistan representative for several major agricultural input suppliers, including Syngenta (Switzerland), Dupont (USA), Bayer (Holland) and Agrapic (Germany).

Input dealers have high incentives for selling inputs to farms on credit as this can increase their sales and profits, if managed properly. More work needs to be done on building the relations between the dealers and farmers and building input dealer capacity to manage their credit sales and liquidity.

1.4.3 INPUT NETWORK FINANCING

The project worked with the input dealers and suppliers at each level of the input network to determine their financing needs and options for supplier credit. The project worked with them to establish the right mix of self-financing, supplier credit, and loans from financial institutions.

For the 2012 voucher program the project provided incentives to participating retail input dealers for accessing formal credit in order to make payments to the wholesalers. Purchase of this large volume of certified inputs was outside normal operations of the retail dealers. The project, therefore, subsidized 50 percent of interest payments on the loans taken by retail dealers from financial institutions to finance the transaction. The loans were taken from different financial institutions (IMON International, Agroinvestbank, Eskhata bank, etc.). The project's finance officer advised the input dealers on how to apply for loans, provided information on loan terms offered by different financial institutions, and developed a loan repayment schedule for them.

The project worked on building trust within the input network. Having built relationships with the input dealers in Khatlon, SAS now provides limited credit to their partner input dealers. Normally, for new customers the line of credit is for about \$10,000–\$12,000 for one month. SAS is willing to sell more inputs on credit to partner input dealers but would appreciate a guarantee mechanism. In their experience, the default rate is about 4–5 percent.

1.4.4 INVESTMENT DEBT FINANCING

The project worked with investment partners who needed financing for their investments and helped them build relationships with financial institutions. Four financial institutions in Khatlon (OJSC Agroinvestbank, MCO OXUS Microfinance, MDO IMON International, and MDO Humo and Partners) were selected as lending partners for the project's investment activities in Khatlon. These institutions have large branch networks in the 12 target districts of western Khatlon and offer loan products suitable for the project's beneficiaries (e.g., lower interest rates of 18–24 percent p.a., longer loan term up to five years, longer grace period up to 50 percent of loan maturity, and flexible repayment schedules).

¹³ Changed name to OJSC Neksigol in July 2014. See more at <http://www.sas.tj>

Two financial officers of partner NGOs Parvozi Parastu and Mehrubon worked with investments partners on developing business plans and analyzing the proposed investments. They provided support to the investors throughout the process of applying for a loan from a financial institution, from filling out a loan application, to providing guidance on collecting all required documents.

The project developed training materials and conducted training for its investment partners on business planning, accounting, and access to credit. The latter emphasized practical aspects of applying for a loan, where to apply, what can be used as collateral, how to compare interest rates, the use of loan proceeds, and consequences of default. Training participants shared their personal experience with borrowing from financial institutions.

OBJECTIVE 2: INCREASED PRODUCTIVITY

2.1 INCREASED SUPPLY OF CERTIFIED INPUTS

Tajikistan's input supply industry is currently in a nascent state, dominated by counterfeit products and low-quality inputs. The project worked with the input supply industry to increase the availability of quality inputs needed to access markets, increase productivity, and drive industry growth. Project activities focused on key inputs that improve quality and yield of target crops for specific markets. Through a competitive process, the project selected wholesale input suppliers to source certified inputs from international suppliers for the project's voucher program. The certified inputs were rarely, if ever, available in the remote areas of Tajikistan where voucher input packages were distributed.

The project supported the business development of input dealers, establishing stronger network of wholesalers and retailers and promoting demonstrations and embedded technical assistance for the use of certified inputs. The project also worked on identifying weaknesses in pesticide regulations and legislation and addressing financing constraints in the input supply chain. These activities resulted in increased availability of certified inputs in Tajikistan in general and Khatlon in particular, an increase in input dealers' income, greater farm productivity, and better quality of farm products.

2.1.1 INTERNATIONAL/NATIONAL DEALER NETWORK

Through the project's activities, such as voucher programs, fairs, stakeholder meetings, demonstrations, and training, the dealer network grew from 13 national dealers (including two in Khatlon) in Year 1 to 19 national dealers in Year 5 (including 11 in Khatlon). A total of 45 national input dealers, including 23 in Khatlon, participated in the project during the life of project.

The project worked to link input dealers at all levels and enhance their knowledge of certified inputs. The project sponsored participation of national dealers in agricultural fairs such as "Silk Road," held in Osh, Kyrgyzstan, in 2010, 2011, and 2012, and numerous Agro Expos organized or co-sponsored by the project in Tajikistan where the dealers were introduced to international suppliers and their products. For example, in the first year of the project four input dealer members of AAT



From left to right: Head of Bokhtar district of Khatlon Mr. Jabbori Ghaffor, Head of Khatlon region Mr. Davlatsho Gulmahmadov, First Deputy Head of Khatlon region Qurbon Hakimzoda and US Ambassador Susan M. Elliott attending 2014 Agro-Expo in Khatlon

participated in the agricultural fair “Silk Road” in Osh and established business linkages with nine Kyrgyz, Russian, and Polish suppliers. As a result, they signed contracts for high-quality inputs valued at \$170,000. Nine dealers who attended the same fair in 2011 signed contracts with international suppliers for high-quality inputs valued at \$205,820.

In 2010 the project sponsored the participation of AAT in the agricultural input fair “Silk Road” in Osh and then trained and mentored AAT in organizing agro expo fairs in Tajikistan. Subsequently, AAT organized annual agro expos for the project in Tajikistan in 2010 and 2014. The 2010 agro expo was the first-ever international agro expo fair held in Tajikistan, and was attended by representatives from 13 foreign countries. The project also sponsored business trips by input dealers to Khujand and Almaty to discuss formal distributorships with SAS and regional representatives of international suppliers. The project also sponsored participation of retail dealers in Syngenta’s OFD in Ukraine and Bejo’s OFD in Holland, where they were introduced to new varieties of certified vegetable seeds and crop protection products.

Through their participation in the voucher programs the dealers were introduced to formal contracting procedures, down payments, bulk purchases and other transactions necessary for formal business relationships and which were lacking in Tajikistan, especially in Khatlon. Many retail dealers made down payments to the wholesalers on agricultural inputs for the first time in the history of their business. Down payments from retailers helped wholesalers overcome demanding upfront payment and minimum order requirements imposed by international suppliers. Down payments and contracts reflecting these arrangements are also mechanisms to build trust for future partnerships along the input supply chain. See more detail on contracting mechanism and down payments under Section 2.2.3 Voucher Program.

International suppliers of certified seeds and crop protection products Syngenta and Bayram¹⁴ provided trainings to project partner farms and input suppliers. Topics of trainings included use of certified crop protection products, planting techniques for high-quality onion seeds, identifying counterfeit or adulterated products, optimal planting times, and dosage and timing for fertilizer application. The project linked Syngenta with the GIZ-supported cooperative Sarob, which sources certified inputs for sale in Tajikistan. Syngenta and Bayram are now funding their visits to Tajikistan, as they build product recognition through their engagement with farmers and dealers in what they now view as a viable market.

The project has helped SAS to open six retail agrosshops in the city of Qurgonteppa and five districts of Khatlon Province: J. Rumi, Vakhsh, Qubodyon, Khuroson and Jomi. These districts were chosen because of their long distance from major input markets in Dushanbe, Qurgonteppa, Regar and Hisor. Prior to this farmers in these districts had to travel up to 150 km on poor roads to buy agricultural inputs. Most of the time they bought smuggled uncertified inputs made in China or Kyrgyzstan. To overcome logistical challenge of supplying retailers in Khatlon from their base in Khujand, SAS rented a warehouse in Qurgonteppa.



Participants of training for input dealers and agronomists in front of Mehroj agricultural input store in Qurgonteppa. The training was conducted by Syngenta.

¹⁴ Bayram’s onion seeds Bay Ersoy were used in the project’s onion voucher program and demo plots in 2013.

Additionally, SAS signed contracts for the sale of certified inputs with five other input dealers in Khatlon in Qurgonteppa and Qumsangir, Shahrtoz, Bokhtar, and Yovon districts. These partner stores have to sell at least 40 percent of SAS's inputs. SAS committed to accepting returns of merchandise unsold by the partners at the end of the season, to reduce their risk. SAS also committed to rewarding several best agrodealers annually with promotional gifts and sending one best agrodealer to an OFD in Holland. Now SAS has either its own store or a partner store in almost every district of Khatlon. About 70 percent of SAS's 48 staff members are now in Khatlon, which SAS sees as agricultural region with the biggest potential in Tajikistan.

Each SAS agrosop has three employees: a senior seller, a junior seller, and an agronomic advisor. All of them receive 40 hours of free training when they are hired. Agronomists also get training internationally (in Holland, Kazakhstan, and other countries), which is required by international input suppliers. In the immediate future, SAS is planning to hire a three-person team for each shop to provide spraying services especially for orchards and vegetables. The spraying teams will be trained in Almaty by Syngenta regional manager. Each team will have a sprayer, protective clothing, and a vehicle. SAS is also planning on opening an agritech service center in Khatlon and a mini lab in five of their Khatlon stores for soil analysis. Soil test costs only \$40 and results are good for 2–3 years.

According to SAS, they are the only official (vs. contraband) supplier of certified inputs in Tajikistan. Thus, creating a demand for certified inputs in Tajikistan in general and Khatlon in particular and bringing SAS to Khatlon is not a small feat. Just for comparison, SAS has only two retail stores in the North and opened only three retail stores in the last three years without the project's support. SAS's sales of certified inputs doubled since 2012, when they opened their first store in Khatlon. Sales of fungicide Ridomil Gold went from 2 tons in 2011 to almost 8 tons per year in 2013.¹⁵

SAS was selected for this activity in an open competition. The purpose of the grant was to expand the input dealer network in western Khatlon, support the business development of input dealers, and promote agronomic technical assistance through demonstrations and embedded technical assistance. The project subsidized only 24 percent of the total cost of these activities with SAS funding the remaining 76 percent.

Additionally, the project worked on addressing pesticide registration issues, which were identified as a constraint to developing the input industry. A Pesticide Law promulgated in 2003 and regulations are vague and there is no enforcement. Thus legitimate input dealers and suppliers of certified inputs do not have a clear path on how to register their products. At the same time products come in illegally, disposal sites are illegal and dangerous, labels are often not in Tajik, and many products are deficient in active ingredients.

The project had an international consultant review the existing pesticide legislation in Tajikistan and in other Central Asia countries and then meet with the government officials responsible for pesticide testing and registration, and with input dealers and international suppliers to discuss the policies and regulations. The consultant then facilitated a joint meeting of responsible government officials, interested international suppliers, and leading input dealers to discuss options for clarifying the input registration policy. The findings and recommendations were presented at the joint stakeholder session at the Khatlon Agro Expo 2013. A follow-on development plan was worked out with partner international input suppliers, local input dealers, and the project to address the issues identified with the pesticide registration process. A final report with recommendations for improving the registration process of pesticides in Tajikistan was provided to the Executive Office of the President, the Ministry of Agriculture, the Ministry of Health, and the Committee on Environmental Protection under the government of the Republic of Tajikistan. More work

¹⁵ Interview with SAS, July 2014

needs to be done on this together with the agricultural input industry, which is eager to bring about changes in pesticide registration.

At the same agro expo, the project also presented the results of the research on the size and potential of the inputs market in Tajikistan. This information is essential for attracting international suppliers.

2.1.2 DEALER DEVELOPMENT PROGRAM

As earlier technical assistance and voucher programs have generated results (increased farmers' yield and income) and increased demand for inputs and services, the project shifted focus toward addressing infrastructure, business capacity, and financing needs to allow input dealers to expand their outreach and growth. International input suppliers indicated that business capacity of local input dealers is a significant impediment to developing the market for quality inputs. Dealers do not have auditable, computerized accounting systems, have limited access to email and Skype, and rarely use bank transfers. They also have limited working capital or access to bank loans, which prevents them from making advance payments to wholesalers to stock inputs.

The project supported its partner retail dealers directly and through SAS by providing training in marketing, assisting with access to finance and recordkeeping, consulting, and building market linkages. In the project's final year, SAS provided 10 trainings on the topics mentioned above to a total of 195 participants.

The project provided training in the use of the Russian-language 1C accounting software to five retail dealers who participated in the voucher program in 2012 and who did not have computerized accounting records. Subsequently, three dealers received the software in order to build their relations with international suppliers. However, the dealers found this software difficult to use and discontinued its use. The dealers also said that they did not want to use accounting software as they were afraid of high taxes that may be levied on them by the tax inspection.

The project made grants up to \$5,000 to upgrade the shops of five retail input dealers in Khatlon who participated in the voucher programs so they could comply with international standards. The shop upgrades included cosmetic repair, equipment (refrigerator for storing pesticides and pheromones, air conditioner, voltage regulator, generator, scale, computer, printer, etc.), furniture (shelves, desk, chairs, etc.), windows, doors and signs. All partner shops are now furnished with modern displays to display a wide range of certified seeds, pesticides, and fertilizers, as well as tools like ploughs, shovels, hoes, and planters. All stores have tables with brochures, pamphlets, guidebooks, and other information on best agricultural practices. The stores are planning to expand the range of their products as demand for their inputs grows.

2.2 KNOWLEDGE OF AGRICULTURAL PRACTICES

2.2.1 DEMONSTRATION PLOTS/PROGRESSIVE MARKETING

The project helped demonstration plots introduce certified inputs to farms and facilitate linkages in the value chain. The project's demonstrations were designed to illustrate that although certified inputs (including complex fertilizer, crop protection products, and R1 seeds) cost more than inputs frequently used in Tajikistan (such as urea, pesticides imported from China, and local reproductions of seeds) certified inputs can lead to greater profits from increased income and sales price of products. The locations for the demo plots were set up in major production areas and in areas with strong markets able to absorb additional production. Demonstration plots were established using project contribution and matching contribution by the participating farmer. Several demo plots were established and maintained by retail input dealers. Farmers were informed about the demonstration plots through mass media, including a television broadcast of the OFDs showing the visual difference between traditional production methods and introduced methods.

The project provided oversight over demonstration plots and advised the farmers on the application of fertilizer and CPP (crop protection products), soil cultivation, animal health, and irrigation. The demonstrations culminated in OFD, where the farmers and other stakeholders (representatives from local and regional administrations, district-level agricultural departments, financial institutions, input and machinery dealers, and media) learned about economic benefits of using certified inputs. OFDs were also used to promote the project’s voucher program. Successful demonstrations were followed by voucher programs, allowing first adopters to try the technology at a commercial level at a discount to create demand.

Table 3. Open Field Days

	Year 1 2009-2010	Year 2 2010-2011	Year 3 2011-2012	Year 4 2012-2013	Year 5 2013-2014	TOTAL
Target crops	Tomato, onion, lemon, apricot, watermelon	Tomato, watermelon, apricot, lemon, onion	Early tomato, early onion	Early onions, orchards	Early onions, orchards	
Number of OFDs	8	8	2	8	12	38
OFD regions	Khatlon, DDR, Sughd	Khatlon, Sughd	Khatlon	Khatlon	Khatlon	
Number of participants	378	570	287	501	957	2,693

The project conducted a total of 38 OFDs/demonstrations on the demo sites countrywide demonstrating to 2,693 participants the use and benefits of certified inputs and application of best agricultural practices. This includes 27 OFDs for 1,924 participants in Khatlon.

In establishing demonstration plots, the project engaged local and international input dealers. The project reached out to all international input dealers and their representatives operating in central Asia to support the project in establishing demo plots. As a result, the project’s partner wholesale input dealer SAS, Russian company Alsico Agroprom, and Netherlands-based Nickerson-Zwaan¹⁶ provided their inputs for the use on the demo plots.

The results of the demonstrations were disseminated at OFDs, through radio and television interviews, newspapers, and newsletters.

Having seen the benefits of applying best agricultural practices, the farmers continue applying them long after the end of the voucher program. An August 2014 survey of farmers who participated in the voucher programs in 2011–2012 and 2012–2013, indicated that in the 2013–2014 growing season, out of the farmers who are familiar with best practices (in their respective crops), 97 percent used tree pruning, 56 percent used grafting, 100 percent transplanted tomatoes, and 55 percent transplanted onions.

¹⁶ Supplier and producer of vegetable seeds

2.2.2 Commercial Extension

In addition to providing voucher inputs, the project provided training and support to the farmers in the proper application of the inputs and best agricultural practices. The project provided group training on the demonstration fields and individual extension services and field oversight to the voucher farmers. The project and its local partners published and disseminated numerous booklets, brochures, crop calendars, and other information materials on target commodities approved by the Ministry of Agriculture. The project developed numerous training materials for the target commodities and a pesticide safety manual approved by the Ministry of Agriculture.

The project carried out extensive research to identify reliable and knowledgeable extension agents to support voucher farmers, but the reality in Tajikistan is that: 1) state extension services are designed to communicate crop targets, as opposed to providing individualized support; 2) agronomists who were trained under the Soviet regime and remain in Tajikistan have had very little opportunity to update their knowledge, and 3) the Agricultural University in Tajikistan produces graduates who have very little knowledge of modern agricultural technology practices. This puts an enormous burden on development organizations to provide basic foundational training for extension agents.

In response to these challenges, the project has run pilot extension programs with SAS Consulting, two NGO partners, and retail input suppliers to identify the best possible strategy for extension support. During the life of the project the NGO extension agents, SAS Consulting, and agronomists employed by input stores provided extension services to the project's farmers.

The NGOs Mehrubon and Parvozi Parastu in Khatlon oversaw 10 field agronomists and two senior agronomists to provide ongoing technical support to the farmers. Each extension agent/agronomist was trained by the project agronomist in the proper use of voucher inputs and by the project's Environmental Officer in integrated pest management, proper storage and disposal of pesticides, safe handling and protective equipment, and emergency measures in the event of an accident involving pesticides. Extension agents/agronomists attended voucher distributions to provide advice to farmers and were tasked with providing ongoing support to all voucher farmers throughout the season. An evaluation of the NGO extension/agronomist program indicated that voucher recipients received appropriate support and that additional training for extension agents/agronomists is required to enhance effectiveness. Extension agents also reported that farmers request and pay market prices for the services they value such as identification of pests/diseases and selection of appropriate pesticides; testing germination rates of farmers' seeds; etc.

At first the project fully subsidized extension services provided by the NGOs. In the last year of the project, the NGOs started charging for their extension services. The current year voucher program participants would receive these services free of charge, the prior year participants would pay a discounted price, and other farmers would pay a full price. In the last year of the project, the NGOs were required to develop sustainability plans and demonstrate how they can provide these extension services on a sustainable basis. Tables 4 and 5¹⁷ below provide information on the paid extension services provided by the NGOs and payments received. These rates are for prior voucher program participants, discounted at about 30 percent from their standard prices.

¹⁷ Numbers as of July 2014

Table 4. Pricelist for Extension Services per Crop

Crop	# Visits per season	Paid Services		
		Cash/ visit, TJS	Cash total, TJS	Payment by product, kg
Onion	12	15	180	200
Horticulture	6	20	120	25
Cereals	6	10	60	100
Melons and gourds	6	20	120	30 units (240kg)
Garden strawberry	6	20	120	25
Potatoes	6	20	120	25
Clover	5	10	50	10 bales

Table 5. Payments for Extension Services Provided by NGOs

NGO Parvozi Parastu				NGO Mehrubon			
Month	Amount of received payment, TJS	Area served, ha	# of signed agreements	Month	Payment received, TJS	Area served, ha	# of signed agreements
April	640	145.5	0	April	1,575	124	1
May	1,105	64.5	22	May	1,850	127	1
June	1,720	52.0	5	June	2,225	127	1
Total	3,465	262	27	Total	5,650	378	3

The project has attempted to engage **retail input dealers** in the provision of extension services. The absence of extension services increases the risk for farms when using certified inputs and the proper application technology to make optimal use of them. Therefore, input dealers have the highest incentive to provide consulting services on the use of inputs they sell. While some dealers did provide in-store advice,¹⁸ none were willing to provide this as an embedded service to farms. This was partially impacted by the financing of extension services by the development community. For example, GIZ hired two of the project input dealers (Abubakar and SAS) as providers of extension services. This opportunity offered immediate income, which made it hard to convince agrodealers that providing embedded services will in turn lead to increased sales. In the fall of 2013 the project subsidized 50 percent of the cost of field agronomists hired by six input dealers who participated in the 2013 voucher program. The remaining 50 percent of the cost was borne by the input dealers themselves. The agronomists were to provide extension services to the voucher recipients. Upon completion of this pilot, two of these input dealers kept field agronomists on staff and paid 100 percent of their costs.

In its final year, the project announced a request for applications to build the capacity of a retail input network to provide extension services. The project awarded the grant to wholesaler SAS. Under this grant, which covered only 24 percent of the total project cost, SAS:

¹⁸ In a survey all input dealers stated that they provide advice to farmers on the use of products and several that they would visit the field if necessary to identify a pest problem and propose a solution (T. Treen's report, 2013 and Input Dealer Survey, 2013)

- Developed a call center service where farmers can call in free of charge to get advice
- Carried out field visits as a fee service (covering transport costs)
- Sent text messages to promote its products, sales, etc.
- Published a biweekly newsletter distributed in Khatlon and Sughd Provinces and in Dushanbe
- Allowed farmers to place ads for their products in the newsletter for free
- Conducted 30 free trainings in Sughd and 30 free trainings in Khatlon for farmers and agronomists (50 percent of these training involve foreign trainers such as Syngenta, Bayer, etc.)
- Provided agronomic consultations to partner input dealers
- Sponsored participation by dealers in local and international trainings by local and international instructors
- Published and disseminated information materials (catalogues, brochures, and leaflets) for their partner shops
- Provided ongoing technical assistance to partner input dealers

Foreign trainers receive consultant fees, travel, and per diem. Sometimes international dealers cover their costs. Seminar participants are distributors, farmers, state agencies, and agronomists, with about 20–30 participants per seminar. The training budget covers participant travel and meals. In a July 2014 interview SAS said that the biggest constraint to their growth was lack of knowledge and education by farmers. However, thanks to the project, this knowledge has increased significantly just in the last couple of years. Farmers now know how to distinguish between certified and noncertified products. Just a few years ago the farmers only knew the pesticide B57, which they knew from Soviet times. Now they can tell an original pesticide from a counterfeited one. Another constraint is a shortage of good agronomists. Current agronomists were educated during Soviet times. There is a need to develop agronomists with knowledge of modern methods and technologies. SAS wants to organize a six-month course for 10 agronomists of Khatlon and at the end select five agronomists to work for SAS.

In 2014 under a contract with the project, the industry association **AAT** joined the ranks of extension service providers and started disseminating via text messaging weather forecasts and prices of inputs (seeds, fertilizers, and pesticides) in Qurgonteppa, Dushanbe, and Hisor as well as answering farmers' questions via SMS.

To supplement the support of extension agents/agronomists, the project also engaged international suppliers and experts in the training of extension agents, dealers, and farmers. For example, representatives from Turkish and Swiss firms Bayram and Syngenta visited Tajikistan and provided training on the proper planting of certified onion seeds and use of crop protection products to partner extension agents/agronomists, dealers, and farmers. The project made use of 20 USAID Farmer-to-Farmer (F2F) volunteers who trained the extension workers and farmers in all aspects of growing target crops, farm management, and farm recordkeeping. Additionally, the volunteers completed two assignments for the extension service workers on delivering effective agricultural extension services. A complete list of F2F volunteer assignments is included in Annex 3.

The agronomists employed by partner NGOs and input dealers in Khatlon received several trainings from USAID and the project environmental officers, as well as F2F volunteers on the donor environmental protection requirements as well as safe use of chemicals in general. The purpose of these trainings was to reduce negative impact of farm chemicals on the environment and human health in compliance with international standards of environmental protection. The agronomists can now provide extension services to farmers while taking into consideration the environment.

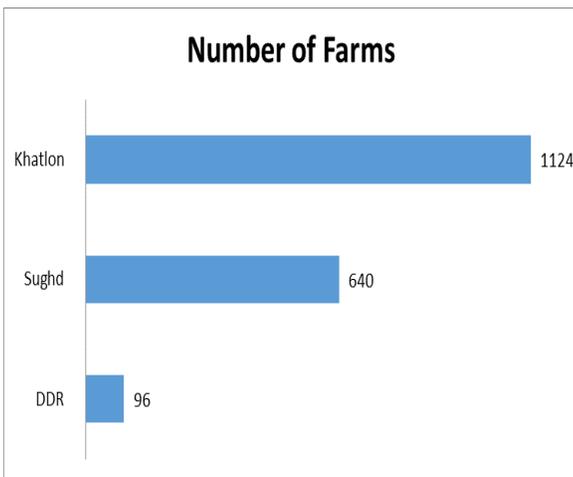
The August 2014 farmer survey indicated that the 87 percent farmers who participated in the voucher programs in 2011–2012 and 2012–2013 received extension services during the 2013–2014 growing season. Most farmers received these services from partner NGO agronomists (52 percent), seminars and trainings (42 percent), and agroschools (25 percent). Note that these farmers (non-voucher participants in 2013–2014 season) had to pay the NGOs for these extension services, as indicated in Tables 4 and 5 above.

2.2.3 VOUCHER PROGRAM

The voucher program was designed to buy down the cost of adoption of intensive production methods that require inputs (seeds, fertilizers, pesticides, animal feed, plastic for greenhouses, etc.) and PHH materials (wooden trays for drying apricots) used in successful demonstrations. A farmer could participate in a voucher program only once. The idea was that once the farmers see the benefits of certified inputs, they will be willing to pay a full price for these inputs in subsequent years. ACIDI/VOCA and its subcontractor IFDC implemented a total of 17 voucher programs including 10 programs in Khatlon, five in Sughd, and two in DRS Provinces. These programs targeted late and early onions, orchards (lemons, stone fruit, and pomegranates), greenhouse and open field tomatoes, watermelons, and beef. The voucher program targeted commercial farms defined as having at least 3 ha of land and at least 1 full hectare under onions or orchards. For greenhouse/hothouse tomatoes the level of commercial production was defined as at least 0.10 ha. Voucher packages were chosen by the project's agronomist based on high-quality inputs tested in demonstration plots. All voucher programs were thoroughly reviewed by the project's Environmental Officer to assess potential environmental consequences and mitigate any concerns.

The voucher programs involved cost sharing between the project and farmers to bring the price of certified agricultural inputs down to the price of more commonly used substandard and smuggled agricultural inputs in Tajikistan. The project covered 30–40 percent of the cost of the products (depending on the voucher program) and farmers covered the remaining 60–70 percent. The reduced cost allowed risk-averse farmers to test certified products, observe their effectiveness for themselves, and then purchase them at full price the following season if they so choose.

Figure 7. Number of Farms



A total of 1,860 farmers participated in the project's voucher programs, including 1,124 farmers in Khatlon, 640 in Sughd, and 96 in DRS. They received \$906,446 in input subsidies to purchase approximately \$2.5 million worth of high-quality inputs. They showed significant increases in yields and incomes over control farms and generated \$3,559,955 in incremental sales over the life of the project, or almost 1:4 ratio of subsidy to incremental sales. Table 6 below provides a breakdown of voucher program participants by crop and Tables 7 and 8 provide a breakdown of yield and income increase by crop and gender over the life of the project.

Table 6. Number of Farms by Commodity

Commodity	Number of Farms
apricot	407
early onion	522
field tomato	105
greenhouse tomato	119
late onion	177
lemon	59
orchard	412
watermelon	59
total	1,860

Table 7. Average Yield by Crop and Gender

Average yield, Tons/ha	18
Yield - Apricot	2.6
Yield - Lemon	1.2
Yield - Watermelons	32.4
Yield - Early Onions	31.8
Yield - Late Onions	35.9
Yield - Tomatoes	27.3
Yield - Greenhouse	32.9
Yield - Orchard	1.7
Yield - Male	18
Yield - Female	15

Table 8. Value of Investment and Loan per Regions

Farmer income, total (increase)	65%
Farmer income (increase) - Early onion	57%
Farmer income (increase) - Greenhouse tomato	83%
Farmer income (increase) - Orchard	110%
Farmer income (increase) - Male	62%
Farmer income (increase) - Female	89%

These results were achieved despite inclement weather in some years. For example, the 2011/2012 winter was long and spring was wet, which delayed the onion harvest. As a result onions were harvested when prices started declining. A late freeze in the spring of 2013 and 2014 destroyed most of the orchard crops and caused bolting in onions, which reduced their yield. In addition, in recent years Uzbekistan has significantly increased its onion exports, putting downward pressure on regional onion prices. More detail on farmers' income and yield by crop, district, year, and gender is provided in Section "Indicators".

The voucher programs evolved over the life of the project as the project staff learned valuable lessons about logistics, distribution, and contracting. For example, in Year 1, the project partnered with water user associations (WUA) in the target districts to market the voucher program. The farmers were not preselected and were served on a first-come-first-served basis. Input dealers were responsible for registering the voucher participants and collecting their contact and other farm information. The project issued paper vouchers which could be used by farmers with the participating input dealers. No down payment by retail dealers to the wholesalers or by farmers to the retailers was required. As a result, some retailers bailed out at the last minute and some farmers did not show up to pick up their inputs. The project then had to urgently find new recipients for these inputs before planting and modify the voucher packages to only what was required for the fall planting. All of this required intensive investment of staff time. Sometimes the project had to offer greater discounts to the new recipients to get rid of the inventory before it expired or lost its qualities. Not surprisingly, some farmers complained that they were not treated fairly. Also, tracking inputs with decentralized distribution was very difficult and took a lot of project staff's time. All these lessons were taken into account when designing subsequent voucher programs. A description of the final year's very successful voucher program is provided below with the workflow of the program presented in Annex 4.

First, the project very carefully designed and documented every step of the program. Voucher packages were selected of inputs tested in successful demonstrations for the use on one hectare of onions or orchards. The project decided on the number of voucher participants for onions and orchards (100 for onions and 200 for orchards) and the districts based on their soil and climatic conditions. It decided to cover 40 percent of the cost of the products with the farmers covering the remaining 60 percent. On a competitive basis the project selected eight input supply dealers and three wholesale dealers to participate in the program. Further, the project developed selection criteria for farmers. The project selected a tier two list of farmers to replace any tier one farmers who could not produce the cash required to purchase the inputs.



Farmers driving home their new Belarus tractors

The project rented a central warehouse for the delivery of inputs by the wholesalers and distribution to retailers, which helped better manage the inventory. The project made sure that the staff and partners clearly understand their roles in the program. It developed a tripartite agreement to be signed by ACDI/VOCA, a wholesale dealer, and a retail dealer, which is included in Annex 5. This agreement required a down payment to a wholesale dealer by ACDI/VOCA and a retail dealer to share the risk and cost of delivering the inputs. The down payment helped the wholesale dealers with cash to pay for the inputs, secured participation by retail dealers, and created a more sustainable supply chain. The project also developed a template for agreements between farmers and retail dealers, which secured participation by the farmers. Under this agreement, the farmers had to make a 10 percent down payment to their retail input dealer and were required to pick up and pay for their input package on a set distribution day.

The project connected input dealers to financial institutions. In 2013 the project subsidized 50 percent of interest payments for the dealers that took loans from financial institutions to make payments to wholesalers. See more on input financing under 1.4.3 Input Network Financing.

NGO partners and extension agents/agronomists were thoroughly trained on the outreach and selection criteria for the voucher program. Their role was to inform the farmers about the program and preselect the farmers based on the program criteria. The project developed marketing materials for the program and announced the program in local newspapers, radio and billboards. A project committee was formed to review initial voucher applications and select voucher recipients based on established selection criteria. Inputs were delivered by wholesalers to a warehouse in the capital city of Khatlon, tagged with inventory numbers by project staff, and then picked up by retail dealers for transport to their respective districts. Upon purchase of the products, farmers were provided a receipt that reflected prices and inventory numbers of each item. See more about lessons learned on the voucher program in Section “Lessons Learned”.

The project’s voucher programs have created sustainable demand for certified inputs and made them available in most

districts of western Khatlon¹⁹. A survey (August 2014) of voucher program participants in 2011–2012 and 2012–2013 seasons indicated that during 2013–2014 growing season, without any subsidies, 69.9 percent of farmers used certified onion seeds, 88.5 percent of farmers used certified tomato seed, 80.9 percent of farmers used certified fertilizers, and 84.7 percent of farmers used certified CPP. A full survey report is provided in Annex 1.

2.3 PRODUCTION INVESTMENT

Access to machinery is essential for efficient and profitable agricultural production. Prior to the introduction of the project's tractor program, the number of tractors in Tajikistan was estimated to be 43 percent of 1991 levels (2010 IFC study). Only 160 tractors were imported to Tajikistan in 2009 (IFC, 2010). The result of this is stagnated productivity and low yields and sales. To address this constraint the project organized and co-sponsored numerous agricultural exhibitions and fairs where it introduced the farmers to modern machinery and equipment. The project also sent a number of staff and beneficiaries to regional and international agricultural exhibitions, such as Agricultural Processing and Machinery Exposition Agroprod mash-2011 and World Food Exposition 2012 in Moscow, Russia, to name a few. Machinery and equipment dealers were also brought to OFDs to demonstrate their machinery and equipment. For example, a distributor of Mahindra tractors from India participated in an OFD in late 2012. The farmers, however, preferred Belarus tractors.

To encourage investment in modern farming machinery and equipment, in 2011 the project launched the tractor loan program for voucher program participants. The purpose of the program was to buy down the risk of investing in new technologies while ensuring private sector buy-in and commercial viability. The program included a grant at 25 percent²⁰ of the tractor price and a 30 percent down payment, with 45 percent being financed by a bank loan. Taking a loan from a partner financial institution and opening a bank account were required to participate in the program. Farms were educated on the program at all farm events (demonstration OFDs, training, information meetings, etc.), and clients of partner financial institutions (Agroninvestbank, IMON, FMFB, Eskhata Bank, TSB Bank, and MDO Arvand) and IFC also participated. Farmers interested in purchasing tractors were trained by the project in cash-flow analysis so that they could assess their cash needs and ability to repay the loan over the course of the season.

Two machinery dealers selected on a competitive basis – AgroTechService and Madadi Tursunzoda – supplied the tractors for the program. Financial institutions MDO IMON International, OJSC Agroinvestbank, MLO Humo and Partners, Microlending Fund Oxus and OJSC TojikSodiroBank were also selected by the project based on the loan terms they could offer to the farmers. The project looked at loan maturities of two years or longer, lower than average interest rates, flexible repayment schedules and good customer service. Step-by-step description of the tractor program is provided in Annex 6.

The program proved to be very effective at addressing the severe shortage of tractors in Tajikistan. Prior to the program, the only people who could purchase tractors were those who could pay up-front in cash. Agricultural machinery was not widely accepted as collateral by financial institutions. Even when accepted, financial institutions required collateral valued at 130–150 percent of the loan amount, a condition most Tajik farmers could not meet. Under the project's tractor program the tractors themselves were used as collateral and the grant from the project helped the farmers meet this collateral requirement.

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 the launch of this tractor program, IMON International

¹⁹ Out of the 12 USAID Feed-the-Future districts, currently there are no partner input dealers in Sarband and N. Khusrav districts but farmers in these districts can buy inputs in the neighboring districts just a few kilometers away. For example, farmers in Sarband can get inputs in Qurgonteppa just 12.7 km away or 11 minutes by car.

²⁰ This was the design in most years. In 2012 instead of 25 percent, the project contributed a fixed amount in TJS.

developed a tractor product that requires a minimum of 30 percent down payment and uses the tractor as collateral (the same model, but now without the grant); while IFC assisted TSB, a major bank, to develop a tractor financial product to work with the project.

A total of 165 farmers received incentive grants valued at \$770,687 to purchase tractors to increase their farm productivity. These grants helped farmers buy four- and three-wheel Belarus tractors (also known as MTZ)²¹ and Chery mini tractors. The farmers also received from the vendors 16 hours of training on tractor operation, maintenance and safety, and environmental standards.

Table 9. Bank Loans for Tractor Use

Years	Tractors available for distribution	Processed applications for tractors	Applications for bank loans	Bank loans approved	Tractors received	Loan approval ratio
2011-2012	100	26	26	13	13	50%
2012-2013	100	87	87	52	52	60%
2013-2014	100	129	110	100	100	90%

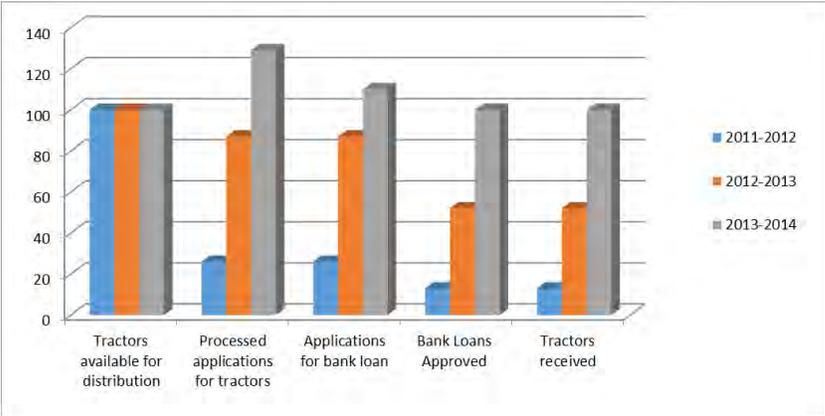
In 2013–2014 two financial officers of partner NGOs Parvozi Parastu and Mehrubon helped the project farmers with their loan applications, from filling out the application and doing loan analysis, to filling out the required paperwork. As a result, the loan approval rate increased to an unprecedented 90 percent as indicated in Table 9 above.

In addition to the demonstration effect of the program, the tractor loans had a multiplication effect in terms of access to tractor service. Farmers who have purchased tractors through the program are renting out their services to hundreds of neighboring farmers in their communities who need only occasional tractor service, thus contributing to multiplication of efficiency gains for the agricultural sector. This tractor program directly benefited about 2,200 farmers who are cultivating about 2,500 hectares of land.

The project also provided matching grants to two greenhouse operators in DRS to upgrade their greenhouse facilities, mainly heating systems, in order to access the lucrative winter tomato market in Dushanbe. Tomato prices, which dip to below TJS 1/kg (\$0.20) during summer, sell for TJS 16/kg (over \$5) during the winter peak. These farms reported substantially increased income and yield due to these upgrades.

The project also provided 2 grants for onion planters and one grant for solar dryer to farmers in Khatlon. These grants for small equipment were used for demonstration purposes and were linked with the respective voucher programs.

Figure 8. Applications for Tractors



²¹ The tractors included Belarus-82.1, Belarus-82.2, Belarus 80-X and Belarus 100-X. These are universal agricultural tractors powered by 80–100 h.p. engines, intended for various farm jobs with mounted, semi-mounted, and trailed machines and implements.

LESSONS LEARNED

Efforts are needed to formalize off field buyer-seller arrangements. It is critical to continue formalizing buyer-seller relationships to take advantage of the early harvest in Tajikistan or premium prices for stored goods in the off season market. Some barriers to formalizing buyer-seller relationships are that products sold from the field are often not sorted/graded, and there are not enough storage facilities to allow for aggregation. Furthermore, there is distrust between farmers and buyers. The farmers should explore forward contracting with established partners, opportunities for aggregation and cold storage facilities, and PHH training for farmers and extension agents to ensure higher value market opportunities for onions and orchard fruit.

Additional foundational training for extension agents is needed. There is very limited knowledge of modern agriculture practices in Tajikistan, including the use of crop protection products and fertilization, and also integrated pest management, integrated soil fertility management, intercropping, etc. Although the project has piloted and supported numerous extension initiatives, extension agents/agronomists require ongoing training to effectively support partner farms. There is more to be done to leverage the ingenuity of extension agents/farmers, combining effective traditional practices and knowledge of modern technology, to enhance productivity.

Concentration of support from international organizations in Khatlon has created confusion among partners. The multitude of projects in Khatlon causes confusion among farmers about the goals and requirements of one project versus another. Additionally, many projects offer generous subsidies or free agricultural inputs, which reduces the incentive of farmers to understand the commercial aspects of farming and engage in cost sharing for certified agricultural inputs. This put an additional burden on ProAPT to invest heavily in marketing and provide extensive training regarding the importance of investment. Furthermore, there are very few local organizations with the capacity to provide subcontracting services to international organizations, thus the resources of these organizations are stretched very thin trying to accommodate the specific needs of many projects. The project worked with commercially oriented farmers and commercial value chain actors to foster market relations and reduce their dependence on donor funding.

Delivery of inputs into Tajikistan is highly unpredictable and depends on a number of external factors. A relatively consistent critique of the voucher programs has been that input delivery did not occur in a timely manner. However, it is important to note that 1) in Years 3 and 4, inputs were offered to farmers before the required planting time and 2) there are external factors that limit ordering/delivery times. Some of those factors are as follows: First, the project's voucher programs required wholesale partners to import products for which they did not have established supply chains. Supporting partners in establishing these supply chains was a critical success of the project, but also exposed the project to the risks of international trade in Central Asia, which include frequent road closures, border restrictions, lengthy customs inspections, poor infrastructure, and unpredictable changes in policies/regulations. Second, the absence of a project-length waiver for specific agricultural commodities contributed to ordering delays of voucher inputs. Finally, bulk shipping of seeds and fertilizer are restricted by harvest and processing times for these goods, limiting the shipment window. The project was able to mitigate these risks through building relationships with international suppliers, submitting waiver approval requests early, supporting wholesalers in understanding and



An orchard voucher recipient in Yvonne district with his project-assigned extension agent

managing international supply risks, and having dedicated staff and retailers that can quickly move inputs to farmers upon their arrival in country. However, the uncertainties of international input supply into Tajikistan remain and must be considered when designing future projects.

Measures to reduce or manage upfront cash requirements for high value voucher packages helped the project meet its distribution goals. Over the course of the project, vouchers were provided for high value products that require significant investments into agricultural inputs. For onions in particular, the cost of production is very high. The price of a full package of inputs was prohibitive for many farmers, particularly as purchase was required before the cotton harvest; which provides the main source of income for many farms. The Project tested a number of strategies which succeeded in lowering cash requirements for voucher participants. The first was to offer inputs for one crop in two separate distributions: one in the fall and one in the spring. This strategy seemed to better align with farmer cash flow, however, required much heavier investment of project time and resources. The second was to offer farmers support in accessing credit. Third, in Year 3 of the project, tier 2 voucher recipients were selected to replace any tier 1 farmers who could not produce the cash required to purchase the inputs. In the last voucher program, the project required farmers to make a down payment of 10 percent before distribution. This requirement incentivized farmers to plan their cash flow appropriately, and was by far the most effective strategy to increase farmer turnout.

The complex nature of Tajikistan's input market and agricultural landscape required learning over time to develop optimal logistics, distribution, and contracting mechanisms for a distinctive voucher program. The voucher programs in Tajikistan were unique in that they required the establishment of international input supply chains and offered full voucher packages for high value crops (seeds, fertilizers, and crop protection products). These nuances increased the complexity of the program and the voucher price for farmers, as noted above. This unique voucher program was extremely valuable in that it created sustainable linkages among international, wholesale, and retail input suppliers and it allowed smallholder commercial farmers to diversify their production into high-value crops. The project learned valuable lessons about logistics, distribution, and contracting, some of which are as follows: 1) The elimination of paper vouchers through setting specific distribution days and directly involving project staff at each distribution increased reliability of documentation. 2) Down payments by retail dealers, initiated in Year 3, facilitated predictability of participation by retail dealers and supported the construction of a more sustainable supply chain. A tripartite contract between wholesale suppliers, retail suppliers, and the project provided the foundation for down payments in a system where there is limited contract enforcement and distrust among market actors. 3) Distribution of inputs from a centrally located warehouse to retail suppliers, as opposed to direct delivery of inputs to retail suppliers by wholesale suppliers, increased project control over input movement. 4) The inventory system developed in Year 4, which required each input item to be tagged with a specific inventory number and then tracked from the warehouse to the farmer, supported increased control of inputs by the project. This system should be computerized in future programs, however, to reduce the enormous burden on staff that had to manually tag and track thousands of input items. 5) Increasing the number of wholesale and retail dealers spread the upfront cash burden and risk among more actors, allowing for needed flexibility in distribution dates given the unpredictable supply chain.

The project has had challenges with identifying the right association partner for marketing and other members services. Many industry associations in Tajikistan are dependent on donor funding and initiative. Membership dues are symbolic or non-existent and direct services to members are donor driven. Future activities in Khatlon need to build on the project's work with AAT and IAPEAT and promote the development of these associations so that they serve the interests of their members. There is a strong interest among the current members of these associations in specific services needed by the members such as laboratory, quality improvement, networking between Sughd and Khatlon partners, price information, extension and marketing services, etc. The farmers are

willing to pay market rates for the services they need. Having industry associations provide these services is more sustainable than providing these services directly by a donor project. If these services are provided directly by the project, once the project ends, so will these services.

Donor projects should make use of local NGOs, especially the strong ones. There are several NGOs operating in Khatlon with sufficient capacity in the provision of agricultural services. Local NGOs added value to the project as they had good relations with the local government and were effective at organizing stakeholder meetings, carrying out farmer surveys and many such other activities. The project used the NGOs' offices in Khatlon as the project's regional offices. However, the project should have a designated person to deal with the NGOs, coordinate their activities, provide supervision and build their capacity. This person should have an office at one of the NGOs and should stay close to the NGOs.

Value chains in Khatlon. The project made a big effort to identify and create new value chains. Early onion value chains were existing only in traditional onion-growing districts such as Qumsangir and Shahrtuz and were inefficient. The project created new early onion value chains in different districts of Khatlon and strengthened the existing ones by supporting farmers, input dealers, storages, a marketing association, extension providers and connecting the farms and other actors to financial institutions. Input suppliers made quality inputs available in the districts; storages were used as collection points and marketing associations worked to link producers with buyers.

Since there were many new orchards established in Khatlon, the project organized new value chains for orchard crops, mainly stone fruits. For example, plums had a good market and commanded a high price in the Russian market. Exporters faced big challenges collecting plums because the orchards in Khatlon were scattered and not specialized (i.e. the farmers grow different fruits and different varieties of the same fruit), buyers incur big transportation costs and spend a lot of time collecting the fruit in their refrigerated trucks from the scattered small farms. The project facilitated investments in cold storages and provided mobile refrigerated units to address this problem for buyers and farmers. The project organized a strong value chain with farmers, processors and exporters. In the last year as a result of the project's effort (with AAT facilitation), Obi Zulol signed several contracts with farmers for supplying fresh early fruits.

The project also identified value chains for early tomatoes and cucumbers (both field and greenhouse) for domestic markets. These value chains are not complicated but the project strengthened them by strengthening input suppliers, which made available new varieties of seeds and improved inputs.

Under the project's mechanization finance program, most farmers preferred a bigger tractor over a smaller tractor or agricultural implements such as sprayers, seeders or ploughs. The project provided grants for 25 percent of the value of machinery. Additionally, one of the requirements for the participation in the program was a loan from a financial institution. This was done to link the farmers with financial institutions. Therefore, the farmers were more interested in getting a bigger tractor as they would receive a bigger subsidy in Tajik Somoni. Twenty five percent of the price of a big tractor is a substantial amount of money and a bigger incentive for farmers to participate in the program, than twenty five percent of a small tractor or an implement. Farmers can more easily afford a smaller tractor without the project's assistance and without borrowing funds from a financial institution. Demand for big tractors was very strong. A big tractor is a good source of income for farmers. They can plow the neighbors' fields and earn extra income. All the farmers participating in the tractor program willingly worked with banks, and the tractors were used as collateral for their loans.

There is a big demand for greenhouses in Khatlon. Greenhouse construction is encouraged by the government. In 2014 the Government of the Republic of Tajikistan issued a decree for building greenhouses in Khatlon on 31 ha but only 5 ha was built. In 2011-2012 the project supported several greenhouse projects in Vahdat and Rudaki districts of DRS through technical assistance and grants for heating system installation and maintenance. However, these investments turned out to be time consuming. The entire project took 14 months: eight months to build the structure and six months to wait until the season starts. In the last year the project received several applications for greenhouse construction from farmers in Bokhtar and Khuroson districts of Khatlon. However, because the project did not have sufficient time to implement these investments and see their impact, these applications were not accepted. A cheaper and faster alternative in Khatlon, which is commonly practiced among the famers, is hothouses.

Input stores at jamoat level. The project established input stores in most of the twelve districts of western Khatlon. Out of the 12 USAID Feed-the-Future districts, currently there are no partner input dealers in Sarband and N. Khusrav districts but farmers in these districts can buy inputs in the neighboring districts just a few kilometers away. For example, farmers in Sarband can get inputs in Qurgonteppa just 12.7 km away or 11 minutes by car. We believe that donors should not be spending resources on opening additional stores at jamoat level. The distances from jamoats to the district centers are not that big and farmers travel to the district centers almost daily to conduct their business. It is better to have well performing input stores at the district's center rather than poorly performing stores in each jamoat.

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