



**USAID**  
FROM THE AMERICAN PEOPLE

John Ogonowski  
Central Asia  
Farmer-to-Farmer Program  
Final Report

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Winrock International Institute for Agricultural Development

In collaboration with:

ACDI/VOCA

Mercy Corps International

Land O'Lakes

Project Hope

Address:

2101 Riverfront Drive

Little Rock, AR 72202

Telephone: 501-280-3000

Fax: 501-280-3090

Cooperative Agreement No. FAO-A-00-99-00014-00

CTO/USAID: Gary Alex

PROJECT MANAGER: Erin Hughes



**WINROCK**  
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## Executive Summary

The John Ogonowski Central Asia Farmer-to-Farmer (FTF) Program, funded by the US Agency for International Development (USAID), had the goal to increase rural prosperity by improving the capacity of local agriculture producers and agribusiness while protecting the environment. Three program objectives supported this goal:

1. Increase sustainable private agribusiness through improved technologies and business management practices in targeted sectors and geographic areas
2. Increase capacity of farmers' associations, cooperatives, agriculture universities, and business support organizations to achieve sustainable service delivery and advocacy in targeted sectors and geographic areas
3. Strengthen the value chain of small- and medium-sized businesses in targeted sectors and geographic areas

Historically, agriculture plays an important role in the economy of the Central Asia Republics. However, these countries faced limited production capacity, a poorly diversified agricultural base, and antiquated and inefficient postharvest processing. After their independence from the former Soviet Union, these countries lost access to Soviet extension services, markets, and inputs necessary to develop the agricultural sector. Further, the Central Asia countries initiated a process of land and agricultural reform which broke up collective farms and increased the number of new farmers in the region lacking technical knowledge, equipment, and the management and marketing skills needed to successfully diversify their production and processing operations.

To address these constraints in various agricultural value chains, FTF mobilized a total of 534 volunteers from 46 states. These assignments directly benefited 15,340 women and 24,187 men.

Accomplishments from FTF interventions include:

***Beef, Dairy, and Veterinary Services.*** Increased overall milk production. Nutrition, animal genetics, and farm management improved by introducing new genetic material, improving insemination techniques and embryo transfer, applying better feed ratio analysis and herd management practices, preventing animal diseases, improving veterinary diagnostic services, and revitalizing livestock research and extension.

***Field Crops.*** Improved seed quality and land management by introducing forage crop production, promoting conservation measures, and demonstrating how to adopt new technologies to local conditions.

***Horticulture.*** Improved production, quality, and marketing of fruits and vegetables by enhancing farmer capacity in new orchard and greenhouse management practices, pruning techniques, pest identification, introducing new varieties of traditional and non-traditional crops, and market development.

***Association and Producer Organization Development.*** Strengthened organization administration and financial controls through trainings in management and business planning,

and promoted the exchange of marketing and technical information. Established youth groups to conduct supervised agricultural projects and provided youth with vocational and entrepreneurial business skills development.

**Water Management.** Improved on-farm water management through water scheduling, determining crop water requirements, land preparation, modern irrigation techniques, and strengthening water user associations.

**Agro-processing.** Improved postharvest handling, processing, and marketing by upgrading processing technologies and introducing new marketing techniques, including packaging, labeling, and product promotion and branding.

**Farm Management.** Strengthened production and farm management by developing the skills of farmers and entrepreneurs in processing, marketing, and legal literacy.

The following table summarizes the Central Asia FTF Program focus areas, number of volunteers, and performance results:

#### Focus Areas and Summary of Key Performance Results

Country	Focus Area	# Vols	# Hosts Strengthened	Annual Gross Sales Increased (US\$)
Kazakhstan	Beef	22	12	127,000
	Dairy	37	31	1,158,000
	Field Crops	21	13	233,000
Kyrgyzstan	Agro-processing	33	21	247,000
	Horticulture	51	33	949,000
	Producer Organization Development	35	20	38,000
	Water Management	3	1	n/a
Tajikistan	Agribusiness	29	30	147,000
	Dairy	24	14	165,000
	Horticulture	44	21	388,000
	Water Management	18	11	17,000
Turkmenistan	Organizational/Youth Development	40	15	50,000
	Veterinary Services Development	9	5	32,000
Uzbekistan	Farm Management Training	23	11	3,600
	Producer Organization Development	11	7	n/a
	Water Management	4	6	n/a
Flexible		130	73	683,000
<b>Totals</b>		<b>534</b>	<b>324</b>	<b>4.2 million</b>

Other key results from FTF interventions include:

- Built the capacity of more than 30 public and private educational institutes and governmental technical agencies;

- Approximately 203,000 hectares (ha) are under improved natural resource management as a result of improved water management, rotational grazing, zero tillage technologies, and use of organic fertilizers;
- A total of 23,116 people in Central Asia received training from FTF volunteers;
- 38% of the direct beneficiaries of FTF activities were women; and
- More than 477,000 people in Central Asia benefited, directly or indirectly, from FTF activities.

## Overview of Experience

Winrock International successfully implemented the John Ogonowski Central Asia Farmer-to-Farmer (FTF) Program, funded by the United States Agency for International Development (USAID) in cooperation with ACDI/VOCA, Land O'Lakes, Mercy Corps, and Project Hope,<sup>1</sup> in Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan. This phase of the FTF Program was implemented between October 1, 2003, and September 30, 2008. In Uzbekistan, the program ended in 2006, and assistance was limited to improving avian influenza responsiveness until the end of the project. Long-standing relationships with host and partner organizations as well as support from host governments allowed programming to respond to changing needs, political obstacles, and logistical challenges created by weather, shortages of power and other resources, and conflict.

Challenges to implementing any program in Central Asia are numerous, particularly when it comes to developing a private agriculture economy in former Soviet states. Although there has been privatization of land and laws passed with the objective to assist farmers, farmers still have many difficulties. They lack access to the necessary credit in order to modernize their farms. Quality inputs and modern agricultural technologies are not available through the government, and policies enabling the private sector to supply agricultural production services are not well developed.

In addition, all of the countries of Central Asia faced political challenges. Political upheavals in other areas of the former Soviet Union had a ripple effect in Central Asia. In some cases, these events changed how governments acted towards international organizations operating in the country. In Tajikistan, registration requirements and processes were tightened, yet Winrock was able to fully comply with the new standards. The political upheaval caused disruptions in FTF activities. For instance, the political upheaval that resulted in the removal of long time President Akiyev caused Winrock to temporarily curtail activities in Kyrgyzstan on two separate occasions. In Turkmenistan, there was sporadic disruption of the program due to the indirect harassment of beneficiaries and by the refusal to provide entry visas for volunteers. Due to budget constraints, the small size of private agriculture, and the difficult operating environment, a plan was developed to close Turkmenistan's operation after the second year of the agreement period. In response, the USAID/Central Asia Regional Mission provided US\$25,000 in add-on funds to the FTF Program to allow a low level of activities to continue into year three. The eventual shut down of Winrock activities in Uzbekistan and the redistribution of volunteer technical assistance and corresponding budget allowed the Turkmenistan program to continue until the end of the agreement.

The political climate between the governments of the United States and Uzbekistan was strained and worsened during 2006. The news of widespread investigations of US-based NGOs by the Uzbek government chilled relations between FTF and potential host organizations. In 2006, the local government closed Winrock operations in Uzbekistan.

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<sup>1</sup> ACDI/VOCA and Land O'Lakes remained as subcontractors until the end of the project; Project Hope joined in the last two years to assist with the Avian Influenza project.

## Summary of Major Outputs and Accomplishments

### Summary of EGAT Indicator Tables

Between 2003 and 2008, the Central Asia FTF Program fielded a total of 534 volunteers, 437 males (82%) and 97 females (18%). The volunteers completed a total of 10,338 volunteer-days during their assignments. The majority were from the west coast region of the United States with California, Washington, and Oregon providing the most volunteers.

The total value of the FTF volunteers' professional time is estimated to be US\$4.1 million and they leveraged US\$107,000 in additional resources. These resources include funds raised to provide grants to farmer groups, grants from other institutions leveraged by the volunteer, technological and computer equipment, farm equipment, books, and pamphlets.

The volunteer assignments covered the following sectors: agribusiness, agro-processing, beef, dairy, farm management, field crops, horticulture, organizational/youth development, producer organization development, veterinary services, and water management. One hundred thirty assignments fell in the flexible category, including assignments in apiculture, aquaculture, credit, energy, organic production, poultry rearing, swine production, and tree crops. Over the life of project, 263 assignments focused on technology transfer, 70 on organizational development, 190 on business/enterprise development, 5 on financial services, and 6 on environmental conservation. FTF targeted different levels of the value chain, including 109 assignments on information and input (pre-production) support services, 283 on on-farm production, 101 on processing, and 41 on marketing.

The FTF Program worked with a wide diversity of hosts, including 121 cooperatives and associations, 97 individual private farmers, 80 private enterprises, 40 NGOs, 23 public and private education institutions, 7 rural financial institutions, and 13 public sector technical agencies. FTF worked with a total of 381 new hosts during this phase of implementation. In total, FTF hosts mobilized US\$2.9 million in resources, such as credit and grants, to strengthen their operations. The estimated value of host contributions to program implementation is US\$190,000.

FTF directly benefited 39,527 people (24,187 males and 15,340 females) through volunteer technical assistance. A total of 23,116 people (14,657 males and 8,459 females) received training from FTF volunteers. An estimated 437,800 people were indirect beneficiaries of FTF activities.

The FTF Program had significant economic impact on the focus areas, resulting in approximately US\$2.3 million in increased incremental income and US\$4.2 million in increased sales. Hosts also increased their organizational capacity and introduced 87 new products or services. FTF interventions produced positive environmental impacts; a total of 203,000 ha are now under improved natural resource management practices and 66 hosts adopted environmentally friendly technologies. The following table summarizes key results by focus area:

### Focus Areas and Summary of Key Performance Results

Country	Focus Area	# Vols	# Hosts Strengthened	Annual Gross Sales Increased (US\$)
Kazakhstan	Beef	22	12	127,000
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	Water Management	4	6	n/a
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<b>Totals</b>		<b>534</b>	<b>324</b>	<b>4.2 million</b>

Of 534 volunteer assignments, CAR FTF field staff completed follow-up impact surveys for 87% of the assignments. In some cases, staff did not conduct surveys because not enough time had elapsed to show impacts. In a few cases, the host stopped operations (for reasons such as lack of electricity in Tajikistan).

#### Major Overall Successes and Breakthroughs

The FTF Program directly supported USAID's mission objectives of promoting open and competitive economies and markets, developing science and technology toward increasing agricultural output and efficiency, promoting the population's awareness of natural resource management, and expanding access to economic opportunities for rural populations. FTF's goal was to increase rural prosperity by improving the capacity of local agriculture producers and agribusiness while protecting the environment. A brief description of each country's major overall program successes and breakthroughs in support of FTF objectives follows:

#### 1. Increased sustainability of agribusinesses through improved technologies and business management practices.

FTF promoted the growth of small- and medium-sized enterprises (SMEs) in the dairy, beef, poultry, swine, horticulture, and field crop sectors. Through extensive training programs and field days, FTF created opportunities for farmers and entrepreneurs to acquire business information, knowledge, and skills. FTF promoted women's participation in business decisions as managers. FTF also facilitated the development of market linkages and institutional infrastructure to connect agribusiness managers to suppliers and buyers in the

region. The program assisted in building a foundation for competitive dairy, beef, field crop, and horticulture markets and helped to enhance food security in the region.

**Kazakhstan:** The introduction of modern artificial insemination (AI) techniques coupled with the provision of new genetic material increased fertility rates of dairy and beef cattle by 22%. FTF reinforced linkages of livestock producers with two US genetics companies, Taurus Services of Central Asia and World Wide Sires. With FTF assistance, Dinara Farm became the first Kazakh dairy enterprise to import cattle from the United States (126 Hereford cows, 115 calves, and 12 bulls) in June 2008. Improved herd management, new crop production practices, and better processing resulted in increased profits for many farms. Livestock productivity improved; milk yields increased by 18%, and the average beef livestock daily weight gain increased by 13%. Livestock farmers and processors now place greater emphasis on food safety issues and sanitary practices. The Kazakh Meat Company obtained a HACCP certification and adopted ISO 9000 safety standards. Furthermore, zero tillage technology in growing field crops is now applied to more than 500,000 ha of land from an initial 100,000 ha, improving soil structure and preventing erosion. The farmers also reported a 22% wheat yield increase.

**Kyrgyzstan:** FTF played a key role in strengthening the capacity of the agro-processing sector through improved input quality, consistent supply, new processing technologies, and brand development, which resulted in 35-40% increase in output. For example, the processor Oregon expanded its product portfolio with jam, cheese, and ice-cream. More than 2,500 fruit and vegetable growers and greenhouse operators increased their average sales by 10% due to higher yields and better management decisions, and reduced postharvest losses from 15% to 8%. The members of the Tayan Social Fund increased their cherry yield by 33% with improved pruning and orchard management practices. A group of 86 producers increased their average vegetable production by 27%. FTF also promoted the development of internal and external market demand for increased horticulture production levels including new vegetable varieties. Fifteen farms in Osh oblast are now growing new tomato and cucumber varieties needed by regional processors for juice, pickling, and drying.

**Tajikistan:** FTF has helped to revitalize the Tajik dairy sector. A major program success is providing dairy farmers with reliable and good quality genetic services. For example, 90% of the dairy farmers in Khalton Region switched to the *French straw* AI technique introduced by FTF volunteers. A donation of Holstein genetic material by World Wide Sires helped increase the weight of newborn calves by 75%. Furthermore, FTF agribusiness training helped the agro-processing sector grow and find new market opportunities for Tajik fruit and vegetable growers. The Khamzaev Dehkan Farm from Sughd Region acquired access to a US\$250,000 Russian market for apricots compared to no market access prior to FTF intervention. More than 20 horticulturists increased their production levels by 50% including reduced postharvest losses and improved product quality.

**Turkmenistan:** FTF Turkmenistan made significant contributions to the development of private agricultural support services. Cattle owners reported a reduction of premature livestock deaths in Dashoguz, Mary, and Balkan regions due to improved veterinary services that received FTF technical support. Dashoguz dairy farmers increased milk production and quality as a result improved animal nutrition. This success also promoted the establishment of a cheese product line by Gamma Private Enterprise. The modern wool processing and dyeing

technologies introduced to Turkmen Artisans Women's Group resulted in their participation in the annual Santa Fe Art Fair in New Mexico. A strategic business plan developed by FTF volunteers for Dashoguz-based Pchelka Beekeepers' Club, combined with improved honey production practices, helped beekeepers increase their honey yields by almost 50% resulting in a 46% sales increase.

**Uzbekistan:** FTF played a key role in assisting the emerging private agribusinesses, including horticulture growers, greenhouse producers, and dairy and poultry operators, to understand their legal rights and status. More than 200 farmers in the Djizzak region asserted their legal land lease rights and obtained exemption from paying off former shirkat farm debts. Technology transfer for non-traditional crop production (artichokes, leeks, and cauliflower) allowed Uzbek growers to develop market links with Tashkent consumers such as the Demir Supermarket chain, as well as enter the German market (more than 10 tons of leeks were exported in 2007). Poultry operations in the Fergana region obtained high-quality protein feed through training on soybean production, which now covers more than 20 ha up from 0.2 ha. FTF also facilitated the introduction of 30 new tomato varieties by the World Vegetable Center for testing before commercial distribution.

## 2. Increased capacity of farmers' associations, cooperatives, and business support organizations to achieve sustainable service delivery and advocacy.

FTF strengthened the institutional, managerial, and technical capacities of associations and farmer groups by promoting cost-effective and efficient linkages of stakeholders (agricultural producers, processors, and marketers), and encouraging the association networks to exchange experiences and ideas. The goal of the association development component was to foster private sector, market-oriented, democratic institutions capable of providing their membership with key services needed to increase productivity and improve incomes. For example:

**Kazakhstan:** FTF developed key partnerships between Kazakh livestock producers and Taurus Services of Central Asia, thereby improving service delivery to livestock producers. FTF promoted the idea of uniting producers and processors into associations to acquire bargaining power in the market. For example, FTF assisted dairy farmers in the Almaty region to create the Farmer – 2030 Fund Association to help retain young farmers and obtain funds for business growth and development.

**Kyrgyzstan:** FTF trainings demonstrated the importance of functioning associations in providing services to their members. For example, six large producer associations increased their membership by 15% by offering additional services to the members. FTF volunteers helped Aksy Beekeepers Association in Jalalabad and Rugen Cooperative in Issykul to re-establish themselves as true producer groups for marketing their produce. FTF assistance in water management resulted in the Suuchu Federation of Water User Associations (WUA) receiving a US\$49,000 government grant to upgrade their water delivery system and increased water users' commitment toward equitable water distribution and management.

**Tajikistan:** FTF partnered with other donor projects to assist farmers to democratically form and manage WUAs, maintain irrigation and drainage infrastructure, and develop equitable water distribution plans. As a result of this effort, two WUAs, Ravot 1 and Ravot 2, were formed in the south of Tajikistan with 1,450 members (45% female). The overall level of

participating farmers in WUA activities increased to 90%, with 80% of its members paying association fees. The improved water distribution system resulted in a US\$93,000 increase in agricultural gross sales and an additional 1,000 ha under improved water resource management. FTF volunteers trained 10 agricultural consultants to provide extension water services to 230 Dehkan farms in the Sughd Region.

**Turkmenistan:** FTF promoted association development helped associations develop improved services. This intervention resulted in a net income increase of 50% for 1,200 association members. FTF volunteers assisted the farmers' group in Geokdepe to form and register *Sahy Jepbar Farmers' Cooperative*. FTF cooperating associations and farmer groups also developed the *Future Farmers of Turkmenistan Youth Organization* in Akhal.

**Uzbekistan:** FTF played a major role in the creation of the National Center for Knowledge and Development (NCKD), which became the primary organization to conduct training and provide consulting services for newly privatized farmers and associations on legal farm issues including land leases and production contracts, farm and association management, and marketing. NCKD with FTF volunteers trained 1,800 farmers and association members. Moreover, the first two private women farmers' associations were successfully registered in Bukhara and Jizzak Regions, which united 50 active female farmers and entrepreneurs.

### 3. Strengthened the value chain of small- and medium-sized enterprises.

FTF encouraged the growth of SMEs by training farmers and value chain participants to analyze market demand for their products and then develop business strategies to offer these products to consumers. FTF also promoted the development of more responsive financial institutions that could readily offer their services to their agricultural clients.

**Kyrgyzstan:** FTF volunteers contributed to microfinance development in Kyrgyzstan including the formation of AgroKredit Plus (AK+), a microfinance agency, in 2005. FTF volunteer William Wolfe assisted AK+ to develop lending procedures, streamline loan applications, work with current and overdue loans, and set up a loan loss reserve. Currently, group loans account for over 90% of the AK+ portfolio, and the value of assets increased from US\$58,546 in 2005 to US\$99,107 in 2008 with a total of 3,796 farmers receiving loans.

**Tajikistan:** FTF promoted business plan and strategy development allowing farmers to manage their farms better and clear their old farm debts. Dehkan farmer Safarbek Kitobiddinov repaid a US\$20,000 farm debt and purchased a tractor as a result of the business plan developed along with FTF volunteer Bob Reel. Many farmers also learned how to apply for bank loans with newly developed business plans. Entrepreneur Mrs. Mamadnazarova received a US\$2,000 loan to start a fruit and vegetable processing business that now employs five women in her village. FTF business skills development also contributed to the opening of a honey retail outlet in Dushanbe by beekeeper Istamjon Islomov who doubled his honey production.

**Uzbekistan:** FTF encouraged agricultural producer associations to offer microfinance opportunities to its members. Four associations of business women in Bukhara, Fergana, Samarkand and Djizzak regions now offer loans to farmers and agribusiness entrepreneurs through government funding sources.

## Volunteer Outreach

During the past five years, 129 Central Asia volunteers conducted outreach to inform the public about the FTF Program, volunteerism, US foreign assistance, and international development. These outreach activities included newspaper articles highlighting the volunteers' in-country technical assistance, as well as the cultural exchange that takes place between the volunteer and the hosts. In a newsletter published by the *Jacksonville Daily News*, volunteer Larry Kent writes about his assistance to onion growers in Tajikistan and the local traditions he engaged in while on assignment. He described his volunteer experience as a, "once-in-a-lifetime opportunity to visit a country and culture I never would have otherwise been able to visit and work with down-to-earth people just trying to make a living."<sup>2</sup>

FTF media outreach serves as a tool to communicate to the American people about US foreign assistance and to disseminate information about FTF in the host countries. Maksatkan Amanova, representative of the host Tayan Social Fund in Kyrgyzstan, learned about the FTF Program by reading about it in the newspaper. Further conversations with other project representatives and consultants led her to request FTF assistance. Since 2006, Tayan Social Fund has hosted four horticulture volunteers.

Returned volunteers conducted 93 media events and 211 group presentations. Volunteer Daniel Drake gave a seminar to 40 faculty and students in the Animal Science Department at the University of California in Davis about his work in Kazakhstan. He also gave a presentation to 75 beef farmers in northern California about beef production in Kazakhstan, informing US farmers about the FTF Program. Additionally, FTF success stories are frequently highlighted in *Innovations*, a Winrock online publication sent to 6,000 people.

Winrock volunteers employ new media in today's digital age. Many volunteer experiences have been published in the electronic media, including online publications and podcasts. Volunteer Charles Bruce Williams ("Dr. Bruce") shared his experience of working with tomato growers in Turkmenistan in a television show that reached 20,000 people. This show was also posted as a podcast on his website. Williams was awarded a Presidential Award during National Volunteer Week for his work with the FTF Program.<sup>3</sup>

Elena Garcia, a volunteer in Kyrgyzstan, Tajikistan, and Nepal in the horticulture sector, was also recognized for her volunteer activities with the FTF Program and Winrock International. She received the 2008 President's Council on Service and Civil Participation Award on behalf of the US President to encourage volunteer service.<sup>4</sup>

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<sup>2</sup> Hickey, Amanda. "Hands on Harvest." *Jacksonville Daily News*. July 28, 2008.

<sup>3</sup> <http://www.growyourown.tv/press-releases.html>

<sup>4</sup> "President's council presents service award to Elena Garcia." *Vision*. University of Arkansas. Division of Agriculture. Vol. 35, No. 3. May-June 2008.

## Summary of Work by Focus Areas

### Kazakhstan

FTF Kazakhstan fielded 80 volunteers to train and demonstrate best agribusiness practices in production, processing, and marketing for dairy, beef, and field crops to 6,630 people (27% women). FTF also provided technical assistance for apiculture, horticulture, poultry and swine production, veterinary services, water management, and energy sectors under flexible assignments.

### Dairy

After the collapse of the Soviet Union in 1991, herd size decreased due to poor genetics and improper herd management, which in return led to lower quality and quantity of milk production. Kazakhstan's dairy production sharply declined, which was surprising for a country with a strong tradition of livestock rearing, extensive pastures, and high demand for milk and other dairy products. The development of the dairy sector in Kazakhstan faced additional constraints such as lack of investment, poor in-country technical expertise, and limited access to modern technologies needed for farmers to develop their businesses.

### *Strategy*

The dairy sector was chosen as a focus area in Kazakhstan because strategic interventions would have significant impact on the capacity of the sector and on the ability of individual farmers to respond to the growing demand for dairy products. FTF increased the competitiveness of dairy operations, milk yields, and animal productivity, while reducing per unit production costs. FTF worked with hosts and partners to provide technical assistance for the provision of modern AI technologies focused on breeding and reproductive issues; animal nutrition with an emphasis on growing, producing, and processing forage; ration mixture production; farm and herd management; and animal health and disease control.

#### Taurus Services: Successful Partnership Improving the Kazakh Dairy Sector

The partnership formed between Taurus Services of Central Asia and Winrock's CAR FTF Program improved the production of dairy farmers in Kazakhstan. Taurus Services of Central Asia was established in 1996 as a result of the visit of Winrock FTF volunteer John Rodgers to Kazakhstan. During his second assignment, Rodgers introduced a host dairy farm manager, Mr. Akhmatov, to Mr. Dick Witter of the US-based Taurus Service, Inc., headquartered in Pennsylvania. Subsequently, Akhmatov opened the Taurus Services of Central Asia branch. Since 1996, FTF volunteers have continued to build the capacity of Taurus Services in areas such as improved artificial insemination techniques, dehorning methods, nutrition and proper feed ratios, forage and pasture management, and animal health.

Presently, Taurus Services has emerged as a leader in commercializing improved genetic inputs and offering livestock health, fertility, and nutrition services to its dairy farmer clients. Moreover, Taurus Services expanded its market and has begun serving dairy farms in Kyrgyzstan.

FTF improved dairy farmers' knowledge of animal breeding and assisted access to high quality genetic material. FTF formed a key partnership with Taurus Services of Central Asia, which evolved into a unique AI service provider to livestock farms throughout Kazakhstan. Through Taurus Services, the productivity of farmers' dairy herds significantly improved via superior quality US genetic material and embryos. Taurus also covered some of the expenses for training Kazakh dairy specialists

under the Cochran and SABIT Fellowship programs in the US. Fourteen groups of 4-5 livestock specialists trained and improved their qualifications in the US.

Other partners included the Kazakh Scientific Production Center for Animal Husbandry and Veterinary, the Veterinarian Association of North Kazakhstan oblast, and the regional and district Departments of Agriculture. These partners assisted in the identification of the hosts and contributed to the distribution of volunteer recommendations among farmers, associations, and educational and training institutions.

### *Activities*

The assignments in the dairy sector focused on five main interventions. Under *artificial insemination techniques*, the hosts received training and practical demonstrations on the “straw method”, a modern and effective AI technique. Volunteers used the US-imported genetic material and additional technical expertise from Taurus Services of Central Asia. For *veterinary and reproductive planning*, the hosts learned breeding, improved genetics, calving protocols, calf rearing, dehorning, hoofing, and livestock diseases identification and control. Under *nutrition and feeding*, volunteers trained the hosts on growing and processing forage, improved feeding, and properly rationed feeds. Hosts learned about proper herd sizes and the importance of record keeping under *farm management*. For *farm engineering and environmental controls*, the hosts were trained on proper ventilation, how to manage their farms in an environmentally conscious way, and farm economics.

FTF also facilitated an award of a US\$40,000 grant from the United States Department of Agriculture to the Almaty Dairy Farm for the purchase and transportation of embryos of Ayrshire, Holstein, and Angus breeds to Kazakhstan. These embryos were used for the AI program and contributed to improved livestock breeding.

FTF worked mainly with small- and medium-sized farms as in-country hosts. The largest of these farms, such as the Adal Cooperative and Almaty Breeding Cooperative, had 1,200-1,700 head of cattle, while the smallest farms had 50-150 animals. FTF worked with 31 primary hosts and 103 secondary hosts (hosts participating in the assignments, but not participating in developing the initial scope of work), for a total of 37 assignments in the dairy sector. Hosts included the Almaty Dairy Farm, the Kamyshenskoye Farm, Kirov Production Cooperative, and the Irtyshskoye Farm. These farms hosted volunteers on different issues of dairy management ranging from farm operations to embryo transfer. The volunteer assignments took place in the Almaty, Zhambul, South Kazakhstan, East Kazakhstan, and North Kazakhstan regions.

FTF initiated *Ag Progress Day* events, which received extensive support from the Kazakh Ministry of Agriculture. The goal of these events was to establish a dairy forum where FTF hosts could share their experience with their counterparts, as well as establish business networks with other value chain participants. A series of *Ag Progress Days* were held in Almaty, East Kazakhstan, and Pavlodar oblasts for 200 people in 2006. These demonstrations accommodated dairy farmers, agricultural input suppliers, dairy processors, as well as professors and students from the Kazakh National Agrarian University. One event was dedicated to forage production, considered one of the main impediments to improving dairy cattle productivity. FTF fielded volunteers from Penn State University who familiarized the participants with advances in forage research, economics, agronomy, nutrition, and

marketing. FTF helped establish two forage trial sites to demonstrate best management practices for forage production including alfalfa, corn, and soybean crops.

### *Results*

FTF helped increase milk productivity with yields increasing between 4% and 18%, depending on the farm's structure. Milk production increased per cow due to improvements in genetics, feeding, and farm management. Kamyshenskoye Farm's production increased considerably from 2,500 to 5,500 liters per cow annually. Almaty Farm currently produces 5,000 liters of milk per cow annually, about a 40% increase from previous levels.

On average, annual revenue of the host farms increased by 10-15%, while the annual net income increased by 5-10% due to increased milk yields and reduced per unit production cost. Improved marketing skills also contributed to higher financial returns. The owner of the Elaman Dairy Farm increased his farm's monthly revenue by 2% when he segregated different milk qualities to sell at different prices rather than mixing high quality milk with lower quality and then selling the resulting "medium quality" milk for a low price, as the farm used to do prior to FTF intervention.

Another notable impact was improved safety and hygiene in the dairy sector. The Ministry of Agriculture now pays significant attention to food safety issues. Workshops on HACCP<sup>5</sup> standards were conducted with the farmers to increase their awareness of food safety and sanitation.

The management capacity and technical skills of the hosts and livestock specialists increased as a result of the training programs conducted by FTF volunteers. FTF hosts have been sharing the information they received with other farmers, associations, and training providers thus widening the impact of project activities.

### **Beef**

Beef is of great importance in Kazakhstan as a traditional staple food and a dominant ingredient in Kazakh cuisine. Although the country has extensive rangeland for grazing, the beef sector suffered many of the same problems and weaknesses faced by the dairy sector including small animal size, meaning that the meat as a percentage of the total body weight was low and, therefore, adversely affected profits.



*Volunteer Neil Tucker demonstrating AI techniques to farm workers*

### *Strategy*

This focus area was characterized by improper use of rangeland and forage potential, limited veterinary supplies and services, seasonality of beef cutting and packaging operations due to

<sup>5</sup> Hazard Analysis and Critical Control Point standards adopted by the U.S. Food and Drug Administration

irregular beef supplies, and the absence of private beef producers' groups that can lobby for improved policies and investments in the industry.

FTF's objective was to increase the competitiveness of beef operations in the southern and northern regions of Kazakhstan by reducing per unit production costs and increasing beef productivity. FTF interventions targeted key components of the value chain, from genetic improvements to the development of beef cutting, packaging, and marketing, seeking to increase production efficiency and ultimately increase incomes by serving lucrative markets with export potential.

FTF partnered with Taurus Services of Central Asia, the Ministry of Agriculture, Regional Farmer's Association, and the USA Hereford Association. As in dairy, Taurus Services was an important partner in terms of improving farmers' knowledge and providing superior genetic material to improve herds. The Ministry of Agriculture with its regional offices advised on which regions volunteer assistance would have the greatest impact and facilitated the import of beef cattle from Texas.

### *Activities*

FTF provided technical assistance and strengthened the components of the value chain through four types of interventions. Under *genetic improvement and artificial insemination techniques*, the hosts received training and practical demonstrations on the straw method and learned about breeding and ways to improve the genetics of local cattle with the application of American genetics. AI technology from the US was implemented for the first time in the Kazakh beef industry with FTF assistance helping farmers overcome difficulties such as the lack of appropriate facilities (e.g., special V-gates to capture cattle for insemination), improperly skilled AI operators, and limited access to high quality semen at a reasonable price. FTF provided the necessary AI training with AI kit supplies while FTF partners helped

#### Computerized recordkeeping: a key step to increase productivity

FTF interventions in Kazakhstan's beef sector expanded beyond technical, veterinarian activities to include good business practices and recordkeeping. Daniel Drake worked with the Dievskaya Farm and 50 direct beneficiaries to replace time-consuming handwritten records with computerized recordkeeping. Computerized records increase the accuracy necessary to track improvements in animal productivity, genetics, and breeding.

With each animal's identification number, farmers are able to track information including birth date, sex, breed, weight at different developmental stages, and date of weigh-in. The computerized program calculates adjusted weight gains at different stages and classifies it as high or low based on local breed standards. The hosts' livestock specialists received training in all aspects of using and maintaining this program. Computerized recordkeeping, along with appropriate technical assistance in veterinarian aspects of beef production, allowed the hosts to increase their sales. For example, the Dievskaya Farm increased gross value of sales from US\$213,582 in 2005 to US\$328,766 in 2008.

Kazakh farmers access superior quality genetic material. For *nutrition and feeding*, volunteers trained the hosts on improved feeding and properly rationed feeds including forage production and processing, and setting up feedlots. For *farm management and recordkeeping*, hosts learned about proper herd sizes and how to keep accurate computerized livestock records. Under *meat processing*, Kazakh hosts learned about safety and food sanitation standards necessary to meet international standards and for entrance into the World Trade Organization. Moreover, FTF provided technical expertise to improve slaughtering, meat cutting, packaging, and marketing techniques to serve a larger pool of customers from sausage makers to restaurants to supermarket services.

Since 2003, FTF Kazakhstan implemented 22 beef assignments in the Almaty, Zhambul, Pavlodar, Kostanai, Karaganda, North Kazakhstan, West Kazakhstan, and East Kazakhstan oblasts. FTF worked with 34 primary and secondary hosts, including livestock farmers, beef processors, input suppliers, producer cooperatives/associations, and public technical agencies. Hosts included the Rassvet Farm from Pavlodar, Association of Farms AGRO from Karaganda, Amanbayev Farm from West Kazakhstan, Dinara Farm and Ospanov Farm from Almaty oblast, and Dievskaya Agri Company Ltd. from Kostanai. The Kazakh Meat Company (KMK) hosted seven FTF assignments since 2006 (see Annex E for details).

### *Results*

FTF technical assistance significantly improved the beef sector in Kazakhstan. In meat production, the average daily weight gain increased 13% from 458 grams to 518 grams. From the financial perspective, the average annual revenue of participating hosts increased by 10-12%, while their net income increased by 8-10%.

The livestock managers improved their knowledge and skills in applying modern AI technology, growing and processing forage including the production of new forage crops, ration development, livestock health, food safety requirements, and farm management. The most important impact in the beef sector was the introduction of modern AI technology, use of AI kits, and introduction of estrus synchronization programs<sup>6</sup>, which resulted in considerable cost savings and improved fertilization rates. The AI operators pointed out that modern AI techniques and the AI kit allowed them to reduce AI related costs by \$5-\$7 per cow insemination due to increased impregnation rates, which meant no need to repeat insemination and reduced hormone use and labor. There is an on-going exchange program between farmers to share the information they received from the FTF volunteers through their practical seminars and workshops.

Farmers work with the Ministry of Agriculture on food safety issues and a greater emphasis is placed on good sanitary practices. For example, thanks to FTF assistance, the KMK adopted safety standards and currently possess a HACCP certification and meets the ISO 9000<sup>7</sup> standards, which satisfies the consumer demand for quality products.

### **Field Crops**

There are many challenges affecting field crop production, such as improper seedbed preparation, lack of quality seed stock, poor crop management practices, and inappropriate postharvest handling. These challenges limit crop productivity and hinder farmers' ability to maximize yields, leading to a poor financial return.

### *Strategy*

The field crops sector is of great importance in Kazakhstan. Three regions in Kazakhstan - Kostanai, North Kazakhstan, and Akmola oblasts - produce 70% of the total grain grown in the country. Grain production is an important source of revenue for farmers in northern Kazakhstan since it accounts for 65% of the on-farm profit, and provides the necessary feed for livestock as well.

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<sup>6</sup> A reproductive management tool that helps cows conceive earlier than the normal breeding period

<sup>7</sup> The International Organization for Standardization's standards for quality management systems

FTF involvement in field crop production helped increase synergies with the dairy and beef sectors by providing technical assistance to meet forage needs for animal feed – a key input in the dairy and beef value chains. FTF increased production efficiency and yields of field crops such as wheat, soybeans, and crops for silage (corn and alfalfa).

FTF partnered with the State Agrarian University in Almaty, the International Maize and Wheat Improvement Center (CIMMYT), Counterpart Consortium, and oblast and district Departments of Agriculture. FTF volunteer assistance complimented the efforts of CIMMYT specialists working in direct seeding and other soil conservation techniques.

### *Activities*

FTF volunteers introduced *conservation agriculture* technologies for rice and wheat production including zero tillage planting systems for flood irrigation or permanent bed planting systems. Zero tillage technology is a high-impact intervention as it increases soil conservation and organic matter, enhances water filtration, reduces erosion by 90%, and reduces fuel usage by 30%. It also reduces labor time, improves wildlife habitat, and leads to higher grain yields and profits.

FTF also introduced testing, modification, and verification of the raised bed planting system for irrigated areas in south and southwest Kazakhstan. That effort has involved a number of researchers in various institutions in Kazakhstan as well as a large number of farmers. Bed planting technology improves water use efficiency and conservation, reduces the amount of nitrogen that leaks into the environment, decreases soil compaction, improves soil structure, and helps control erosion.

For wheat production, FTF worked with CIMMYT to improve planting technologies to increase productivity and efficiency. In potatoes, FTF volunteers provided training on diseases, storage, and marketing issues, as well as facilitated the production of *virus free* potato crops. FTF also supported alfalfa and clover forage crop production to address the lack of protein in livestock feeds.

FTF worked with 15 primary hosts and 28 secondary hosts in the Almaty, Zhambul, and Pavlodar, Kostanai, South Kazakhstan and Akmola oblasts. FTF fielded 21 separate assignments. The hosts included farmers, producer cooperatives and associations, private entrepreneurs, and public institutes which specialize in Kazakh field crops.

FTF conducted two Ag Progress Days to demonstrate the results of modern crop production technologies. In 2005, volunteer John Haight contributed seeds for forage trials from the US and planted them in a demonstration plot in Almaty oblast to show how high-quality forage can increase dairy and beef production levels. He emphasized planting depth and time, and the optimum time to harvest to receive maximum nutritional value for cattle. He also demonstrated various agronomic techniques including the production of mixed forage crops and new forage varieties (e.g., alfalfa with higher nutritional value). In 2006, he replicated this demonstration plot in two different sites to facilitate wider coverage of farmers through Ag Progress Days.

### **Results**

Land under zero tillage increased from 100,000 to 500,000 ha under FTF assistance. The farmers reported that this technology increased their profitability by US\$20 per ha and improved soil structure while reducing erosion. This technology is currently used in Uzun Agash and Koksy districts of Almaty oblast, Merke district of Zhambul oblast, and Sairam district of South Kazakhstan oblast.

The Chief Agronomist of the Yassiavei Production Cooperative, Mr. Auvaskhan Babochodzhanov, replicated the bed-planting technique in his cooperative by planting wheat in raised beds for the last three crop cycles using a modified vegetable planter. In 2003, he planted wheat in raised beds on 5 ha. The bed-planted wheat yielded 3.8 ton/ha, whereas conventionally planted wheat (on a flat surface) yielded 2.4 ton/ha. In 2004, he planted 100 ha of wheat in beds which yielded 4.4 tons/ha, while the conventional method gave 2.5 tons/ha. The following year he increased the bed planted area to nearly 300 ha and since then has obtained consistently higher yields while cutting the seed planting rate by 44% at considerable cost savings.

As a result of these successes in multiple sites, agronomists are now exploring new options, including seeding wheat in permanent beds under zero tillage technology. They are also testing other crops like soybean, maize, and safflower in the raised beds.

The farmers have readily shared the information they received from the FTF volunteers with other farmers. Many neighboring farmers are attempting to replicate wheat bed planting techniques on their farms as appropriate bed planters become available. Also, local participants - government agricultural representatives, researchers, and farmers - held initial seminars and group discussions that were followed by field visits to see on-going wheat bed planting activities. During these visits, all the participants tested the bed forming and planting machinery and made suggestions for improvements or modifications.

### **Results through Flexible Assignments**

FTF volunteers completed 30 flexible assignments. FTF helped farmers' associations develop to improve services and increase group bargaining and lobbying power. Dairy farmers in the Almaty region created the *Farmer – 2030 Fund* named after the Kazakh national program designed to advance the country to one of the world's highest living standards by 2030. Volunteer Dale Dunivan trained leaders from 12 member farms on association creation and development, business plan writing, and fundraising, while attracting rural youth to engage in agriculture. Due to Dunivan's training and recommendations, the Fund created the School for Young Farmers and received a grant to open a 12-day summer camp for 20 children from the rural Almaty region in July 2008.

## **Kyrgyzstan**

During 2003-2008, FTF Kyrgyzstan focused its interventions on four main sectors: agro-processing, horticulture, water management, and association and organizational development. The program mobilized 154 volunteers, 122 in focus areas and 32 in flexible assignments in agribusiness, apiculture, aquaculture, dairy, energy, field crops, organic production, small ruminants, tree crops, and veterinarian services.

## Agro-processing

The agro-processing sector is an important part of Kyrgyzstan's economy accounting for 3%-7% of the country's GDP. However, processors face several challenges including a shortage and inconsistent supply of high-quality fruits and vegetables; factories operating at very low capacity with intermittent production; lack of investment capital for factories to upgrade to modern processing technologies; and ineffective marketing such as poor packaging making local products less attractive and harder to market than foreign imports. Finally, there is a lack of skilled managers who can oversee effective supply chain management, plant operations, distribution, and marketing of their products.

In spite of these obstacles, the last several years have seen the re-emergence of the agro-processing sector, demonstrated by the opening of two factories in Osh and Jalalabat in southern Kyrgyzstan. The factories' capacities are 3,000 metric tons (t) of tomato paste, 6,000 t of fruit concentrates, and up to 6,000 t of jams. These factories have created a growing demand for fruits and vegetables, prompting local growers to plant larger areas or to improve yields on existing farms. Furthermore, agro-processors want to reduce transaction costs by purchasing raw materials in bulk quantities from farmer groups. The best way to achieve this is to promote cooperation between commodity producers and suppliers and create linkages between the producers and the processors.

### *Strategy*

FTF Kyrgyzstan provided farmers with the skills to take advantage of opportunities emerging in the agro-processing sector. FTF strengthened this sector through trainings focused on improved product quality, consistent production levels, updated processing technologies, and brand development.

FTF formed partnerships with grower associations and other donor-funded projects. These partnerships helped access farmer groups and coordinate efforts with other programs. For example, FTF partnered with the UNDP's Poverty Reduction Program, sending 18 volunteers to work with self-help groups in Issykkul oblast in a variety of assignments, including the development of homemade jams. Partnering with the Rural Advisory Service (RAS) in Osh oblast, FTF volunteers introduced opportunities for drying fruits taking into consideration the limited resources of processors, particularly women farmer groups. FTF also partnered with the Association of Fruit and Vegetable Producers.

### *Activities*

FTF Kyrgyzstan worked with commodity producers and processing plants through 33 assignments in Osh, Issykkul, Jalalabat, Batken, and Chuy Oblasts as well as in the cities of Bishkek and Osh. Volunteers worked with apricot, apple, and pear growers to achieve better and more *uniform quality and supply to processors, upgrade existing processing technologies, enhance packaging, and improve food security*. Assignments enabled farmers to develop the basic technical knowledge and skills necessary for drying and canning fruits and vegetables. Volunteers provided assistance in tomato paste, ketchup, jam, and juice production. The processing plant Oregon in Barskoon village diversified its products after working with FTF volunteer Bill Schafer, who developed new formulas for rose hip jams and blackberry and sea buckthorn jellies. Furthermore, the plant improved the color of their apricot puree by adding ascorbic acid which prevents browning. Host organizations receiving volunteer assistance in cheese and ice cream production became familiar with the

management and technology to produce high-quality dairy products that meet western standards.

Follow-on marketing trainings addressed packaging, labeling, promoting new products, and *brand development*. Skillful brand management is necessary for successful promotion of canned fruit and vegetables in a sector offering unlimited opportunities for product diversification.

### **Results**

Over 1,500 farmers increased their knowledge and skills by attending trainings in fruit and vegetable storage. Seven medium-sized processors were trained in drying fruits and nine processors increased output by 10% per year over the life of project. Five processors finalized contracts with producer groups to supply commodities and thus developed a stable market for their products. Furthermore, 15 farms introduced the cucumber and tomato varieties needed by processors to meet market demand.

As a result of FTF technical assistance, the LLC Rahmonberdi processing plant in Osh oblast increased gross value of pickle sales from US\$8,000 in 2006 to US\$9,500 in 2008 while net income increased from US\$4,000 in 2006 to US\$5,600 in 2008. These increases resulted from introducing new packaging of 800 gram and one liter glass pickle jars.

### **Horticulture**

The market for fresh and processed fruits and vegetables is strong both within Kyrgyzstan and in the region. The agro-climatic conditions for horticultural production in Kyrgyzstan are

Cherry farmers who received FTF volunteer assistance in orchard management are investing their profits to expand their businesses. Twenty people, about one-fourth of the participants, have purchased vehicles to transport cherries from Uch Korgon to markets in Kyzyl-Kia.

excellent. However, there is a considerable weakness in the value chain for fresh and processed fruits and vegetables and in farm management practices. Many of those who are operating fruit and vegetable farms have insufficient knowledge of proper production practices and orchard management. Farmers lack access to market information needed to make sound management decisions. The lack of working capital keeps growers from upgrading and expanding their operations. Access to good quality seed and fertilizer is also a problem, as is severe scab/scale infestation of orchards.

### **Strategy**

FTF Kyrgyzstan strengthened the capacity and developed the skills of farmers to increase their productivity and the quality of their produce, while addressing the weaknesses in farm management and marketing that are stunting their operations.

### **Activities**

FTF implemented 51 assignments with fruit and vegetable farmers, nurseries, farm cooperatives, and farmer groups in the Osh, Jalalabat, Batken, and Issykkul oblasts. The *vegetable production* assignments, with an emphasis on tomatoes and cucumbers, addressed organic fertilization, irrigation, weed control, and pest and disease control, with the aim to increase productivity and vegetable quality. Some assignments also focused on marketing agricultural goods. Under *orchard management*, volunteers assisted the farmers on fruit

orchard maintenance practices, disease control, propagating and growing dwarf rootstocks, pruning, thinning, and fertilization. Volunteers conducted trainings in cherry orchard management with an emphasis on pruning and pest and disease control which helped farmers increase their yields, sales, and income. For instance, farmers from Uch Korgon, a member of the Tayan Social Fund, increased their yields from 30 kg to 100 kg per tree after receiving training on pyramid pruning, tree maintenance, watering and irrigation, planting requirements, and pest and disease control.

"The pruners and other equipment we received [from FTF volunteers] are now feeding us."

Chynubek Abdykerimov,  
Kyzyl-Alma Fruit Growers

Assignments also focused on apple and pear orchard production, management, and protection. Growers learned new skills and techniques such as pruning, bud grafting, and thinning. Host and apple orchard owner Strelnikov Vyacheslav Nikolaevich received training in orchard management including pruning, tree grafting, equipment

usage, and drip irrigation, and received recommendations on how to deal with specific problems affecting his orchard.

FTF also provided technical assistance in *flower growing*, including disease control and prevention, ventilation and moisture levels in greenhouses, temperature, storage, greenhouse maintenance, and bouquet making.

FTF volunteer Peter Pitts disseminated US\$2,000 worth of vegetable seeds donated by US seed companies during the trainings he conducted in Osh. Farmers were instructed on how to diversify their crop base and try new cultivars without significant risk.

### Results

Vegetable production per producer for a group of 86 farmers increased from 660 tons to 840 tons over life of project. Around 1,200 vegetable and fruit producers increased their marketable crops by 10%. More than 2,500 producers benefited from volunteer assistance and increased their sales by US\$949,400 and income by US\$716,700. In addition, 34 hosts reduced postharvest losses to 8% in 2008, down from 15% in 2003.

For instance, the members of the Kyzyl-Alma Fruit Growers Association witnessed a sharp increase in their apple production and profits after applying FTF volunteer recommendations in orchard management. The increase in profits has allowed the association members to rent an additional 340 ha for orchard production. They expect to employ 150 permanent and 600 seasonal employees once they expand to their new orchard.



Volunteer Ross Penhallegon demonstrating pruning techniques to farmers

Prior to FTF intervention, host Hudenko, a flower greenhouse in Issykkul, lost 40% of their yield to disease. As a result of implementing new recommendations, their greenhouse is now disease-free and rose stem height climbed from 60-70 cm to 80-90 cm, producing a more marketable product able to command higher prices.

Contributions of volunteer Ross Penhallegon had a far-reaching impact. Through four assignments, he trained 1,340 farmers from 16 villages in Issykkul in new orchard management techniques such as pruning, grafting, and thinning. Prior to his first assignment in 2005 only 10 ha of orchards in Issykkul were pruned. By 2008 that number increased to 2,880 ha, and apple production grew from 11 kg per tree in 2004 to 47 kg per tree in 2008.

## Water Management

Kyrgyzstan has vast amounts of water resources but faces great weaknesses in terms of its management and efficient use. One million ha of Kyrgyzstan's irrigated cropland suffer due to lack of funds and investment necessary for better maintenance of irrigation and drainage structures.

### *Strategy*

The focus of FTF assistance in the water management sector was to address the organizational constraints of Water Users Associations (WUAs). FTF complemented the efforts of other programs funded by the World Bank and Asian Development Bank.

FTF also collaborated with the USAID-funded Water User Association's Support Program (WUASP), implemented by Winrock International. WUASP is increasing the capacity of WUAs by providing the skills necessary to manage and improve local water delivery systems. FTF-funded water management activities decreased once WUASP started to avoid duplication.

### *Activities*

FTF strengthened the capacity of WUAs by providing technical assistance on all aspects of water management including financial management. FTF conducted trainings on association building, including WUA purpose, structure, and legal status. Assignments addressed fundamentals of recordkeeping, organizational structure, water distribution, fee collection, and water loss calculation of various canals. Along with other donor-funded projects, FTF promoted the concept that farmers in a single hydrological unit should cooperate to share the irrigation structure rehabilitation, operation, and maintenance costs.

Three volunteers conducted FTF assignments for the USAID-funded WUASP and provided assistance to the WUA Kara Dobo in Osh oblast, Myrza Suu WUA and Suuchu WUA Federation in Issykkul oblast.

### *Results*

Three hosts, WUAs Kara Dobo, Suuchu, and Myrza Suu, increased membership by 25%. Between 2003 and 2008, two WUAs increased membership dues collection by 40%. The overall knowledge and use by farmers of WUA principles improved significantly.

The Suuchu WUA Federation, with a total membership of 1,800 within three WUAs, is using the knowledge provided by volunteer Brian Boman to apply for grants and loans to develop a water delivery system in the area. Boman provided aerial photography depicting washed out areas, construction equipment recommendations, pH analyses of water from a mountain

“Thanks to the word ‘Winrock’, the government officials are taking the federation seriously.”

Irina Bratashova, General Manager of the Suuchu WUA Federation

source, and water flow measurements. Using this information, the Federation applied for a grant to the Water Management Department under the Ministry of Agriculture. Through the Council of Water Users Associations, the federation received a grant of US\$48,991 for

the construction of a water delivery system that will benefit 500 water users by improving the irrigation of 1,490 ha.

### Association and Organizational Development

The development of producer organizations in Kyrgyzstan is constrained by a limited awareness of market-oriented management principles among the leadership. The development of such groups requires a high level of trust, something lacking after decades under the Soviet system. Furthermore, the legacy of Soviet-style cooperatives, which offered their members little or no say in the activities or policies of the group, alienates people from joining. Although enabling legislation for cooperatives and producer associations exists, the laws do not recognize such entities as non-profits, and taxes them as for-profits. Also when donor funds are involved, people generally come together without specific goals or a purpose simply to form an organization to access grant funds, trainings, or other privileges without viewing the organization as a vehicle for change. There is often a tendency for leadership and decisions to be dominated by a single individual.

However, farmers have grasped the advantages of collective action. Individual farmers recognized the bargaining power gained by pooling their products and buying inputs, as well as by forging a united front on agricultural policy issues. Producer organizations already exist for specific commodities and for different geographic regions of the country. Many rural citizens understand the importance of associations as vehicles for economic development and for voicing their concerns to the government. Support for producer organization development on the part of government and donor organizations has resulted in many new grower associations and cooperatives.

#### *Strategy*

FTF Kyrgyzstan’s strategy in association development was to take advantage of the governmental support for these organizations by building the capacity of association leaders and members to manage associations and provide better services to their members. FTF Kyrgyzstan partnered with the Agency for Technical Cooperation and Development (ACTED). ACTED helped small groups of farmers to establish new agricultural cooperatives in Osh, Jalalabat, and Batken oblasts, while FTF volunteers provided business planning training. FTF cooperated with USAID implementers such as the Eurasia Foundation in Central Asia and USAID-funded WUASP, AgFin+, and AgLinks projects.

#### *Activities*

Throughout the life of project, FTF Kyrgyzstan focused its assistance in the association development sector on working with association management and staff in planning,

marketing, delivery of membership services, and expanding active membership. Volunteers completed a total of 35 assignments in this sector.

FTF volunteers worked with ACTED's cooperatives to develop their capacity in business planning and marketing, which was a central element for these cooperative to receive micro-credit from ACTED programs. FTF volunteers worked with the members of Association of Agribusinessmen of Kyrgyzstan (AAK) Jer Azygy to develop their management and selling skills, become familiar with soybean and soy oil production principles, and market opportunities for end-products. FTF assisted the Association of Fruit and Vegetable Processors (AFVP) in organizational development, promotion of an AFVP trade mark, and elaboration of a strategy for an AFVP promotion. FTF also worked with other hosts, such as Kyzyl Alma Fruit Growers Association, Chelpek Potato Seed Growers Association, Zarya Cooperative, the Association of Beekeepers of Issykkul Oblast, Seed Association of the Kyrgyz Republic, and the Women Handicraft Association.

### *Results*

Six producer associations increased membership by 15% by improving marketing and service delivery. Information and trainings delivered through the organizations resulted in increased revenue and profits for their members. For example, the AAK increased their revenues by US\$300 per ha through yield increases of 30-50 metric tons per ha.

With FTF volunteer assistance, nine members of the Chelpek Potato Seed Growers Association's Executive Committee learned aspects of preparing a formal business plan, including the Articles of Incorporation, bylaws, preparation of a balance sheet, income and expense reporting, and cash flow projections. With new skills, they now have run their organization more efficiently and have applied for grants with ADB and JICA. Also, 130 members of the Chelpek Potato Seed Growers Association increased net income by 43%.

FTF volunteer Alan Leo contributed to Aksy Beekeepers Association in Jalalabat oblast and Turgen Cooperative in Issykkul oblast. Like many associations and cooperatives in Kyrgyzstan, these two organizations were only on paper and basically inactive. Members of the Aksy Beekeepers Association learned how to increase profits by sharing costs and marketing their honey in bulk to central city markets. The association developed a business plan for the next three years.

### *Results from Flexible Assignments*

FTF Kyrgyzstan implemented 32 flexible assignments. For example, FTF worked with host NGO Barsem, which received a US\$6,200 grant from the Eurasia Foundation. The project will generate alternative income for people with limited abilities and for an orphanage through beekeeping. Grant funds paid for 45 bee hives, and FTF volunteer John Kennedy conducted training. The orphanage workers are now teaching young men and women beekeeping skills, providing them with vocational training in preparation for their future.

FTF also helped prevent animal diseases and increased the capacity of veterinarians. Kyrgyzstan has only about 700 veterinarians, well below the demand for approximately 5000 veterinarians and other specialists. Poor laboratory facilities and weak market testing and food security are additional weaknesses. FTF volunteer Bruce Olcott assisted the State Veterinary Department to develop a Comprehensive Strategic Plan, which will serve as basis for the development of a National Curriculum for the Improvement of Livestock and Human

Health in Kyrgyzstan. This plan outlines actions required to develop the skills of the country's veterinarians and ensure procedures are in place to combat the outbreak of various animal diseases and provide other essential services.

## Tajikistan

FTF Tajikistan implemented 132 volunteer assignments, 17 of which were flexible. Focus areas were agribusiness training, horticulture, dairy, and water management. Flexible assignments addressed production and value chain constraints in aquaculture, apiculture, beef and swine, small ruminants, veterinary services, field crops, and credit institution development.

### Agribusiness Training

Agriculture, one of the most important sectors of the Tajik economy, is still recovering from the dissolution of the Soviet Union and civil war. Despite poor infrastructure, the agricultural sector grew by nearly 4% in 1999, 36% in 2003 and 46% in 2006<sup>8</sup>. It now contributes roughly 27% to GDP, nearly one third of the country's export earnings, and accounts for nearly 67% of employment. The number of private farms and agribusinesses is increasing despite the lack of basic skills in enterprise start-up, production, and business management. FTF targeted the weakest links in the value chain – from farm gate to consumer. FTF worked with input providers, traders, and processors to improve productivity and quality, create market linkages, and expand value-added opportunities for Tajik agribusinesses.

#### *Strategy*

The sustainability of agricultural enterprises and organizations in horticulture, dairy, and water resources management ultimately depends on improved business management practices. The primary objective of this focus area was to train producers in basic skills of recordkeeping, decision-making, leadership, business and strategic planning, financial management, and marketing.

Agribusinesses in all sectors require a substantial input of technical assistance and capital to become financially viable entities. Dehkan farms<sup>9</sup> are overburdened with an 'informal mandate' on crop production, farm debt from the Soviet days, and current futures contracts<sup>10</sup>. Secondly, market linkages are weak, and the physical infrastructure for connecting agribusinesses to suppliers and buyers has poorly evolved, thus constraining expansion.

FTF Tajikistan assistance focused mainly in Sughd, Dushanbe, and Khatlon provinces. FTF selected these areas for their importance as agricultural production areas and their relatively

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<sup>8</sup> Tajik State Statistics Department

<sup>9</sup> Dehkan farm is an independent managing subject carrying out its activities being not a legal person and based on individual business of a person, or members of the one family and other citizens jointly producing agricultural commodities on the basis of the plot of land and other properties being in its possession. (*From Law # 48 on Dehkan farm, Tajikistan*)

<sup>10</sup> Futures dealer or contract in Tajikistan is a type of transaction where futures dealers advance farmers with necessary production inputs and in return, the farmers are obliged to deliver agricultural produce at a specified price and on a specified future date.

large, concentrated population centers. FTF complemented Mercy Corp's and other NGO agricultural development activities throughout Tajikistan.

### *Activities*

FTF Tajikistan primarily focused volunteers' expertise on business plan development and conducting basic market analysis to determine demand for agricultural products and available market resources for agricultural inputs/services. Assignments addressed the following topics through a series of training programs:

- Business planning including market potential, cost/benefit analysis, and strategy
- Agribusiness capacity assessment including farm production capacity meeting current and future business requirements in a cost-effective way
- Agricultural enterprise sustainability analysis
- Human, physical, and natural resource management
- Recordkeeping

Volunteers took a comprehensive approach to agribusiness development. These assignments involved several experts, one of whom would initiate a cost/benefit analysis of the host, while other experts would address cash flow planning, market research, or production capabilities. For example, Khamzaev Dehkan farm received business plan assistance from David Pearce while simultaneously another volunteer, Wayne Williams, conducted pest management and pruning training for the host to improve marketability of apricots for the Russian market. These technical areas included enterprises in mushroom production, apiculture, beef, swine, aquaculture, and field crops.

FTF actively pursued cooperation with local and international partners, such as World Bank, the Canadian Center for International Studies and Cooperation (CECI), and other USAID agricultural development projects capable of providing capital and other inputs that could be leveraged with FTF technical assistance to create and enhance sustainable enterprises.

### *Results*

During the past five years, FTF completed 29 volunteer assignments in this focus area. Volunteers trained 1,481 farmers and agribusiness entrepreneurs, 26% of whom were women. These assignments resulted in a US\$147,399 increase in annual gross sales and an US\$79,550 increase in net income of participating hosts.

In addition, 50 primary and secondary hosts have started new businesses (e.g., entrepreneur Mamadnazarova started a fruit and vegetable canning business) and expanded existing ones (e.g., a beekeeping farm Istamjon opened a honey shop in Dushanbe City in 2007). Forty hosts have developed business plans and are now applying to the government and international donor funding resources (e.g., entrepreneur Mamadnazarova obtained a US\$2,000 bank loan for her fruit and vegetable canning business).

Implementation of a strategic business plan developed for a dehkan farmer Safarбек Kitobiddinov (15 ha) by volunteer Bob Reel in 2005 helped the farmer repay a US\$20,000 debt inherited from the Soviet days. Moreover, the farmer purchased a tractor and started procuring the required inputs and services independently from futures dealers who offer their extraordinarily expensive services to Tajik farmers.

Skills and knowledge acquired through trainings and consultations delivered by volunteers David Pierce and other volunteers on marketing strategies and crop management enabled Khamzaev Dehkan farm, an apricot grower from Sughd Region, to increase sales. The assistance specifically resulted in a US\$250,000 contract with Russian customers to deliver 80 tons of fresh and 15 tons of dry apricots, compared with pre-FTF intervention sales of US\$1,300 in the local market.

According to several hosts, FTF interventions in assisting farmers with business plan development occurred at the most opportune time. The Tajik government had just introduced a package of new legislation<sup>11</sup> in 2008 that would allow Tajik farmers to apply for bank loans on the basis of a business plan submitted for the bank commission's approval.

## Horticulture

Horticulture is one of the major sectors of Tajik agriculture, utilizing significant portions of arable land and constituting 16% of GDP. Market potential exists both locally – in the large market centers of Dushanbe, Khujand, Kurgan-Tube, and Kulyab – and internationally, especially in European Russia and Siberia. Most farmers have small household plots, which are conducive to raising high-value crops in greenhouses and orchards.

Although Tajiks have traditionally been strong horticulturists, nowadays there are many families with little or no knowledge or experience in horticulture who need to learn 'on the job' how to grow enough fruits and vegetables for their own consumption and for the market. FTF focused on production, processing, and marketing of fruits such as apples, apricots, and grapes, and greenhouse vegetables such as tomatoes and cucumbers. There was also an unmet demand for mushrooms, particularly in the north, due to the lack of knowledge about mycelium spore production, critical to the mushroom cultivation.

### *Strategy*

In Tajikistan, horticulture serves as an alternative to cotton production. In this sector FTF supported greenhouse operations, orchard management, mushroom growing, various horticulture production issues such as crop management and input supply, processing issues related to value-added product standardization and sanitary/attractive packaging, and marketing of horticultural products. The main objective of this focus area was improving food security and incomes by enhancing productivity of fruit and vegetable farms.

Constraints to the development of a vital horticulture industry includes inadequate and outdated husbandry skills that contribute to sub-optimal yields, shortages of high quality inputs and supplies, poorly organized wholesale/retail market linkages, lack of infrastructure for perishable products, and non-existence of a product grading system and quality standards. Tajik farmers lose nearly 40% of their fruit and vegetable harvest because of spoilage.

The geographic focus of FTF activities has been mainly in Sughd and Dushanbe regions. FTF selected these regions for their importance as major horticulture production provinces.

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<sup>11</sup> Resolution No.111 on "Plan of measurements to solve the debt problems of Dehkan Farms" and Resolution No.312 on "Regulation of debts of cotton growing farms and improvement of financial conditions of agricultural commodity producers"

### *Activities*

FTF volunteers assisted farmers with horticultural crop production, storage, and processing technologies. In Dushanbe and Sughd regions, FTF conducted assignments on fruit and vegetable production, greenhouse management, and mushroom growing. FTF assistance to this sector combined a strong base of traditional knowledge and the introduction of modern methods of fruit and vegetable production, processing, and marketing. FTF identified and focused its interventions on small-scale ‘model’ producers and processors in several communities who could demonstrate the utility of volunteers’ recommendations to their counterparts. FTF activities at Khamzaev Dehkan farm attracted 20 other apricot farmers in the area who later partnered with Khamzaev farm to export Tajik apricots to Russia.

FTF transferred horticultural technologies and skills through a series of on-farm trainings and practical sessions on various topics including pruning/propagation techniques, pest and disease control, nursery husbandry, fruit quality and yield increase, greenhouse management, hybrid tomato husbandry, soil analysis and methods to increase soil fertility, fruit and vegetable processing, and marketing, including product grading and standardization.

In the southern and central regions of Tajikistan, FTF conducted several partnership assignments with International Finance Corporation (IFC) on greenhouse management. The FTF volunteers emphasized innovative heat-efficient greenhouse designs to revive declining greenhouse production due to the high cost of heating fuel and unreliable electricity, simple methods of soil fertility improvements, drip irrigation, crop rotation, new varieties of tomatoes and cucumbers, and production of non-traditional crops.

### *Results*

FTF Tajikistan completed 44 volunteer assignments in this sector, which benefited 1,758 farmers, 35% of whom were women. Because of the FTF interventions, the sector achieved a US\$387,600 increase in annual gross sales and a US\$177,000 increase in net income.

FTF assistance resulted in 20 fruit and vegetable producers in the Sughd Region increasing production to more than 3 tons per ha from the baseline level of 1.5-2 tons per ha, as well as improving produce quality. Moreover, 10 targeted producers reduced postharvest losses by more than 500 kg per ha due to improved production, harvest, and storage practices.

A newly opened tomato processing company Geha Food, with a plan to bring its processing capacity to 75,000 tons of hybrid tomatoes annually, requested FTF help to train local farmers on growing hybrid tomato varieties. FTF addressed improved production techniques including growing tomato seedlings in plastic cassettes and machine transplanting into the open soil and linking farmers with input suppliers. The production and processing of hybrid tomatoes started in 2007.

In cooperation with the USAID-funded WUASP project, volunteer Martin Connaughton introduced greenhouse technology and high-value crops of early tomatoes and cucumbers to members of the WUA Chirik in southern Tajikistan. More than 20 members started to grow tomatoes and cucumbers applying the volunteer’s recommendations. This resulted in the creation of new jobs, improved rural livelihoods, and the development of a customer base from local markets. Additionally, the host received a US\$1,000 grant to help finance construction of a model greenhouse which is now being used to demonstrate greenhouse techniques in the region.

The Khujand Branch of Technological University of Tajikistan (KbTUT) requested FTF assistance with mushroom production, more specifically with a technique of mycelium production, which before FTF's intervention had to be imported from Uzbekistan. The assignment resulted in the first production of mycelium and mushroom spores in 2006. The production grew to 14 rooms designated for mushroom spawn growing. The five pioneers of this project headed by Dr. Thomas Saifulloev trained 30 KbTUT students and distributed 35kg of mycelium free-of-charge to their family members with the purpose to propagate mushroom production. Currently, Dr. Saifulloev is considering developing a small mushroom processing plant to supply northern and southern markets with both fresh and processed mushrooms.

## Dairy

The Tajik dairy sector fell into decay during and after the years of civil war. The productivity of individual herds declined due to poor herd management and lost potential of genetics and forage resources. The majority of dairy cattle (90%) belong to individual households (2-3 cows per household) who keep cattle as means of investment and for additional household income selling dairy products.

The main problems hampering milk productivity are the lack of proper feeding rations and poor forage production. Tajik farmers cannot afford expensive imported feed concentrates from Russia, and local concentrates do not exist in Tajikistan. These subsectors of the dairy industry require large investments to develop locally.

Recent trends show positive signs of revival in the sector. One hundred new AI centers are opening throughout the country with a potential to cover 15% of total heifers in Tajikistan. Several private dairy farms (20-100 cows per farm) have appeared as well.

### *Strategy*

Dairy is an important source of protein to combat malnutrition in rural areas of Tajikistan. FTF's primary objective in this sector was to increase productivity through genetic improvements, proper feeding ratios, and proper herd management including disease control. A secondary objective was to promote milk processing capacity in Tajikistan.

FTF built a partnership with the Republican Center of Livestock Biotechnology (RCLB) established by the government of Tajikistan in 2003 to improve national genetic material for sheep and cattle. The RCLB requested FTF to train local AI technicians and to acquire new genetic materials and needed equipment. The advantages of cooperation with the Center were access to the leading genetics expertise in the Republic led by Dr. Sharofjon Rakhimov, a Cochran Exchange student in 2005, the centralized AI center and its capacity to disseminate genetic improvements to farmers through its experimental dairy farm near Dushanbe, and satellite AI centers throughout the country.

FTF also identified individual farms that used the services of the RCLB with substantial numbers of livestock (10-100 head), and with whom FTF could demonstrate genetic improvements to other farmers through modern AI methods and embryo transfer.

FTF worked mainly in the Dushanbe and Sughd regions, where most dairy farms, forage land, and processors are located there.

### *Activities*

FTF organized training sessions and practical demonstrations for farm managers, regional AI center operators, AI technicians, and relevant government officials on modern AI methods using the 0.5 ml *French Medium Straw*; embryo transfer; improved feeding rations and development of forage production with improved agricultural practices and new forage varieties; improved management of dairy farms; dehorning methods; and new product development and food safety issues. Volunteers addressed livestock management covering all components of the production cycle, from adequate forage production to analyzing production records and selecting the higher producing heifers, as well as introducing rapid milk cooling techniques.

To assist RCLB with setting up AI centers throughout the country, volunteers helped develop business plans for the establishment of private AI centers among local entrepreneurs and dairy farms that had the physical and human capacity for AI services. The program targeted small- and medium-size dairy farms (20-100 head) such as Karim Ismoilov dairy farm in Vahtatobo, Firdavsi dairy farm in Rudaki, and Khamzaev Dehkan Farm in Sughd.

With regard to dairy processing, several small- and medium-sized cheese and ice-cream factories in Dushanbe and Sughd received assistance. Volunteers assessed existing capacity and made recommendations on how to replace old equipment and upgrade processing technologies to produce new and higher quality dairy products.

#### *Small-Scale FTF Intervention Changes Rural Livelihoods in Vahtatobod*

The life of Khurshed Davlatov, a refugee from Gorno-Badakhshan, changed after FTF volunteer Kevin Dennis's visit to Karim Ismoilov dairy farm. Working as a veterinarian for the dairy farm, Davlatov was one of the poorest among the villagers. Now, as a supplement to his farm salary, he makes \$14 per cow in his private AI center servicing 800 village households. One of his significant contributions in promoting AI methods was his training of an 18-year old Tajik woman Gulandom Hafizova. Hafizova became the only known female AI technician in Tajikistan. She initially became interested in this male-dominated profession after she was introduced to Stephanie Garlich, a female FTF volunteer visiting Tajikistan for AI training. Hafizova received a one-week training from Davlatov in February 2007 and since then she has been assisting him in his private AI center. In August 2008, Hafizova participated in an inter-regional competition for AI where, after demonstrating her theoretical and practical skills in modern AI technique, she placed second and was the only female participant among 12 male AI technicians. She was awarded pre-selection status to participate in a National AI competition.

### *Results*

FTF completed 24 volunteer assignments targeting 17 primary hosts and 19 secondary hosts. A total of 793 farmers/entrepreneurs and AI operators received training and technical assistance, of which 36% were women. Over the life of the project, these assignments contributed to a US\$164,700 increase in gross sales and an US\$79,900 increase in net income of participating hosts.

Since 2005, an experimental dairy farm of RCLB has conducted eight field days a year for 15 people at a time to share the experience acquired from FTF volunteers on feeding rations, crop rotation on dry and irrigated land (including new forage crops such as rape seed), and forage processing. The experiments conducted on this farm showed that

even with minimum improvements in feed rations and forage quality, the milk yield can increase 33% from 1,500 to 2,000 liters per cow per year.

As a result of FTF efforts, World Wide Sires donated 510 units of US cattle semen and 12 AI kits to RCBL. World Wide Sires also sent regional representative Tony Evangelo to assist FTF volunteer, Dr. Neil Tucker, to train and conduct demonstrations on modern AI techniques.

According to the Director of RCLB, Dr. Sharofjon Rakhimov, 90% of dairy farmers in Khatlon Region have switched to the new AI method. Eleven AI technicians trained by RCLB on the new AI method now serve 16,000 households and 21,000 cows a year. On average, prior to FTF assistance, the average calf weighed 20 kg at birth. After FTF interventions, calves weighed 35 kg on average. This result of improved genetics was made possible through FTF cooperation with the US-based World Wide Sires Company to import Holstein semen.

An impact survey conducted in August 2008 showed that AI conception rates increased dramatically as a result of improved delivery practices. Before FTF intervention, the average conception rate ranged between 35-50% while after intervention rates increased to a reliable 80-90% among targeted FTF hosts. According to several hosts, the improved conception rate would be even higher if US semen straws were available (the 80-90% conception rate was achieved with Russian semen).

There are significant advantages of the modern AI method, including the reliability of conception, improvements in recordkeeping through printed information on a plastic straw, no need for repeated insemination and the use of hormones, and most importantly, cutting costs by about US\$7 per cow. In 2007, Karim Ismoilov farm obtained 87 calves from 100 cows by applying modern AI method using Russian semen, compared to 50 calves obtained from 100 cows under the previous AI method in 2003.

## Water Management

Irrigated agriculture is critical to livelihoods in Tajikistan, where it accounts for 90% of crop production. Poor irrigation management represents a major constraint to improve yields and farm profitability. Nearly defunct irrigation and drainage infrastructure was built to serve large farms, rather than the smaller farms emerging from land reform. The development of WUAs to facilitate cooperation on irrigation issues is considered by water users and policymakers as key to improving agricultural productivity.

### *Strategy*

For many producers, improvements in farm management, production practices, and business planning, will be only marginally effective without improved irrigation. FTF primarily targeted existing and newly formed WUAs willing to take over irrigation and drainage network management transferred from the government and recognize farmers' cooperation as the most appropriate mechanism for equitable water distribution.

FTF partnered with ACTED, CECI, CARE, and local NGOs that had the financial capacity to assist WUAs with physical rehabilitation of irrigation and drainage infrastructure and procuring on-farm water management equipment, while FTF conducted trainings and

consultations focused on improving existing irrigation methods and introducing innovations needed to achieve more effective and efficient water delivery.

Considerable FTF assistance was delivered through WUASP with the focus on training water users how to share water and ensure timely water delivery to both “head” and “tail-end” users along the distribution canal. In addition, since WUAs suffer frequently from a lack of financing, FTF also emphasized cooperative marketing and purchasing as a tool for creating new sources of income for the WUAs, as well as developing the bargaining power of farmers when dealing with various customers and suppliers.

### *Activities*

To promote *WUA institutional capacity building*, training sessions focused on leadership skills, participatory approaches, democratic governance, WUA purpose and structure, and legal status. FTF volunteers also trained water users and WUA technical personnel on how to develop a water use and distribution plan, hydrology, and timely operation and maintenance of irrigation and drainage infrastructure.

#### FTF Helps Resolve Water-Related Conflicts

While water is key for growing crops, not all farmers have equal access to this valuable resource. FTF volunteer Robert Morris, a WUA expert, assisted farmers from Shohon-1 farm in Sufy-Orif village to establish a WUA in 2007 to resolve water conflict between the ‘head’- and ‘tail-end’ water users for 30 ha of irrigated wheat and 10 ha of irrigated almond trees, vineyards, and pastures. During the training session, Morris emphasized the importance of expanding WUA into a Western-style cooperative for marketing, purchasing, and services. As a result, the WUA members are considering ways to expand existing WUA along cooperative principles, which will provide cooperative members with the bargaining power in the market of inputs and services.

Under *on-farm irrigation management*, FTF trained and demonstrated irrigation scheduling, efficient and modern irrigation technologies (drip irrigation, pivot irrigation, etc.), benefits of laser leveling, water measuring, and ways to determine crop water requirements.

The FTF activities in this sector focused primarily on Sughd region, while the USAID-funded WUASP intensively covered the southern part of Tajikistan.

FTF Tajikistan completed three partnership assignments with ACTED. During the first assignment, two WUAs, Ravot 1 and Ravot 2, were established in Kanibadam District of Sughd region with 1,450 total beneficiaries (650 female). During the second round of assignments, FTF provided assistance in establishing a water

distribution plan for the next irrigation season. The volunteers cooperated with local experts in optimizing water delivery, improving crop selection, and helping develop a socially and economically acceptable fee for irrigation water. Currently water users pay dues of US\$6 per ha annually to the WUAs.

FTF implemented partnership assignments with CECI in support of WUAs in the Sughd region. FTF volunteers trained 10 agricultural consultants now employed by CECI to provide extension water services in five districts (Moscho, Zafarabod, Spitamen, Konibodom, and Jabor Rasulov), with 230 dehkan farms receiving technical assistance in water management issues.

### **Results**

FTF Tajikistan completed 18 volunteer assignments targeting 14 primary and 7 secondary hosts. The program provided direct technical assistance to 2,937 WUA members, 39% of whom are female.

Thanks to FTF intervention, the level of participation of farmers in WUA decision-making process increased to 90%, as compared to 0% participation prior to FTF involvement. Moreover, 80% of WUA members now understand their membership rights and obligations and regularly pay their WUA fees. These assignments led to a US\$93,000 increase in annual gross sales and a US\$37,000 increase in net income through greater production and lower costs made possible through improved water distribution.

Moreover, the program achieved considerable socioeconomic gains. For example the Community Women Organization (CWO) Saodat, based in Khujand, requested FTF to bring a volunteer with an irrigation engineering background to design a water-intake point which would convert 50 ha of dry land into irrigated farm land. The recommendations and drawings of the water-intake by the FTF volunteer were implemented by CWO with a grant received for this purpose. As a result, the water from this water-intake improved the livelihoods of a group of women who later established dehkan farm Saodat which in 2007 produced 55 tons of wheat earning US\$8,000 – a direct impact of obtaining water for their land. The indirect impact of FTF was the increase of their socioeconomic status in their community.

### **Turkmenistan**

FTF Turkmenistan implemented 77 volunteer assignments. Key focus areas were organizational development and veterinary services.

#### **Organizational/Youth Development**

A major problem in the organizational/youth development sector in Turkmenistan was the cumbersome process of registering cooperatives and youth groups. A presidential decree in 2003 enabled the legal registration of cooperatives and associations as a new form of unions; however farmers' groups located in remote areas, while accepting the value of cooperation and its benefits, found the registration process tedious and gave up before completion. The most persistent farmer groups introduced a new form of cooperative identifying it as a license-holder partnership, defined as a number of farmers obtaining a license for an agricultural production business that provided them the right to export agricultural products and to sign contracts acting as a farmer unit. The unending constraints of legal registration of farmer cooperatives, associations, and agribusiness economic entities drove farmers and entrepreneurs willing to work together to form unregistered farmers' groups based on mutual trust.

#### **Strategy**

FTF assistance enhanced management of the organizations while expanding their membership services, especially information distribution and training. Trainings for members focused on food processing, on-farm production, and business/enterprise development. In youth development, efforts concentrated on establishing Future Farmers of Turkmenistan (FFT) groups to conduct supervised agricultural projects and entrepreneurial business trainings.

While the number of farmer's associations (former kolhoz and sovhoz) and other types of agribusiness groups and enterprises decreased from 700 in 2000 to 600 in 2005<sup>12</sup>, the number of personal household plots rose by 15% as they were replacing state and collective entities. The new farmers recognized the advantages of pooling resources to buy inputs as a group, as well as selling their produce. In Turkmenistan, many inputs are not available for purchase by individual private farmers. They banded together to pursue common interests that affected both their geographical regions and their commodities. However, in some farmer unions' the old concept of cooperatives dominated and members still expected someone to make decisions for them. Former government youth organizations are very interested in youth agricultural programs, but have little or no funding to support efforts.

### *Activities*

The initial FTF technical assistance focused on enhancing management of farmer organizations - cooperatives, associations, farmers' partnerships, and unregistered farmer groups - and effective delivery of training and other services to their members. Thirty-eight assignments provided technical assistance in fruit/vegetable and meat processing, dairy and macaroni production development, women's crafts business development, credit management, and greenhouse farming improvement.

FTF assisted existing cooperatives and farmer associations with business and enterprise development to improve their production and processing technologies. While FTF supported the organizational development of the few official and legal farmer unions, it also supported the informal cooperatives and farmer groups in recognition of the difficulties in registering cooperatives and associations. The technical assistance focused on proper sharing of limited, collective resources and the power that accrued to their membership. When the legal rights of cooperatives in Turkmenistan become more clearly defined and accepted, these existing cooperatives will be well positioned to serve as models for other organizations.

Youth groups provided similar benefits to those of cooperatives, but the ideas formed through their activities were more likely to be incorporated into the attitudes of the young members. Through participation, these future leaders and managers of the country gained an understanding and appreciation of collective actions and self-empowerment, as well as gaining skills needed to assume responsibility and leadership roles in their family, careers, and community.

To achieve long-term sustainability and profitability for emerging farmer groups or enterprises FTF placed a high priority on sequential assignments that built upon previous work with the hosts. For example, assignments upgrading wool processing technology and dyeing as well as introducing new embroidery techniques helped rural women's groups produce modern handmade wares using traditional patterns and fabrics. The project deeply impacted two innovative hosts by enhancing their member's income opportunities. Through repeat assignments, FTF volunteers developed an even stronger working relationship with their hosts and in some cases became their business partners.

FTF also provided volunteers and technical support to enhanced activities the USAID-funded Agriculture Improvement in Turkmenistan Project and Counterpart Consortium's

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<sup>12</sup> Statistical yearbook of Turkmenistan for the period of 2000-2005

Community Empowerment Program to support producer organization development. FTF provided trainings on improved fruit and vegetable production, meat and dairy processing, greenhouse development, and fodder crop and feed production.

In the cooperative/youth group development sector, linkages with major partners such as the United States and British Embassies, Counterpart Consortium, OSCE, TAGT Farmer Producer Cooperative, and Ilkinjiler License Holder Partnership played a significant role. The British Embassy provided financing for FFT chapters to make the students' small businesses sustainable. Volunteers mentored FFT groups in three major agricultural regions - Ahal, Mary, and Lebap.

FTF activities primarily focused on three geographical areas - Ahal, Mary, and Dashoguz – and gradually expanded to include the Balkan region.

### *Results*

FTF strengthened registered agricultural cooperatives and economic entities, and 13 farmer groups presently organized under the umbrella of existing ones, such as TAGT agricultural producer cooperative in Gorogly etrap (a second tier administrative division) and Ilkinjiler License-holder Partnership in Bairam-Ali etrap.

The program helped develop tools for agricultural organizations to increase cooperative income, sustainability, and membership. Volunteer assistance to the Dashoguz cooperative taught them budgeting, product marketing, recordkeeping, and expanding retail offerings, all aimed at increasing profitability for its members. By fostering agricultural support services through rural Farmers' Resource Centers established by TAGT Farmer Cooperative and Ilkinjiler farmer support organization, as well as by diversifying products, FTF helped farmers gain a better return on their investments.

Consulting and skills training delivered through host organizations resulted in more than US\$37,100 in income directly impacting more than 1,100 beneficiaries. Approximately 160 women received the formal training on small business development including handicraft beading, dyeing and wool processing techniques, advertising, and product marketing. Half of the participants were able to increase the gross value of product sales by 60% shortly after the assignment.

After attending a series of FTF trainings in 2003 on subjects such as cooperative business economics and cooperative credit, a group of Geokdepe farmers established the Sahy Jepbar Farmer Producer Cooperative and completed their registration in 2004. Along with co-op activities they formed an Association Credit Board that managed a total of 15 loans from the fund during the first year. FTF assisted many cooperatives such as the TAGT Farmer Productive Cooperative and Ilkinjiler License-holder Partnership to expand their credit funds and obtain funding from other sources. The cooperatives demonstrated their community involvement by sponsoring the FFT youth organization at its initial stage of development and community and farmer resource centers in the buildings where they had offices. The experience gained by board members and credit committee members in administering and overseeing the fund enabled members to more effectively deal with commercial banks to acquire larger loans.

Though the economic activity in the private agricultural sector of Turkmenistan continues to be affected by the local authorities and its scale limited by legislation, FTF achieved significant impacts with private farmers, farmer cooperatives, and small- and medium-sized agribusinesses. Results have appeared through the organizational development assignments where members of five host farmer and agribusiness organizations increased their sales by 1.7 times resulting in an annual net income increase of more than US\$12,000. As another example, farmers' understanding that good healthy soil reduces pest problems by increasing crops' ability to withstand various stresses inflicted by pests and the weather, as taught by the FTF expert, resulted in 70% average gross sales value increase in Dashoguz region and more than 30% in Mary region.

### Veterinary Service

Although nearly every rural household in Turkmenistan has some animals for family consumption, veterinary services were rarely if ever used. Farmers were not accustomed to paying for veterinarian services and even if so inclined, lacked access. They practiced traditional folk medicine and did not feel the need for modern veterinarians. Of particular concern was a lack of veterinary care that could identify problems, such as foot and mouth disease, in a timely manner. Even if diagnosed, treatments were unavailable to control its spread. Preventative measures to avoid disease were not well known or understood.

#### *Strategy*

Nine assignments in Turkmenistan strengthened livestock extension service development, veterinary viral diagnostics service, animal disease prevention, animal nutrition, and dairy processing. In the veterinary service sector, the FTF focus was divided between the assistance to the private livestock, sheep, and poultry sectors and support to the State Veterinary Service Department to improve their staff knowledge and skills on contemporary methods and approaches to veterinary medicine. The volunteer assistance to those involved in both private and state sectors of veterinary care was to educate, demonstrate, and provide hands-on training on cattle farms in treating and preventing widespread diseases as well as dehorning cattle.

The State Veterinary Service and the British Embassy remained FTF's primary partners. All major state veterinary service offices in the country worked in close cooperation with the FTF Program and regularly approached FTF for technical support. The British Embassy donated two fecal testing kits to be used as training tools for veterinarians to do field diagnoses.

#### *Activities*

FTF increased the sustainability of private veterinary services by improving veterinarians' ability to diagnose and treat viral diseases and parasites. FTF presented models of private veterinary enterprises used in the US and elsewhere to local veterinarians and helped link them to local veterinary supply sources. Volunteers conducted countrywide seminars, trainings, and workshops on veterinary viral diseases, diagnosis service improvement, and disease prevention. Clinical and laboratory diagnosis trainings were conducted in four out of five major regions of Turkmenistan.

FTF assisted in improving livestock nutrition (by feeding high protein ingredients such as soybeans) while reducing the environmental degradation caused by indiscriminate grazing of

desert plants, and reducing morbidity among livestock through more timely and precise diagnosis/treatment services.

### *Results*

Recommendations and trainings provided to FTF clients, interested private practice veterinarians, and cattle producers in four country regions on livestock disease treatment and control promoted an increase in their annual net income of 20%. The eight hosts within the veterinary service development program increased annual sales by more than US\$31,000 as a result of implementing volunteer recommendations.

FTF activities in this sector improved quality and outreach of veterinary services. The number of livestock in the country significantly increased due to the reduction of premature livestock deaths from one head over three-year period to one head over a four-year period in three target regions. Approximately 75% of livestock producers in three target regions were educated in most prevalent and lethal livestock diseases.

More than 800 veterinarians, laboratory technologists, and livestock and poultry producers directly benefited through technology transfer and improved their businesses making them sustainable and profitable. Extensive brochures and manuscripts were developed with current information on mad cow disease, rinderpest, and other animal diseases. More than 2,400 indirect beneficiaries developed a new awareness of the potential of serious outbreaks and endemics of ruminant viral diseases, diagnostic efforts and techniques that would be needed to determine the presence of these diseases, and measures that could be used to eradicate or control them in the indigenous animal populations.

As a result of FTF, nutrition of livestock and poultry improved significantly. Volunteers helped develop and put into practice charts that visually represented the nutritive values of the common feedstuffs used by the farmers and that showed the nutritive needs of different types of livestock at various sizes and stages of production. It became obvious that if the farmers could see the nutritive and financial value of a particular feedstuff in comparison with other alternatives it would help them understand the reasons for feeding balanced rations and aid in the decision-making process that they faced daily.

The FTF activities on veterinary viral diagnosis service helped to enrich the hosts' knowledge on preventing, identifying, and curing trans-boundary diseases of livestock and helped to elevate the level of livestock health care and production. It increased annual net income by US\$9,400 for FTF beneficiaries. The time needed to identify livestock diseases fell from nine to two days through training the local veterinary service staff to apply a new ELISA diagnosis method.

## **Uzbekistan**

FTF Uzbekistan completed 38 assignments in farm management training, producer organization/association development, and water management. The program also completed 23 flexible assignments which addressed production and value chain issues in aquaculture, dairy, poultry, field crops, horticulture, and agribusiness. These assignments allowed FTF program to continue their association development initiative and strengthen the institutional capacity of the farmers' associations through improving farmers' production capacity.

## Farm Management Training

The central government management style was inherited from the former Soviet Union. The production of fruit, vegetables, dairy, beef, and poultry mainly takes place in the traditional private household plots (0.1-0.5 ha), while the production of cotton and wheat (75% of arable land) is under tight government control. A 2003 Presidential Decree on reforms in agriculture restructured more than 177 shirkat farms<sup>13</sup> into small- and medium-size cotton/wheat farms (up to 100 ha). Additionally, this decree prompted the emergence of a number of private agribusinesses such as fruit and vegetable growers, greenhouse producers, and dairy and poultry operators.

### *Strategy*

FTF focused on newly privatized farmers who were farm laborers before the 2003 agricultural reforms. These newly franchised farmers did not think of agriculture as a business and did not understand the new laws and decrees or what land and farm rights they possessed. They also lacked basic skills related to farm production, management, and marketing. FTF primarily targeted fruit and vegetable growers, dairy and poultry owners, and greenhouse producers. Moreover, FTF provided support to private agribusiness entrepreneurs involved in processing, marketing, and distribution.

#### New Tomato Varieties with Export Potential

A short but fruitful collaboration between Dr. Ravza Mavlyanova, the World Vegetable Center regional coordinator for Central Asia and the Caucasus, and FTF volunteer James Burleigh during a training program in Andijan region, resulted in the introduction of 30 new tomato varieties for variety tests in Uzbekistan. Burleigh invited Mavlyanova to assess the capacity and needs of tomato growers and assist with training programs addressing the results of the assessment. The assessment showed that the growers needed new tomato varieties for drying purposes for the Russian market. These new varieties for Uzbekistan were selected from the World Vegetable Bank that comprises the best vegetable varieties of the world. The new varieties will be tested 4-5 years before commercial distribution among Uzbek tomato growers.

Through partnerships with Academy for Educational Development (AED) and Israel's Center for International Cooperation (MASHAV), FTF developed a private farmer training initiative, which included farm management, legal, contractual, financial, and marketing topics. USAID/CAR requested FTF to provide volunteer technical assistance to AED in developing a pilot training program for the new farmers at the request of the Uzbek Ministry of Agriculture and Water Resources (MAWR).

In February 2004, 12 Uzbek trainers departed for a two-week training program in Israel on general farm management and

agricultural legal issues. Upon their return, they formed the core of a group of trainers to work with FTF volunteers in providing training programs and contribute to the sustainability of the farmer's training programs during and after FTF activities in Uzbekistan.

### *Activities*

FTF organized the general agricultural training programs into farm and production management (including tomatoes, cucumbers, potatoes, vineyards, fruit and non-traditional vegetables), processing, marketing, and the legal education of private farmers and entrepreneurs.

<sup>13</sup> An agricultural production cooperative created in 1993, a prototype of an old Soviet collective farm

The majority of assignments targeted large groups of farmers and entrepreneurs through the following primary hosts: Andijan Networking Center - a private NGO in Andijan Region; Ardoneti Consulting Group and Agro-Hamkor Learning-Consulting Group in Fergana Region; Madadkor Farmer's Association in Samarkand Region (extension networks established by Mercy Corps); and the Associations of Business Women in Fergana, Djizzak and Bukhara Regions.

In 2004, local NGO NCKD, nurtured by FTF Uzbekistan, trained 1,800 newly privatized farmers on land tenure issues including rental and production contracts and basic legal rights of farmers and the rural population. The MAWR joined this effort and published a booklet in Uzbek describing the training topics. The publication of the booklet was an important event in a country where information is limited and highly censored.

With FTF assistance, NCKD also became the primary organization that conducted training programs on Integrated Pest Management (IPM) under the Michigan State University IPM Collaborative Research Support Program (IPM CRSP). The goal of the collaboration was to set up an IPM extension service for farmers on issues of environmentally sound pest and disease control in agricultural production.

FTF volunteers Dr. Julio Navarro-Monzo and Eric Spilde assisted hundreds of greenhouse operators in the Fergana region including a large private farm Agri-Man, which grows rose seedlings for the Russian market. Volunteers worked on the improvement of greenhouse operations, introduction of new greenhouse crops, and increasing fresh flowers exports. Furthermore, Eric Spilde helped Agri-Man publish the second edition of a greenhouse operator's manual (he also assisted with the first edition) including greenhouse specific management and technical production recommendations for the fall and winter/spring growing seasons. Other secondary hosts benefiting from FTF assignments included Otish-Agrifirm, and their producer associates from the Andijan Networking Centre.

FTF trained more than 200 women from seven female producer groups in the Fergana region and four in the Samarkand, Djizak, and Bukhara regions in partnership with the associations of business women. The participants learned about improved greenhouse management (tomato and cucumber), vegetable seedling production practices, value chain initiatives including the design of a vegetable grading/sorting/packing center, and microfinance opportunities.

### *Results*

FTF implemented 23 assignments with 13 hosts in this sector. A total of 3,719 farmers and entrepreneurs were trained of which 39% were women. The assignments contributed to a US\$3,600 increase in gross sales and a US\$1,670 increase in net income.

FTF changed attitudes and perceptions of private farmers and those involved in agribusiness relative to private sector development. NCKD experts along with FTF volunteers trained Djizzak farmers in skills needed to defend their land lease rights in front of the regional khokim (highest regional authority), including exemption from paying off the old farm debts they inherited when they received land during the shirkat dissolution process. The immediate outcome of the legal training session was the first 40 farmers winning their court case in the local economic court that exempted them from paying off old shirkat farm debts.

Subsequently, another 200 farmers in the region asserted their legal land lease rights and obtained the same exemption.

The Imkoniyat poultry farm in the Fergana Region applied new poultry feed rations from increased soybean production. FTF interventions resulted in increased land under soybean production for high quality protein chicken feed, from 0.2 ha to more than 20 ha (average yield - 4 tons/ha). Moreover, the host is working with 20 farmers in the region who will grow soybeans which he will then buy and process for his and other poultry farms in the Fergana region. FTF volunteer Paul Miller assisted poultry operations by helping farmers obtain 3,000 chicks for initial start-up of broiler operations in 2004.

### Producer Organization/Association Development

The Uzbek government attempted to reorganize the numerous privately owned farms into producers' groups in an effort to address their farm management problems. However, the western style producer's group/association lost its purpose of primarily defending producers' interests under this government arrangement, which also constrained the legal basis for genuine association development.

#### *Strategy*

FTF interventions for association development targeted promoting the principles of real market-oriented production, where associations represent farmers' interests to lobby government for improved agricultural policies, and collective bargaining power is used to manage relationships with value chain participants. FTF also focused on strengthening the democratic transition and promoting civil society participation.

FTF collaborated with other USAID-funded agricultural and civil society development projects, such as Mercy Corps' Community Action Investment Program (CAIP), Pragma Corporation, Joint Development Associates (JDA), and many other international donor agencies such as World Bank and ADB to help farmers establish effective producer-centered associations.

#### *Activities*

FTF strengthened the institutional, managerial, and technical capacities of the associations by promoting cost-effective and efficient integration of stakeholders (agricultural producers, processors, and marketers) and encouraging the association networks to exchange experiences and ideas. The goal of association development was to foster private sector, market-oriented democratic institutions. FTF Uzbekistan addressed a wide range of topics on association development from basic principles of forming associations to institutional strengthening through farmers' participation in association management. In collaboration with regional government representatives, agencies responsible for association registration and management, FTF volunteers evaluated existing opportunities and barriers to association development, and formed their recommendations into a work plan for groups.

A few FTF volunteers, including Lynette McGowan, assisted the creation of women farmers associations in Bukhara and Jizzak regions by helping them develop the necessary charters, bylaws, and action plans for registering associations under NGO status.

FTF actively collaborated with the Science and Technology Center of Ukraine (STCU) on several projects including the formation of a Tashkent-based Center for Integrated Pest Management (IPM) extension service. Two FTF volunteer experts from Michigan State University (MSU) evaluated IPM needs in Uzbekistan and developed an action plan for the center's expansion through the farmers' associations. In September 2005, MSU received a US\$150,000 grant to create and develop a Tashkent-based Pest Management Center.

### *Results*

FTF implemented 11 assignments with 8 hosts in this sector. A total of 485 farmers and entrepreneurs, 40% women, received training and technical assistance during this phase.

The formation of NCKD was one of the main achievements of the FTF Program in Uzbekistan. NCKD officially registered under an unfavorable political environment in the fall of 2004. The organization currently consists of 86 members, most of whom are professional trainers on legal issues, farm production and management, and marketing. The main activity of the organization is to provide training and consultation services to the agricultural sector of through the application of participatory learning approaches introduced by FTF volunteers.

As a direct result of FTF intervention, the first two private women farmers' associations formed and successfully registered in Bukhara and Jizzak regions. Both associations currently have more than 50 active female members who support association development despite strict government control of their activities. Moreover, the Uzbek government allowed farmers' associations to offer microfinance opportunities to members. Thus, these two associations, as well as the Associations of Business Women, nurtured by FTF in Bukhara, Fergana, Samarkand, and Djizzak regions, now offer credit opportunities to farmers and agribusiness owners.

### **Water Management**

The break-up of large shirkat farms into many small private farms along with inadequate funding of irrigation and drainage infrastructure has made water distribution more problematic and weakened both main canal and on-farm water management. The resulting water losses due to unlined canals, deferred irrigation and drainage infrastructure maintenance, high water tables, and soil salinization due to over irrigation, became the main reasons for poor crop yields and overall agricultural production declines. Recognizing the need for investment, the Government of Uzbekistan initiated the formation of WUAs to maintain and operate the irrigation and drainage infrastructure. Unfortunately, government support was minimal, and there was no specific legislation that could protect WUAs and their members from various national, regional, and local government control agencies. In addition, WUA development in Uzbekistan required considerable assistance from both local and international organizations to ensure transparent and equitable water management and allocation among water users.

### *Strategy*

Many newly established WUAs in Uzbekistan faced challenges from water users/farmers uninterested in WUA governance and operation, because they considered it another method of government control. Moreover, the essence of a WUA was a new phenomenon in

Uzbekistan; therefore, the country lacked the requisite expertise in integrated community-based water management approaches.

Since establishment of WUAs was a USAID/CAR Mission priority, FTF provided technical expertise in areas of institutional support for association development; improved land, crop, and irrigation management practices; improved water distribution and control in the canals; as well as providing additional member services.

FTF surveyed the principal stakeholders - farmers, irrigation managers, villagers, and government officials - to identify their interests and their likely impact on the sustainability of WUAs. The intervention included the identification of desirable social development outcomes and the social, economic, institutional, and managerial components needed to achieve them.

FTF Uzbekistan continued its partnership with the USAID-funded Natural Resource Management Project (NRMP) until 2005. FTF also provided volunteer support to WUASP.

### *Activities*

FTF supported the management of WUA affairs in a transparent and democratic manner; improved water management of on-farm canals; and improved irrigation management at the field level. FTF assisted WUA members to develop the required managerial, organizational, and leadership skills, and develop charters and bylaws to support association activities. FTF also provided advocacy assistance to MAWR regarding the formation of a WUA legal framework, which would address sustainability, income, and tax status of the WUAs.

To improve water management in on-farm canals, FTF fielded irrigation and canal engineering volunteers to help WUA members develop operation and maintenance work plans for irrigation and drainage networks, install and upgrade water control and measuring structures, train WUA technical personnel on how to compute and apply water measuring techniques and keep records, and develop water use and distribution plans.

At the field level, FTF focused on irrigation and crop management techniques including the benefits of land leveling, water scheduling, and crop water requirements. To assist WUAs in creating additional services for its members, volunteers also addressed production and reducing value-chain constraints on agricultural production, processing, and marketing.

Through primary partnerships with NRMP, FTF worked with the following host associations:

- Amir Timur Water Users Association, Urgench, Khorezm regions
- Kushkulok Water User Association, Mirzaobod Rayon, Syrdarya regions
- Ok Koya Water User Association, Mekhnatabad, Syrdarya regions
- Sokil Water User Association, Navoi region
- Ok Oltin Water User Association, Yazivani, Fergana regions
- Berdakh Water User Association, Amudarya region, Karakalpakstan

Under WUASP, FTF fielded volunteers for WUA organizational support in 13 pilot WUAs of Samarkand, Djizzak, Namangan, and Bukhara regions.

## **Results**

FTF Uzbekistan implemented four assignments with 3 primary hosts and 16 secondary hosts in this sector. A total 768 farmers/water users received training and technical assistance, of which 15% were women.

As a result of FTF intervention, farmers' participation in the association decision-making process increased to 100%, including 100% democratically elected Board of Directors and Audit Committees and membership-approved WUA charters and bylaws. Almost all of WUA members understood their membership rights and obligations and more than 60%<sup>14</sup> of the WUA members paid their association dues.

The major accomplishment of FTF assistance in developing integrated, community-based water management systems in Uzbekistan was the creation of a foundation to make WUAs institutionally and financially viable. Volunteers' WUA development expertise was transferred to various country specialists including the Tashkent Institute of Irrigation and Agricultural Mechanization Engineers (TIAME) which participated in numerous FTF assignments. Volunteers also assisted TIAME to establish partnerships with their US counterparts, such as Washington State University who later established Partnership for Resource and Environmental Management Analysis (PREMA) with TIAME professors and students.

### **Results from Flexible Assignments**

Per the request from the UNDP Environment Task Force, FTF fielded Dr. Fee Busby, a Dean from Utah State University, to facilitate UNDP's feasibility study on, "*Achieving Ecosystem Stability on Degraded Land in Karakalpakstan and the Kyzylkum Desert*" in 2005. Dr. Busby assessed the capability and carrying capacity of desert land, determined desert community needs, and developed an integrated Land Use Plan for Kyzyk Rovat and Kazakhdarya districts, which would ultimately improve the livelihoods of six remote villages. The assessment outcomes were incorporated into a project proposal, which received a US\$2,867,609 grant from UNDP, GEF<sup>15</sup> and the Uzbek government. The project began implementation in February 2008 and will continue through 2010.<sup>16</sup>

FTF also assisted the US Rice Producers' Association to conduct a rice market study in Uzbekistan. Through volunteer Steve Welker, the US Rice Producer's Association received a US\$67,000 USDA grant to implement the market analysis. Through this study, many Uzbek entrepreneurs learned the value of market analysis and the power of producers' groups in strengthening the bargaining position of farmers and processors. Over 600 people in Uzbekistan have benefited from this collaboration in market analysis training.

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<sup>14</sup> The indicator could be higher if private farmers had had easy access to their bank accounts, which were regulated by government authorities.

<sup>15</sup> Global Environmental Facility of the World Bank

<sup>16</sup> See <http://www.undp.uz/en/projects/project.php?id=123> for more details.

## Avian Influenza Add-On

### Overview

In October 2006, Winrock received US\$550,000 in special funding from USAID to increase the capacity of veterinary services throughout Central Asia to prevent and contain the negative impacts of Avian Influenza. The two-year program provided practical trainings to veterinary service providers, government agencies, and poultry producers, introduced bio-security strategies, and raised general public awareness throughout Central Asia. The effective use of volunteers and regional master trainers, along with close cooperation with other host government agencies and donors such as the World Bank and Asian Development Bank, resulted in maximum impact.

Governments, veterinary workers, poultry producers, and other key stakeholders cooperated with the program. Volunteers, key regional experts, and Winrock staff delivered technical assistance through a training of trainers (TOT) approach while creating a regional network of stakeholders. Initial trainings delivered by international and regional experts were then replicated throughout Central Asia by skilled participants of those trainings. Awareness and educational materials were distributed through the events and through host country veterinarian services.

Building on success achieved during the RAISE Sanitary and Phytosanitary (SPS) in Kazakhstan, Winrock applied lessons learned and improved local capacities while building lasting professional relationships and networks. Regional cooperation is essential to prevent and contain Avian Influenza, and FTF activities advanced cross-border relationships while assisting local governments, veterinarians, and poultry producers in developing awareness and improving the capacity to prepare for and respond to outbreaks.

### Major Outputs

During the project period, the program produced more than 1,100 trained specialists and distributed 300,000 information packets. Additionally, this program complemented and acted as a bridge to USAID's STOP AI Program which was officially launched in Central Asia in mid-September 2008. Results included:

- Improved the Surveillance System and general response practices of veterinary services throughout Central Asia. The surveillance systems' structure and processes are more organized, adding active and passive types of surveillance.
- Strengthened country AI surveillance, biosecurity, rapid reporting, and response capabilities by developing a cadre of more than 1000 region-wide veterinarian and laboratory diagnosticians.
- Introduced bio-security practices to veterinarians who work at the community level.
- Improved stakeholders cooperation and communication processes between producer and veterinary services, between veterinary and health agencies, and between cross-border counterparts.
- Adapted training and communication materials now used by host government agencies throughout Central Asia. In Kazakhstan, the government funded printing and distribution of the materials throughout the country.

- Created a “Central Asia Regional Network of Animal Infectious Disease Surveillance Specialists with Primary Focus on Highly Pathogenic Avian Influenza H5N1.”
- Advanced veterinary services throughout the Central Asia region. Veterinarians are now empowered by new methods of working with both authorities and the local population.
- Established the foundation for a regional partnership and communication network through a series of regional and in-country follow-up conferences and workshops during June-September 2008. The results of this activity will be broadly used during the implementation of the STOP AI Program in Central Asia.

## Summary of AI Work by Country

### Kazakhstan

The program held a specialized workshop for the State Veterinary Service at the national, oblast, and rayon levels. Winrock, teamed with local experts, trained 35 veterinarians and laboratory staff on the proper use of lab equipment in testing poultry samples for surveillance.

Six of the 35 participants of the initial trainings were selected as master-trainers and received additional coaching. These six trained approximately 600 specialists in containment and response to possible outbreaks and awareness raising. In addition, 146,000 Information-Education-Communication (IEC) materials were printed and distributed in three oblasts. As cost share, the Kazakhstan Ministry of Agriculture printed and distributed the IEC materials to the other 13 oblasts.

### Kyrgyzstan

FTF volunteer Dr. Henzler conducted a preliminary assessment of the Avian Influenza situation in Kyrgyzstan. He identified areas of the poultry production and Veterinary Services system that needed to be strengthened and trained senior national staff responsible for HPAI-surveillance and reporting. Building on the results, FTF conducted a TOT on Surveillance and Monitoring of H5N1 and biosecurity procedures. In December 2007 and January 2008, Winrock staff and master-trainers from Kazakhstan conducted two regional trainings and coached local trainers for replicating the trainings in the other four regions in accordance with a cost-share agreement with the World Bank AI-program.

The State Veterinary Services improved their reporting to the national disease investigation system – the flow of information and chain of command, notification of results, and implementation of needed response actions. In addition, 25,000 pamphlets and posters were printed and distributed through the vet services with an additional 400,000 copies printed through cooperative support received from UNICEF. Building on the results, FTF conducted a national training for lead veterinary and lab specialists training 33 participants in Surveillance and Monitoring of H5N1. This TOT prepared the participants to deliver the next training to oblast level audiences of veterinarians, laboratory technicians, government officials, and leaders of poultry production, processing, and trading associations to significantly raise awareness of the dangers and prevention of Avian Influenza.

### Tajikistan

Winrock staff and regional experts conducted five TOTs at regional centers located throughout Tajikistan. Dr. Henzler’s assignment in November 2007 included an evaluation of

the existing level of knowledge and preparedness of local government officials, veterinarians, and poultry producers. Winrock then conducted a practical workshop based on these findings with inclusion of public organizations and leading mass media representatives. Workshop participants completed the first steps to develop recommendations and an Action Plan, with follow-on activity which took place at the regional conference in Kazakhstan in November 2007.

Over 200 vet and lab specialists were trained in AI-surveillance, response, and biosecurity. In addition to knowledge and skills, the specialists learned how to replicate the trainings in other centers as well as at local production centers. IEC materials were adapted to the local conditions and language, and pre-tested with a small pilot group in Khujand oblast, the region where poultry growing is more popular, and larger poultry operations function. After recommended changes, 54,000 copies of IEC materials in the form of posters and pamphlets were distributed to rural populations through the Veterinary Service.

### **Turkmenistan**

Winrock staff and regional experts from Kazakhstan conducted a national TOT in early August 2008 for the lead veterinary and lab specialists, and government veterinary services officials to prepare them to replicate the trainings throughout the country. This team provided training in August for veterinarians of the Balkan oblast and covered the remaining four oblasts in November. Audiences comprised leading veterinary, laboratory, government, and poultry production specialists.

Using gained knowledge and skills, three high performing participants and one awareness-raising specialist comprise a national team to replicate the trainings throughout the nation. The team trained nearly 100 additional specialists and approximately 3,000 sets of IEC materials were printed and distributed through veterinarian services.

### **Uzbekistan**

Project Hope was subcontracted to maintain organizational and logistical support for program activities. An expert recruited by Project Hope participated in one of the oblast trainings in Kazakhstan and learned basic knowledge and new training methods. When the Uzbek master-trainer was not able to attend follow-on trainings in Tajikistan, Winrock staff provided additional coaching in training methodology prior to the Uzbek trainer leading five regional workshops that trained more than 100 members of the Uzbekistan Veterinary Service.

The program prepared participants to deliver trainings to oblast level audiences comprised of veterinarians, laboratory technicians, government officials, and leaders of poultry production, processing, and trading associations. They learned key concepts and practical skills required for changing the existing practices and behavior models to avoid infection and further spread of AI. In addition, 89,000 copies of communication materials in the form of posters and pamphlets were produced to be distributed to rural populations through the Veterinary Service.

### **Regional**

In December 2006, the program conducted a veterinary workshop within the USAID/CDC Central Asia's Regional Conference on, "Practical Aspects of Avian Influenza Surveillance"

to share practical skills and guidelines for laboratory and veterinary services. A Central Asia Regional Workshop was conducted in November 2007 in Shymkent, Kazakhstan. Key government officials, veterinarian experts, and leaders of poultry production from throughout Central Asia attended the TOT workshops. Dr. Henzler led the practical skill training and discussions focused on, "Preparedness Status and Best Surveillance and Bio-security Practices." Workshop sessions also introduced methods on stamping out, liquidation, and disinfection of the outbreaks. A key outcome of the Shymkent conference was the establishment of cooperative relations between veterinary inspectors and directors of laboratories and the Deputy Chief Veterinary Officer of the Republic of Kazakhstan. They received information on the latest practices for controlling an outbreak and dealing with its consequences from an experienced international expert.

A regional partnership on H5N1 communication, cooperation, and response initiatives was launched through a series of regional and follow-on country specific events. The first conference, entitled, "Regional Collaboration to Enhance the Control of Highly Pathogenic Avian Influenza H5N1 and Other Emerging Diseases" was held in Almaty. Then a workshop was conducted in each of the Central Asian countries to elaborate on findings and conclusions of the initial conference. A final event conducted in September shared findings of the country events and outlined next steps to ensure continued cooperation during the STOP AI activities.

More than 50 leading veterinarian specialists and government officials from Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan learned new skills from Dr. Henzler and regional master trainers. Participants learned basic biosecurity practices and discussed cross-border communication methods needed in the region. A set of recommendations for the region, specific countries, and a strategy and Action Plan for moving forward as a regional information network was a key outcome. A major impact of the H5N1 Communication and Partnership workshops were recommendations made to the Central Asia governments on improving the flow of the information, and exchanging information between both human and animal health services and between the different country services. The instruments to be used include a standardized form for information gathering, reporting and exchange, an electronic database, and the establishment of a Central Asia website devoted to avian influenza issues.

The following are lessons learned under the Avian Influenza add-on project:

- Frequent rotation or replacement of top officials significantly complicates work. Although relations at the highest levels are important, it is advisable to nurture relations with second tier officials and key administrators who tend to have longer tenure.
- In some countries, such as Uzbekistan or Turkmenistan, simple visits to a small poultry operation or a university veterinary department require written permission from a ministry official.
- Nationwide activities in some countries, such as cotton harvesting, should be considered when planning local events.
- Specific sessions on training methodology should be included in most skill and knowledge workshops.
- The political and economic relationships between separate countries of Central Asia should be taken into account when planning regional events.

## Analysis of Key Impacts, Success and Failures

### Methodology for measuring impacts

Winrock's monitoring system aims foremost to provide the information that FTF staff members need to effectively manage for results, as well as to provide data for reporting. Data is gathered that is most useful to hosts, partners, and field staff, and cost-effective to collect.

Baseline data for individual hosts was collected while preparing the FTF assignment's scope of work. The profile included available information about the host's production, services, membership, and incomes, and enabled hosts and field staff to assess changes that occur as a result of the volunteer assignments. This information also informed the volunteers about the host's capabilities and size. Winrock used existing subsector data for baseline and annual monitoring, rather than spending resources to conduct rigorous sector and competitiveness analyses. Existing data sources included studies from USAID and other donors, government statistics, and analyses conducted by FTF partners. In a few cases, volunteers collected some baseline data as a secondary activity during their assignment.

Output data was collected in the volunteer's debriefing and end of assignment report. Field staff and partners conducted follow-up impact surveys for assignments approximately 9 to 12 months after completion. These surveys were an important tool for field staff to provide additional guidance to the hosts. Lessons from impact monitoring were fed immediately back into program implementation at the host and country level, and significant lessons were shared across countries through email and during regional retreats.

Field staff adjusted the timing to conduct the impact survey when results were expected to appear. Staff followed up with a sample of hosts from previous fiscal years, as well as hosts for assignments during the past 12 months.

Some impact data was gathered through direct observation (for example a new product or enterprise can be observed). However, most impact information was gathered by interviewing the host and other assignment participants. Winrock's survey format is intended to be an outline for in-depth interviews, which means that the interviewer does not follow a strict survey form, but instead asks open-ended questions that guide the conversation to discuss assignment results, lessons, and next steps. Survey questions were translated into terms that are appropriate for the local language and particular assignment situation. After each interview, the country manager and other relevant staff discussed the survey responses and lessons for how to improve future volunteer assignments.

Based on CAR FTF's value chain approach, Winrock analyzed quantitative and qualitative impacts in different ways. FTF field staff documented tangible results, such as increased gross sales and net income, for targeted value chain actors including producers and agroenterprises. FTF staff also document qualitative results such as changes in technologies and practices that can lead to improved value chain competitiveness. Lastly, FTF staff documented sustainability indicators, such as new organizations, grants, or loans that hosts achieved with FTF assistance. Quantitative data is compiled in EGAT's FTF indicator tables. Qualitative information is provided in focus area summaries and success stories.

### Qualitative assessment of impacts

FTF volunteer technical assistance impacted farmers in positive ways beyond those that are quantifiable by the program's M&E systems. The qualitative impacts were essential to the success of the FTF interventions and emphasized the accomplishments of the program.

FTF interventions achieved many qualitative impacts:

- FTF technical assistance empowered women. They learned new skills and were able to contribute actively to their families' wellbeing. For example, the 337 women farmers of Tayan Social Fund hosted FTF horticulture volunteers to learn more about managing their farms while their husbands worked abroad or in other businesses. The women are very proud of the skills and knowledge they have acquired and the contribution they are able to make to the family. One-fourth of the Tayan Social Fund women participating in trainings in Uch Korgon reinvested the income derived from FTF-assisted farm improvements by purchasing vehicles to transport their produce to markets. They also refurbished their homes and contributed to family events such as weddings.
- FTF technical assistance contributed to conflict reduction by assisting producer groups and WUAs. By learning democratic principles and proper managerial skills, introducing financial controls, and using resources equitably, these organizations reduced conflict among members and resource users. Also, members came together to achieve greater results for the organization, such as when applying for grants.
- FTF technical assistance promoted collaboration between farmers. By supporting producer organizations and emphasizing the benefits of collective action, farmers created important bonds that positively impacted their livelihoods.
- Farmers invested in natural resource conservation and sustainable use. They understood the importance of sustainable agricultural practices, such as zero tillage, water conservation, and using biological fertilizers rather than chemical, to benefit both farm productivity and the environment.
- FTF assistance contributed to the growth of the farmers' entrepreneurial spirit. Many farmers realized that they can start new enterprises related to the one they already have and add value to their production. By tackling their current problems, they are able to expand their businesses. For example, members of the AAK Jer Azygy realized they could offer other services, besides input supply, to their clientele year round, such as veterinary services.
- Overall, the skills, knowledge, and capacity of farmers increased through trainings and active participation.

For achieving sustainable impacts, the FTF field offices, hosts, and volunteers noted the following:

- Experienced volunteers particularly with a background in production, promoted significant changes and increased farmer response as they 'spoke the same language'.
- Host commitment was very important because it helped ensure that recommendations were adopted and tailored to the specific constraints of the host.
- Synergy with other donors helped provide financial assistance to farmers to implement volunteers' recommendations.

- Sector-wide interventions proved successful due to a comprehensive approach to include all stakeholders (farmers, processors, policymakers, and marketers) to address value chain issues.
- Systematic interventions were instrumental in promoting changes at the host and sector levels.
- Demonstration plots reached a larger audience and helped promote the acceptance of interventions by farmers.
- Increased capacity of support institutions was instrumental to ensure sustainability of technology transfer and knowledge after FTF Program activities concluded.

### Key accomplishments in addressing sector constraints

The following accomplishments were common throughout the focus areas in the Central Asian countries, with some degree of variance.

The dairy, beef, and veterinary services sectors suffered from low quality and productivity, improper nutrition, and poor farm management. FTF interventions in both sectors addressed these constraints by:

- Establishing and promoting the foundation for improved livestock genetics by introducing new AI techniques and AI kits, embryo transfer, importing Hereford cattle breeding stock to Kazakhstan, and most notably, transferring knowledge and skills to the hosts and in-country support organizations (AI stations) to provide sustainability for the intervention;
- Analyzing and improving feed rations for cattle;
- Introducing best herd management practices, including culling, dehorning, calving protocols, animal health, ear tagging, electric fencing for pastures, and recordkeeping;
- Improving meat processing practices (meat cutting, packaging, and marketing), food safety, and feedlot operations to improve the quality of the final product;
- Revitalizing livestock research institutions in genetics and livestock management; and
- Increasing the capacity of veterinary service providers.

The field crops sector suffered from low quality seed stock, improper seedbed preparation, and poor crop management practices. FTF volunteer technical assistance accomplished the following:

- Improved forage crop production practices including new varieties with higher nutritional values supported the dairy and beef sectors by meeting animal feed requirements;
- Promoted conservation practices for rice and wheat production, including zero tillage, raised bed planting, and other best crop management practices; and
- Established demonstration plots to adopt new technologies to local conditions and demonstrate results to farmers.

The horticulture sector was afflicted by low production and quality, pests and disease, lack of access to high quality inputs, and lack of appropriate marketing. Through targeted interventions, FTF technical assistance:

- Improved orchard management practices, including pruning, fertilization, irrigation, pest and disease control, and postharvest handling;
- Improved greenhouse management practices, including improved plant cultivation techniques, irrigation, and heating;
- Introduced new varieties of fruits and vegetables to the farmers, as well as non-traditional crops such as leeks, cauliflower, broccoli, and zucchini; and
- Developed market outlets for agricultural produce.

Association and producer organization was underdeveloped in Central Asia; organizations lacked proper management, missions, and bylaws. Also, farmers were not taking advantage of collective action to achieve benefits in marketing. FTF interventions in this sector accomplished the following:

- Strengthened producer organization, association administration, management and financial controls through trainings in business planning, cost benefit analyses, and contracts;
- Increased capacity of producers and processors to operate in a liberalized trade environment by achieving economies of scale and honoring contracts;
- Promoted new initiatives for producers and processors to share market and technical information; and
- Established youth groups to conduct supervised agricultural projects and train them in vocational and entrepreneurial business skills development.

Water management interventions allowed farmers to deal with constraints such as poor management, water losses due to failing infrastructure, and lack of proper organization. FTF dealt with these constraints through:

- Improved on-farm water management, including water scheduling, determining crop water requirements, land preparation, and modern irrigation techniques; and
- Improved inter-farm water management, including the development of WUAs and irrigation and drainage system operation and maintenance.

The agro-processing sector in Central Asia is underdeveloped and lacks capital for improvements in processing plants. FTF interventions dealt with low quality raw supplies, improper processing techniques, and poor marketing. FTF interventions:

- Upgraded existing processing techniques and technologies, and improved food safety; and
- Introduced new marketing techniques, including packaging, labeling, product promotion, and brand development.

Overall farm management in Central Asia is weak, particularly in Uzbekistan where agricultural reform has been slow. FTF provided training in farm management, addressing:

- Skill development of farmers and entrepreneurs in processing and marketing; and
- Land tenure, including rental and production contract, and basic legal rights of farmers and the rural population.

### **Influence on other projects and activities**

The FTF Program contributed to the activities of many projects. FTF worked with the Water Users Association Support Program (WUASP), the Sustainable Dairy Enterprise Development in the CAR through Improved Pasture Management Global Development Alliance (SD-GDA), and the Preventing Human Trafficking in Kyrgyzstan Project (PHT), all funded by USAID. FTF provided volunteer technical assistance to these projects in areas related to FTF objectives and sector focus, while meeting the needs and goals of the partner project. FTF provided volunteer assistance in water management and horticulture for WUASP, irrigation of field crops and cattle nutrition for SD-GDA, and vocational training including wool and potato production for PHT. FTF also worked with other projects including Stop AI, AgLinks, and AgFin+. Under these projects, FTF provided volunteers in veterinarian training, marketing, and horticulture.

The FTF Program contributed to the activities of projects implemented by other organizations and funded by other donors. For example, FTF volunteers provided technical assistance to the United Nations Development Programme's (UNDP) Poverty Reduction Program in Issykkul and Osh oblasts, Kyrgyzstan, and UNDP Environment Task Force on the *Achieving Ecosystem Stability on Degraded Land in Karakalpakstan and the Kyzylkum Desert* feasibility study in Uzbekistan.

### **Failures**

In general, the Central Asia FTF Program did not experience failures in its interventions, but it did sometimes encounter slow response and reluctance from farmers to implement FTF volunteers' recommendations due to the following reasons:

**Land tenure issues.** Land tenure concerns are common in Tajikistan, Turkmenistan, and Uzbekistan where farmers could not exercise their land lease rights and had government mandates to grow certain crops. In addition, farmers were reluctant to invest their money into land, which could be taken away by the government at any time. In Kazakhstan, land tenure is also a concern because farmers cannot use it as collateral to obtain bank loans, thus constraining farm improvements or production expansion initiatives.

**Limited farm production opportunities.** Farmers were constrained by limited resources including financial services (e.g., bank loans were hard to obtain or offered at high interest rates), material inputs (high quality fertilizer or seeds), and equipment (pruning equipment or AI kits) to adopt technology transfer recommendations on their farms or processing units. Farmers had varied levels of risk aversion/acceptance based on their financial vulnerability and scarce resources including lack of information, technologies, and equipment.

## Major Lessons Learned

During the past five years, the FTF Program acquired a wealth of lessons about program implementation, focus area selection and intervention strategies, managing effective partnerships, and types of volunteer interventions under the specific circumstances and needs of each Central Asian Republic.

**Demonstrable interventions are the most effective.** Seeing is believing. The most successful and effective interventions were often those where the farmers were able to observe the results firsthand. Demonstrated technologies encouraged farmers and value chain participants to implement FTF recommendations, invest their time and scarce resources, as well as disseminate their experiences to their colleagues. Furthermore, a combination of theory and practice has proven to be a good approach in providing technical assistance. For example, the three demonstration plots on modern forage production technologies, set up by volunteers John Haight and John Rodgers, illustrated to livestock producers the potential of high quality forage in increasing dairy and beef productivity levels in the region.

**Low-cost interventions generate the most response.** Affordable and readily available interventions proved to be the most successful and sustainable rather than those requiring high capital investments. Kyrgyz horticulturists achieved a 10% increase in marketable fruit and vegetable production along with an 8% reduction in postharvest losses thanks to the low-cost (time and money) volunteer recommendations. With their new skills, farmers utilized the available agricultural resources in a cost-effective manner.

In a few occasions, the volunteers' recommendations in the agro-processing sector addressed equipment/technology upgrades to achieve desired production and profit levels, requiring large capital investments that agro-processors could not afford. This limited the value of the recommendations and overall impact on the value chain.

**Working with cooperatives and farmer groups maximizes impact.** Working with cooperatives, associations, and farmer/producer groups was cost-effective in reaching the maximum number of beneficiaries with limited FTF resources. Many assignments were designed to transfer volunteer's knowledge to association members and technical personnel who would set up an extension training service for other farmers. For example, FTF volunteers trained two extension agents for the Samarkand-based Madadkor Farmers' Association in Uzbekistan to ensure the sustainability of the suggested interventions. This approach also helped increase the association's status among member-farmers. However, FTF encountered difficulty in tracking program impact on individual farmers who participated in volunteer assignments. In this case, it is important to collaborate with groups that have or can develop the capacity to monitor and track the impact of interventions on their members.

**Piggyback assignments are cost-effective.** Fielding one volunteer for multiple assignments during one trip, within the country or to other Central Asian countries, is a cost-effective strategy when appropriately designed and coordinated. It is particularly effective when volunteer assignments consist of separate yet similar scopes of work, and the activities with the hosts are not time consuming. This arrangement in Central Asia helped reach a wider audience and ensured extensive technology transfer with reduced costs. For example, John Rodger's dairy assignments in Tajikistan and Kazakhstan in June-July 2004 were similar in

terms of goals, objectives, and tasks, and altogether 35 people received training and provided direct benefits for 294 people in both countries. In Tajikistan, the volunteer conducted a cost/benefit analysis of forage production, developed optimum feeding regimes, and demonstrated modern AI techniques, dehorning, and other herd management practices. Similarly in Kazakhstan, the volunteer improved hosts' knowledge in modern AI techniques and herd management practices, and provided technical advice on how to improve the quality of forage, supplements, and rations for cattle.

**Volunteer continuity builds sustainability.** Assignments that required multiple visits by a volunteer to a host proved to be effective. During the initial visit, volunteers familiarized themselves with specific constraints on the host and targeted sector, and initiated the required technology transfer. During subsequent visits, the volunteers assessed how the initial technology transfer influenced the host and what the host could do to accelerate improvements. For example, Jorge Juliano visited Tajik mushroom producer Tolmas Saifulloev several times. During his initial trip, he trained the host on how to grow mycelium (mushroom spawn) and mushrooms in a specially designed room with natural light. During subsequent visits, Juliano focused on how to upgrade old mushroom pasteurization techniques, storage, and processing practices. Thanks to Juliano's recommendations, Saifulloev transferred the mushroom production technology to 30 growers in the region with the aim to buy their produce for a mushroom processing plant he is planning to build.

**Assignment continuity builds all-around capacity.** Assignments that required multiple visits by volunteers from various skill areas to build the capacity of the host proved to be very effective. Volunteers addressed complex business development issues, including production, processing, and marketing, which helped hosts to strengthen their businesses from various perspectives. For instance, the Kazakh Meat Company (KMK) hosted seven assignments, focusing on different aspects of meat processing, including specialized meat cuts, packaging, storage, and food safety. On subsequent assignments, FTF also assisted KMK to design a feedlot operation which allowed the host to improve the quality of the final product.

**Broader focus area interventions maximize sector impact.** Program implementation demonstrated that broader focus area interventions and covering all key linkages of the sector (e.g., increasing productivity of dairy cattle through improved genetics, farm management, nutrition, milk processing and storing), are more effective than targeting a narrow aspect of the focus area (e.g., focusing only on genetics to increase milk yields).

**FTF public outreach is important to gain partners and hosts.** FTF conducted both US-based and host country public outreach campaigns, which proved to be highly effective in promoting the goals and objectives of the program. The US-based public outreach strategy allowed FTF to facilitate US agribusinesses to enter Central Asian markets (e.g., Taurus Services, World Wide Sires), as well as attract interested volunteers for various technical assignments. The host-country public outreach approach allowed the FTF Program to find additional hosts willing to adopt modern technologies, provide wider public coverage for FTF interventions and program objectives, and reach remote areas of the host countries. For example, FTF Tajikistan noted that they attracted about 40% of their hosts through publications in local newspapers.

**Cooperation with agricultural ministries and agencies is key.** By forming strong partnerships with agricultural ministries and agencies, FTF was able to gain support for its activities, create an important network between FTF hosts and governing institutions, and effectively represent farmers' needs to policymakers. In Kyrgyzstan, the Ministry of Agriculture initiated quarterly meetings for agricultural and economic development donors/implementers to discuss their program issues and share experiences. FTF used these meetings to identify donors and organizations involved in FTF focus areas. In Kazakhstan, FTF assisted the Ministry of Agriculture to promote food safety policies among livestock producers and processors.

FTF cooperated with the Ministries of Agriculture in each host country, their regional and district satellites, state veterinary services departments, ministries dealing with environmental issues, and agrarian universities. Furthermore, FTF invited government representatives to participate in the training programs to garner the support necessary to effect widespread and sustainable technology transfer through legislative policy enactment.

**Local volunteer recruiters increased FTF effectiveness.** Staffing FTF field offices with a local volunteer recruiter proved to be very effective. Field office recruiters were able to easily prioritize assignments based on host's needs. They worked closely with FTF country managers and hosts to adapt scopes of work depending on the timing of the assignment, volunteers' availability, and the requisite skills.

## Recommendations

The lessons extracted from the last five years of program implementation in Central Asia resulted in the following set of recommendations for future FTF programs in the region:

**New agricultural trends and innovations.** FTF should continue tailoring its interventions in targeted focus areas to encourage development and innovations in the sectors and host country economies, including the promotion of agricultural reforms. One of the primary objectives that the FTF Program successfully achieved in Central Asia was to bring modern expertise and highly productive technologies to the countries during their on-going transition. For example, in Tajikistan, FTF efforts in developing business plan writing skills culminated at the most opportune time in 2008 when the Tajik government introduced new agricultural legislation that allows farmers to apply for bank loans based on approved business plans. In Uzbekistan, as a result of past FTF interventions during 1999-2003, the Uzbek government introduced new legislation in 2005 enabling farmer associations to offer microfinance opportunities to their members.

**Demonstration plots.** FTF should encourage more demonstration plots in cooperation with hosts and donor organizations to show how innovative, low-cost technologies can be highly productive and profitable. For example, FTF's assistance in greenhouse technology for the members of the WUA Chirik facilitated the award of a US\$1,000 USAID grant by WUASP-Tajikistan to finance the construction of a model greenhouse, which is now being used to demonstrate modern greenhouse techniques in southern Tajikistan. In Kazakhstan, FTF complimented the efforts of CIMMYT by demonstrating to farmers direct seeding and other soil conservation techniques in specifically designed plots for wheat, corn, and alfalfa crops.

**Sector-focus interventions.** FTF should select a specific agricultural sector (e.g., dairy or horticulture) as a program focus area for technology transfer, rather than dispersing its efforts through a focus area that unites them all, such as the farm management training focus area in Uzbekistan. FTF Uzbekistan conducted numerous training programs for various sectors (aquaculture, dairy, poultry, field crops, and horticulture) under this focus area but experienced difficulties in measuring impacts since the intervention on each particular sector was limited. In comparison, Kazakhstan's dairy sector received a comprehensive intervention approach addressing all its value chain components and saw results in readily identifiable production improvements and productivity increases attributable to the program's input. Similarly, FTF faced difficulty in assessing impact from long-term interventions that required behavioral change, particularly in association development where FTF targeted membership and fee increases.

**Sustainable natural resource management.** The FTF Program should continue to promote sustainable natural resource management initiatives and increase the population's awareness about agriculture and water conservation. In Central Asia, environmentally friendly practices are an immediate necessity if additional man-made disasters are to be prevented. Technical assistance in areas such as water and land management should be intensified through promoting zero tillage technologies (which increase soil conservation and reduce soil erosion by 90%), crop rotation, modern irrigation technologies, improved water distribution, and the use of innovative heat-efficient greenhouse designs (e.g., solar heating).

**Increase women's participation.** FTF should continue its emphasis on including women as participants and targeted clients in its programming activities. Each host country had specific opportunities to promote women's active involvement in agricultural and community development. FTF fielded numerous women volunteers to assist their counterparts in host countries to learn new agricultural production technologies and management practices which in turn gave them the necessary skills to participate in decision-making processes. For example, FTF Uzbekistan assisted women involved in agricultural production, processing, and marketing to establish business associations in the Fergana, Bukhara and Djizzak regions. Volunteer Lynette McGowan trained these women in business and marketing management and emphasized a participatory approach in land and water management.

**Technology transfer expansion efforts.** FTF should maximize the dissemination of its interventions through continued work with association/producer groups and agricultural education institutions, as well as facilitating agricultural producer forums. Continued collaboration with associations/producer groups will increase FTF's impact on a larger audience, as well as encourage members to share experiences. Agricultural producer forums will allow the program to reach important players in targeted sectors. For example, an agricultural forum facilitated by FTF Kazakhstan helped livestock value chain participants develop business networks and find solutions to their business constraints.

Continued collaboration with agricultural education institutions helped FTF ensure the sustainability of interventions by transferring skills and knowledge to the professors and students. FTF's collaboration with the Tajik Agrarian University allowed the transfer of innovative livestock management knowledge and skills to graduate students. In Uzbekistan, FTF volunteers facilitated cooperation between TIAME and Washington State University which resulted in the establishment of the Partnership for Resources and Environmental Management Analysis which oversees environmentally friendly technology transfer including water conservation and agricultural extension services.

As described in this report, Farmer-to-Farmer is a unique people-to-people development program that has contributed substantially to Central Asia's agricultural development and transition from command to market economies. Starting soon after the collapse of the Soviet Union, Winrock volunteers were often the first westerner that Central Asian participants had ever met. From these assignments, American volunteers and their Central Asian hosts found vast areas of common interest, and helped the region's producers become forward-thinking entrepreneurs with the ability to support their families and the skills to face the many challenges of global agricultural markets.

## **Annex A**

**EGAT Indicator Tables 1-7  
(see accompanying Excel file)**