Report#2 on ICARDA Project
"Community Action in Integrated and Market Oriented Feed-Livestock Production in Central and South Asia."

June – November 2007

Women producing samples of mohair yarn, Katarbulak village, April 2007.

Activity #16:
"Value added local processing of goat fibers by women and assessing the characteristics of naturally colored mohair and the potentials for its marketing."

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Abstract:
The report offers a progress summary on the ICARDA project "Community Action in Integrated and Market Oriented Feed-Livestock Production in Central and South Asia," activity #16 "*Value added local processing of goat fibers by women and assessing the characteristics of naturally colored mohair and the potentials for its marketing.*" This activity is focused on establishing a market chain for mohair yarn which is one of the key export commodities produced by women in the pilot region. During the first project year 2006-2007 research was conducted on the production and marketing of Tajik mohair and mohair yarn and a promising new market for handspun kid mohair yarn in the United States was identified. An access to the this growing US market would allow the Tajik women to earn much higher incomes than by producing coarse, low quality yarns for the Russian market which is currently their main outlet. The report briefly overviews the work that has been done to link the Tajik spinners to the American market during the first project year. It then describes a second set of steps that has been taken to further develop yarn production and marketing and bring the Tajik spinners closer to the objective on marketing mohair yarn and knitted products in the United States.

Acknowledgements:
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1 Overview of Production and Marketing Opportunities and Constrains for Angora Goat Farmers.

1.1 Changes in the angora goat production systems in the pilot region: decentralization of goat farming.

The research conducted in 2006-2007 established that the estimated number of angora goats in Tajikistan is around 300,000. Out of that, approximately 270,000 angoras are produced in two pilot regions of the Soughdiskaia oblast. In the Bobodzhan Gafurov region there are around 150,000 goats and in the Asht region there are around 120,000 goats. The Matchinsk region has a much smaller number. The goats produce over 400 tons of mohair and the yearly revenue from the sales of mohair is around $2,000,000 (270,000 goats x 1.5kg of mohair per goat x $5 per kg of mohair).

The largest herds of angora goats are produced by cooperative farms which are the descendants of the former state farms[1]. Based on the estimates of Tajik project collaborators, in the Gafurov region there are three large cooperatives focused on breeding angora goats: the Urunkhudzhaev cooperative (25,000 heads), the Kushatov cooperative (15,000) and the Nabiev cooperative (6,500). In addition there are four medium cooperatives that have anywhere between 3,500 and 5,000 goats.

Breeding goats of the Kushatov cooperative, September 2007.

[1] Although in most other Central Asian republics cooperatives have been dissolved, in Tajikistan market reforms were delayed by the war and privatization of the cooperatives is only in its infancy.

The goats are produced in herds of 250-300 animals and each heard is tended by a shepherd and his family who work for the cooperative. The shepherds are responsible for producing a certain number of kids and mohair per year and receive some inputs such as feed from the cooperative. The shepherd's family also owns their own goats, usually 50 – 100, that graze together with the cooperative flocks. During interviews several shepherds claimed that they would prefer to work independently but do not have access to pastures which currently belong to the cooperatives. For example, 78% of pastures of the "Ismoil" country are owned by the Kushatov cooperative (Makhmudov, ICARDA report, 2007). The shepherds feel exploited by the cooperatives and hope to privatize pastureland and set up private farms.

Based on the history of agricultural transitions in other Central Asian countries, it is evident that the cooperative is a transitional form and that cooperative goats and pastures will be divided among private farmers in the future. Although the legal foundations for privatization of the cooperatives are currently unclear, the expectations that privatization will take place are widespread among the local population. According to the words of an old shepherd from the Takli settlement in the Gafurov region who worked for a cooperative his whole life "We all know the day [of privatization] is coming." The managers and staff of the cooperatives also know this. As a result they are motivated by short-term interests and do not invest in the long-term sustainability of the farms and the angora goat herds. For example, the managers of the Kushatov cooperative admitted that the breeding herd of goats pictured above has not received replacements during the last two years and that the older goats are not well prepared for the breeding season.

The private sector of goat producers is developing alongside of the cooperatives. Currently there are around five to seven large private farms in the two regions that have around 500 – 1,000 goats, thirty medium farms that have over 100 goats and approximately one hundred small farms with 50 to 100 goats. Many village households also have small herds of goats, usually less than 50. Rural families and small farmers raise goats primarily for fiber and food and as a form of liquid capital. When the families are under financial pressure they sell their goats to pay for schooling or medical care or to raise money for family events such as weddings or funerals. Although private farmers and households own much smaller numbers of goats than the cooperatives the small owners are so numerous that they account for nearly 50% of angora goat production in the region (Makhmudov, ICARDA Project Report, 2007).

The share of households and private farms in angora goat production will increase after the cooperative herds are privatized. As noted earlier, similar trends can be observed in Central Asian countries such as Kazakhstan and Kyrgyzstan where most cooperatives and former state farms had dissolved and 95% of livestock is now produced by households and private farms. Similar processes will take place in Tajikistan where market reforms were delayed as a result of the civil war. Full-scale privatization will lead to a much greater decentralization of angora goat production, with important consequences for producers, processors and markets. In order to anticipate problems related to the decentralization of grazing, breeding, feed production, pasture management and the marketing of mohair, it is important to study the decentralization of the livestock sector in countries such as Kazakhstan and Kyrgyzstan that are much further along in the

privatization process. However, given that those countries did not effectively resolve many of the related problems, it is also important to look for successful organizational models used by small sheep and goat producers in other countries including Argentina and South Africa. Given that Tajik farmers do not have access to such information such initiative should be undertaken by international development projects.

In summary, the angora goat production systems that are currently present in the pilot regions include large cooperatives that are on their way to extinction and cannot be expected to invest in the improvements of goat production and marketing. Some of the large private goat farms have greater opportunities and resources to invest in improved breeding, feeding and animal maintenance but need access to pastures and different forms of support to develop into sustainable, effective and globally competitive production systems. This includes access to information, technology, expertise and organizational models directed at resolving specific production and marketing problems. The smaller, subsistence farms have fewer resources to invest but are more numerous and represent a much larger percentage of the rural population. They also need a targeted technological, informational, financial and organizational support to develop collaborative strategies in breeding, feeding, resource management and marketing of angora goat products to improve livelihoods. Similarly, households that produce goats not on farms but in village settings face a specific set of production and marketing constraints that need to be addressed. The Tajik government cannot be expected to provide sufficient finances and expertise to resolve these issues and it is important that international development projects pick up the slack. International experts need to collaborate with local researchers and specific groups of producers on finding creative solutions for the problems they face. They need to work on identifying and developing the unique opportunities of the local production and marketing systems and finding synergistic linkages among these systems.

A shepherd who works for a cooperative farm, Gafurov region, April 2007.

1.2 Revenues from Angora Goat Production.

The collaboration on improving angora goat production is crucial because angora goats provide an important source of livelihood for all types of producers in the pilot region. First, angoras are the only ruminants well adapted to the extreme conditions of the local eco-system, especially the foothill areas of the Matchinski mountain range. They graze on pastures that are too poor to support other livestock and can move on rocky slopes that are not accessible to cows or even sheep. The goats are also more resilient to diseases and parasites than sheep and require less veterinary care. Secondly, goats provide a variety of products including milk, meat, mohair, skins and also horns, hoofs and manure. All these products can be consumed, sold or locally processed to make value-added products. Thirdly, mohair is the most valuable local product that rural households can produce, store, process and sell throughout the year on domestic market or export it to neighboring Russia. With the assistance of the ICARDA project, producers can export value-added mohair products such as yarn and knitware to the United States and other new markets and substantially increase their revenues.

Based on the calculations generated by ICARDA researchers, goat production is profitable even for families who hire a shepherd to graze their goats.

Yearly production cost for one angora goat is $18.46. This includes:
Shepherd's yearly fee for one goat: 6.1 somoni ($1.80)
Fees for pasture use: 0.9 somoni ($0.26)
Feed: 54 somoni ($15.90)
Veterinary care: 1.7 somoni ($0.5)

An average goat brings $23.6 in revenue. This includes:
One kid that can be sold for 40.8 somoni in the fall ($12)
1.5kg of mohair that sells on average for 26 somoni ($7.6)
Milk (.15 liters x 90 days) for 13.6 somoni ($4)

This represents a profit of $5.14 per head for a family that pays a shepherd to graze their goats. Many families graze their livestock themselves, increasing the profitability by $1.8 to $6.94 per head. A shepherd who works for one of the cooperatives claimed that a single family could live relatively comfortably if it owned 100 goats.

1.3 Goat Products and Markets: Export Markets for Tajik Mohair.
The main angora products are meat and mohair. Goat meat is consumed locally and the demand for it depends largely on the buying power of the population which is currently very low. For example, a $40 goat equals to 1/2 of the $81 average salary of an industrial worker. An agricultural laborer who makes $11 would have to save for several months to afford such a purchase. That is why most rural families produce goats and sheep for their own consumption and rarely purchase meat. Some families can afford meat because one or more family members work in Russia and send or bring home their savings. However, the overall demand for meat remains low due to the low average earnings and will not increase unless economic conditions improve.

Mohair represents an important source of income because of its export value. Mohair was never industrially processed in Tajikistan but was exported to factories in Russia for processing. The same situation exists today. Based on interviews with mohair traders, although countries such as India, China and Turkey occasionally purchase Tajik mohair, the greatest share of mohair production goes to Russia.

Mohair market in Khudzhand, April 2007.

The mohair season begins in April and lasts until the end of May. During this time the goats are sheared and the mohair markets are most vibrant. Small farmers and household producers bring mohair either to a market nearest to their settlement or to the market in the regional capital of Khudzhan where prices are slightly higher. They sell their mohair to middlemen who collect several tons of mohair each season for export to Russia. Larger producers who own several hundred heads of goats store mohair after shearing and sell it to buyers who come to the farm. The highest quality mohair sold for 35-40 somoni per kg or $10.17- $11.62 in April 2007. Most mohair sold for 25 somoni or $7.26. Naturally colored mohair is slightly more expensive (by 2-3 somoni/kg) than white mohair. One adult goat gives approximately 1.5 kg of mohair.

Traders collecting large quantities of mohair for sale, Khudzhand market, April 2007.

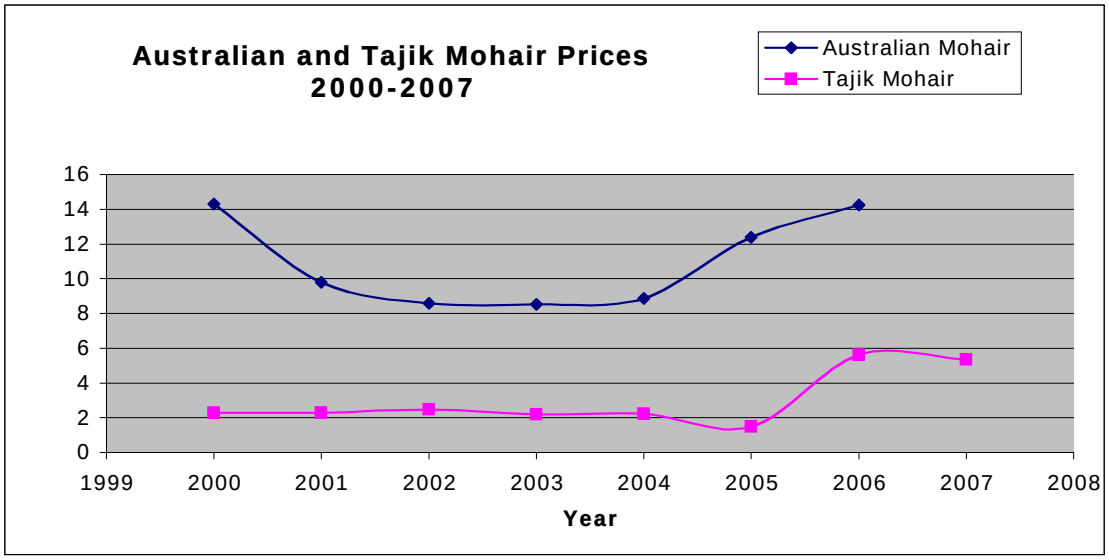
The world price of mohair fluctuates based on the demand for mohair by the world fashion industry. There have been relatively sharp price jumps, including in 2005, 2006 and 2007, triggered by a short supply of mohair on the world market and current fashion demands. The price peaks are followed by slow declines over 4 to 7 years before another price spike occurs. Based on price figures obtained by the research team, mohair sold on the Australian market (Figure 1) has been more than twice as expensive compared to mohair sold on the Tajik market (Figure 2).

Figure 1. Australian mohair production 1999-2006.

Year	Total Kgs	**Ave Price/kg (USD)**
1999	285,884	9.02
2000	313,054	14.29
2001	263,630	9.79
2002	278,228	8.59
2003	228,227	8.53
2004	219,843	8.85
2005	208,978	12.39
2006	197,459	14.23

Figure 2. The price of the Tadjik mohair in 2000-2007 (Matazim Kosimov).

Year	Price (USD/kg)							
	Non-uniform mohair	Female Goats 1 - 1,5 years	Male Goats 1-1,5 years	Female Goats 2 – 2,5 years	Male Goats 2-2,5 years	Female Adult Goats	Male Adult Goats	Average
2000	1,5	2	2	2,1	2,1	3,1	3,2	2.28
2001	1,6	2	2,1	2	2	3,2	3,2	2.3
2002	1,6	2,3	2	2,3	2,3	3,4	3,5	2.48
2003	1,4	2	2	2	1,9	2,9	3	2.18
2004	1,6	2	2	2	2	2,9	3	2.21
2005	1	1,3	1,2	1,3	1,3	2,1	2,1	1.47
2006	3	5,2	5,2	5,2	5,2	7,7	7,8	5.61
2007	2,8	4,9	5,1	5,1	5,2	6,5	7,8	5.34



The data show that the mohair prices on the Tajik market only loosely follow the global market trends but are consistently much lower. These differences in prices reflect a multitude of factors that go well beyond the actual quality of mohair fiber produced in Tajikistan:

1) Poor organization of mohair producers and traders: unlike fiber producers and buyers in developed countries such as Australia, mohair producers in Tajikistan are not organized into associations. This makes it difficult for them to coordinate their responses to changes in market trends and prices, adopt common quality standards and develop joint marketing arrangements that would allow them to create economies of scale. Standard quality and volume are two key demands of international buyers and processors. The lack of organization makes it difficult for Tajik producers to satisfy such demands and collect large volumes of sorted mohair, classed on the basis of international standards.
2) Lack of objective testing: Tajik mohair is not objectively tested which means that

there is no reliable market information on quality. Such information is essential for international buyers and processors who will not pay premium prices for untested fiber. Fiber testing laboratory that uses standard, contemporary equipment such as the OFDA4000 recently opened in Almaty, Kazakhstan. The ICARDA project is facilitating linkages between Tajik mohair producers and the laboratory. First mohair samples from Tajikistan were tested there in June 2007.

3) Lack of sorting, grading and packing standards: In addition to the lack of testing the producers and buyers do not follow international standards in fiber preparation and bail together different types of fibers. Such practices will lower the price of Tajik mohair and jeopardize the producers' access to the global market.
4) Poor legal and physical infrastructure: Undeveloped legal infrastructure and corruption of customs officials make it difficult to export mohair and complicate the work of international buyers on the Tajik market.
5) Isolation of Tajik producers from the global market: Tajik mohair producers and buyers lack easy access to the international mohair market because of language barriers, lack of information and the geo-political isolation of Tajikistan.
6) Decline in breeding, feeding and animal maintenance: The quality of Tajik mohair has declined after the breakdown of the Soviet Union due to the collapse of breeding programs and other forms of state support. In order to produce high quality mohair, the emerging private producers need to focus on improved breeding and animal maintenance. However, due to the civil war, farm restructuring and general economic decline, the attention to breeding, animal nutrition and health has been minimal. Most private producers lack financial resources, information, technology, extension support and also market stimuli to invest in the production of high quality fiber.

The ICARDA project is seeking to resolve some of these problems by providing information, technical support and market stimuli to promote the production of high quality goats and mohair in the pilot region.

1.4 The Paradox of Kid Mohair Pricing.

Although the explanations offered above clarify why the Tajik mohair is priced well below the Australian mohair, it is more difficult to explain another major the discrepancy in mohair pricing on the Tajik market – the low value of fine, kid mohair. The relative fineness of mohair, measured by fiber diameter, is the most important criteria that determines the price of the fiber. According to an article by Bruce McGregor prepared for the international textile industry that buys Australian mohair, only a small number of attributes affect 98% of the variation in greasy mohair price: mean fiber diameter, length, style, kemp, stain, cotting, selling period and agent and vegetable matter. Among those variables, mean fiber diameter was the most important factor influencing price and accounted for 59% of the variation in the price of mohair (B.A. McGregor, 2007, Premium Quality Mohair, (http://www.dpi.vic.gov.au/dpi/nreninf.nsf/LinkView/F7ED8DF37A2E3404CA256FFE0003F17220F21D8BF56C9D51CA257011001A5F0F).

Figure 3. Relative contribution to the variance in greasy mohair price accounted for by mean fiber diameter, vegetable matter, visual grades and selling period and agent combinations (McGregor, 2007).

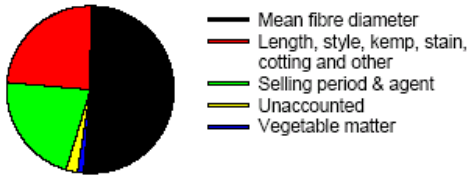


Figure 4. The baseline response of greasy mohair price to the mean fiber diameter, for A length of average style, without fault, 0.5% vegetable matter (McGregor, 2007).

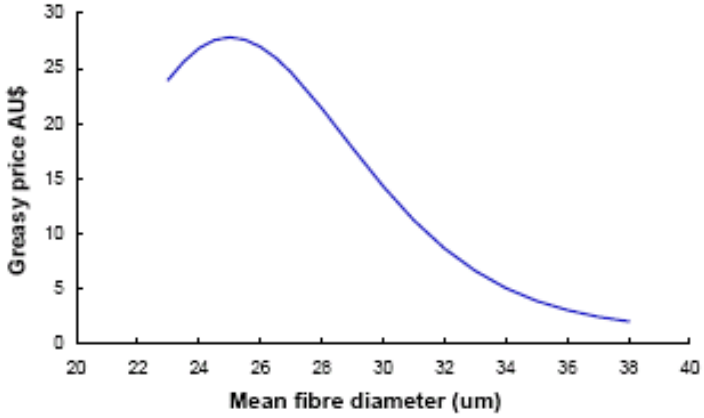
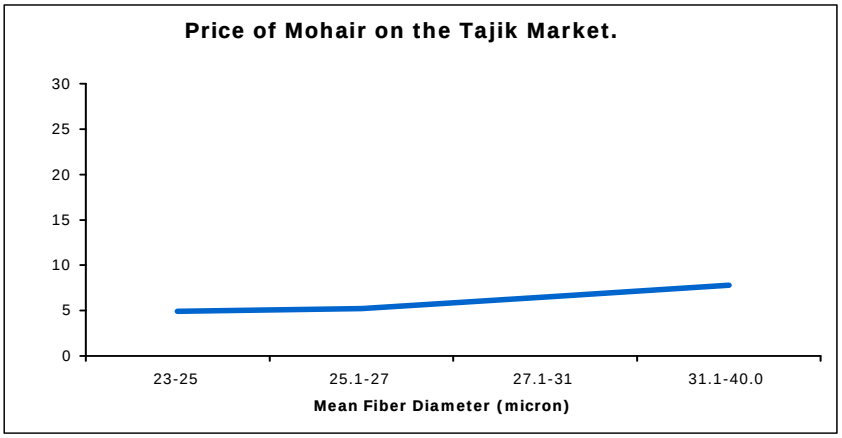


Figure 5. Price of Tajik mohair relative to fiber diameter (M. Kosimov, F. Kosimov, 2007).



As shown in figure 4, the relationship between fiber diameter and price of mohair, as well as wool and cashmere on the world market is that of negative correlation – the larger the FD, the lower the price. The maximum price was for mohair of 25 micron[2]. The reason for the high value of fine mohair is that mohair has been used for lightweight, luxury clothing valued for comfort properties, namely the lack of prickle. Only mohair of fiber diameter under 30 micron[3] can be processed into yarns and fabrics that do not irritate the human skin (i.e. cause the sensation of prickle). 45% of world production of mohair is greater than 34 micron and therefore the price of coarse mohair is heavily discounted on the world market. The finest mohair is produced by angora kids and kid mohair is most highly valued.

However, as shown in figure 5 and 6, the correlation between fiber diameter and price on the Tajik market is positive. The finest mohair of yearling female goats is the cheapest and the most valuable fleeces are those of adult male goats that have the strongest but the longest fiber. These statistics were confirmed by interviews with traders at the mohair market in Khudzhand April 2007. All traders claimed that the most valuable mohair is the "strong" mohair of adult animals.

Figures 5 and 6 also show that the greatest difference in the pricing of Tajik and Australian mohair is in the area of kid mohair. The Tajik coarse mohair of 34 micron and higher is not underprised but rather overprised compare to the Australian mohair of the same fiber diameter. However, the finest kid mohair of 23 micron that sells for as much as $27/kg on the Australian market sells for $5/kg on the Tajik market.

Figure 6. Price of Tajik mohair in 2007 (M. Kosimov, F. Kosimov, 2007).

Groups of goats (sex and Age)	Fiber Diameter	Fiber Diameter in Microns	Price of 1 kg of mohair in 2007 in USD
Non-uniform fiber – Kemp, vegetable matter, large CV			2,8
Female Goats 1 – 1,5 years	60 - 58	23,1-25,0	4,9
Male Goats 1-1,5 years	58 – 56	25,1-27,0	5,1
Female Goats 2 - 2,5 years	58 – 56	25,1-27,0	5,2
Male Goats 2-2,5 years	56 – 50	27,1-31,0	5,5
Female Goats adults	56 - 48	27,1-34,0	6,5
Male Goats adults	48 - 44	31,1-40,0	7,8

In order to explain why the Tajik kid mohair is so heavily discounted, the researchers tried to understand the needs and preferences of the Russian mohair market that absorbs

[2] The decline in price at below 25 micron may be explained by noting that most fiber below 24 micron was shorter and AB and B length kid mohair discounted for various faults such as poorer style, length, kemp and vegetable matter.

[3] When fiber diameter exceeds 30 micron, the skin "prickle" sensation begins to be felt.

the largest share of the Tajik mohair production. The following section offers a few insights about the market that seek to explain this apparent anomaly.

1.5 The Blessing and the Curse of the Russian Market.

Although the Tajik mohair producers and buyers are not well connected to the global market, their linkages to the Russian mohair market have a long history. Angora goats were first introduced in the region in the 1930 when Soviet economic planners imported angoras from the United State to develop a local breed that would supply Soviet textile factories with mohair. Unlike their western counterparts, however, the Soviet processors were not using mohair to make luxury textiles. While British and Italians manufacturers used Merino wool, cashmere and mohair to produce luxury fabrics for the high fashion industry and its "bourgeois" clientele, Soviet factories made heavy wool coats and coarse, thick fabrics to clothe the military and the working classes. Their purpose was not to make fashion but to protect the population against the severe Russian winter. Mohair & wool blends were used to make military coats and mohair yarn was knitted into thick socks and shawls that the Siberians enjoy wearing even today. For these items, long mohair of adult animals was most suitable and fiber diameter was not as important.

The preferences of the Russian consumers and the capacities of the Russian textile industry continue to shape the value, price and characteristics of Tajik mohair to this day. Russian consumers value mohair as a natural material but are not particularly concerned with the fineness of mohair products. The residents of northern cities such as Omsk, Tomsk and Sverdlovsk where much of the Tajik mohair production is sold, are not particularly interested in fine, luxury clothing but prefer warm sock, shawls and pullovers that can protect them from the Siberian climate. Siberian women enjoy wearing brushed mohair sweaters, scarves and shawls for warmth on top of other clothing which helps to moderate the prickle. In order to produce brushed mohair yarn, longer fiber of the adult animals is required. Kid mohair has little use in industrial processing as well. Those Russian textile factories that survived market reforms do not have the machinery to produce fine, luxury fabrics but continue to focus on the production of utilitarian clothing for which there is local demand. Although the author did not research the Russian market for Tajik mohair and this theory is based mostly on anecdotal evidence, it provides the most plausible explanation for the peculiar pricing of Tajik mohair – the climatic, historical, cultural and technological characteristics of the Russian market.

After the breakdown of the Soviet Union, the linkages between Tajik mohair producers and Russian consumers have shifted from state-managed to private trade but the influence of the Russian market remained formidable. Anywhere from 70-90% or 280 – 360 tons of Tajik mohair is shipped to Russia each season. In addition migrant workers from the mohair-producing regions bring knitted mohair products to Russia for sale[4]. Tajik

[4] The export of mohair to Russia presents a multitude of risks. Firstly, mohair can be legally imported only in a scoured form. However, there are no scouring facilities in Tajikistan. As a result Tajik traders have to bribe Tajik and Russian customs officials to ship the unscoured mohair into Russia. If they are caught inside of Russia they have to pay additional bribes or are in danger of loosing the entire shipment. The marketing of mohair, yarn and knitted clothing by the Tajik men and women in Russia was further complicated by a Russian law adopted in 2007 that prohibits non-Russian citizens from acquiring a sale permit to work at a market. This leaves the Tajiks with the option to sell their mohair to a Russian

mohair traders had limited information about how the mohair is processed in Russia. Traders interviewed at the market in Khudzhand in April and September 2007 reported that large shipments of mohair go to a processing factory near Moscow. They also recalled seeing $10,000 Japanese-made knitting machines in Russia that are used to produce knitted clothing out of mohair. There is no similar technology for industrial mohair processing in Tajikistan

Thick, coarse mohair socks made for export to Russia, Khudzhand market, September 2007.

In summary, although the Russian market represents an important outlet for Tajik mohair, the market's narrow preference for coarse fiber undermines the value of kid mohair and hurts producers who are forced to sell fine mohair for very low prices. The current market prices also stimulate the Tajik angora goat farmers to breed for coarse mohair

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salesperson, hire a Russian seller or try to obtain a Russian citizenship. In fact, many Tajik mohair traders already obtained Russian citizenship to gain more legal protection and to make it easier to bring mohair to Russia and sell it.

while high prices of kid mohair are motivating producers in all other mohair producing countries to breed for fine fiber. This may hurt the chances of Tajik producers to successfully compete on the world market once the market linkages become available. In other words, although the Russian market represents an important source of revenue for the otherwise isolated Tajik producers, the pricing structure and the breeding incentives offered by the market are costly to producers in terms of underpricing part of their production and discouraging the selection for fine fiber. In order to resolve these issues it is important to assists the Tajik producers to fully develop their resources and successfully integrate into the global community of mohair producers, processors and consumers.

The development of linkages to global markets can take a variety of forms. For example, producers can receive assistance with fiber testing and grading, with adopting international marketing standards, setting up an electronic marketing system and forming joint marketing organizations. In order to improve the quality of mohair, producers need assistance with developing breeding programs and resolving issues concerning access to pastures, animal feed and proper animal maintenance. Such assistance will vary depending on the needs of the particular production system (large, medium and small farms and village households).

In addition to offering assistance to goat farmers, Tajik women who currently produce mohair yarn and knitted products for the Russian market can receive support in finding new export markets for luxury mohair products. The ICARDA project was designed to work specifically with women to develop luxury yarn and knitted products for markets in the United States. The successful sales of these products would 1) improve livelihoods of poor rural women through increased income; 2) create a market stimuli for farmers to produce fine, quality mohair through investment in breeding, feeding and animal maintenance and 3) help to promote Tajik mohair on the international market and increase the interest of foreign buyers. The following section describes the involvement of Tajik women in yarn processing and sales and outlines ICARDA's work on developing linkages to the US market for knitting yarn.

1.6 Women's Involvement in Mohair Processing and Marketing.

Mohair can be sold either as a fleece or as a value added product such as handspun yarn or knitted clothing. All these products can be found at the weekly market in the city of Khudzhand and at several other markets in the pilot regions. Small and medium producers bring several kilos of mohair to the market when they need money and sell it to middlemen who collect mohair for larger traders or to women who process mohair into handspun yarn or make socks, shawls, pullovers and other clothing. The women sell the yarn and knitted products at the market and use the income to buy food and household items and to purchase small amounts of angora fiber to spin more yarn. This way they can make a small amount of income every week.

The sale of yarn and knitted clothing represents the single greatest source of income for rural women in the pilot regions and a large percentage of women is involved in spinning and knitting. According to one informant, she spins around 50 kg of mohair yarn in the course of the year and sells it for 35 somoni per kg or $10.17, for $508.50 total. It takes

approximately 55 kg of mohair to produce 50 kg of mohair yarn. The woman buys most of the mohair for 20 somoni per kg or $5.81. This means it will cost her 1,100 somoni or $319.76 in raw material and she will earn $188.74 (508.50 – 319.76) annually for spinning 50 kg of yarn, or $15.72 per month. However small, her earnings will be larger than the $11.70 per month salary paid to workers of the cooperative farms.

Farmer selling his mohair to spinners, Khudzhand market, April 2007.

Women spinning yarn, Karadzhingil village, September 2007.

The technology for mohair processing is very simple. The women use homemade carding boards to prepare the fiber and spindles to produce mohair yarn. Some women use electric, homemade spinning machines. However, the usage of such tools is limited by the availability of electricity which is sporadic especially during the winter months. None of the women have dyes for mohair and the yarn and knitted products sold are either white or of natural colors. There are no quality industrial carding machines available in the pilot regions that could card mohair for spinning, which is the most time-consuming part of the process[5].

[5] In order to card mohair for spinning, quality carding machines that do not tear the fiber need to be used. Such machines were previously produced in Russia in the city of Orlov. However, no information is available on the current state of the production. It is likely that the Orlov enterprise is no longer producing this equipment.

Yarn sold at the Khudzhand market for 30-35 somoni/kg (approx $10) September 2007.

Mohair yarn and clothing is also purchased by traders who export it to Russia. According to information obtained at the market in Khudzhand, the price of yarn on the local market is 25-35 somoni ($7.27 - $10.17). In Russia it sells for 500 – 1000 rubles ($19.23 - $38.46). According to a woman informant, middlemen purchase up to 10,000 pairs of mohair socks on the local market for resale in Russia (Shamsi Makhmudov, ICARDA project report, 2007).

In some cases, the women artisans themselves export the yarn and knitted products to Russia. For example, Ms. Tilloeva Gulbibi is a mother of four children whose husband left to work for Russia and never returned. Her brother produces colored mohair goats in the Matchinski mountains and she uses the mohair to make yarn and knitted goods for sale in Russia. From September to January she and older sons travel to Russia where they sell mohair yarn, socks and shawls at the market. The two younger children have to stay home alone. The income the family makes from mohair sales in Khudzhand and in Russia is their main source of livelihood.

Ms. Tilloeva and her family with colored mohair fleeces, Adrasman village April 2007.

2. Developing An Alternative Marketing Chain.

The ICARDA project is focused on developing a new value chain centered on the production of luxury mohair yarn and knitted products for the American market to complement the Russian market for coarse yarn and utilitarian mohair knitware. The project objective is to increase the income of Tajik women spinners and the angora goat producers by developing a high-value added luxury yarns and marketing them in the United States. The project included the following activities up to date:

1. Research on the American market for luxury handspun yarns (March 2007).
2. Survey of skills, resources, supplies and capacities of Tajik women to produce high quality yarn for the American market (April-May 2007).
3. Work with groups of women spinners on producing yarn samples for the American market (April-May 2007).
4. Development of a registry system for artisans and their samples (May-June 2007).
5. Testing of yarn samples by American knitters and storeowners (June-August 2007).

6. Delivery of test results to spinners and discussions about improvements needed (September 2007).
7. Delivery of supplies to artisans and production of a second set of yarn samples (September-October 2007).
8. Testing of new mohair samples by American spinners (currently underway).
9. Development of other components of the production and marketing chain including:
    a. Working with the groups to introduce quality control and training new spinners who wished to join the current groups.
    b. Working with angora producers on shearing 6-moths old kids for "superkid" mohair for spinning and on breeding and selection to improve fiber quality.
    c. Working with local craftsmen on producing quality spinning wheels for artisans.
    d. Working with suppliers of dye, silk and other raw materials to establish reliable supply linkages for the spinners.

2.1 Research on the American market for luxury yarns.

The project began with a brief survey of the American market for knitting yarns to assess the supply and demand for luxury mohair yarns. The research had shown that the knitting yarn market is rapidly developing and offers a unique opportunity for specialty yarns made of natural fibers. Based on the information offered by the website of the Craft Yarn Council of America, 36% or 53 million of American women know how to knit or crochet – a 51% increase over the last ten years. Since 2002, participation in the craft of knitting and crocheting increased by around a quarter. Many young women aged between 25 and 34 were starting to knit which resulted in an exponential growth in the import of knitting yarns into the United States in 2004 – 2005. Based on the statistics, yarns made of natural fibers were especially in demand. Many knitters were spending more money to buy expensive handspun, hand-dyed yarns made of 100% wool or mohair.

"Of the Beaten Path" yarn store, Madison, WI.

The researcher also visited yarn stores in Madison, Wisconsin to inquire about yarn quality, variety and prices and purchased a variety of samples of mohair yarn sold in American stores to show to the Tajik spinners. She discussed the use of mohair yarn with knitters and weavers and researched mohair yarn sales on the web to understand the range of prices and the types of yarns marketed. The research showed that the prices of mohair yarns vary greatly. For example the "Sow Ear" yarn store in Madison, WI carries the following types of yarns:

Name	yards/meters	Contains	Retail price per scane	made in	Retail price per 100g
Kidsilk haze	229 yards	70%kid mohair, 30% silk	$13.95/25g	Italy	$55.80
Parisienne	221 meters	70% kid mohair, 30% polyamid	$13.50/25g	England	$54
Soft Comfort Mohair	95 yards	80% kid mohair, 5% wool, 15% polyamide	$7.25/25g	Italy	$29
Kid Mohair	225 yards	70% mohair, 30% nylon	$11.30/50g	South Africa	$45.20
Mountain Colors	490 yards	78% mohair, 13% wool, 9% nylon	$24.50/100g	Dyed in USA	$24.50

The prices were the highest for finer mohair such as the Kidsilk haze and the Parisienne and lower for the thicker yarn made of adult mohair (the Mountain Colors). Based on the prices available, the Tajik mohair yarn could sell for a wholesale price of anywhere between $279 to 122.50 per kg. Even after subtracting costs for shipping, customs and wholesale services, the artisans could make at least $80/kg which represents very attractive earnings. If an artisan spun 50kg of mohair per year, she could make $4,000 - $630 for raw material (90kg of raw mohair for $7kg)) = $3,370. Such income could greatly improve the living standards of her entire family.

2.2 Survey of skills, resources, supplies and capacities of Tajik women to produce high quality yarn for the American market.

2.2.1 Spinning Skills.

Secondly, the research focused on assessing the resources, skills, capacities and interests of women in the pilot regions needed for the production of competitive mohair yarn. The research showed that most women in the pilot region possessed the skill to spin mohair yarn using a simple homemade spindle. Some women also knew how to knit clothing and how to market their products at the local market or in Russia. Whereas in many other Central Asian countries only older women knew how to spin yarn, in Tajikistan all generations of women in the region were proficient, active spinners and young girls learned spinning in school. The interest in spinning yarn was not limited to families that produced angora goats. Women whose families had no goats were going to the market to purchase raw material and sell their production.

Tajik girls are taught yarn spinning at school, Katarbulak settlement, April 2007.

2.2.2 Spinning Tools.

The researchers learned that the tools for spinning were readily available. Relative to processing other local agricultural products, adding value to mohair through spinning yarn and knitting clothing requires small investment in equipment and machinery – it can be done using a simple carding board, a spindle and knitting needles. These types of tools could be found in most rural households in the region. Some women also used homemade electrical spinning machines when electricity was available. However, their proficiency in using hand spindles gave them the opportunity to continue working during blackouts that have been frequent in northern Tajikistan especially in winter months.

The absence of industrial machinery for mohair processing and the women's reliance on simple, homemade equipment presents certain advantages. First, the women do not need electricity to produce yarn which is important especially for families in rural settlements that are off the grid. Secondly, having simple and relatively cheap carding and spinning tools at home gives the women the opportunity to work as independent producers and be in control of their work time and their earnings.

2.2.3 Angora Fiber and Other Materials.

The women also had an easy access to mohair fiber which was available at a weekly market in Khudzhand and several other cities. The selection of colors and styles was best in the early spring after shearing but individual angora fleeces of good quality were for sale through out the year. As explained earlier in the paper, fine kid mohair was cheaper

than mohair produced by adult animals. This was important for the ICARDA project that intended to organize the production of kid mohair yarn.

In addition to mohair, the researcher learned that rural families in the pilot region produce silk cocoons in April and May and sell them to the silk factory in Khudzhand that produces unspun silk thread for export to Vietnam. They also learned that silk thread and batting could be obtained from neighboring Uzbekistan and potentially produced by rural households in Tajikistan. This opened the opportunity to produce fine mohair yarns that are spun onto a silk cord and to develop luxury silk and mohair yarn blends that are in demand in the United States[6].

2.2.4 Interest in Joining the Project.

Finally, the women interviewed and informed about the project were very interested in collaborating on making yarn for the American market. Many of the women were already making yarn for the Russian market and were very enthusiastic about making luxury yarns for knitters in the United States for higher prices.

2.3 Work with groups of rural women on producing yarn samples for the American market.

2.3.1 Organizing Groups of Spinners.

Based on the research results, the ICARDA project team decided to work with several groups of spinners to organize the production of yarn samples for the American market. The first objective was to establish the experimental spinning groups and provide them with the needed raw material, instructions and market information. The researchers enlisted a dozen of enthusiastic spinners at the yarn market in Khudzhand and also through local connections in pilot villages. The project established five spinning groups in the Karadzhingil village, the small towns of Taboshar and Adrasman and in the Katarbulak and Takli settlements. Each group included several women who agreed to produce high quality yarn samples for American knitters.

[6] In order to produce fine yarn, kid mohair is spun onto a base thread. The thread is most often made of nylon or rayon but can also be silk. Using silk in place of artificial fibers increases the quality and the value of the yarn. In addition, raw silk can be carded much like animal fiber and spun into yarn and colored. Silk yarn can be sold independently or spun together with mohair yarn to create another version of luxury yarn – a mohair/silk blend.

Project Participants, Katarbulak settlement, April 2007.

2.3.2 Obtaining Raw Materials and Supplies.

The next objective was to obtain quality kid mohair fiber that artisans could spin into high quality yarn. The research team visited mohair markets and angora goat producers in the pilot regions to select and purchase quality white and colored kid mohair for sample production. Kid mohair is often sold first because it is less valuable and it was important to purchase the fiber at the beginning of the season in April before it was sold off to the traders. The researchers decided to supply the artisans with mohair to ensure that they work with the highest quality fiber available on the market.

Dr. Matazim Kosimov examining kid mohair, Taboshar settlement, April 2007.

In order to obtain silk thread for the production of fine yarns, the research team visited the silk factory in Khudzhand, established a collaborative relationship with the management and obtained multiple samples of silk thread and silk batting to make fine mohair yarn, silk yarn and mohair/silk blends. The factory managers and the production technologist promised to assist the project with obtaining quality spun silk threads that are produced in neighboring Uzbekistan and collaborate on producing other types of silk fibers that could be used in the yarn-making process[7].

[7] The unspun silk thread the factory produces cannot be used for yarn spinning.

Silk cocoons produced in Tajikistan, Khudzhand Silk Factory, April 2007.

Finally, the team obtained samples of wool dyes made in Turkey that are used by artisans in Kyrgyzstan to dye wool and felt. These quality dyes of many different colors can be used to dye mohair and silk fiber to produce a variety of colored yarns.

2.3.3 Improving Spinning Technology.

The project also worked to improve the yarn production technology by introducing a wooden spinning wheel which is used by spinners in the United States and Europe and made by the Ashford company in New Zealand. The spinning wheel is easy to use and much more productive than the spindle. However, importing such wheels to Tajikistan would not be economical given that each wheel costs around $400 and the shipping cost is $100 and higher. The team decided that it would be more efficient to try to produce similar spinning wheels in the pilot region. Some Tajik families tried to produce such wheels but with only a moderate success and needed assistance with prototypes and parts.

Homemade spinning wheel used by a family in Takli settlement, April 2007.

The research team left the Ashford wheel with a master craftsman in a village near Khudzhand who made electrical spinning wheels for sale[8]. The master agreed to use the Ashford wheel as a model to produce similar wheels locally for approximately $100. In addition the team delivered to Tajikistan a $300 drum-carding machine also produced by Ashford that can be used to card together colored fibers and create unique blends of colored mohair yarn. This machine can also be locally produced in the future.

[8] Electrical spinning wheels cannot be used to produce high quality, thin yarn due to the lack of control the spinner has over the velocity.

Discussing the production of Ashford-type spinning wheels, April 2007.

2.3.4 Providing Market Information and Yarn Samples to Artisans.

The project participants needed to see what kind of mohair is sold on Western markets and learn about the consumers they were trying to produce for. The researchers provided each group with samples of mohair yarn from stores in the United States as well as photos of yarn shops and samples of knitting magazines. They spoke with the artisans about the US yarn market and about the preferences of the American consumers. Providing market information and samples has helped the women to conceptualize the market they were trying to produce for and the production they were competing against. The researchers helped them to understand how the preferences of the American consumer differ from those of the Russian consumer whom they were much more familiar with and from whom they could receive feedback more directly.

2.4 Development of a registry system for artisans and their samples.

Thirteen women from the four villages and farming settlements were distributed mohair and silk and paid to produce several different types of yarn samples for the project. The samples were collected in a week and a registration system for the women and their

samples was created by Matazim and Farhod Kosimov. The Excel file included the names and addresses of the spinners and descriptions of the yarn samples each woman produced. A code was designed to identify the different types of samples. The registration system allowed to insert feedback on specific samples into the database and deliver the information to each artisan. All women were very enthusiastic about the project and produced quality samples that were taken to a yarn store in Madison, Wisconsin to be examined by professional knitters and storeowners.

Dr. Kosimov collecting and recording samples in the Takli settlement, April 2007.

In order to provide an extra incentive to the Tajik spinners, the research team offered the Ashford spinning wheel as a price to the spinner who made the best samples. After the evaluation of all the samples, the research team came to the unanimous conclusion that Matluba Khanaeva of the Takli farm settlement produced the highest quality samples and won the Ashford wheel.

Ms. Khanaeva with the Ashford wheel, Takli settlement September 2007.

2.5 Testing of yarn samples by professional American knitters and storeowners.
A group of professional knitters who teach knitting classes in Madison and the owners of a Madison yarn store agreed to participate in testing the samples and knitting patches from the mohair yarn. They were shown photographs and given background about the Tajik artisans and the objective of the project was explained to them. Each knitter received samples from two Tajik spinners and was asked to test the yarn by knitting swatches and provide feedback about the yarn to the project researcher. The Madison knitters commented on the washing and preparation of the fiber, the presence of vegetable matter and dandruff, the evenness and consistency of the spinning, the strength of the yarn, its softness, color and other characteristics.

The samples of the prize-winning spinner Khanaeva Matluba were tested by a professional lace-maker Ann Varda who teaches classes at the yarn store and has worked with similar types of yarn for many years. Ms. Varda was very pleased with the quality of the samples and used them to create beautiful patterns. She and the storeowner ordered yarn from Ms. Khanaeva and several other artisans for the store.

Knitters in Madison, Wisconsin with the tested samples of Tajik yarn, June 2007.

Yarn 10BI made by Ms.Khanaeva and tested by Ms. Varda, June 2007.

Yarn 1C made by Ms. Abdurakhmonova and tested by Ms. Varda, June 2007.

2.6 Delivery of test results to Tajik spinners; production of a second set of samples. The comments and suggestions made by the knitters were included into the database and delivered to the Tajik artisans together with the tested samples in September 2007. The researchers visited the groups of spinners and discussed the comments on her yarn samples with each spinner. The spinners were also shown photographs of the knitters who worked with their yarn and the swatches that the knitters made from their samples. The researchers distributed mohair fiber and silk thread to the artisans and the women produced a new set of larger samples, taking to account the comments and suggestions they received. The samples were delivered to Madison in October 2007. The yarns were well received by the Madison knitters and are currently being used to knit articles of clothing and accessories to fully test the quality of the yarn. Based on the preliminary feedback, the Tajik spinners responded very well to the comments their received and the quality of most of the samples had improved dramatically. Some women made samples of very high quality and are ready to compete with mohair yarns that are currently on the market. Their yarns will be test-marketed in stores in Madison in the spring 2008.

Spinning group in the Takli settlement produced high-quality samples, September 2007.

Knitters from the Sow's Ear yarn store with the latest mohair samples from Takli, October 2007.

3. Development of other components of the production and marketing chain including.
3.1 Improving group organization and quality control; training new spinners.
The team worked with the groups to introduce a quality control system that would allow the women to evaluate their yarn according to a number of parameters that are key in determining quality. According to the system, each artisan would evaluate her yarn based on the selected set of characteristics (i.e. cleanliness, lack of dandruff, evenness of spinning, strength, quality of plying etc.). In addition, the entire group, led by a group leader, would provide comments on the quality of the yarn made by each member. This process would ensure that each group produces high quality yarn and maintains the reputation of its product on the market.

The yarn-making project has become popular in the pilot villages and many women expressed interest in joining the current groups. The project researchers decided not to set up additional groups but included new participants in the existing groups. Initially, 13 spinners participated in the project. In October 2007, 6 additional spinners were included and entered into the project registry. The researchers also met with several new artisans who are highly skilled in knitting and will be able to train other women.

Discussing Mohair Samples with Spinners, Katarbulak village, October 2007.

3.2 Working with angora producers on shearing 6-moths old kids for superkid mohair for spinning and on improving breeding and selection.

The team also began to work with several farmers in the pilot region on providing quality fiber to the artisans. The farmers were explained the objective of the project and the need to focus on the production of high quality fiber that will be needed by the local women to produce luxury yarns. Dr. Kosimov will collaborate with farmers to create experimental herds that will be used to improve breeding and select for high-quality colored and white fiber. Especially naturally colored mohair yarn is in high demand on the US market and Tajik angoras include an exceptionally high percentage of colored goats compared to angoras produced in other countries. The researchers began to work with farmers who produce quality colored goats to include them into the project. For example, they convinced a farmer in the Karadzhingil village who breeds uniquely colored goats to separate his white and colored animals during breeding season to improve selection. Farmers that have produced uniquely colored angoras have not found a special interest in their animals and fibers and were not particularly interested in selecting for such animals. They did not understand the uniqueness and value of these fibers until their learned about the international mohair market through the ICARDA project and were told relayed the enthusiastic responses of the American knitters towards yarns made of these fibers.

Colored angora fiber, Karadzhingil October 2007.

6-months old kid selected for shearing, October 2007.

The Karadzhingil farmer became especially interested in collaborating with the project after he learned that his wife and daughters, and of course also the male family members, could participate in spinning his fiber into expensive yarns for sale in the United States. He and several other farmers also agreed to shear 6 months old kids and sell the mohair to the project for the production of high-quality "superkid" mohair yarn. The fleeces of 6-months old kids are used to produce the highest quality, soft and clean fiber that makes the finest yarn and knitted products. Thus far, there has been no demand for this type of fiber in Tajikistan and the farmers have not been shearing 6-month old kids but only yearlings.

The yarn-making activity shows that a direct market stimuli in the form of high prices for luxury yarn and fine, quality mohair fleeces can serve as an immediate incentive for improvements in breeding and animal maintenance. In fact, subsistence farmers who have very limited resources are not likely to invest in these improvements unless they are clearly and immediately motivated by increased revenues. It is difficult to motivate farmers by assurances that the market will reward their investment in improved quality when they are not receiving market signals that would back up such assurances. However, when the market signals are present it is much easier to mobilize producers behind collaborative efforts to improve production and marketing standards.

Dr. Kosimov and farmers from Karadzhingil selecting angora kids for shearing, October 2007.

3.3 Working with local craftsmen on producing quality spinning wheels for artisans.
The project worked with local craftsmen who tried to produce models of spinning wheels on the basis of the Ashford model from New Zealand. Two new prototypes of spinning wheels were produced and are in the process of being tested. The researchers distributed the wheels among the groups of spinners and the spinners are expected to provide feedback to the craftsmen about the wheels and can make any improvements or adjustment they see fit. The team imported another model of the Ashford spinning wheel to Tajikistan. The wheel was given to a group of artisans in Takli that produced the highest quality yarn samples in October. Although it is clear that the production of a functional spinning wheel will take at least a year, several craftsmen are involved in the work. They have an interest in supplying the women with quality wheels and other tools including drum carders. Demand for such tools could lead to the development of another cottage industry in the region.

Spinners from the Takli settlement examining a prototype of a spinning wheel made through the project, September 2007.

3.4 Working with suppliers of dye, silk and other raw materials to establish reliable supply linkages for the spinners.
The researchers also collaborated with the experts from the silk factory on producing silk batting for the artisans to create silk and mohair yarns. They tried to establish connections to silk spinning factory in Uzbekistan that produces silk thread that can be used as a base for spinning fine mohair yarn. The researchers also worked with the

Central Asian Craft Support Association in Bishkek, Kyrgyzstan to obtain recipes for natural dyes that can be used to dye white mohair and imported quality chemical dyes from Kazakhstan that will be used to produce dyed mohair yarns. Some spinners already started working with dyed mohair based on color schemes developed by the research team. These yarns received very high marks from the Madison knitters.

In order to fully develop the yarn production and marketing project, a number of additional activities needs to be developed. Some of these include:

1) Test-market yarn in Madison and other US cities in the spring and summer of 2008 and develop a plan to scale up the project.
2) Develop a marketing network for the Tajik yarn in the United States, including a website, a label for the yarn and a documentary video on the project.
3) Work with angora goat producers to focus on breeding and animal maintenance to improve the quality and fineness of Tajik mohair.
4) Strengthen connections between groups of yarn producers and farmers who produce the highest quality fiber, white and colored.
5) Improve access to other materials needed for yarn production including silk threads, silk batting and natural and chemical dyes.
6) Work with artisan groups to identify group leaders who could organize local Fair-Trade businesses and work directly with American distributors.
7) Work on the development of local production of spinning wheels and other tools for the artisans.
8) Work with artisans to produce different types of marketable yarns and develop standards for those yarns.
9) Work with designers in the United States to develop prototypes of marketable knitted products that could be made by Tajik artisans out of their yarn and train artisans in producing them.
10) Organize training for artisans in spinning, knitting, dying, marketing and small business fundamentals.
11) Research the improvements in the women's earnings and their effects of on gender dynamics within the family and community.

4. Conclusion.

The research on livelihoods in the pilot regions showed that the production of mohair and the sale of mohair yarn represents an important means of livelihood and provides an opportunity for rural women to generate income. The research also showed that an alternative market exists especially for kid mohair and fine, handspun yarns in the United States. Based on preliminary price calculations, producing luxury mohair yarns for US yarn shops would lead to much higher earnings for the Tajik women than they currently receive by selling coarse mohair yarn to Russia. The results of testing mohair yarn samples by American knitters verify that the Tajik spinners can produce attractive yarns that can successfully compete with similar production sold in American stores. The ICARDA project continues to work with the artisans and the angora goat farmers to open the American market for knitting yarn to the Tajik spinners and help them to establish successful, women-led small businesses organized as Fair Trade.

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