Improving Livelihoods of Small Farmers and Rural Women through Value-Added Processing and Export of Cashmere, Wool and Mohair

IFAD Grant 1107 – ICARDA

Woman bringing her tagged cashmere goat to be included in the breeding nucleus, Andarob village, Badakhshan Tajikistan, September 2011.

Fifth Progress Report

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List of Acronyms

AKF	Aga Khan Foundation
CAC	Central Asia and the Caucasus
CACSARC-kg	Central Asian Craft Support Association's Resource Center - Kyrgyzstan
CESVI	Italian, "Cooperazione E Sviluppo", cooperation and development
CIDR	Controlled Internal Drug Release
FAO	Food and Agriculture Organization of the United Nations
FD	Fiber Diameter
ICARDA	International Center for Agricultural Research in the Dry Areas
IFAD	International Fund for Agricultural Development
NC	Nomadic Condition
NGO	Non-Governmental Organization
PGF2A	Prostaglandin Faa
PMSG	Pregnant Mare's Serum Gonadotropin
US	the United States
USA	the United States of America
USD	US Dollars
USAID	United States Agency for International Development

1 Introduction and grant background

1.1 Grant goal, objectives and target groups

The overall goal of the programme is to improve the livelihoods and income of small livestock producers and rural women through improved production, processing and export of value-added fiber in producing areas of Tajikistan, Kyrgyzstan and Iran.
Hence, the project aims at setting up value chains focused on fiber production, processing and marketing at the project sites.

The target groups are small producers of cashmere, mohair and wool and women processor groups. The pilot sites at the four project sites in Iran, Kyrgyzstan and Tajikistan have been selected to represent typical fiber producing and processing areas.

The project works at four sites:

1) Northern Tajikistan, Sugd region on Angora goat breeding and mohair processing and marketing;
2) Eastern Tajikistan, Badakhshan region on cashmere goat breeding and cashmere processing and marketing;
3) Kyrgyzstan, Naryn region on improving wool quality and producing wool felt handicrafts for regional and international markets;
4) Iran, Baft region on cashmere goat breeding and cashmere processing and marketing.

At each site, the project collaborates with producers on improving breeding, animal husbandry and fiber quality of sheep and fiber goats, and works with women's groups on processing the fibers into luxury yarns and products for export. The objective of these activities is to improve the income of the target groups: small sheep producers, Angora and cashmere goat producers, and rural women who add value to cashmere, mohair and wool through local processing. Improvements in sheep and goat production help farmers earn more income from selling wool, mohair and cashmere. Fiber processing and sales of yarns, felts and other products help poor women in remote, rural areas to earn income and improve livelihoods. The number of direct beneficiaries varies with the nature of the activity. In the case of establishing breeding programs only a small number of farmers have been included as it demands very intensive work and data collection on the farms. The fiber processing activities are targeted at women groups that vary related to the initial experience of the women and conditions at the sites.

1.2 Changes in grant implementation context and grant design having occurred during the reporting period

No significant changes in implementation context or grant design occurred during the reporting period.

2 Progress and performance by component

2.1 Sogd, Northern Tajikistan

2.1.1 Component 1: Characterize production systems and improve fiber production of small ruminants at all target sites.

2.1.1.1 Changes in fiber markets and Angora goat breeding and their affects on Tajik producers

Angora producers in Northern Tajikistan raise around 200,000 Angora goats and produce around 300 tons of mohair worth $1,000,000 or more, depending on the strength of the market. There are approximately 500 small, medium and larger producers with 100 – 500 goats, several cooperatives (former state farms) that raise several thousand goats and hundreds of households that have small flocks of 10 – 15 goats. The goats are grazed all year, produce around 1.5 kg of mohair on average and are sheared once a year. Mohair production and export is a significant source of livelihood not only for mohair producers but also for spinners and knitters who process part of the clip into yarn and products. However, the decline in systematic breeding after the collapse of the Soviet breeding program is starting to erode mohair quality and threaten the long-term survival of the Tajik Angora goat, the mohair sector and the livelihoods of men and women who depend on it.

The project team was able to identify shortcomings in Angora goat breeding and mohair quality by examining Angora goat flocks, collecting data on Tajik mohair and trying to process mohair into yarn. After two years of work on mohair processing, the project team concluded that the presence of kemp and medullated fibers is the most serious problem in producing quality yarns and knitwear. Kemp fibers reduce softness of mohair yarn and garments and generate the sensation of prickle which is unacceptable in luxury knitwear. As a result, Tajik mohair cannot be processed into an expensive yarn without costly dehairing. Problems in fiber quality frustrate the project efforts to expand production of yarns and products that benefit poor rural women.

Deficiencies in mohair quality result from the lack of targeted breeding in Tajikistan. Systematic breeding is key to improving mohair quality and has been a major concern of Angora goat producers worldwide. Especially during the last decade the demand for specific fiber qualities such as softness has risen, creating pressure on wool and mohair producers to decrease fiber diameter and improve quality. Producers of luxury knitwear such as Italy demanded fine mohair that could compete with cheapening and abundant alpaca and cashmere. Consumers became accustomed to a new standard for softness when cashmere products became accessible to mid-income buyers and when soft nylon fleece products flooded the market and replaced coarse wool. As the price of fine natural fibers rose relative to coarse ones, so did the efforts of Angora goat farmers to breed for fineness and against kemp. With the assistance of state-sponsored breeding programs, South African, Australian, American and Argentinean producers were able to nearly eliminate kemp from the majority of their flocks and decrease fiber diameter. In the meanwhile, Angora goat breeders in Tajikistan remained isolated from global markets, fashion trends and price incentives and continued to produce relatively coarse and kempy mohair for the Russian and the low-end Chinese market. In addition, state Angora goat breeding program that was in place during the Soviet period was largely dismantled and newly emerging private

farmers lacked knowhow and standards in breeding. The problem of kemp, high fiber diameter and medullation thus remained unresolved, and the overall quality of Tajik Angora goats and mohair has steadily declined since the mid 1990s.

Poor breeding and fiber quality is costly to Tajik farmers and women who process mohair – it prevents producers from selling mohair for world-market prices which are much higher especially for fine, kemp-free kid mohair. For example, while Tajik farmers earned on average $7-8 for 1kg of mohair in 2011, American farmers earned $15/kg. Poor breeding also lowers fiber productivity - American goats produce more than twice as much mohair per year compared to Tajik Angora goats[1]. In terms of processing, poor fiber quality prevents Tajik spinners from producing high value-added mohair yarn and products without costly and laborious dehairing. The project calculated that the production cost of 1kg of luxury mohair yarn would decrease even if the price of raw mohair doubled, provided that the fiber was fine, uniform and kemp-free and did not require dehairing. This means that both farmers and women who process mohair could earn considerably higher incomes if breeding and fiber quality was improved.

Improvements in breeding are necessary not only to increase mohair prices and develop local processing. A comprehensive breeding program is essential to reverse the ongoing decline in fiber quality and preserve the Tajik Angora goat. The loss of this breed would mean the loss of livelihoods for hundreds of mohair producers and rural women who produce cheap mohair yarn for the Russian market and are now starting to produce fair trade, luxury yarn and knitwear for export to the United States and Europe. In terms of income, the loss of the Angora goat sector would cost the impoverished Sogd region approximately $1,000,000 in revenue from yearly mohair sales.

2.1.1.2 Breeding work under the ICARDA/IFAD project

Import of new genetics

The objective of the ICARDA/IFAD project has been to assist mohair producers and local scientists to implement sustainable, long-term breeding improvements. To jump-start the breeding work, the project decided to import Angora goat semen from the United States to Tajikistan and collaborate with Tajik scientists and Angora goat producers on setting up a new breeding program linked to global market trends. Introduction of American genetics to Tajikistan is not new. The Tajik Angora goat breed was developed through crossing local fiber goats and Angora bucks that were imported to Russia and then to Tajikistan from the United States in the 1930s. The ICARDA project was unable to import live animals due to the prohibitive transportation costs, but decided to bring in semen of performance-tested Angora bucks. The usage of American genetics will promote faster changes in fiber quality than selection from the local breeding stock of mostly coarse bucks with kempy fleeces. The new genes are expected to gradually eliminate kemp fibers, decrease fiber diameter and increase homogeneity and fleece weight of Tajik Angoras.

[1] The fleece weight of breeding does is 1.6 – 1.8kg in Tajikistan and 2 – 3.9kg Texas, USA, and the American Angora goats are sheared twice a year.

Angora breeding bucks in Tajikistan are often coarse with a high percentage of kemp and medulated fibers, Dulana farm 2011.

As described in previous reports, the project worked with Angora goat scientists from Texas A&M, Drs. Dan Waldron and Chris Lupton, to select Angora bucks for semen collection in 2010. Eight top-rated bucks were purchased at an auction in Sonora after completing a performance test at the Sonora Research Station administered by the Texas A&M University. The bucks were tested on a variety of characteristics including FD, kemp content, fleece weight and body weight. The project team selected bucks with a maximum kemp content of 0.1%, medulated fiber content of 0.4% or less and with an overall test score of 110 or higher (Table 1). The team also selected one buck with a high clean fleece weight and two bucks with low FD. The plan was to obtain bucks from at least four different breeders to ensure genetic variability. All purchased bucks received high performance scores that can be found at http://safiles.tamu.edu/genetics/angoratest.htm.

The semen was collected at the American Genetics and Biologicals in Bryan, Texas in the fall and winter 2010-2011. About 1,900 doses of semen were collected and shipped to Tajikistan in October 2011.

Table 1. Key Characteristics of bucks purchased for semen collection

Test id	Tag id	Breeder	Number of straws	180 days adj CFW (lbs)	AFD (mic)	Med (%)	Kemp (%)	Index	Comment
9	1333	Naumann	311	10.2	30.9	0.0	0.0	127.0	Low FD, high index, without med/kemp
19	2329	Cerulean	225	13.1	34.4	0.3	0.2	156.7	Top index of the test
20	2334	Cerulean	137	11.3	35.2	0.3	0.0	120.4	Good CFW, very low med/kemp
21	2340	Cerulean	141	12.9	36.0	0.3	0.0	135.9	Good CFW, good index, very low med/kemp
23	22	Haby & Coates	371	11.0	32.6	0.0	0.1	112.8	Good CFW, very low med/kemp
25	33	Haby & Coates	12	11.2	35.4	0.0	0.0	124.6	Good CFW, good index, without med/kemp
45	19	Ross	289	9.1	30.3	0.3	0.1	115.5	Added. Low AFD
	59	Speck	326						Added visually

The following objective was to organize artificial insemination at pilot sites and ensure that it was implemented by a trained specialist. During the Soviet period, Tajik Angora goat scientists used artificial insemination on large state flocks and the project identified a number of specialists who knew how to inseminate with fresh semen. However, there were no technicians experienced in using frozen semen. The project team decided to invite an Iranian scientist and experienced inseminator, Mr. Ramin Aliverdi, to assist Tajik scientists with the insemination. Mr. Aliverdi made a preliminary visit to the pilot site in September to meet with Tajik scientists, prepare the insemination plan and assess local facilities and equipment needs. He arrived for a second visit at the end of October to conduct the insemination.

Buck #9 (Naumann) had a fine fleece and was the most highly valued breeding buck at the 2010 auction in Sonora, Texas.

Selection of farmers and flocks for artificial insemination.

The project team selected farmers from the Asht and Gafurov regions that have the highest number of quality, white Angora goats in Tajikistan. The Asht region is a home to a state Angora goat breeding cooperative named "Dulana" that has approximately 8,000 Angora goats and is the main Angora goat breeding center in Northern Tajikistan. The farm is located at the foothills of the Kuraminsk mountain range, an area with excellent conditions for goat production. The cooperative goats are organized into flocks based on gender, age and overall ratings. Private farmers graze the Dulana flocks together with their own goats. The cooperative raises a flock of registered breeding bucks that are used during artificial insemination with fresh semen organized by the farm in October each year. The project team decided to use the insemination facility of the Dulana cooperative to conduct the insemination with frozen semen in October 2011. The second insemination site selected is in the Gafurov region near the Takli village. This site also includes a cooperative named "Kushatov" with 8,200 Angora goats. The Kushatov farm has a similar arrangement with farmers who graze its goats together with their own goats.

Five private farmers affiliated with the two breeding farms were selected by the project team to collaborate on the insemination in 2011. During the selection, the project team considered the quality of their flocks, their long-term capacity to develop Angora goat breeding, their interest in collaborating with local scientists and the project team on the insemination and the follow up breeding program, and also the distance between their flocks and the artificial insemination site.

The following farmers were selected: Nemat Rakhimkulov, Gafur Fozilov (Eshbay), Uktam Ibragimov, Ulugbek Beknazarov and Khaitkul Askarov. The team also invited farmer Tirkashali Urinboev who owns the white nucleus flock in the Markhamat village and collaborates with the project on breeding. Mr. Urinboev could not participate due to family circumstances.

Selected Dulana farmers:

1. Gafur Fozilov

Mr. Fozilov has 418 quality Angora goat on a farm near the Dulana village. He has 210 of his own goats and 208 goats that belong to the Dulana cooperative. His goats are distinguished by the staple length of their fiber (around 15 cm) and high luster. The goats have about 3-5% of kemp and medullated fibers. Mr. Fozilov earns most of his livelihood from Angora goat production, owns his own farm and is very interested in improving the breed and producing quality mohair. He has strong collaborative ties with Tajik Angora goat breeding scientists and is prepared to collaborate on developing a long-term breeding program. Mr. Fozilov and his family are also interested in working with women in the Dulana village on mohair processing, especially weaving.

Mr. Fozilov bringing his nucleus flock for synchronization, October 2011.

2. Nemat Rakhimkulov

Mr. Rakhimkulov owns 380 goats and takes care of 196 cooperative goats. He comes from a family of Angora goat producers – his father was the most well-known Angora goat breeder in the region. Mr. Rakhimkulov has worked on breeding coarse Angora goats with fleeces that are in demand on the Russian market. He sells all his mohair directly to Russia for relatively high

prices. However, he is interested in decreasing kemp and diversifying into breeding for fine fiber. He has invested considerable resources into Angora goat production and has some of the best animals the project team has seen in Northern Tajikistan in terms of size, body condition and fiber uniformity. Mr. Rakhimkulov also owns his own farm and has an excellent potential to develop Angora goat breeding. His exemplary animal husbandry practices are reflected in the quality of his animals.

Mr. Rakhimkulov's does used for insemination, October 2011.

Synchronizing Mr. Rakhimkulov's flock, October 2011.

Selected Takli farmers:

3. Uktam Ibragimov

Mr. Ibragimov has about 244 Angora goats, 158 his own and 86 cooperative, and is interested in improving his flock. His goats have some of the finest fleeces found in Northern Tajikistan, with exceptional length and luster. Based on a visual estimate, the kemp content in his goats' fleeces was about 4-5%. However, not all goats in this flock were in excellent condition in terms of overall health and body weight at the time of the insemination. This is likely to affect the insemination rate. Mr. Ibragimov promised to work closely with the project team on improving feeding and other aspects of animal husbandry and is ready to invest more resources in his Angora flock. He also owns his own farm and has good conditions for developing production of fine-haired Angora goats.

Mr. Ibragimov's flock used for insemination, October 2011.

4. Ulugbek Beknazarov

Mr. Beknazarov has his own farm and raises private and cooperative goats, 285 and 182 of each. His goats are similar to the Ibragimov goats in terms of fleece style and other characteristics. This young farmer is very appreciative of being able to collaborate with the project team and has a strong interest in improving his flock. The women in his family are enthusiastic about spinning yarn and producing knitted products with the help of the project. The team plans to work with the family on breeding and fiber processing in 2012.

Synchronizing Mr. Beknazarov's flock, October 2011.

5. Khaitkul Askarov

Mr. Askarov has 235 of his own goats and 80 cooperative goats. His goats are very similar to the goats of the previous two farmers and also originate from the Kushatov breeding farm. Mr. Askarov is also interested in improving breeding and fiber quality and in close collaboration with the project.

6. Supernucleus (Tajik Breeding Institute)

The Tajik Breeding Institute obtained 37 of the inseminated goats (Table 2). These goats will be used to produce breeding bucks for the "supernucleus" – a breeding flock that will be under a direct supervision of the Angora goat breeding institute in Khodzhand.

Table 2. Supernucleus flock formation

Purchased from	Number of goats
Gafur Fozilov	10
Nemat Rakhimkulov	15
Uktam Ibragimov	5
Ulugbek Beknazarov	4
Khaitkul Askarov	3
Total Supernucleus	**37**

Insemination process

A total of 258 does were selected for insemination out of 1,758 does evaluated in October 2011. Of the 258 preselected does, 237 were inseminated (see Table 3). During selection, the team considered size, body condition and qualitative and quantitative indicators of mohair quality. All goats were tagged. Prior to the insemination, the 237 does were measured and weighed (Table 4).

Table 3. List of farmers whose does were inseminated with imported semen

#	Name	Farmer's location	Number of goats	Number of inseminated does	Color of goats
1	Gafur Fozilov	Dulana	418	68	White
2	Nemat Rakhimkulov	Mullomir	576	76	White
3	Uktam Ibragimov	Takli	244	40	White
4	Ulugbek Beknazarov	Takli	285	38	White
5	Khaitkul Askarov	Takli	235	15	White
	Total		**1758**	**237**	
6	Supernucleus flock			37	White

Table 4. Indicators of live weight and exterior of inseminated does by age groups

Groups	Farmers	n	Age, years	Live weight, kg	Height at the shoulder, cm	Straight body length, cm
I	Gafur Fozilov	1	2.5	29	57	53
	(Eshbay)	29	3.5	29.01 ±0.58	54.55 ±0.32	53.1 ±0.53
		31	4.5	30.77 ±0.55	54.7 ±0.37	53.87 ±0.45
		11	5.5	31.27 ±0.63	56.72 ±0.71	55.18 ±0.96
		4	6.5	33.37 ±0.68	56.5 ±1.19	58.25 ±0.85
II	Nemat	2	2.5	26.75	54	52.5
	Rakhimkulov	24	3.5	29.54 ±0.62	54.0 ±0.69	52.66 ±0.51
		16	4.5	32.75 ±0.84	55.18 ±0.85	55.0 ±0.86
		19	5.5	34.44 ±0.74	56.15 ±0.58	54.84 ±0.45
		7	6.5	35.35 ±1.2	55.85 ±0.98	56.14 ±1.16
III	Uktam Ibragimov	26	2.5	24.72 ±0.60	53.22 ±0.57	50.55 ±0.45
	Ulugbek	22	3.5	25.34 ±0.48	54.45 ±0.61	51.59 ±0.43
	Beknazarov	20	4.5	26.47 ±0.55	54.8 ±0.79	52.4 ±0.46
	Khaitkul Askarov	19	5.5	28.13 ±0.62	56.42 ±0.71	53.68 ±0.68
		6	6.5	27.83 ±0.72	55.83 ±0.91	52.83 ±0.74
Average for the five age groups		29	2.5	25.01 ±0.59	53.48 ±0.54	50.79 ±0.44
		75	3.5	28.1 ±0.38	54.34 ±0.30	52.52 ±0.29
		67	4.5	29.96 ±0.46	54.85 ±0.35	53.70 ±0.34
		49	5.5	31.28 ±0.56	56.38 ±0.38	54.46 ±0.38
		17	6.5	32.7 ±1.05	56.0 ±0.55	55.47 ±0.76
Group I		76		30.39 ±0.37	55.06 ±0.24	53.98 ±0.33
Group II		68		32.18 ±0.47	55.07 ±0.38	54.17 ±0.35
Group III		93		26.14 ±0.30	54.70 ±0.33	51.99 ±0.27
Total		**237**				

Data in Table 4 show that goats in group II (Mr. Rakhimkulov) had the highest live weight (32.18 kg), height at the shoulder (55.07 cm) and straight body length (54.17 cm) and exceeded goats in group I by 5.56% (P<0.01), 0.09% and 0.35%, and group III by 18.7% (P<0.001), 0.67% and 4.02% (P<0.001) respectively.

The project team, led by Mr. Ramin Aliverdi, synchronized the ovulation of the 258 selected females and inseminated 237 females on 24-30 October 2011. All insemination procedures were discussed and planned with Mr. Aliverdi in mid-September. The AI sites and necessary materials and tools were prepared in advance. Due to the delay in semen import, the AI activities had to be postponed for 7 days. The implementation stages are indicated in Table 5. Before pouting of sponge (CIDR) all does (n=258) were marked (ear tags, tattoos and paint).

Table 5. Time schedule for synchronization and artificial insemination

Item	Day	Time	Date
Group 1			
Sponge or CIDR pouting	0	8-10 AM	15/10/2011
PMSG + PGF2A	9	10-12 AM	24/10/2011
Sponge remove	11	10-11 AM	26/10/2011
Heat detection	12	15-17 PM	27/10/2011
Artificial insemination	13	7- 10 AM	28/10/2011
Group 2			
Sponge or CIDR pouting	0	8-10 AM	16/10/2011
PMSG + PGF2A	9	10-12 AM	25/10/2011
Sponge remove	11	10-11 AM	27/10/2011
Heat detection	12	15-17 PM	28/10/2011
Artificial insemination	13	7- 10 AM	29/10/2011
Group 3			
Sponge or CIDR pouting	0	8-10 AM	17/10/2011
PMSG + PGF2A	9	10-12 AM	26/10/2011
Sponge remove	11	10-11 AM	28/10/2011
Heat detection	12	15-17 PM	29/10/2011
Artificial insemination	13	7- 10 AM	30/10/2011

The goats were inseminated 24 hours after synchronization. Based on the suggestion of Mr. Aliverdi, nearly all females (237 in total), were inseminated, even the difficult cases, to ensure the highest possible number of offspring. As a result, the insemination rate might be lower, around 40%. The project team discussed feeding and care of the nucleus females with the farmers to ensure the highest possible birthrate. The nucleus goats were also provided with concentrated feeds and minerals for successful wintering. Goats that participated in artificial insemination received 18 -25 kg of oats and the other nucleus groups received 12-15 kg per head. In addition 55 kg of minerals were distributed to farmers. The project team plans to monitor the care of the nucleus flocks and collect data on the progeny in March – April 2011.

Artificial insemination using frozen goat semen was conducted for the first time. Project team members, including Khurshed Davlatov (from the Badakhshan site team), specialists from the agricultural cooperatives, AI technicians and farmers participated during the introduction and training in the new method. The remaining semen was stored in a cool place. Evaporated liquid

nitrogen will be refilled on a monthly basis. The remaining 1700+ doses of semen will be used in the following years.

Mr. Aliverdi inseminating Mr. Fozilov's flock, October 2011.

Mr. Aliverdi training local scientists in insemination, October 2011.

Training on selection and breeding.

The project team conducted extension training with farmers on how to select and replenish the nucleus groups with the best bucks and does and how to identify and cull inferior goats. Activities on culling and replenishing of the nucleus flocks were organized in the spring and fall 2011. The animals were evaluated based on mohair productivity and quality, body size and condition, and age. This work was conducted with farmers Turghunboy, Suyunboy, Anarboy who participated in the previous project, and farmers Tirkashali, Usarboy, Makhmudali, Khaydarali involved in the current project. Nucleus groups were established on the new pilot site in the flocks of farmers who participated in the artificial insemination in October 2011- Nemat Rakhimkulov, Gafur Fozilov (Eshbay) and Uktam Ibragimom.

After the training farmers sold and traded quality bucks evaluated with the assistance of the project team. Eight bucks were sold and exchanged among participating farmers before the 2011 mating season. Collaboration on breeding among farmers was not very common prior to their involvement in the project activities. Participation in the project gives them the opportunity to form closer alliances, assess and compare their flocks and build trust. Collaborative ties among private producers are key to improving breeding and strengthening private Angora goat sector which is replacing collective farming.

The project team regularly provided farmers with recommendations and suggestions regarding improvements in flock structure, preparation and storage of forage and feed and their rational utilization, care and feeding of pregnant goes, animal health and other topics.

Details on training for farmers
Theme: "Training on selection and culling of the best goats"
Date: 07.09.2011 .
Site: Dulana
Trainer: Kosimov M.A., Assistants: Kosimov F.F. and Isomatov S.
Participants: farmers – 11 people.
Training agenda

Theoretical part

- Goats of which color should be produced: white or colored?
- Selection parameters: fleece weight and mohair characteristics (fineness, fiber length, % of kemp, luster, curvature, grease); fineness is a key selection criterion.
- Reasons for pure breed reproduction and crossing.
- Culling: due to age; castration of the less producing kids; monitoring of goats' health.

Practical part

- Demonstration and presentation of pictures of domestic and foreign bucks.
- Using the goat flock of farmer Kamol Juraev's.

Handouts:

- *Selection of goats for reproduction*
- *Optimization of the flock structure*
- *Culling*
- *Preparation of the does' flocks and mating*

Conclusion
Traditionally, farmers use only the age criterion when culling their goats. During the training they learned to consider multiple factors that affect the productivity of their flock and how to evaluate their goats based on qualitative traits of mohair. They also learned how to clarify their breeding objectives and how to optimize their flock structure depending on specific breeding objectives. They also received information on preliminary preparation of doe flocks for mating.

2.1.1.3 Support for Master Thesis on Economic Efficiency of Mohair Goat Production in Tajikistan

Memorandum of understanding was signed between four parties - ICARDA, University of Pannonia (Hungary), Institute of Agricultural Economics and Sogd Branch of Institute of Livestock for development and writing of master thesis by Alisher Kosimov on "Increasing of the Economic Efficiency of Mohair Goat Production".

Publication. Article called "Analysis of the Tajik mohair market" (A.Kosimov, N. Nishanov, M. Kosimov) was published in the special edition of Bulletin issued by Tajik Academy of Agricultural Sciences (TAAS) for the International Scientific Conference "Actual Development Problems of Agricultural Science" dedicated to the 20th

anniversary of independence of Tajikistan and the 20th anniversary of establishment of TAAS, Dushanbe, Tajikistan, 27-28 October 2011.

Literature review. Review of 88 articles on agricultural economics was completed, particularly on goat production, including 43 articles published by foreign scientists. The most important literature was summarized for the literature review section of the thesis.
Data collection and analyses. Collection of data required for economic analysis and determination of efficiency improvement in this sector continues on Angora goat producing pilot farms. Data on Tajik mohair market and activities of different farm types was collected using various economic surveys (primary data of community and cooperative farms, questionnaires, interviews, discussions with farmers, etc.). Materials for articles were prepared based on the economic analyses.
Work on thesis research. Current situation on goat producing farms and mohair product manufacturing technologies were studied. Collected materials and data were processed and systematized; charts and tables were developed for preparation of the third thesis chapter. Discussions and consultations on the thesis were conducted with the supervisor and leading economist scientists.
Work in libraries. Required book on this topic were studied to improve the theoretical part of the thesis. Useful electronic books on agricultural economics were found in electronic libraries and are being studied in preparation for defending the thesis.
Participation in trainings. Alisher Kosimov took part in trainings for farmers called "Training on selection and culling of the best goats" (September, 2011) and for women "Processing and improvement of value addition for mohair products" (August, 2011) conducted on the research sites with ICARDA support.

2.1.1.4 Lessons learnt

As discussed earlier, the project encountered major difficulties trying to import frozen semen from USA to Tajikistan. It was very challenging to ensure that all the paperwork required by the US and the Tajik authorities was filled and certified. It was also very difficult to find a shipping company that would deliver the semen from the US to Tajikistan. All major shipping companies refused to take this cargo to the Dushanbe airport and finally the project team had to organize shipping through Kyrgyzstan. In spite of these challenges, the project was able to deliver the semen to the pilot site in time to conduct the insemination.

The other challenge was the lack of trained personnel in Tajikistan that could implement the insemination. The project team resolved this issue by inviting an inseminator from Iran who provided professional help and training to the Tajik team and ensured that the insemination was conducted according to standard.

2.1.2 <u>Component 2</u>: Work on formation and capacity building of women's groups to develop fiber processing and export of value-added fiber and products in all pilot sites. Encourage the development of women-led small businesses.

2.1.2.1 Overview of mohair processing at pilot sites

The work with women's groups in the Sogd region focuses on developing efficient and economical production of luxury mohair yarn and knitwear and on setting up export linkages for these products. The project team works closely with women's groups on organizing all processing activities and the purchase of raw mohair. In the summer and fall of 2011 the team collaborated with the women's groups on upscaling the processing activities and organizing

spinning of 400kg of mohair purchased in the spring 2011. The following section offers an overview of this process.

Yarn Production

Fiber purchasing

In spring 2011 the team purchased around 400 kg of mohair to avoid shortages of raw material experienced by the spinners during previous years, and to produce a larger volume of yarn for export. During this first purchasing campaign the team identified farmers who produce high quality fiber, established a new market for fine, kid mohair and gained experience in working on the local mohair market. In 2012 the team plans to develop a more comprehensive purchasing system for quality kid and adult mohair. This includes setting up a buying point at the weekly mohair market in Khodzhand that will be operated by women processors. In 2011 and 2012 fiber purchasing will be covered using project funds. In 2012 and 2013 the project expects to accumulate a revolving fund through the export of larger volume of yarns and knitwear produced in 2012. The fund will be used by the women's group to purchase raw fiber in the spring of 2013.

Fiber dehairing, washing and carding

Fiber used to produce luxury yarn needs to be dehaired from kemp and medullated fibers. Fiber used for blankets and carpets does not require dehairing. All fiber needs to be scoured and carded prior to spinning. Dehairing, scouring and carding 400 kg of fiber purchased in 2011 is taking place in winter 2011-2012. The group responsible for this work is located in the Markhamat village and led by Tuluikhon Abdulazizova. The project team works closely with Ms. Tuluikhon on organizing all the activities. Emphasis is being placed on developing the most efficient method of fiber dehairing, which is the most complex and time-consuming task in processing. The processing is currently financed from project funds and proceeds from sample sales. By 2013, the project expects to fund the dehairing, washing and carding from the revolving fund.

Ms. Abdulazizova with scoured mohair, Markhamat village, September 2011.

Spinning

Carded, washed and dehaired fiber will be used to spin yarn according to standard developed by the project. The yarn will be spun by lead spinners, selected by Ms. Abdulazizova in winter and spring 2012. Each spinner will receive 5.2kg of fiber that can be spun into approximately 5kg of yarn. Spinners will be selected based on their skills and capability to fulfill the order according to instructions. Ms. Abdulazizova is responsible for quality control and for distributing the orders. Spinning of yarn will be funded from project funds in winter 2011-2012, and from the revolving fund in winter 2012-2013. Ms. Tuluikhon and the project team estimate that all 400kg of fiber will be processed into yarn by April - March 2012.

Knitting and weaving

Some of the kid mohair yarn will be used to knit products – sweaters, dresses, hats and socks – for export. The main knitting group is located in the Oshoba village and led by Ms. Dilorom Khaitova, an excellent knitter who can produce sweaters, hats and other knitted products in complex designs. Ms. Dilorom Khaitova trains other knitters and has an excellent potential to develop a successful knitting business. The project collaborates with Ms. Dilorom Khaitova on developing a number of product samples based on luxury designs imported from Europe and the United States. These samples will be presented to potential buyers and test-marketed in 2012 - 2013.

Mrs. Khaitova knitted a sweater from Tajik yarn based on western design, May 2011.

The project is starting to expand into production of woven products. It plans to use quality adult mohair to produce luxury, hand-woven mohair blankets for export. A Canadian loom was purchased by CACSARC-kg in 2010 from funds of a FAO grant and imported in 2010. The loom is located in Taboshar, and the lead weaver is Mrs. Shaira Kosimova. Mrs. Kosimova and other women from Taboshar and Dulana, in total 12 artisans, were trained by an experienced weaver from Kyrgyzstan, Ms. Gulmira Akhmatova, in August 2011. This training was also a contribution of CACSARC-kg to the project development in North Tajikistan from the additional funds received from FAO.

Learning a loom weaving technique, Taboshar town.

Shaira Kosimova with Canadian loom imported by the project, September 2011.

Mrs. Kosimova, the lead weaver, currently works with the team to produce samples of woven blankets from naturally colored mohair using Japanese "Saori" design introduced by the project team. The team expects excellent results in this new area of mohair processing.

2.1.2.2 Increasing production of yarn and products to meet demand

The 100% kid mohair yarn made by the Tajik spinners retails for $280/kg and wholesales for $140/kg. Since the start of the project, samples of yarn and products for $4,611.88 have sold and $3,774 was reinvested back into processing (vis Table 6).

The yarn was very well received by a variety of buyers in the United States and also in Europe. In 2009 – 2011 samples of yarn and products were sold in the USA at a Fair Trade Holiday Festival which takes place in Madison, Wisconsin in December. Some yarn samples were also sold at a Sow's Ear yarn store in Madison, Wisconsin. In 2011 the project received orders for the yarn through the project marketing website. Orders came from individuals and from companies that sell knitting yarns including an American company called "ClothRoads", based in Colorado that buys fairly-traded, handspun yarns from South America and other regions. ClothRoads ordered 3kg of naturally colored mohair yarn (all that was available for sale) in July 2011. The company is interested in ordering 25kg of yarn that will be produced in winter 2012. Other

interested buyers include a wholesaler in Vienna, Austria who purchased yarn samples in 2010 and was very pleased with her customers' response. She would like to order more yarn once available and distribute the yarn in Europe. The project also received inquiries from buyers in Canada and Peru.

Currently, the project team has no difficulty finding buyers for the yarn at a wholesale price of $140/kg. The bottleneck is on the supply side. Mohair purchase and processing activities need to be streamlined and improved to increase yarn production. This includes developing a new purchasing system to collect a larger quantity of quality fiber during shearing in April 2012. Secondly, processing needs to be reorganized to increase volume and production efficiency while maintaining quality and lowering processing costs. The project team works on developing a new mohair purchasing system and on reorganizing processing, as described earlier. Innovative approaches in fiber purchase and processing applied in 2011-2012 are expected to increase yarn production and sales in 2012 - 2013.

After the 400 kg of mohair is successfully processed in 2012, the project plans to advertise the yarn and products through the updated website "adventureyarns.com." The site features the yarn and products available and the description of project sites and activities. A project representative also plans to attend a trade show in Chicago in the summer or fall of 2012 and advertise the yarn, knitted products and blankets to potential wholesale buyers. The team intends to work on developing a close connection between Tajik groups of spinners, knitters and weavers and international buyers. This includes identifying and training representatives of women's groups – women and men who know English, are computer literate, are trusted by the women's groups and can successfully mediate between them and foreign buyers.

2.1.2.3 Highlights and challenges in mohair processing in 2011.

Improving mohair dehairing

As explained earlier, in the summer and fall of 2011 the project team worked on organizing the processing of 400 kg of mohair purchased in April 2011. The first step was to dehair the fiber from kemp and medullated fibers. The fiber was distributed among women's groups for manual dehairing using a comb. The groups worked on the dehairing throughout the summer and the project reviewed the results in September 2011. The results of the initial dehairing were disappointing: the process has proven to be very time consuming and the clean fiber yield was very low, about 25% and less. The women had other work during the summer and managed to dehair only 20 kg of fiber. The project team had hoped that the volume of dehaired fiber would have been much higher.

The team decided to work with the lead spinning and dehairing team to alter the dehairing method. After a number of experiments, the team leader, Ms. Tuluikhon Abdulazizova, decided to use manual dehairing without the comb. This process is expected to produce clean fiber with a minimal yield of 33%. The new dehairing process started in October 2011 and will continue in winter 2011 - 2012. After the group prepares 25-30kg of dehaired fiber, the mohair will be blended, washed, carded and distributed to spinners. Each spinner will receive around 5.2 kg of fiber to produce 5 kg of mohair yarn according to standard. Spinners will be paid $26 to spin 1 kg of yarn.

Dehairing mohair in Markhamat village, September 2011.

Improvements in spinning: solar power for spinners

The key challenge in spinning is lack of electricity in the pilot region during late fall, winter and early spring – seasons when the women have the most free time to spin. The villages receive on 2 hours of electricity in the evenings and in the mornings. During those time the women are busy preparing food and do not have time to spin. The project team decided to purchase a solar panel for the groups that can be used to power several spinning wheels. The $520 panel was purchased in Dushanbe with earnings from product sales, delivered to Khodzhand and installed in the Markhamat village at the home of the lead spinner Ms. Abdulazizova in November 2011. The solar battery powers 3 spinning machines during the day and enables the group to work in spite of winter blackouts.

The project also delivered four New Zealand Ashford wooden spinning wheels to the pilot site and purchased two locally produced electric spinning machines for the spinners in 2011. Although some women prefer wooden spinning wheels (and several models have been locally produced based on the imported New Zealand wheels), the majority of spinners prefer the electric machines due to their higher productivity. For this reason, resolving the energy deficiency in winter is very important. The project plans to purchase additional solar panels for the spinners in 2012.

Designing an accounting system and business plan

Interviews with spinners and knitters revealed that although they have been producing yarn for the Russian market for many years, they never used an accounting system to estimate the cost of yarn production and profits from sales. The team decided to work with the women's groups on setting up an accounting system for their yarn business. The accounting system is necessary to assess the profitability of yarn production and the data will be used to evaluate the prospects for further upscaling of the project. It is also important to teach the women how to keep financial and other business records and how to manage the revolving fund.

In November 2011 the team organized training for the women's groups focused on producing an estimated budget for processing 500kg of quality kid mohair into yarn. The work on budget formation has proven to be a valuable exercise that helped the spinners estimate the expenditures and proceeds from producing yarn for the American and Russian markets. The budgeting exercise produced the following estimates:

Fiber Purchasing:

To begin processing, the spinners' groups need to purchase fiber during shearing in April and May. Investment of $4,000 - **$5,000** will be sufficient to organize the purchase of 500kg of quality mohair, accounting for variation in mohair prices and for transport expenses.

Fiber Preparation (dehairing, scouring and carding):

Dehairing 500kg of mohair will cost approx. **$2,100** and will yield approx. 200kg of clean fiber and 300kg of "waste" fiber. Waste fiber will consist of 150kg of dehairing waste, and 150kg of fiber that cannot be dehaired. All "waste" fiber will be processed into yarn for the Russian market.

The next step is to scour the 200kg of dehaired fiber and the 300kg of waste fiber. Scouring will cost approximately $0.75/kg: **$375.**

After scouring, the clean yield will be approx. 160kg of clean dehaired fiber and 210kg of clean waste fiber, alltogether 370kg of mohair. This fiber will be carded first by hand (to open the locks) and then on a carding machine. The cost of manual and machine carding will be approximately $1/kg: **$370.**

Spinning:

160kg of dehaired, soured and carded fiber can be spun into yarn for export to the United States or Europe. 210kg of scoured, carded "waste" fiber that can be spun into yarn for the Russian market. Spinning will cost 120 somoni ($25) for 1kg of the American yarn, which is much finer that the Russian yarn (i.e. the yardage per 1kg is much greater for the American yarn). The total cost of spinning 160kg of dehaired fiber into fine, luxury yarn will be approximately **$4,000.** Spinning 210kg of yarn for the Russian market will cost 30 somoni/kg ($6.25), and the cost of spinning 210kg of fiber will be approx. **$1,320**. Total cost of spinning both yarns will be **$5,320.**

Total processing cost of 500 kg of mohair:
Fiber purchase: $5,000
Dehairing: $2,100
Scouring: $375
Carding: $370
Spinning: $4,000 + $1,320 = $5,320
Total processing cost: $13,165

The project further estimated that transportation costs for the American yarn would be:
Transport: $1,600
Tariffs: $1,600
Custom Fees: $500
Total tariffs and transport: $3,700

The Russian yarn will be sold on the local market. This means that total processing and transportation costs for $160kg of luxury yarn and 210kg of low quality yarn for the Russian market will be around **$16,865**.

The team produced separate budgets for the two yarns. The cost for the 160kg of American yarn will be the following:
Fiber purchase: $5,000

Dehairing: $2,100
Scouring: $150
Carding: $160
Spinning: $4,000
Total processing cost: $6,410

Transport: $1,600
Tariffs: $1,600
Customs: $500
Total cost: $15,110 or $95/kg

1kg of yarn for the American market will be sold for $140, and 160kg will be sold for $22,400. Profit per 1kg of yarn will be $140-95 = $45. Total profits will be $7,200. Earnings for women processors will be $2,100 (dehairing) + $150 (scouring) + $160 (carding) + $4,000 (spinning) = $6,410. Earnings for Angora goat farmers will be $4,500 ($5,000 - $500 in transport expenses). Total profits and earnings for women's groups from making American yarn will be $7,200 + $6,410 + $4,500 = $13,610. Total earnings for farmers and women will be $18,110.

The cost of Russian yarn will include:
Scouring: $225
Carding: $210
Spinning: $1,320
Total cost: $1,755 or $8.40/kg

1kg of yarn for the Russian market will be sold for 65 somoni or $13.60/kg, and 210kg will be sold for $2,856. Profit per 1kg of yarn will be $5.20. Total profits will be $1,092. The total earnings for women processors will be $1,755. Total profits and earnings from making Russian yarn will be $2,847.

It is important to note that in the above calculations we do not account for raw material costs for the Russian yarn, given that it is made from fiber left over from producing American yarn. This makes the profit from producing Russian yarn seem larger than it actually is. If the spinners had to purchase 300kg of raw fiber to make Russian yarn, they would have to pay at least $1,200. This would increase the total processing expenses to $2,955 ($1,755 processing + $1,200 raw material). In this case, the processing costs would be larger than the revenues from yarn sale by approx. $100 ($2,955 - $2,856), meaning that the women would not make any profit from producing this kind of yarn. These calculations imply that the actual profits from making yarn for the Russian market are negligible, and that women make the yarn to earn a small wage from processing.

Finally, if we combine the total expenses, profits and earnings from making and selling both types of yarn, the figures are the following: total production cost of both yarns will be $16,865. Total sales of both yarns will be $25,256. Total profits will be $25,256 - $16,856 = $8,391. Payments to producers for raw material and to women for making Russian and American yarn will be $4,500 + $1,755 (Russian yarn) + $6,410 (American yarn) = $12,665. Local transport expenses will be $500. This means that an investment of $16,865 will bring approximately $21,556 in profits and earnings to Tajik farmers and women's groups. The project will update these figures at the end of the processing cycle currently underway. Figures obtained at the end of the cycle can be used to prepare a business plan for the groups.

2.1.3 **Component 3: Develop sustainable market chains that link fiber producers and processors with buyers.**

2.1.3.1 Highlights and challenges in mohair marketing in the fall 2011.

Since the start of the project, samples of yarn and products for $4,611.88 have sold and $3,774 was reinvested into processing activities and women's groups (Table 6).

Table 6. Product sales and Reinvestment

Period	Markets/Buyers	Amount Received from Sales	Amount Reinvested into ICARDA Project	Used for	Remainder
March 2009 – June 2010	Fair Trade Show, Madison, WI, USA "Sow's Ear" yarn store, Madison WI, USA	$1,941.80 (yarn and scarf samples)			$1,941,80

Period	Markets/Buyers	Amount Received from Sales	Amount Reinvested into ICARDA Project	Used for	Remainder
January 2009			$1,000 (wired to Matazim Kosimov)	Yarn sample purchase	$941,80
August 2010	Yarn store, Vienna, Austria	$392.36 (yarn samples)			$1334,16
November 2010			$500 (to Farhod Kosimov)	Yarn sample & fiber purchase	$834,16
December 2010	Fair Trade Show, Madison, WI, USA	$702 (yarn and scarf samples)			$1536.16
March 2011	"Spirals" store, Madison WI, USA	$153 (scarf samples)			$1689.16
April 2011			$500 (Liba Brent, Farhod Kosimov)	Mohair fiber purchase	$1189.16
May 2011			$500 (Farhod Kosimov)	Samples of yarn & knitted products	$689.16
June 2011	"Sow's Ear" yarn store, Madison WI, USA	$102.60 (yarn and scarf samples)			$791.76
July 2011	"ClothRoads" yarn retailer, Colorado, USA	$452.12 (yarn samples)			$1243.88
August 2011	"Sow's Ear" yarn store, Madison WI, USA	$102.60 (yarn samples)			$1350.88
September 2011			$10.41 (Tuluikhon Abdulazizova)	Yarn samples purchased from Ms. Abdulazizova	$1340.47
September 2011			$300 (Tuluikhon Abdulazizova)	Mohair dehairing	$1040.47
October 2011			$80.83 (Tuluikhon Abdulazizova)	Yarn for carpets	$959.64
October 2011			$62.50 (Dilorom Khaitova)	Knitted samples purchased	$897.14
October 2011			$250 (Nazir)	2 spinning machines purchased	$647.14

Period	Markets/Buyers	Amount Received from Sales	Amount Reinvested into ICARDA Project	Used for	Remainder
November 2011			$520 (Dushanbe market)	Solar panel purchased	$127.14
December 2011	Fair Trade Show, Madison, WI, USA	$761			$888.14
December 2011			$50 (fee for participating at the Fair Trade Show, Madison WI	Fee paid to CALA, Madison, WI	$838.14
Total Sales					**4,611.88**
Total Reinvestment					**3,774.00**

Based on strong sample sales and a good demand for products, the team decided to scale up processing and increase production. In 2011 the project team and the women's groups purchased 400 kg of mohair that is currently being processed. The new yarn for the American and Russian markets will be available in 2012. The project plans to further develop marketing linkages once the new yarn is available for sale in spring 2012.

Although the new yarn was not ready for sale in winter 2011 (it is currently being spun), the project had good results test-marketing knitted product samples in winter 2011. In December 2011, the project participated in a Fair Trade Holiday Festival in Madison, Wisconsin and sold new samples of mohair and cashgora hats and sweaters. The products sold well and received many compliments from buyers. The buyers appreciated soft, lightweight mohair hats in fashionable design, and also mohair sweaters all of which had sold. The products were made in the Oshoba village in the knitting workshop of Mrs. Dilorom Khaitova. The knitting group used 100% mohair yarn produced in the neighboring Markhamat village by spinners led by Ms. Abdulazizova. Some products were also made from cashgora and cashmere yarn produced at the pilot site in Badakhshan. The knitters used models of hats and sweaters imported from the United States for the design. The team plans to continue working with the knitters' group to design several new models of hats, scarves, sweaters and other products and participate in a trade show in Chicago that is frequented by retailers to solicit orders for fair-trade, luxury knitwear in 2012. The products will also be advertised on the project marketing website "adventureyarns.com".

In 2011 the project further expanded market linkages in the United States. An American company "ClothRoads" purchased yarn samples and ordered 25kg of yarn in 2012. The collaboration with the project is featured on the company's website: http://www.clothroads.com. Other buyers in Europe and South America are also interested in mohair, cashgora and cashmere yarns.

The marketing experience supports the main concept of the ICARDA/IFAD project - that Tajik artisans can successfully use their skills, locally produced equipment and local raw material to

make high quality yarn for export. They can also use this yarn and imported designs to produce high quality, fashionable knitwear that can compete with expensive clothing marketed to high-end consumers in the United States and Europe. However, it is important that the artisans work closely with designers and importers, follow their instructions regarding design, and maintain high quality. Under these conditions it is possible to avoid common mistakes made by artisan groups in developing countries that end up producing cheap, low quality products that cannot compete on the international market.

2.1.4 Component 4: Research on changes in income of fiber producers and women processors and their effects on livelihoods and gender roles.

The project is recording incomes of spinners and knitters who produce yarn and knitted products for export. The spinners and knitters have thus far sold mostly product samples and their earnings have not been large. The groups' earnings are expected to increase in 2012 after the women process 400kg of fiber into yarn and products.

Although the earnings have not been large, the women have already benefited from sales – Ms. Abdulazizova who leads the spinning group, received a solar panel from the project, purchased from profits from yarn sales. Although Ms. Abdulazizova is a divorced woman who supports her children and elderly parents, she is now one of the few people in the Markhamat village who has solar electricity in winter. Her work as a leader of fiber processing group has also earned her recognition and status in the community. In October 2011 Ms. Abdulazizova made her first trip to the capital city of Dushanbe to participate in the project meeting, train women from the Badakhshan site in spinning and demonstrate her yarn. The project plans to produce a detailed accounting of the earnings of Ms. Abdulazizova and the other spinners after finishing mohair processing in 2012 and the team will interview members of the spinning group about the effects of their earnings on livelihoods.

The other group that is starting to benefit from the project are knitters lead by Mrs. Khaitova. The group is starting to earn income by making samples of hats, scarves and sweaters. Given the successful sale of these samples at the Fair Trade Holiday festival in the USA in December 2011, the project plans to place an order for hats and sweaters with the group in 2012. Mrs. Khaitova is receiving a considerable recognition from being the most highly skilled knitter and the group leader in her village. She also visited Dushanbe for the first time in October 2011, participated in the project regional meeting and impressed the participants by demonstrating samples of hats and sweaters she and her group made. The husband of Mrs. Khaitova is very supportive of her and her business and can become a good role model for other men in the village and an advocate for developing women-led businesses.

2.1.5 Component 5: Linkages (business, scientific and cultural) between the pilot communities and the global communities of producers, processors and consumers of fiber and fiber products.

1. The project linked Tajik Angora farmers and scientists with Angora breeders in Texas, USA by importing 2,000 doses of frozen semen from Texas to Tajikistan. This gives Tajik farmers access to new genetics and helps them to improve local Angora goats and fiber.

2. The project arranged collaboration between Tajik Angora goat scientists and Iranian scientist Mr. Aliverdi who assisted Tajik breeders with artificial insemination with frozen semen.
3. Tajik Angora goat farmers are being linked with women's groups who process mohair into yarn. The women's groups and farmers will set up a new market for quality, kid mohair.
4. The team linked Tajik spinners with yarn buyers in the United States and Europe. Yarn wholesalers, retailers and individual knitters are learning about the yarn produced in Tajikistan and the marketing network for the yarn is expanding. For example, the ClothRoads company is now advertising Tajik mohair on their website.
5. The project is also creating new linkages between Tajik knitters and buyers and consumers of knitted products. It is developing fashionable knitwear based on contemporary design that will be marketed in 2012. For the first time, rural women from remote parts of Tajikistan will be able to market luxury items to high-end consumers, earning both income and prestige.
6. The project linked Tajik mohair weavers with carpet-makers in Afghanistan to enable production of luxury carpets from Tajik mohair in both countries. It also imported a weaving loom and linked Tajik women with weavers and designers from Kyrgyzstan who showed them how to make throws and blankets for export. Such linkages will allow the women to learn new skills in fiber processing and develop new products from adult mohair.

The project plans to strengthened these linkages and create new contacts through the new website developed in March 2011.

2.2 Badakhshan, Tajikistan

2.2.1 Component 1: Characterize production systems and improve fiber production of small ruminants in all target sites

2.2.1.1 Organizing breeding with Altai bucks in 2011

The import of live Altai goats to Badakhshan was key for promoting interest in breeding among the villagers. They could see and evaluate what quality breeding bucks look like and compare them to their own bucks. In spring 2012 they will be able to see the new progeny and compare its productivity in terms of fiber and meat with the other goats. This will convince many villagers to invest in community breeding and animal husbandry. Such investment is expected to have a significant impact on increasing goat productivity in the long run. Community breeding practices in goat production can be adopted to improve breeding and productivity of all livestock in Badakhshan and the community breeding structure developed and tested in the pilot region can be replicated in other regions.

The most important work completed in the fall of 2011 was organizing community breeding with imported Altai bucks during the mating season in September – November. The project team

began organizing the breeding in the spring by selecting and tagging the best fiber-producing females in all pilot villages and encouraging the castration of all low quality males.

To encourage the women to bring their goats for evaluation and tagging, the team combined the evaluation with free vaccination against goat pox and distributed medication against parasites. Combining free vaccination with tagging and selection of best fiber-producing females and males proved to be a very effective method of selecting animals for the breeding nuclei. Women were willing to bring their flocks of goats for vaccination, and let the team evaluate and tag their animals at the same time. Table 7 shows data collected on the tagged females.

Table 7. Description of nucleus does in Askar Zamirov community, Ishkashim district of Badakhshan

Village	**Anda-rob**	**Khas-khorug**	**Dasht**	**Garm-chashma**	**Snib**	**Vogz**	**Syst**	**Total**
No of women owners	32	26	32	38	12	7	7	**154**
No of does	96	106	101	83	26	26	10	**448**
Age structure of does:								
1,2	30	35	42	29	8	6	4	**154**
3,4	28	49	40	37	13	16	6	**189**
5,6	21	22	19	17	5	4		**88**
7,8	17							**17**
Body condition of does:								
medium	58	103	86	82	26	26	10	**391**
poor	38	3	15	1				**57**
Breed type of does:								
Altay	22	63	26	22	11	13	4	**161**
Angora	28	25	28	17	7	5	3	**113**
Local	46	18	47	44	8	8	3	**174**
Date of weighing	11/05/11	12/05/11	13/05/11	14/05/11	15/05/11	17/05/11	18/05/11	
Av. liveweight of does (kg)	27.0	25.9	23.9	24.3	25.1	24.7	23.2	
Av. liveweight of kids (kg)	19.0	13.0	11.8	12.9	15.3	15.1	n.a.	

Seven Altay bucks imported from Russia and seven procured local bucks with good fiber were selected for the nucleus groups. Ratio of females to males equals 31-32:1, which corresponds to the norms of physiological capacity of animals. The following step was to collect the tagged females and the Altai and local bucks and send the breeding nucleus to mountain pastures with a hired shepherd. The team planned to keep the Altai bucks and the selected females at the mountain pastures throughout the breeding season and bring them back in mid November.

However, as explained in the previous report, the project team encountered a serious obstacle when trying to form the breeding nucleus: the women wanted to keep many of their tagged females in the village for milking as opposed to sending them to the summer pastures, as these goats were not only good fiber producers but also good milk producers. Secondly, not all women knew the shepherd who was selected by the project and the village leaders and some were worried about sending their goats with him to distant mountain pasture. This was a different system than taking turns grazing the summer pasture flocks, which is how the grazing is usually organized. For these reasons, the majority of quality, tagged females remained in the villages and only 150 females (70 from Andarob and 80 from Dasht) went to the summer pastures with the Altai males.

Another factor that interfered with the breeding plan was cold October weather and frequent attacks by wolves. This forced the shepherd to bring the nucleus flock back to the villages earlier than planned, in mid October. The shepherd brought all female goats safely back, but lost one of the seven Altai bucks to an injury by another buck at the beginning of the mating season.

Based on these developments the project team had to formulate an alternative breeding plan to ensure that the tagged goats that remained in the villages were inseminated by the Altai bucks, and that all goats in the nucleus flock were mated. The team decided to organize breeding nuclei in two villages that had the best conditions for maintaining a separate breeding flock. This included a large sheep pen that could be rented for the nucleus animals, good pastures near the village, a large flock of quality, tagged females and a shepherd who was willing and capable to take a good care of the animals during the breeding season.

Khaskhorog breeding nucleus

The Khaskhorog village was a good candidate for maintaining a breeding nucleus based on these criteria. It has good pastures near the village, a large flock of quality fiber-producing females, a large sheep pen the owner was willing to rent for one month, and an experienced, dedicated shepherd, trusted by all villagers. Given these conditions, the process of organizing the Khaskhorog nucleus was relatively simple. The project team rented the sheep pen, hired the shepherd and delivered two additional Altai bucks to Khaskhorog, one from Sist and one from Garmchasma. The Khaskhorog village leader helped to inform all households about the breeding plan and on a specified day, all women who had tagged female goats brought them to the rented sheep pen to be grazed and kept separately with the three Altai bucks for one moth, during the peak of the mating season. The Khaskhorog nucleus included 83 females and 3 Altai males. All animals in the nucleus were vaccinated against contagious pleuropneumonia.

Vaccinating Khaskhorog nucleus, October 2011.

Dash and Andarob nucleus.

The project then proceeded to organize the second nucleus in the Dasht village. The Dasht village has a large sheep pen that was rented, good pastures near the village and a relatively large number of tagged, quality fiber goats. Many women in Dasht have also been very interested in harvesting and processing fiber. The only hurdle was the absence of an experienced shepherd, trusted by the women. The village leader recommended one of the villagers to graze the goats

but the women initially rejected him, saying he had little experience. Only after a long discussion did they agree to give him their goats to graze. The project selected 80 females for the nucleus and imported another Altai buck from Devloch to Dasht.

Altai bucks with the Dash & Andarob nuclei, October 2011.

The women in Andarob village also showed interest in organizing a nucleus flock, but did not have a sheep pen for the nucleus or an experienced shepherd. In addition, the pastures near Andarob are not very good and Andarob has the least homogeneous flock with the fewest quality fiber goats. The advantage of Andarob is its location at the center of the pilot region. This makes it easier for the Andarob women to frequently interact with the project team and collaborate on a variety of activities. The Andarob women and the project team decided to take the tagged goats to Dasht for a month and include them in the Dasht nucleus. Surprisingly, nearly all women in Andarob were willing to entrust their 52 tagged females to the project team and send them to Dasht. This shows that the villagers trust the project team and are willing to take a certain amount of risk with their animals to improve breeding and fiber quality.

Villagers in Khaskhorog collect female goats for the nucleus, October 2011.

Garmchasma breeding nucleus

Finally, the team tried to organize a breeding nucleus in Garmchasma. The Garmchasma village has the best pastures of all pilot villages and the best flock of fiber goats. However, the women are not very well organized and the project does not have an equally strong support base in Garmchasma as in the other villages. The village also lacks a sheep pen that could house the nucleus flock and does not have an experienced shepherd. For this reason it was challenging to organize a separate nucleus in Garmchasma and the project chose a simpler method of letting one of the Altai bucks graze with the village flock during the mating season. It transported the buck from Snib to Garmchasma to graze with the females and local males.

An overview of the finally established breeding nuclei is given in Table 8.

Table 8. Breeding nuclei in Badakhshan.

Village	Does, heads	Attached buck	Expected progeny
Khaskhorog	83 ear-tagged +87=170	9295 5069-5085-5057-2295+local	150
Andarob + Dasht	52+80=132	060-089 5315-2525	100
Garmchashma	80 ear-tagged +100=180	5215+ local	160
Kukhilal		5315-2525	no nucleus
Snib		5215	no nucleus
TOTAL	**482**		**410**

The project also selected few local bucks with relatively good fiber to mate with untagged females that were not part of any nuclei. Selecting good local bucks for the non-nucleus flocks was possible because households in all villages were willing to castrate bucks that were considered inferior during the evaluation conducted by the project team in the spring. Convincing the families was easy because they themselves prefer to castrate all their males if a veterinarian is available. The preference of the households to castrate their male goats will make it easier for the project to implement long-term community breeding.

2.2.1.2 Breeding plans for spring 2012.

The nucleus females are expected to kid in February, March and April. The project team plans to collect data on the 2011 and 2012 offspring of the Altai bucks in April - May 2012. All male offspring will be tagged and weighted and their birthdates will be recorded. During combing, the fiber of 2011 male offspring will be evaluated based on color, fiber diameter, fiber length and uniformity of the fleece. Based on the results, the males will be divided into 3 groups: nucleus candidate, base candidate and male to be castrated. The nucleus candidates will be selected for the nucleus groups in 2013, base candidates will be selected for the base flock and the third group will be castrated. The team will discuss the breeding male selection with the households who own these animals and try to ensure that breeding animals are not castrated and the discarded males are castrated. The team will also evaluate and select adult and yearling females for the nucleus based on fiber quality. New females will be tagged and tags will be removed from females that no longer qualify.

5 months old male offspring of Altai buck, Khaskhorog village, October 2011.

2.2.1.3 Fiber goats in Roshkala region.

In November 2011 the team visited cashgora goat producing farms in the Roshkala region. The Roshkala region is a long mountain valley at the end of which are several farms that raise sheep and goats. These farms are the descendants of a former state farm that produced Altai fiber goats, combed cashgora fiber and sent it to Russia for processing. The production system was very similar to that in the Ishkashim pilot region. However, the Roshkala region is much more remote than the Ishkashim region and more sparsely populated. The farms in Roshkala are not easily accessible but have much better access to quality summer and winter pastures and can produce larger numbers of animals. Because of the remoteness of these farms, the purebred Altai cashgora goats were much better preserved in the Roshkala region than in Ishkashim. While the villagers in Ishkashim sold many of their goats to Afghanistan and Pakistan after the civil war in 1997, the farmers in Roshkala preserved their Altai goats and continued to practice systematic breeding. They select breeding males, graze them separately until the breeding season, and start breeding in early November. The project team visited a couple of farms located in the lower valley and examined their flocks. The flocks included a large number of fiber goats, the animals were in a very good physical condition and the flocks were more homogeneous than the flocks in Ishkashim.

The Roshkala farmers knew about the project and wanted to participate in supplying their fiber and collaborating on breeding. In spring 2011 they combed some of their goats and saved the

fiber to show to the project team. The fiber was of high quality and some fiber was completely free of guard hair and did not require dehairing. In the spring 2012 the team plans to conduct a more comprehensive overview of the Roshkala farms, research how the clean fiber was collected and from which goats, and try to reproduce this combing method in Ishkashim. Working with fiber that does not require dehairing is highly desirable as it would substantially decrease the processing cost.
The team also plans to collaborate with the Roshkala farmers on breeding. For example, the Roshkala farmers could exchange breeding bucks with the Ishkashim households. Fiber processing initiated in the Ishkashim region can be developed in the Roshkala region in the future.

Roshkala farmer with Altai fiber goat, November 2011.

2.2.2 <u>Component 2</u>: Work on formation and capacity building of women's groups to develop fiber processing and export of value-added fiber and products in all pilot sites. Encourage the development of women-led small businesses.

2.2.2.1 Fiber collection at pilot sites.

The fiber purchasing experience of 2011 made it clear that many households were in urgent need of cash and chose to sell fiber to the Kyrgyz for a low price early rather than waiting for the

project to sell for a higher price. The project decided to make the 2012 purchasing system more convenient for the households by setting up purchasing points in three villages – Garmchasma, Khaskhorog and Andarob. The Garmchasma village produces the largest volume of quality cashgora fiber and the women's leader in Garmchasma agreed to take responsibility for organizing fiber purchase on behalf of the project. The Khaskhorog village also produces quality cashgora fiber and the local shepherd who cares for the Altai buck agreed to organize a fiber purchase point together with his wife who is active in fiber processing. The Andarob village does not have many quality goats and fiber but is easily accessible and can serve as a collection point for the other villages, including Dasht. The leader of the Andarob spinning group plans to organize fiber purchase at her home.

The three purchasing points will open in the beginning of April, when women start combing their goats. The project team plans to supply electronic scales, instructions and funds to each collection point and the families who run the points will be responsible for collecting, classing and purchasing fiber from other villagers. The new system will transfer the responsibility for fiber collection from the project to the communities, teach local families how to sort and grade fiber, make it convenient for all villagers to sell fiber immediately after combing, and create competition for Chinese buyers. Families will have an incentive to sell their fiber to the collection points not only because of the convenience and higher prices, but because the fiber will be processed into yarn and products locally, providing income opportunities for them and their neighbors. Because the fiber will be processed into high value products for export, the project will be able to pay higher prices for quality fiber than the Kyrgyz traders working for Chinese buyers. This will benefit the women who produce fiber goats and sell fiber and also those who earn income from spinning and knitting.

Purchasing fiber in Khaskhorog village, May 2011.

2.2.2.2 Fiber dehairing

The cashgora and cashmere fiber harvested in Badakhshan needs to be dehaired prior to processing. The project team plans to arrange dehairing at a factory in Faizabad, Afghanistan that was recently built and is expected to start operating in winter 2012. The local collaborator, Khonun Daulatquadamov, plans to visit the factory this winter and work on arranging the dehairing. The Aga Khan office in Khorog that also works in Faizabad agreed to assist Mr. Daulatquadamov in arranging the visit. Liba Brent plans to visit the factory in spring 2012. The project team will ship all fiber collected in 2010 - 2012 to Faizabad for dehairing as soon as the dehairing plant is operating so the spinning groups that are forming in Badakhshan can start making cashgora yarn from the dehaired fiber in 2012.

In addition to working with dehaired fiber, the project team plans to continue improving the fiber harvesting method to produce a large percentage of fiber that can be spun into quality yarn without dehairing. In spring 2012 the project team plans to experiment with different combing methods and identify all factors that contribute to harvesting clean fiber without guard hair. The team will then train the women in the most effective combing method and raise the price of clean, combed fiber.

2.2.2.3 Organizing spinning and knitting groups in spring and fall 2011.

Test-spinning undehaired cashgora and dehaired Afghan cashmere

The project started collecting samples of yarn from women in all villages to select the best spinners and formed the first spinning group in the Andarob village in 2011. The women practiced spinning with undehaired and manually dehaired cashgora fiber. After knitting sample products from these yarns, the project determined that products made from undehaired fiber are too prickly and cannot compete on the international market. Manually dehaired fiber is less prickly and could be processed into some products such as Jurabe socks. However, it would be difficult to achieve uniformity and ensure quality control using manual dehairing. The team concluded that cashgora fiber needs to be machine-dehaired in Afghanistan and then spun into yarn to guarantee excellent quality. The alternative to dehairing is training women to harvest clean fiber. As noted earlier, women in the Roshkala region were able to collect goat fiber without any guard hair and the project will work on improving fiber harvesting methods in 2012.

While waiting for the cashgora fiber to be dehaired, the Andarob group is currently spinning 10kg of dehaired Afghan cashmere imported by the project in 2010. Given that cashmere is a very expensive fiber, costing around $70/kg, only the best spinners are given 1kg of cashmere to process. The group leader is responsible for monitoring quality and the women plan to finish spinning this winter. The yarn will be dyed in the spring and used to make samples of Jurabe socks and other knitted products. Some of the Afghan cashmere was already spun and the yarn was sent to the pilot site in Asht and knitted into samples of hats that will be test-marketed in 2012.

The dehaired Afghan cashmere was purchased to learn what kind of yarn and products could be made by hand from dehaired cashmere and whether it would be feasible in terms of quality and price to use pure, dehaired Afghan cashmere for handspinning and knitting. The project will explore these questions in 2012. The project team plans to compare the processing costs and qualities of cashmere and cashgora fiber and test consumer responses to these two products. Such comparison is useful for spinners and knitters in Badakhshan given they can have access to both types of fiber and the project needs to know whether one of them is easier to process and/or can bring more revenue to women's groups.

Comparing properties of cashgora and cashmere yarns and products.

The early results of the comparative processing experiment show that one clear disadvantage of Afghan cashmere is its short staple length that makes it difficult to spin it by hand. This is why cashmere is best suited for machine processing and handspun cashmere yarn is virtually non-existent on the knitting yarn market. Shortness of the fiber has been the main complaint of the Andarob group that currently spins the cashmere. Secondly, the price of dehaired cashmere is very high, which will make the products less competitive. The project has calculated that one cashmere hat, handknitted from handspun cashmere, will cost approximately $16 to produce. Finally, products made from short cashmere will be more likely to pill, which will decrease their attractiveness and longevity. The clear advantage of cashmere is its superior softness. However, the relative softness of dehaired cashmere versus dehaired cashgora has yet to be established.

Examining cashgora fiber, the early results show that it can be very easily spun because its staple length is at least twice as long as cashmere (about 3-5 cm). The Tajik spinners clearly prefer to work with cashgora as opposed to cashmere. Although cashgora is not as soft as cashmere (its fiber diameter is 2-3 micron greater), the machine-dehaired cashgora is expected to have attractive softness. Another difference between cashmere and cashgora is luster. While cashmere fiber is very "dull", some cashgora fiber has a slight luster, which makes cashgora products more attractive to buyers. Cashgora knits are also more "fuzzy" than cashmere knits. Based on consumer responses to samples of cashmere and cashgora hats marketed side by side, the fuzziness of cashgora hats is another very desirable trait. The preliminary processing tests also suggest that products make from cashgora yarn will be stronger, will not be subject to pilling and will maintain their form and last longer than cashmere products. Finally, although it is not possible to estimate the exact cost of cashgora yarn and products without knowing the cost of dehairing, cashgora products are expected to be cheaper than cashmere products because the market price of fine cashmere is higher than the price of cashgora (i.e. coarse cashmere).

In summary, the preliminary processing tests of cashgora and cashmere suggest that cashgora yarn and products will compare very favorably with cashmere products not only in terms of the processing qualities but also in terms of marketability and price. Cashgora products will be less soft than cashmere products, but will compensate for this with other desirable characteristics such as fuzziness, luster, lack of pilling and longevity. This supports the initial assumption that cashgora goats are more suitable for the Badakhshan site than cashmere goats. Not only do they produce more than twice as much fiber compared to cashmere goats, but their fiber is cheaper and easier to process locally into luxury yarn and knitwear. After the project begins to work with dehaired cashgora fiber in 2012, it will produce a full comparison of cashmere and cashgora fiber in terms of processing and marketability.

Equipment for spinning groups

In addition to providing dehaired fiber to spinners in Badakhshan, the project plans to supply them with electric spinning machines. The project ordered 24 spinning machines from a producer in Northern Tajikistan that will be delivered to Badakhshan in winter 2012. The team also works with the Aga Khan Foundation to produce the same spinning machines locally. It gave one of electric spinning machines made in Northern Tajikistan and one wooden spinning wheel made in New Zealand to the Aga Khan product development team in Khorog to reproduce. The Aga Khan team agreed to set up a local production of such machines. The project plans to order additional 20 machines from the Aga Khan workshop in 2012.

Organizing knitting groups

The project also started organizing knitting groups in three villages. The knitters were asked to make samples of Jurabe socks and gloves and lead knitters were selected based on the results. The lead knitter in the Andarob village produced a beautiful sample of Jurabe socks from Afghan cashmere yarn spun and dyed by the Andarob spinning group. After the Tajik cashgora fiber is dehaired and spun in 2012, the project will work with the knitting group to produce Jurabe socks from their own fiber.

The knitting groups plan to use traditional Pamiri patterns to produce long Jurabe socks, gloves, legwarmers, handwarmers and other items that can be successfully marketed in the United States and Europe and also sold in tourist shops in Badakhshan. Prototypes of such products sold in the US will be delivered will deliver to the pilot sites in 2012. Many women in the pilot region want to form knitting groups and make knitted products for sale, and have been asking the project team for yarn. The project plans to concentrate on working with the knitters as soon as the cashgora yarn is produced in 2012.

Knitting Jurabe socks from cashmere yarn, Andarob village, October 2011.

2.2.3 **Component 3:** Develop sustainable market chain that links fiber producers and processors with buyers.

The project will start producing cashgora yarn and products from dehaired fiber in 2012 and plans to market these products in the fall and winter 2012. The team plans to use some of the market linkages developed to sell mohair yarn and products and create additional market outlets specifically for cashgora yarn and Pamiri knitwear.

2.2.4 **Component 4:** Research on changes of income of fiber producers and women processors and their effects on livelihoods and gender roles.

The project is recording the earnings of spinners and knitters and plans to start interviewing women about the benefit of earning income after they start processing a larger volume of fiber in 2012. It also plans to interview women who sell cashgora fiber about the effects of the project on their livelihood.

2.2.5 **Component 5:** Linkages (business, scientific and cultural) between the pilot communities and the global communities of producers, processors and consumers of fiber and fiber products

The project started setting up multiple linkages that promote improvements in goat breeding and fiber processing in Badakhshan.

1. In goat breeding, the project linked the communities with Altai goat breeders in Russia and imported breeding bucks to improve local goats and fiber. The project also plans to create a linkage between the pilot communities and goat breeders in the Roshkala region where Russian fiber goats are produced, and facilitate an exchange of breeding bucks between them.
2. To develop fiber processing, the project imported spinning wheels from New Zealand and works on setting up local production. It also imported electric spinning machines from northern Tajikistan that are in high demand and will be locally produced with the help of the Aga Khan Foundation in Badakhshan.
3. Another linkage that will facilitate fiber processing is the collaboration with the dehairing plant in Faizabad, Afghanistan where the project plans to dehair Tajik cashgora fiber. The dehairing is expected to be organized in 2012.
4. After cashgora yarn is produced, the project plans to develop marketing outlets for the yarn in the United States and Europe and link the spinners with foreign buyers.
5. The knitting groups will be linked with western designers who will help them develop fashionable, competitive products for export and for the local tourist market using the locally made yarn and traditional Pamiri designs.
6. The project also developed a new website that describes the activities in Badakhshan and is starting to advertise first samples of cashgora yarn and products to potential buyers. The project will strengthen these linkages once the first products from cashgora fiber are produced and marketed in 2012.

2.3 Naryn province of Kyrgyzstan

2.3.1 Component 1: Characterize production systems and improve fiber production of small ruminants at all target sites.

2.3.1.1 Characteristics of wool producer in Lakhol and Min-Bulak villages

A survey of wool producers was conducted in Lakhol and Min-Bulak villages located in the Naryn district in 2010.

The major objectives of the survey were to find out the current status of agricultural activities in households; to study smallholders' agricultural assets; to analyse farmers' perceptions on income generation and expenditures; to study their sheep wool production practices as well as their awareness about felt products; and to see their willingness to participate in this project. The project team developed a questionnaire (Annex 1), pretested it and conducted interviews of livestock producers in both villages.

There are about 1125 households in Min-Bulak, and 15 artisan women are involved in the project for fiber processing. About 210 households live in Lakhol, and 10 artisan women participate in the project. The number of the interviewed farmers was 51 in Lakhol and 35 in Min-Bulak. In Lakhol, 88% of respondents were men and 12% women, while in Min-Bulak only men answered the survey questions. By legal status in Lakhol (Min-Bulak) village a share of households formed 63% (64%) and that of the registered farms 37% (36%). The average farmland area accounted for 1.1 ha in Lakhol and 2.57 ha in Min-Bulak. Farmers in both villages mainly grow hay, and there are more farmers in Min-Bulak growing vegetables that can be explained by the larger arable land endowment compared to farms in Lakhol. As anticipated from the smaller cropland in Lakhol, Figure 1 indicates that there are more farmers in Min-Bulak than in Lakhol who have sufficient crops for both sale and feeding of livestock. The same figure shows that more farmers in Lakhol choose one of the two options, i.e. they either sell the entire harvested crops or only feed their animals.

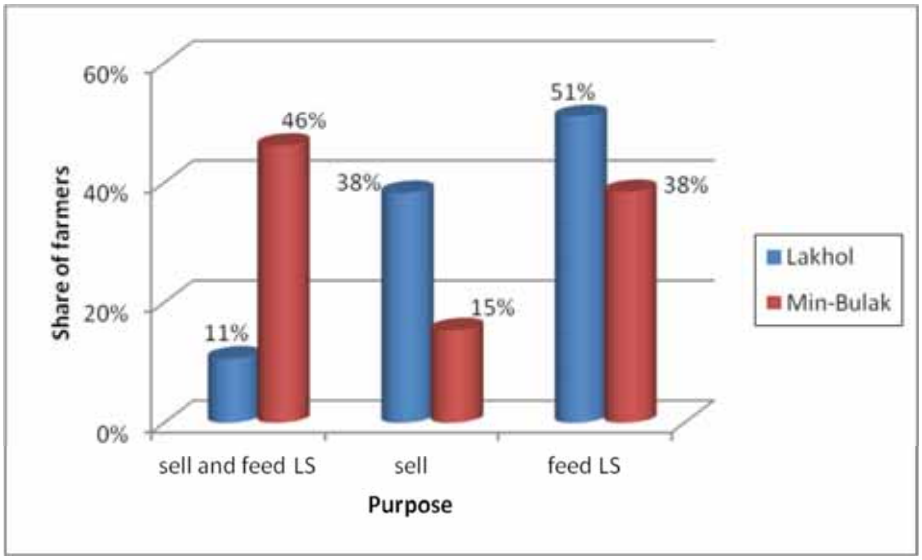


Figure 1. Purpose of crop production

The analysis of the livestock kept by farmers in the two villages shows that in both villages the number of small ruminants is similar and the highest compared to other livestock (see Table 9). Comparison of the share of farmers keeping livestock indicates that there are more farmers in Min-Bulak than in Lakhol keeping small ruminants and cattle.

Table 9. Livestock flock size

Indicator	Cattle		Sheep and goats		Poultry		Other (incl. horses)	
	Lakhol	Min-Bulak	Lakhol	Min-Bulak	Lakhol	Min-Bulak	Lakhol	Min-Bulak
Average farm flock (calculated for farms keeping certain livestock)	6	6	40	39	6	8	5	5
Share of farms keeping certain livestock	88%	100%	84%	100%	35%	46%	51%	26%

Relatively similar replies were given by livestock producers in both villages on the main purpose of producing sheep and goats. Most of farmers explained that they keep small ruminants for both sale and family consumption (see Figure 2).

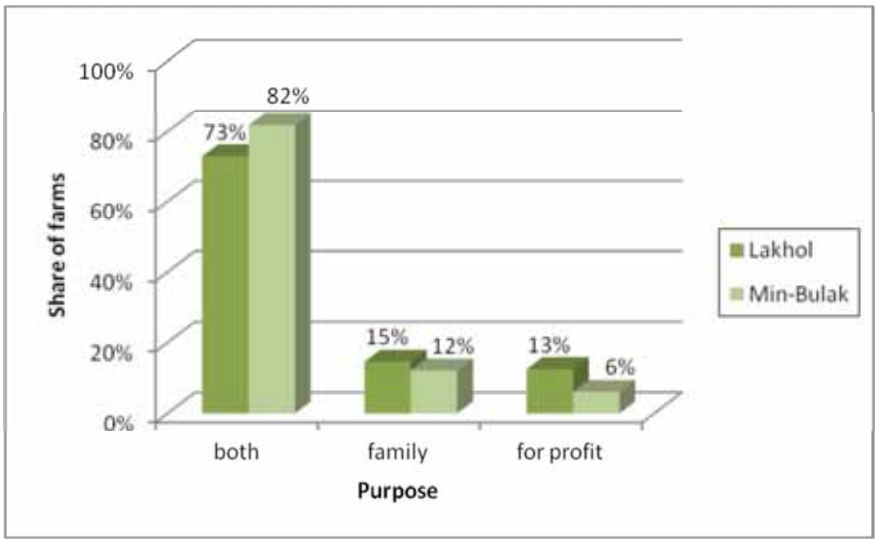


Figure 2. Purpose of small ruminant production

Figures 3 and 4 show farmers' perceptions of the most profitable products they get from small ruminants. In Lakhol, the majority of respondents mentioned meat and wool, while only meat was mentioned by more than a quarter of the producers. In Min-Bulak, selling meat and live lambs provides the highest income for 40% of farmers, while only live lambs and only meat were considered as the most profitable products by 20% and 17% of farmers, respectively.

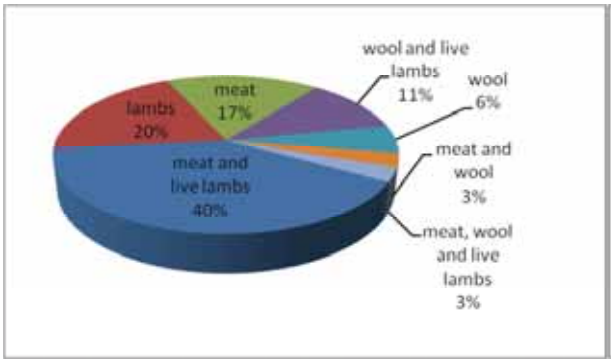


Figure 3. The highest income generating small ruminant products in Min-Bulak

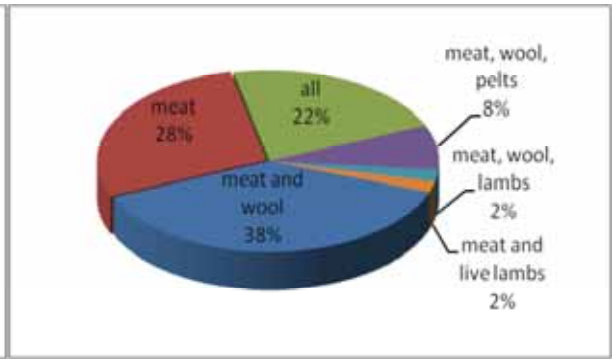


Figure 4. The highest income generating small ruminant products in Lakhol

Marketing practices of the farmers in both villages are similar. Most of them prefer selling entire volume of agricultural products to middlemen or wholesalers rather than to individual buyers as shown in Table 10.

Table 10. To whom farmers sell the agricultural products

Buyers	Lakhol	Min-Bulak
Middlemen	59%	54%
Wholesalers	35%	34%
Individual buyers	6%	12%

All respondents in both villages advised that they find out the price information for the agricultural products from markets. At the same time, part of them, 33% in Lakhol and 3% in Min-Bulak, try to sell their products at the price that is attractive for them. The survey results showed that more livestock producers in Lakhol village (75%) were willing to cooperate to transport and sell their products than in Min-Bulak (33%; Figure 5).

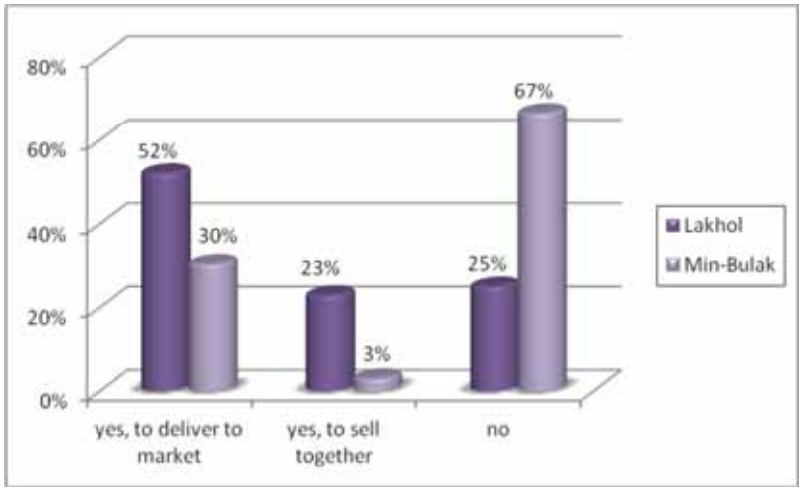


Figure 5. Farmers' willingness to cooperate

The structures of expenditures (Figures 6 and 7) show that the top two expense categories named most frequently by the respondents were the same in both villages (expenses for family and for feed & seeds). Producers in Min-Bulak named expenses for equipment and fuel also very frequently (69%), while in Lakhol this expense item was mentioned less frequently (20%) instead expenses for hired labour was named more often (27%).

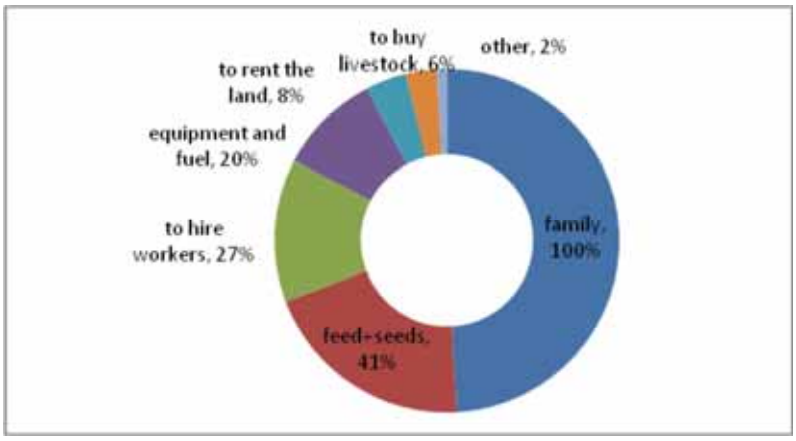


Figure 6. Major expenditures of farmers in Lakhol

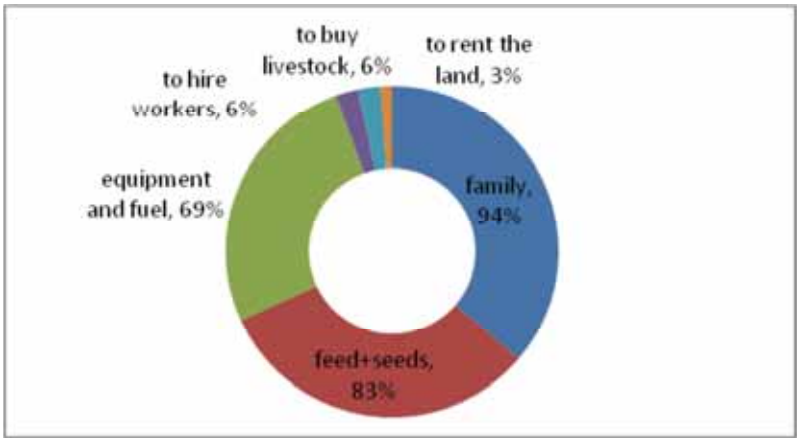


Figure 7. Major expenditures of farmers in Min-Bulak

The analysis of farmers' motivation for wool production led to controversial results in the studied villages. In Lakhol, wool producers that stated for sale and family consumption dominated over those who used all produced wool for family needs only. While in Min-Bulak, most farmers prefered using the produced wool entirely for family. A very low (3%) percentage of farmers in Min-Bulak and none in Lakhol were interested in selling wool after processing (see Figure 8).

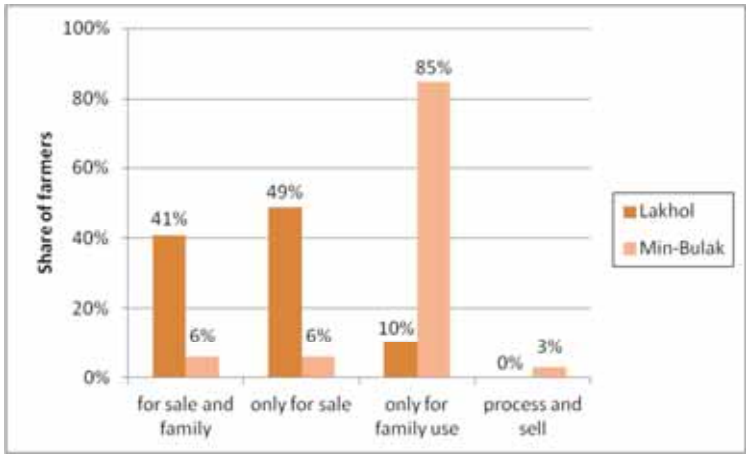


Figure 8. Reason for wool production

Farmers showed a relatively good awareness about felt products. In Lakhol, 94% of wool producers said that they know felt products, only 6% did not know any. In Min-Bulak, farmers' awareness is somewhat lower as 79% of them had heard about these products, while 21% were not familiar with them. As indicated in Figure 9 about three quarters of farmers in both villages know two national felting techniques.

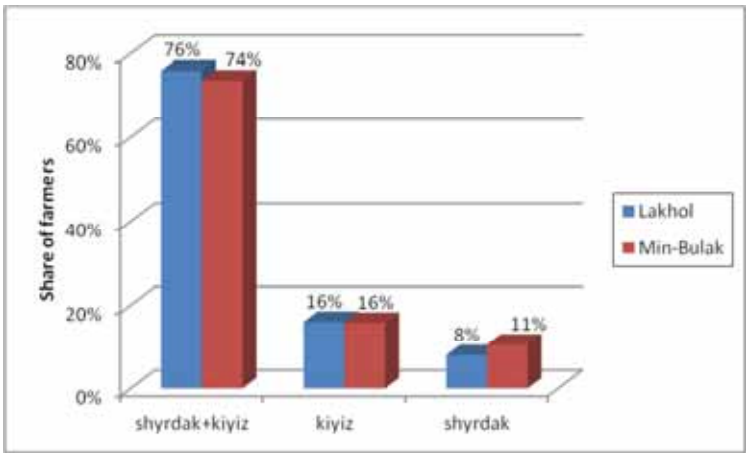


Figure 9. Awareness about felt products

Willingness to be involved in the project was also studied. In Lakhol, 86% of farmers advised that they were willing to participate in the project, while 12% responded negatively (Table 11). And in Min-Bulak, all of the interviewed livestock producers said they would like to join the project activities. Major reasons for participation in the project were listed on table 3 Most of the reasons specified by wool producers coincide with the project goals.

Table 11. Why farmers want to take part in the project

Reason for participation in the project	Share of farmers who specified a reason (out of those willing to take part in the project and)
Lakhol	
to sell products without middlemen	9%
to improve farm, livestock breeds	9%
to get profit from sales of pelts and wool	2%
Min-Bulak	
to increase family income	20%
to improve farm, livestock breeds	17%
to improve wool processing to produce national felt products	9%

2.3.1.2 Improving the quality and productivity of sheep flocks at the project sites

Study of wool quality

Shearing of sheep on the project sites is done manually using special scissors which affects the staple length of the wool as approximately 0.5-1.0 cm of wool is left on the body of an animal after shearing.

In spring 2011, the wool of the Tyan sheep from the five household at Lakhol site participating in flock improvement program was evaluated based on visual classification (Table 12).

Table 12. Fiber fineness and length of the wool from Tyan-Shan sheep owned by farmers at Lakhol site (based on visual classification in spring 2011)

Farmers	Sheep group	Quantity	No of sheep by fiber fineness (quality grade) sampled at the animals' side				Fiber length, cm
			58	56	50	48	
Usupbaeva G.	ewes	55	1	31	21	2	11.5
	young females	23	-	9	14	-	14.7
Akunov Kh.	ewes	34	1	14	11	8	12.0
Kasmaliev R.	ewes	32	3	11	12	6	11.0
	young females	18	4	14	-	-	12.0
Asanaliev M.	ewes	10	-	-	6	4	12.0
	young females	10	-	5	5	-	12.5
Sydykov Y.	ewes	50	4	24	21	1	11.0
	young females	25	4	16	5	-	12.0

The farmers sheared 313 sheep including 254 (or 82.1%) Tyan-Shan sheep and 56 (or 17.9%) indigenous coarse wool sheep. Records were mainly taken from the Tyan-Shian sheep wool, as there is no demand for the coarse wool and hence, it is not marketed. The total volume of the

shorn semi-fine wool was 756 kg or 2.9 kg per head (Table 13). The fiber length was between 11-12 cm with an average fineness of the 56th and 58th quality standard or 25-28 microns. All harvested wool was sold to the middlemen in average for 101 Kyrgyz Som per kg. Farmer G. Usupbaeva managed to get a relatively higher price of 105 Som/kg being an evidence of breed typicality of the flock, that is why wool met requirements for the crossbred wool by length, fineness and homogeneity.

Table 13. Data on shorn wool (kg) by wool quality grades at Lakhol site in 2011

Farmer	Total semi-fine wool (kg)	Kg wool by quality grade			Total quantity of coarse colored wool (kg)
		60-58	56	50-48	
Usupbaeva G.	242	4	138	100	-
Akunov Kh.	95	2	38	55	9.0
Kasmaliev R.	140	14	70	56	15.0
Asanaliev M.	54	-	30	24	40.0
Sydykov Y.	225	23	101	101	-

At Min-Bulak site, six household farmers sheared 200 sheep including 155 heads or 77.5% of semifine wool sheep (Table 14). These sheep produced 397 kg wool with an average shorn wool productivity of 2.6 kg per sheep. Visual assessment of 155 kg of the shorn wool showed that it is characterized as semifine with the 7-8 cm length and an average fineness of 56^{th}-58^{th} quality standard with insufficient density and fiber length and thickness of fleece within staple. Due to the small amount and relatively low quality sheep owners do not sell their wool but prefer using it for the production of felt for yurta (nomad's tent), shyrdaks, etc.

Table 14. Data on shorn wool (kg) by wool grades at Min-Bulak site in 2011

Farmer	Total semi-fine wool	Including by quality grades			Total quantity of coarse colored wool
		60-58	56	50-48	
Musaev A.	10	10	-	-	9.0
Ismadiyarov O.	17	7	10	-	11.0
Musaev S.	28	12	10	6	10.0
Samakov Zh.	21	15	3	3	10.0
Musaev E.	60	21	29	10	9.0
Aseinov T.	19	13	6	-	8.5

Crossbred wool is a good raw material for production of slippers and chair mats, that is why 400 kg of such wool procured for the project funds from the contact farmers on the “Lakhol ”site are used by artisan women on the Lakhol and Min-Bulak sites for production of a quite good quality products that found a niche on the local market.

As a potential supplier of fine Merino wool for artisan women at the project sites, our sheep breeders work with the large farm “Sabaaji” owned by U. Abdurasulov in Kochkor district of the Naryn province At this farm 1,100 fine wool sheep were shorn and 4,500 kg of fine Merino wool were produced in 2011; thus an average wool yield of 4.09 kg is produced per head. The wool

was entirely fine Merino with fiber length of 8.0-8.5 cm and a fineness mainly of the 64th quality standard. The wool produced by "Sabaaji" farm" meets all technological characteristics required of fine Merino wool. Thus, 100 kg of the selected Merino wool were procured from project funds at the price of 155 Som per kg and distributed to artisans at the sites. For "Lakhol" site 42 kg (including 24 kg of 64th QG (21.1-23.0 μm) and 18 kg of the 60th QG (23.1-25.0 μm)) were procured and for "Min-Bulak" 58 kg (including 34 kg of the 64th QG (21.1-23.0 μm) and 24 kg of the 60th QG (23.1-25.0 μm)). The farmer sold the rest of the wool to China for 155 Som per kg. In addition, the project team facilitated the procurement of 33 fine wool sheep from Sabaaji farm by two large farmers from At-Bashi district, Aly Manapbaev and Monolbay Manapbaev, to improve the quality of fine wool and decrease inbreeding in their flocks.

Improving the genetics and homogeneity of the flocks

Farmers are now more interested in fine wool and semi-fine wool sheep production and sheep wool quality improvement due to the increased market price for wool in 2011. The domestic semifine crossbred wool market prices increased from 60 Som per kg in 2010 to 105-110 Som per kg in 2011, and for the fine Merino wool from 80 Som per kg to 155-175 Som per kg. Another important factor is that the wives of some farmers are members of the participating artisan groups and thus are interested in high quality wool.

Four 1.5 year old Tyan-Shan rams were procured by the project to improve sheep wool quality of the contact farmers (Table 15). Two of them were provided to farmers at "Min-Bulak" and the other two to "Lakhol" site. At these sites, natural mating of ewes was undertaken using these rams from early November to mid-December 2011, and then the rams were separated from the flocks.

Table 15. Characteristics of rams (born in 2010) that were used for mating in 2011

Ram no.	Liveweight at procurement	Fiber fineness	Wool length
Min-Bulak site			
Ram # 8260	62 kg	50th quality grade	12.5 cm
Ram # 8809	59 kg	56th quality grade	11.5 cm
Lakhol site			
Ram # 8942	63 kg	50th quality grade	13.0 cm
Ram # 8940	61 kg	50th quality grade	13.0 cm

The mating of ewes from end October to mid-December 2011 was organized as follows: every day ewes in heat were selected by the owners, grouped together and then this group was mated with one of the rams; the next day the next selected group of ewes was mated with the other ram. Thus, the two improved rams mated ewes every other day. At the beginning of December 2011 both rams joined the flock of ewes where they were kept together till mid-December.

In the flock of the "Sabaaji" farm mating of ewes was done by artificial insemination from 25 October to 1 December. The farmer hired an artificial insemination specialist.

2.3.1.3 Monitoring of flocks and disease prevention

Anthelmintics for sheep were procured and given to the participating farmers and a preventive washing of sheep against mange was organized at "Lakhol" site for 483 sheep, and at "Min-Bulak" site for 310 sheep.

Regular monitoring of flocks was conducted by the project team to document the condition of farmers' flocks. The flock inventory as of 19 December 2011 is shown in Tables 16-17 below.

During their regular visits A.S. Ajibekov and D.V. Chebodaev gave practical trainings on the following sheep management issues:

- feeding and preparation of rams for mating;
- evaluation of sheep flocks;
- methods of sheep wool quality improvement;
- organization of mating of ewes;
- keeping and feeding of ewes and rams in thewinter period.

Table 16. Flock structure of the five participating sheep farmers at Lakhol site on 19 December 2011

Farmer	Total no.	Tyan-Shan sheep				Indigenous coarse wool sheep			
		total	including			total	including		
			ewes	female lambs	castrates		ewes	female lambs	castrates
Y. Sadykov	74	56	47	7	2	18	12	4	2
R. Kasmaliev	72	45	23	14	8	27	18	6	3
N. Akunov	32	18	10	7	1	14	11	3	-
M. Asanaliev	77	32	18	9	5	45	38	6	1
G. Usupbaeva	103	103	68	20	15	-	-	-	-
Total	**358**	**254**	**166**	**57**	**31**	**104**	**79**	**19**	**6**

Table 17. Flock structure of the six participating sheep farmers at Min-Bulak site on 19 December 2011

Farmer	Total No.	Tyan-Shan sheep				Indigenous coarse wool sheep			
		total	including			total	including		
			ewes	female lambs	castrates		ewes	female lambs	castrates
B. Musaev	32	25	19	6	-	7	7	-	-
E. Musaev	62	54	33	21	-	8	8	-	-
O. Ismadiyarov	27	25	13	12	-	2	2	-	-
A. Musaev	17	11	11	-	-	6	-	6	-
A. Asankulov	57	49	36	13	-	8	-	8	-
J. Samakov	38	26	26	-	-	12	-	12	-
T. Asenov	24	21	9	12	-	3	3	-	-
S. Musaev	42	40	36	4	-	2	2	-	-
Total	**299**	**251**	**183**	**68**	**-**	**48**	**22**	**26**	**-**

The flock structure of the large "Sabaaji" farm on 19 December 2011 was as follows:

- Main rams and teasers: 25 heads
- Male breeding lambs born in 2011: 15 heads
- Ewes: 710 heads
- Female lambs born in 2011; 300 heads
- Lambs for sale and slaughtering: 200 heads
- **Total: 1,250 heads.**

2.3.2 <u>Component 2:</u> Work on the formation and capacity building of the women group in all project sites to develop value added processing and export of wool and wool products. Encourage the development of women-led small businesses.

2.3.2.1 Enhancing project sustainability through the institutional development of the pilot groups

<u>Providing the groups with equipment, tools and raw materials</u>

In the second half of 2011, the project continued to work on capacity building with women's groups at all pilot sites. A wool-carding machine was purchased and installed in Min-Bulak village and the groups were provided with a variety of raw materials that are not readily accessible to them - tops, silk, dyes, leather, felt, shoetrees (Table 18). CACSA also helped the groups to find new channels for purchasing raw materials.

Table 18. Sources of raw wool and other felting materials provided to women's groups

Materials	Sources	Address
Merino wool	Farmers	Naryn oblast (through A.Ajibekov)
Crossbred wool	Farmers	Naryn oblast (through A.Ajibekov)
Tops	Runo-Asia Ltd.	Vinogradnaya street 1, Vostochnaya Promzona, Bishkek city.
Factory made felt	Runo-Asia Ltd.	1, Vinogradnaya street, Vostochnaya Promzona, Bishkek city, Kyrgyzstan.
Boot trees, natural leather	"Service" Shop selling goods for sewing and footwear repair.	295, Abdrahmanov street, Bishkek city, Kyrgyzstan.
Silk	Mediators	Margelan city, Uzbekistan.
Colors	Shop «Shveiny Mir»	195, Moskovskaya street, Bishkek, Kyrgyzstan
Services for sewing leather soles to felt slippers.	«Bigser sport» Production Complex	1-A Matrosova street, Bishkek city, Kyrgyzstan

The groups use merino and crossbred wool to make certain types of products (two-sided ala-kiyiz chair mats, hollow-shape felted slippers). The project purchased both types of wool for the artisans in 2010-2011 (A. Ajibekov). In 2011 the pilot groups started purchasing raw wool

through channels recommended by CACSARC-kg using their own funds from product sales (Table 19). Other raw materials and tools for felt production were purchased partially from project funds and partially with income from product sales.

Table 19. Funds used for providing the pilot groups with equipment, tools and raw materials (2010-2011)

Description	**Financial sources**		
	The grant funds	Income from selling products in the USA	Groups' own funds
Felting machine			
Wool-carding machine			
Desks			
Bulletin board			
Product samples			
Methodical and visual aids			
Merino wool			
Crossbred wool			
Tops			
Factory made felt			
Shoetrees			
Electronic scales			
Silk			
Colors			

Institutional development of the pilot groups

Institutional development of pilot groups continued in 2011. The groups began to market new products and used the initial marketing experience to focus on increasing product sales and strengthening their position on the market.

All pilot groups learned the basics of record keeping, accounting and reporting on the amount of products made, the volume and revenues from sales, labor costs, administrative expenses and income distribution.

In the course of the project, all pilot groups developed different forms of internal organization and management that affect the production process and the end results. The project team works with each group to improve mechanisms of internal governance when necessary.

1. At-Bashy: Artisans themselves produce handicrafts which they consider profitable or interesting (on the existing premises or sometimes at home). Then they collect the products to

sell them at the local markets, for example at the crafts fair during the "Oimo" Festival, charity events, etc. However, the group is not managed by a professional felter/designer, but by a Kindergarten Director with experience in felting, Shaigul Omuralieva. That may be one of the reasons why products made by this group tend to be of low quality. Neither is there a competitive spirit within the group and the artisans have very different levels of skills. There are talented and creative young women like Tologan kyzy Meerim, but they work individually and their contribution to the group's development is minimal. These are some of the reasons why the At-Bashy group is making very slow progress. The team discussed these problems with the group and the group members agreed to make changes in the group's management.

2. Acha-Kaindy: The leader of the Acha-Kaindy group, Toyun Amanova, supervises the group and works to develop marketing strategies. The leader is an experienced exporter of traditional felt products who tries to follow market demand and encourages the artisans to produce new products that meet market standard. However, the authority and opinion of the leader dominates in terms of product design. The project team concluded that the leader could delegate more responsibility to other designers, and encourage innovative aspirations of young designers such as Umut Malikova.

3. Min-Bulak: As of today, this group has developed the most effective model of managing production and marketing. The group's leader is a manager, marketer and economist. She successfully promotes the products on the local markets, finds customers and organizes the production process to complete specific orders according to buyers' requirements. The leader and the group members discuss design and color selection and effectively use methodical aids and product samples. The group has good results in monitoring product quality.

4. Lakhol: The issues of management and other concerns of the Lakhol group are decided collectively. The group is capable and consolidated. The role of the group leader, Gulmira Usupbaeva, is not domineering, but she is highly respected by the group members. The group promotes the creativity of individual artisans, delegation of power, division of labor, cooperation and bonus payment that corresponds to individual results.

2.3.2.2 Increasing the competitiveness of products produced by the pilot groups.

Introduction of new designs and processing technologies to meet market demands.

Elaboration of models and production of felt slippers in combined technique (stitched technique with further seamless felting on a shoetree).

During the period covered by the report, the project focused on the production of slippers. According to the project curator Dr. Liba Brent, slippers are one of the products made by the pilot groups that has a good prospect to succeed on international and regional markets if the existing model is improved. The women's groups previously mastered the techniques of producing stitched and seamless (hollow-shape) felt slippers. The project team decided to work with professional designers to improve the existing design and develop a new version of stitched slippers based on a prototype that Liba Brent imported to Kyrgyzstan from the United States. The imported slippers were manufactured in Denmark and marketed by the "Orvis" clothing store in the United States. Kyrgyz designers and the pilot groups are trying to produce a model

that would approximate the Danish slippers. After a successful model is developed, the women's groups can start producing this new version of slippers for export and for domestic and regional markets.

Designer O. Potapenko and Dr. Liba Brent are discussing the cut of slippers

Two designers worked on developing the new model of slippers – a designer Mrs. Olga Potapenko, who specializes in working with leather, and a felt designer Mrs. Kamala Abdykadyrova. Mrs. Olga Potapenko developed the technology of slipper production from premade felt layers. The felt layers are stitched and then shaped by stretching them on a shoetree. Mrs. Potapenko prepared felt templates for shoetrees of different sizes based on the imported slippers and Mrs. Kamala Abdykadyrova developed decorative appliqué for the slippers. The designers made 6 pairs of sample slippers that were used as models during a practical fellowship organized in Bishkek on 21 – 23 November 2011. 14 successful artisans who intend to produce slippers in the future were invited to participate. The objective of the fellowship was to teach the artisans how to produce felt slippers using the new templates and felt stitching technique and how to finish them by felting on a shoetree.

Development of the new slippers is still in progress and the designers and women's groups are focused on achieving the desired shape and quality in winter 2012. As with any product design, it is a lengthy process. Several attempts were made to produce the desired slipper shape, but only after the artisans mastered the technology and design it become clear that in order to develop the new model the artisans need different shoetrees. The shoetrees sold in Kyrgyzstan have a different shape compared to the imported model and it is necessary to grind them manually to achieve the desired shape. However, the grinding causes disproportions that affect the shape of the slippers. The project team decided to try to import shoetrees of a different shape and in different sizes from China. Discussions with Chinese exporters are in progress.

Theoretical class during the fellowship

Practical class during the fellowship

Discussing the results of the fellowship

Various designs of slippers

Analysis of the slipper-production fellowship results:

1. The new technology based on the imported design speeds up the production process by reducing the number of seams required to stitch the slippers. The stitching technique is also much less time-consuming than the hollow-shape seamless felting technique;
2. Proper shoetrees are principally important for producing slippers of the desired shape. Manual grinding of available shoetrees does not yield the desired results;
3. Variation in design is achieved by different methods of dyeing felt and finished slippers and by using different decorative materials and accessories;
4. During a line production of slippers using this new technology, an average productivity per artisan per day would be 4 – 5 pairs of slippers. This would make slipper production efficient and profitable.
5. Average price of one pair of slippers with leather sole at the local market is 450 – 500 Kyrgyz Som ($9.80 – $10.80); with leather-substitute sole 350 - 400 Som ($7.50 - $8.60). The production cost is 320 Som ($6.90) and 260 Som ($5.60) respectively.
6. The quality of slippers directly depends on the quality of felt: felt layers must be equally thick, without coarse specks and quite dense.
7. Net cost can be reduced if artisans produce felt of the needed standard on their own felting machines.

Practical trainings on production of scarves from silk with felt.

In 2011 the Min-Bulak and Lakhol groups were provided with merino wool and trained to use the wool to produce fine silk and felt scarves. The trainings were conducted on 22-25 September 2011. The trainer was Anara Chakaeva.

Artisan from Min-Bulak (producer of a wedding scarf)

Artisans from Lakhol village

The production of silk and felt scarves is favored by artisans because it gives them the opportunity to use various creative approaches and designs and it is easier compared to other products. Although scarves are in demand on local and regional markets, there is a big competition in scarf production - many designers in Bishkek have been producing scarves for many years and successfully export their products to European countries and the USA. Consequently the Naryn artisans face a strong competition in scarf production.

Eleven women from the Naryn oblast produced scarves during the three-day workshop at CACSARC-kg office using patterns and designs prepared by the trainer. Practical work under the supervision of designer K. Abdykadyrova led to a considerable improvement of the artisans' scarf-felting skills. After the trainings all workshop participants mastered different scarf-making techniques.

Designer Kamala Abdykadyrova shares her professional secrets

Participants are laying out felt layers to make scarf patterns

The seminar had a sequel in December, when four artisans (three women from Kulanak and one from Acha-Kaindy) worked at Kamala Abdykadyrova's studio producing orders of her customers. They received salaries and acquired valuable experience in producing high quality products. Kamala is one of the best designers in Kyrgyzstan. Her scarves are successfully sold in boutiques in Bishkek and she also receives orders from Europe and the United States.

Scarves (made on order from Canada)

2.3.2.3 Contest among artisans for the best product sample.

According to the project plan, the team organized a contest for the best ala-kiyiz two-sided chair mat set to promote creative competitiveness among the pilot groups. The contest was announced to the pilot groups in May 2011. All artisans were invited to participate individually in the contest and produce a set of chair mats. The team planned to evaluate the products in two stages: first, the best chair mat set in each group was to be selected based its design, quality of wool and craftsmanship. Secondly, the jury planned to select the contest winner (producer of the best product) out of the four best sets of chair mats produced by the four groups.

Criteria for the best chair mat set produced by the contest participants:

1. Quality of the raw material;
2. Interesting design;
3. Attractive combination of colors;
4. Original/creative approach to the design;
5. The four chair mats within the set had to have equal parameters: size, shape, design, color combination, weight, pattern etc.

Based on the conditions of the contest, a winner from each group was to be chosen and then the producer of the best chair-mat would be selected among the 4 winners.

Total 27 chair-mats were submitted to the contest:

"Cheber Koldor" Group, Acha-Kaindy village	7 sets
"Ak-Bairak Ltd", At-Bashy village	5 sets
"Uz-Nur-Ayim" Group, Min-Bulak	10 sets
"Lakhol Ayimdar" Group	5 sets

The jury session was held in Bishkek, on 30 September 2011.
The Jury members included:

Chairperson:	Gulmira Kutueva, designer, trainer
Members:	Kenjekan Toktosunova, master, trainer
	Kamala Abdykadyrova, designer, trainer
	Saori Nakatani, designer, volunteer

The jury members examined the products according to the above criteria.

Jury members are evaluating the products submitted by the project participants

Based on a careful examination of products, the jury made an unanimous decision not to award with the prize groups "Cheber Koldor", "Lakhol Ayimdar", "Ak-Bairak Ltd." because none of the chair-mat sets produced by members of these groups met the contest criteria. At the same time, the jury members noted the high quality of products produced by "Uz-Nur-Ayim" group. Based on the results it was decided to change the conditions of the contest and to award all three prizes for chair-mats to the "Uz-Nur-Ayim" group.

The jury awarded the following producers:

1 place: **Chinar Mamyrkanova,** Prize 4500 Som ($96).

2 place: **Gulzin Ibraeva,** Prize 3600 Som ($76).

3 place: **Cholpon Solpieva,** Prize 2700 Som ($57).

In addition, the jury awarded recognition prizes for good design and attractive color combination in the amount of 2200 Som ($47) to three members of "Uz-Nur-Ayim" group: Gulnara Omurkeyeva, Ainura Naamatova and Zina Mambetova.

In addition, 1500 Som ($32) was awarded to a member of "Ak-Bairak Ltd.", Tologon Kyzy Meerim, for innovative design.

The jury members recorded all comments about each chair-mat set that were delivered to all contest participants.

2.3.2.4 Monitoring progress of pilot groups

In October 2011 Dr Liba Brent and project manager Svetlana Balalaeva carried out monitoring of the work of pilot groups. They visited the four groups at the pilot sites and the new fifth group in Kulanak village that was included in the project in 2011.

Monitoring results:

1. The leader of the «Ak-Bairak» group, Shaigul Omuralieva, failed to monitor product quality. To remedy the lack of oversight, the task of monitoring the groups' work and controlling quality of raw materials and products was assigned to an experienced artisan Damira Toktonazarova.
2. All groups, with the exception of the Min-Bulak group, were not seriously engaged in the contest for the best chair-mat set. Results of the contest were carefully analyzed and the jury's comments were read out in all groups. The awarded chair-mats were shown in each group and all participants received comments about their products written by the jury. The most common remarks pertained to color combinations, quality of design and unequal dimensions of chair-mats within the same set. The contest winners were awarded monetary

prizes and the winning products were purchased with the project funds for further promotion and marketing.

3. The 2011 project report and future plans were discussed in all groups.
4. Dr Liba Brent purchased various samples of felt products for test marketing in the USA.
5. Organizational meeting was held with artisans in Kulanak village and the decision was made to include this group in the project.

Contest winners from Min-Bulak village

Recommendations by Dr Liba Brent based on the monitoring results:

- Taking into consideration the sufficient number of trainings conducted in all the pilot groups, the most capable group members, seriously interested in handicraft business, should have fellowships and practical training with designers in Bishkek;
- The most talented and responsible group members should be identified and placed in charge of completing future orders from customers on individual basis;
- Before receiving orders for products, artisans who participate in making the products must first produce a product sample according to standard. The artisan in charge of the order has to guarantee that the standard will be maintained;
- The raw materials must be used efficiently and distributed only to those artisans who guarantee to process them into quality products (as opposed to wasting them on producing low quality products that cannot sell);
- Scarf producers must use merino wool with fiber diameter of no more than 20 micron or selected, factory-made Merino tops;

- Felt slippers are one of the products with a good marketing potential and production of felt slippers should be developed.

2.3.3 Component 3: Develop sustainable market chains that link fiber producers and processors with buyers.

2.3.3.1 Test-marketing of felt products at the local markets.

The project provided marketing support to pilot groups by helping their representatives participate in the "Oimo" Festival and craft fairs in Bishkek. The project supported eight artisans from the pilot groups to participate in the Sixth International Festival "Oimo" held from July 24 to August 2, 2011 first in Bishkek then in Cholpon-Ata, the main recreational area on lake Issyk-Kul. 120 artisans from Central Asian countries, Russia and Turkey attended the Festival. Representatives of the pilot groups participated actively in many events of the "Oimo" Festival. They had the opportunity to market their products and to evaluate and compare their handcrafts with felt products made in different regions of Kyrgyzstan and in other countries. They were also able to assess the demand for their products and receive direct comments from customers.

T. Amanova (Acha-Kaindy) shows to the trainer Kamala Abdykadyrova scarves produced by the group members

Bishkek citizen Alfiya likes the scarf produced in Min-Bulak village

During the "Oimo" Festival, the women's groups sold products for $2,000. 80% of this was income earned from selling new products mastered by artisans during the implementation of the ICARDA/IFAD project.

Artisans from At-Bashy village at the "Oimo" Festival. Cholpon-Ata, Issyk-Kul

In the second half of 2011 the pilot groups started actively marketing their products on local markets through participation in handicraft fairs in Bishkek. Representatives of 3 pilot groups participated in a crafts fair in Bishkek at the end of September 2011. Burulush Jamanbaeva from Min-Bulak village participated in a New Year crafts fair organized in the "Caravan" Shopping Mall on 9 -10 December 2011. She displayed 15 pairs of the newly made slippers and sold them all successfully at the price of 400 – 450 Som. During participation in handicraft fairs, the artisans not only earned income from selling their products, but also had the opportunity to find wholesale buyers for the products.

The analysis of product sales shows that the export-oriented new products of Naryn artisans will be in demand on local and regional markets especially if their assortment and quality is further increased. The groups can successfully compete with new products such as chair mats, slippers and felt and silk scarves in spite of strong competition from designers in Bishkek who are well established on the local and regional markets.

The groups used a portion of their income from sales to purchase raw materials: silk, felt, dyes and accessories.

2.3.3.2 Test-marketing in the USA.

The test-marketing of felt products in the USA is being conducted by Dr. Liba Brent. In winter 2010 – 2011, the project sold felt products of Naryn artisans in the amount of $768. The products test-marketed included chair mats, pillows, slippers and felt and silk scarves. Most products were sold at a Fair Trade Festival in Madison, Wisconsin in December 2010 and some

products were sold at a boutique called “Spirals” in Madison, Wisconsin in winter 2010-2011. Products that did not sell in 2010 - 2011 were left for test-marketing in winter 2011 - 2012.

The test-marketing results suggest that some products, such as the felt and silk scarves, are more profitable to make because of the difference between the production cost and the sales price and because the scarves are light which lowers the transportation cost. On the other hand, products such as chair mats or pillows cannot be sold for high enough prices to make them viable export products. Chair mats, for example, are expensive to produce because of the high cost of raw material and labor and also high weight and bulkiness which makes them expensive to export to the US. These types of products are better suited for the regional market and the groups successfully sold them at crafts fairs in Kyrgyzstan.

Based on test-marketing results in 2010 – 2011, the project focused on selling felt and silk scarves in 2011 – 2012. During the 2011 Fair Trade Festival in Madison, WI, the project sold felt and silk scarves for $650. Scarves that did not sell at the Fair Trade Festival are being test-marketed in a store in Verona, Wisconsin in winter 2011 – 2012. Although the demand for felt and silk scarves at the Fair Trade Festival was very good and the scarves received many compliments, the overall market for luxury clothing and accessories in Madison, Wisconsin is limited. There are few stores that sell luxury, hand-made products, and some of those stores carry products made by local or US artisans only. For example, a manager of the Overture Center Gift Shop in Madison – a store that would be perfectly suited for marketing Kyrgyz luxury handicrafts – refused to sell them because they were not made in the USA.

In order to expand the market for luxury felt accessories, it will be necessary to market these products in larger cities in northern United States. To solicit orders from retailers in these cities, it will be important to display the products at trade shows or crafts fairs that are visited by wholesale buyers. To do this, additional funds need to be allocated for test-marketing products. The project also plans to send samples of felt and silk scarves to potential retailers in these cities and to advertise them on the project website www.adventureyarns.com.

The small-scale test-marketing in Madison, Wisconsin is very important because it provides consumer feedback that helps the project team identify products that have the best marketing potential. Based on customer responses at the Fair Trade Festival, the project selected types of felt and silk scarves that have the best marketing potential and plans to order these scarves from the Naryn artisans in 2012. In 2012 – 12013 the project also plans to produce and test-market the new version of felt slippers that are in the process of being developed.

The full results of test-marketing in winter 2011 – 2012 will be available in spring 2012 and detailed production and marketing plans will be developed in view of these results.

2.3.4 **Component 4: Research on changes of income of fiber producers and women processors and their effects on livelihoods and gender roles.**

2.3.4.1 Socioeconomic baseline survey of artisans involved in the projects and their neighbors

A socioeconomic survey was conducted in the four target villages in 2011 to collect baseline information on the artisan households and to evaluate the representativeness of the artisan women involved in the project compared to their neighbors. Accordingly, the project team interviewed two target groups for the survey:

1) artisan women involved in the project and

2) neighbors of artisans with knowledge of wool processing and felting.

The specific felting experience of the latter group was set as a criterion for their selection to compare the baseline characteristics of supported and not supported felt producers.

The objective was to study livelihoods of families involved in the project activities and their neighbors.

The specific objectives of the survey included:

- comparative analysis of the economic situation of artisan women and their neighbors,
- determination of the major family income sources,
- studying major expenditures.
- analyzing sources of women employment in the villages.

The descriptive information about the interviewed women in the Naryn province is provided in Table 20. Among the four villages At-Bashi was the largest by its population and the number of households, while Lakhol was the smallest by the same indicators. The total number of interviewed wool processing women involved in the project was 55, and 75 neighbor women were interviewed (see questionnaires for each target group in annexes 2 and 3).

Table 20. Information on the interviewed women

Interviewed group	No inter-viewed	Average no of family members	Average land plot, ha	Average per capita annual income, USD	No of households (population) in the village
At-Bashi artisans	15	6	0.06	286	1814
At-Bashi neighbors	20	7	0.08	437	(10883)
Acha-Kaindy artisans	15	5	2.52	267	990
Acha-Kaindy neighbors	20	4	2.91	229	(3760)
Lakhol artisans	10	5	1	277	210
Lakhol neighbors	15	4	1.55	273	(1050)
Min-Bulak artisans	15	4	2.43	195	1125
Min-Bulak neighbors	20	5	2.15	102	(5064)

Household income distribution

Income generated from all economic activities (including livestock production, crop production, etc) was considered during the survey. The analysis of the household income structure shows that artisan women compared to their neighbors have a relatively higher share of income from sheep wool products, a higher share of income from crop production in all villages, and slightly lower dependence on the livestock income in the studied villages except Lakhol (Figure 10 and 11). In general, higher income share from felt products allows mitigation of risks through product diversification, i.e. sheep wool processing, and reduces vulnerability of artisans' households during crop and livestock production shocks.

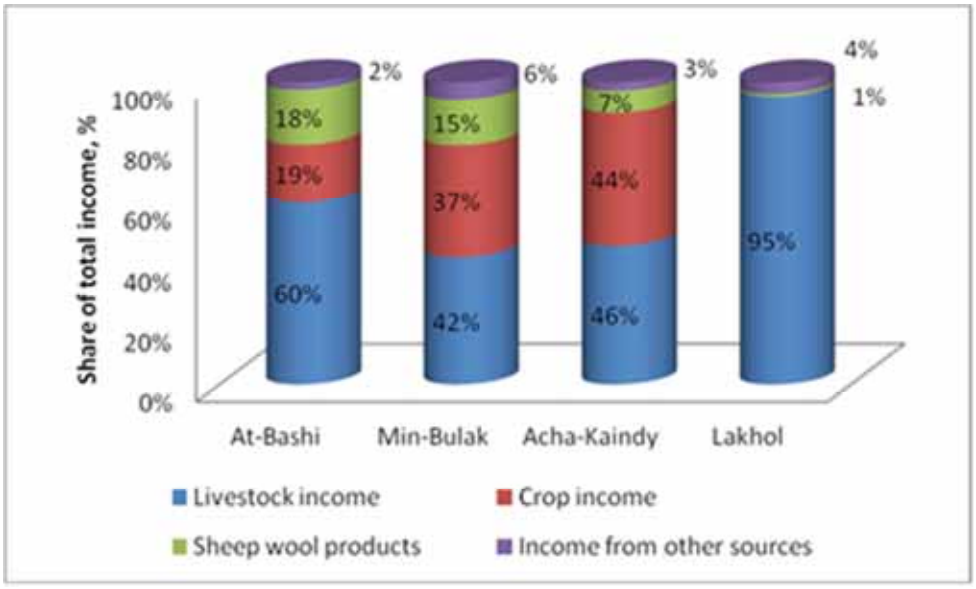


Figure 10. Income structure of artisan women's families

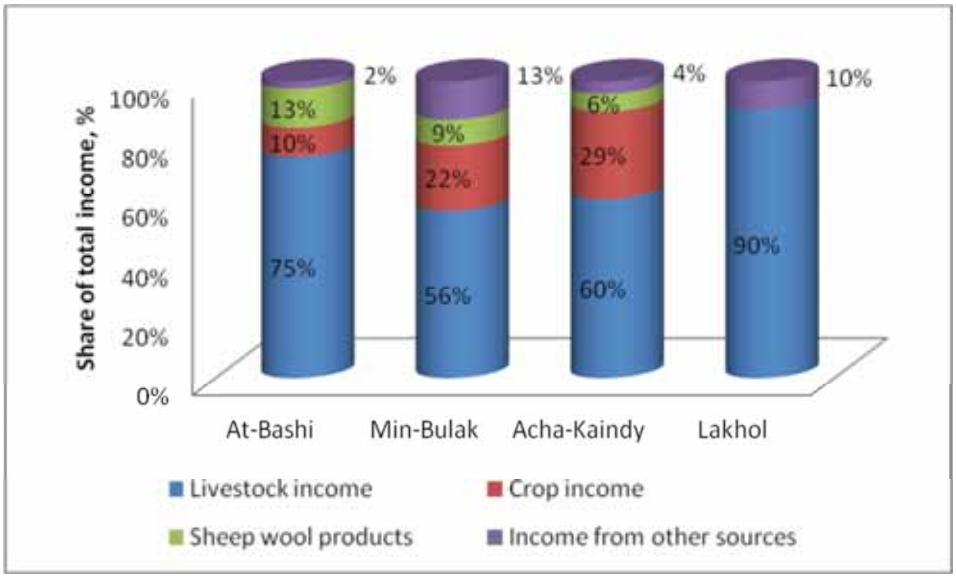


Figure 11. Income structure of neighbors' families

Wool production

In average, wool and cashmere sales in 2011 accounted for 2% of the total livestock income obtained by artisans and 4% of income generated by their neighbors. These figures indicate the importance of value addition through wool processing as opposed to sales of the raw wool at low prices.

Crop production

The selected sites, except Lakhol, are favorable for potato production generating the highest income for both artisans and their neighbors (Table 21). Households also grow carrot, wheat, barley and hay for livestock. In Lakhol village, crop production is limited to subsistence level due to low quality of land plots mainly used as rangelands for livestock grazing.

Table 21. Share of households producing certain crops

Crop	At-Bashi		Acha-Kaindy		Min-Bulak	
	artisans	neighbors	artisans	neighbors	artisans	neighbors
Potato	67%	100%	100%	100%	100%	100%
Carrot	27%	5%	0	0	93%	45%
Barley	33%	0	0	0	60%	35%
Wheat	0	0	7%	0	0	35%
Hay	0	15%	27%	0	0	0

Artisans in At-Bashi village are more interested in both selling produced crops and feeding livestock compared to their neighbors. In the other studied sites similar trends were observed in both target groups (Table 22).

Table 22. Purpose of crop production

Purpose of crop production	At-Bashi		Acha-Kaindy		Lakhol		Min-Bulak	
	artisans	neigh-bors	artisans	neigh-bors	artisans	neigh-bors	artisans	neigh-bors
for family	87%	100%	80%	100%	100%	100%	100%	100%
for selling	47%	15%	60%	65%	0	0	60%	50%
for feeding livestock	47%	5%	13%	0	20%	80%	60%	30%

Income from sheep wool processing

Data on net profit from felt products collected from artisan women and neighbors indicate the diversity of products being produced by the project artisan groups. It allows these artisans to enter new niche markets through introduction of new types and designs of products. By July 2011 nearly half of profit generated in the project artisan groups was from non-traditional products (scarves, chair mats, pillows and slippers), while their neighbors mainly sold shyrdaks and ala-kiiz (Tables 23 and 24).

Table 23. Income generated by artisans as of July 2011 (in USD)

Village	Net profit					
	traditional products	scarves	chair mats, pillows	slippers	total profit	per capita profit
At-Bashy	1304	246	312	118	3175	132
Acha-Kaindy	978	0	101	0	2182	72
Min-Bulak	109	0	256	239	1060	40
Lakhol	0	0	59	20	79	5
Total	**5146**	**246**	**728**	**376**	**6496**	

Table 24. Income generated by neighbors as of July 2011 (in USD)

Village	Net profit			
	traditional products	slippers	total profit	per capita profit
At-Bashy	3196	22	3217	161
Acha-Kaindy	1626	0	1626	81
Min-Bulak	435	0	435	22
Lakhol	0	0	0	0
Total	5257	**22**	**5278**	

As expected the answers of neighbors about their awareness about different felt products indicate the popularity of shyrdaks and ala-kiiz (Figure 12). Chair mats and slippers were rarely mentioned by neighbors.

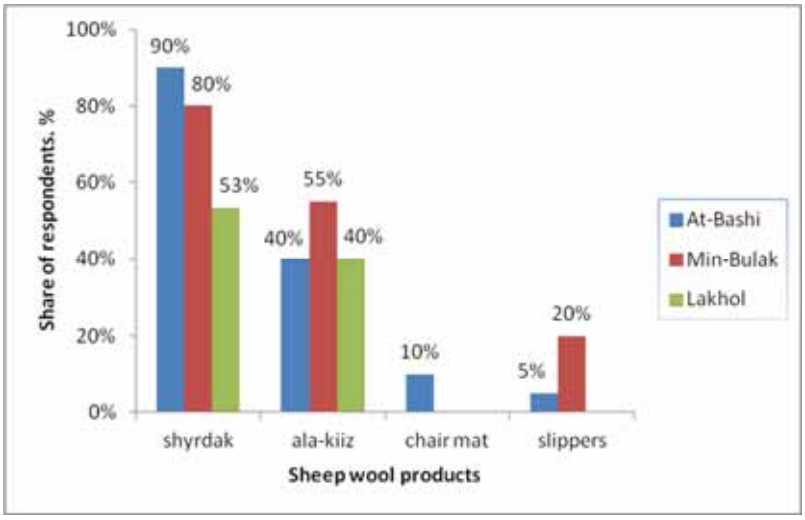


Figure 12. Awareness of neighbors about felt products

Collected data on the structure of expenses in artisans' and their neighbors' households show that the two major expense categories at all sites were "family needs" and "seeds and feed" (Table 25).

Table 25. Major expenses of artisans and their neighbors

Village	Group	Expenditures, share of respondents			
		for family	for seeds and feed	for equipment and fuel	to buy livestock
At-Bashi	artisans	100%	60%	20%	20%
	neighbors	100%	55%	65%	80%
Acha-Kaindy	artisans	100%	93%	0	33%
	neighbors	100%	75%		
Lakhol	artisans	100%	50%		
	neighbors	100%	73%		
Min-Bulak	artisans	100%	20%		
	neighbors	100%	45%		

The analysis of product marketing showed that about 50% of project artisans are willing to send felt products abroad, 35% of them sell at local markets, and 15% of women try to go to fares or exhibitions organized in provincial centers or in Bishkek. Marketing practices of neighbor women show that 82% sell felt products at local markets, while 18% try to sell at fares or exhibitions.

2.3.4.2 Collecting data on handicrafts sale and income of artisan groups

The group leaders have been collecting data on earnings from handicraft sales. The data shows that the groups' product sales have been increasing as a result of the trainings and consequent improvements in product quality. The project also requires that the groups report on sales during the handicraft fairs organized by CACSARC-kg. To collect this data, CACSARC-kg designed special questionnaires that are filled by the artisans during the fairs.

Based on the project data we can see that artisans earned good income in 2011. The four artisan groups generated 8,500 USD profit from felt products in 2011. The At-Bashi group was the champion with the highest profit recorded. This achievement should be credited to a very professional group leader as well as to proximity of the village to market in the district center. The lowest sales of felt products were recorded in Lakhol group. Lack of experience in felting, remoteness of market, and harsh climate can explain this relatively low result. However, the group showed a very significant and promising progress during the 2nd half of 2011 by achieving 115 USD per artisan profit for 2011 (Table 26).

Table 26. Incomes of the pilot groups from their handicraft activities in 2011

Pilot group	Income from producing traditional products, USD	Income from producing new products, USD				
		Scarves	Chair mats, cushions	Slippers	Total amount	% of income from new products in total income
At-Bashy	1645	563	338	162	2708	39%
Acha-Kaindy	1147	520	390	182	2239	49%
Min-Bulak	139	255	1508	520	2422	94%
Lakhol	281	257	522	87	1147	75%
Total	**3212**	**1595**	**2758**	**951**	**8516**	**62%**

In 2010 the ICARDA-CACSARC-kg project conducted a survey of artisan groups that included questions about the average annual income from the groups' handicraft business. Below is a table that shows the growth of income from handicraft activities of the pilot groups between 2010 and 2011 (Table 27).

Table 27. Increase in income from handicraft activities of the pilot groups from 2010 to 2011

Group	Average annual income before 2010 according to the CACSARC-kg – ICARDA survey, USD	Income from handicraft activities in 2011, USD	% increase in income from handicraft activities in 2011
At-Bashy	1602	2708	69%
Acha-Kaindy	1991	2239	12%
Min-Bulak	1515	2422	59%
Lakhol	433	1147	165%
Total	**5541**	**8516**	**53%**

In September 2011 the project conducted a survey of the artisans, asking how their handicraft production within the project affected their livelihoods. The survey was made in the form of a video interview and the interviewers, researcher Bahtygul Kapalova and video operator Rustam Sadykov, worked in all four groups.

Video interview of artisans in Lakhol village

A 20-minute video film was produced in the form of a report. The full video footage of interviews on different topics (300 minutes of shooting material in total) was used to identify and analyze problems and included in the portfolios of artisan groups. The video material will be also used for advertising the project and the groups.

The interview analysis shows that the artisans highly value the project's role in increasing their earnings from felt production and explains how greater earnings improve the women's livelihoods.

2.3.4.3 Changes of income and their effects on gender roles, decision-making and status of women

Earning good income from handicraft business gives women the ability to contribute to the family budget which considerably improves the social standing of women within the family and the society. The families of the Naryn women, including their husbands and children, witness how the development of handicraft business can improve their family's welfare. This inspires them to support the women morally and technically in developing their business. We can see evidence of such support in families of the group leaders and the artisans. As a rule, their husbands maintain the machines, help with transport and work premises and take part in the discussions of strategic issues. Such attitudes in the rural areas are uncommon and testify about the increased role of women in their family and community and the recognition of their contribution to the family budget on the part of other family members.

In addition to economic benefits, the collaboration between the project and the women's groups on developing the handicraft business helps to increase the women's self-confidence and

maintain a positive outlook on their future. The women learn how to be more self-reliant and in control of their work and livelihoods. They acquire new ideas, contacts, skills, habits and perspectives and learn how to mobilize capacities and resources that are necessary for making a living in the context of global market economy. They learn that they can succeed in making competitive products for demanding customers in Central Asia, the United States and Europe which brings them not only good income but gives them a sense of pride and accomplishment.

2.3.5 Component 5: Linkages (business, scientific and cultural) between the pilot communities and the global communities of producers, processors and consumers of fiber and fiber products.

2.3.5.1 Multiple cross-national linkages (in science, commerce, know-how and culture) are being developed and supported by the project.

The project developed multiple new linkages between artisans of the pilot groups in the Naryn region, designers in Kyrgyzstan and local and international buyers of handicraft products.

1. It linked Naryn artisans with Kyrgyz designers who provided consultations and conducted trainings on the development of high-quality new products.
2. It linked women artisans with project leaders and specialists and also with Tajik and Iranian women who participate in the ICARDA Project "Improving Livelihoods of Smallholders and Rural Women through Value-Added Processing and Export of Cashmere, Wool and Mohair" during the visit of three pilot group leaders from Kyrgyzstan to the ICARDA Regional workshop in Dushanbe on 3-5 October 2011.
3. It linked the Naryn artisans with local wool producers and connected the producers and processors to local, regional and American markets by helping them to develop new products from local wool.
4. Catalogue of products produced by Naryn artisans was prepared for publication.
5. The CACSARK-kg website (www.cacsarc.kg) posted information about the project including photos of the products of Naryn artisans that can be produced to order.
6. Methodical aids on different handicraft techniques and design have been prepared and distributed to artisan groups.
7. The number of women participants was increased by including the artisan group from Kulanak village, Naryn rayon in the project. 15 artisans from women's self-help group in Kulanak village received training at CACSRC-kg on handicraft technologies in August 2011 with the support of the UN Women; the group members showed good organizational capacities, high productive potential and a strong motivation to succeed. The suggestion of CACSARC-kg to include the group in the project was approved at the ICARDA Annual Regional workshop, held on 3-5 October in Dushanbe, Tajikistan. Relevant changes were made in the project workplan of CACSARC-kg for 2012.

Group leaders are presenting their products at the ICARDA Regional workshop in Dushanbe, October 2011

2.4 Kerman, Iran

2.4.1 <u>Component 1</u>: Characterize production systems and improve fiber production of small ruminants at all target sites.

2.4.1.1 Improving breeding and animal husbandry practices focusing on fiber quality

The breeding scheme with the aim to decrease fiber diameter while maintaining the excellent cashmere staple length and curvature was continued in the eight Raeini breeding herds. Forty females per herds were divided in two groups of 20 does in each of the eight herds. The females were mated with the two bucks that had been selected in May 2011 (see last progress report). All the nucleus herds were penned in separate fences during the mating season. To supply the herds with adequate feeding during the mating period, all herds were supplied with free barley.

A typical Raeini cashmere goat herd kept in the fence, April, 2011.

Pedigrees were recorded and the kids born were ear tagged in December 2011 and January 2012. While four herds had stayed in the spring grazing area, four others had migrated to the winter grazing area in Hormozgan province. The nomad farmers were provided with ear tags and punch to ear-tag the kids. This process is still continuing.

Typical spring grazing area in Baft region, Kerman province covered with wild oak trees and bushes.

The 192 samples taken in April 2011 from females from the base and nucleus population of each breeding herd were analyzed in Almaty and laboratory results were received. The data is now being analyzed to confirm that the nucleus female are superior to the base population in fiber quality and to evaluate the accuracy of the visual assessment of fiber quality.
To ensure that superior bucks will be used for the nucleus flocks, samples from candidate bucks will be collected in February 2012. Herd owners have been trained as how to select female goats based on subjective criteria and visual assessment of fibre quality; such as fineness, curliness and density of cashmere fibre. Thus, no samples will be taken from adult females.

2.4.1.2 Introducing better cashmere harvesting methods

In some parts of Iran, cashmere is harvested by combing during the three to six weeks spring period when the goats are moulting or by collecting the moulted fibers from the ground and bushes. Cashmere is harvested using combs at the beginning of spring in south eastern provinces of South Khorasan, Khorasan Razavi and parts of Sistan and Baluchestan in Iran. Figure 14 reflects the areas in which cashmere is combed or shorn in Iran.

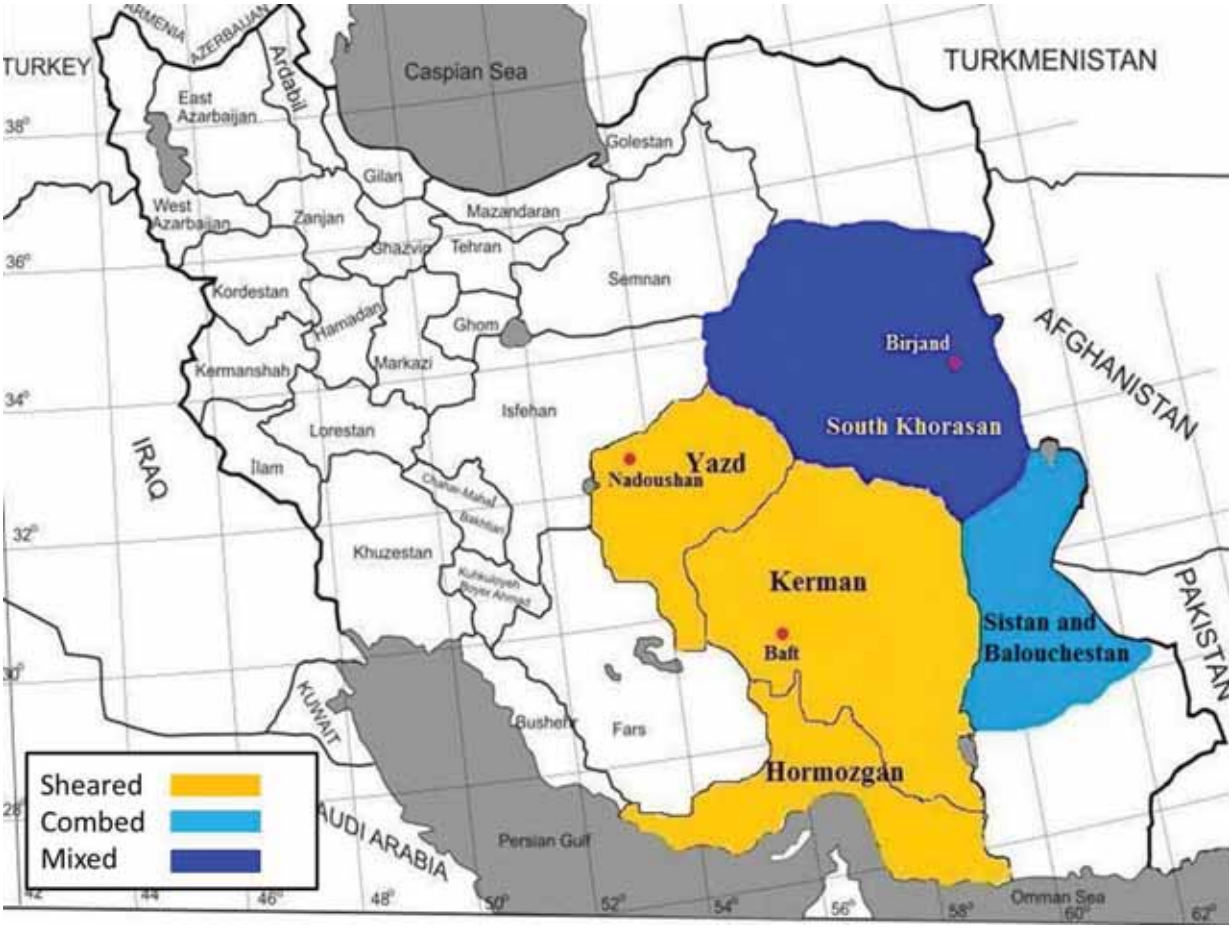


Figure 14. Illustration of cashmere harvesting methods in different provinces

120 cashmere samples were collected and sent to Almaty laboratory for determination of fibre characteristics. Results of laboratory analysis were received in November 2011. The data is being statistically analysed and the results would indicate which type of combs are suitable to use for combing the cashmere under nomadic situation in Baft.

2.4.1.3 Lessons learned:

- The culture of cashmere producing nomads in Baft region (cashmere project site) is closely intertwined with the Raeini goat breed. Improving the quantity and quality of cashmere and providing incentive to maintain the breed, contributes to conserving the culture and maintain the nomadic society population.
- The initiated breeding program should stimulate the creation of a strong local program to train and support the nomads in technical and management skills, e.g. selection of superior bucks and does based on subjective cashmere characteristics such as fineness, density and curliness of fiber.
- The goat owners in Kerman province shear their goats 1-2 months after onset of shedding and sell the whole fibre, containing both rough outer hair and the inner fine cashmere, to

local or travelling merchants. This leads to a loss of cashmere as a result of delayed shearing after the shedding season and has a drastic effect on the quality.

- Nomads are declining in number and resort to other professions also due to the efforts of governments to sedentarize them and due to severe environmental conditions such as droughts which force the nomads to search for wages in urban settings. As a result of sedentarization there would be shortcomings of supply in the markets and an increase in the price.

2.4.2 Component 2: Work on formation and capacity building of women's groups to develop fiber processing and export of value-added fiber and products in all pilot sites. Encourage the development of women-led small businesses.

2.4.2.1 Form and organize groups of women processors at pilot site

The aims of the women organization are:

1. Production of yarn using either simple electronic yarn making machine which will be imported from Tajikistan or traditional spindles.
2. Sell produced raw cashmere directly to the processing factory in Mashad or Semnan.
3. Find a market for cashmere yarn or finished products in the international market. Attempts have been made to join the IFAD-ICARDA cashmere project website (www.adenturesyarn) to present cashmere yarn and products globally.

At the end of 2011 this organization started its activity with 6 nomad women at the cashmere project pilot site. A challenging problem for the cashmere yarn making part of the cashmere project is deharing the fibre before making yarn. Raw cashmere contains approximately 50% coarse hair which should be dehaired. It was decided to buy the Raeini raw cashmere and process the fibre in Pazhan Sefit processing mill in Semnan province and distribute that among nomad women to make yarn. 40 kg of cashmere was processed in Janurary 2012. Making samples of yran for testing the quality has been started. If the test resuls are acceptable the processed cashmere would be given to spinners to make yarn at a larger level. However this procedure is very expensive and requires substantial financial asset. A kilogram of cashmere is sold at 140 thousand tomans (100 dollars/kg). Any successful yarn making program requires a cheep dehairing system in order to make the finished yarn price acceptable in international markets. There is a great challenge in dehairing cashmere because there is no dehairing system in the nomadic area. There are two options for dehairing: organizing a centralized dehairng system either by having a contract with Semnan (Pajan) cashmere processing factory or by providing each Nomad cashmere producing farm unit (composed of 3-5 families) with a small dehairing machine. National Project team is presently studying different options for adopting a proper dehairing system that would suit well with nomadic system. The next step will be to distribute the dehaired fibre to spinners at the pilot site.

2.4.2.2 Training in yarn making and dyeing for nomad women

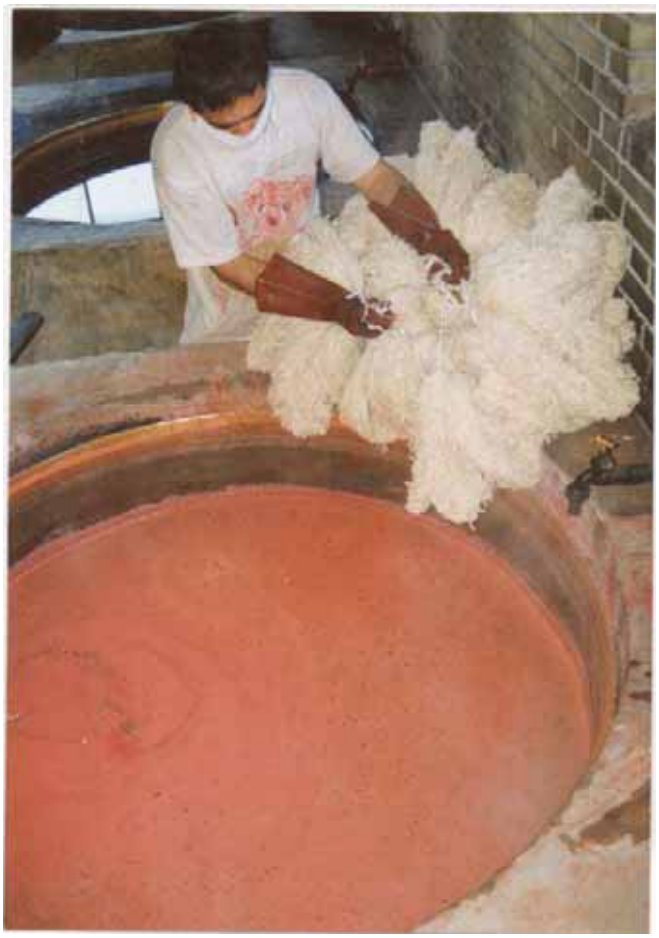
As reported in the last progress report almost all nomad women know how to spin fiber into yarns using traditional spindles. However this has been only practiced with wool and not with cashmere. From October to December 2011 sheep wool, undehaired and a limited amount of

dehaired cashmere was used for training the women. Four nomad women made samples: (1) Jeiran Mousapour, (2) Hajar Mousapour, (3) Golbas Mousapour and (4) Masoumeh Mousapour (The head of the group).

Pictures of the produced yarn were taken and sent to Dr. Liba Brent to be examined. Technical assistance was given by Mrs. Nasim Karegar (a member of national project team) to five nomad women spinners to make better yarn.

Spinning yarn by nomad women using traditional spindles. November 2011.

In suburbs of Kerman city practices for dyeing wool yarns using various natural and artificial dyes are well developed and will be adopted for cashmere yarns. Measures have been taken to organize yarn dyeing in the area. A group of five nomad women will be working together to make cashmere yarn at a larger level. The preliminary yarn making for testing has been started by this group



Yarn dyeing using traditional natural dyes in Varamin region.

2.4.2.3 Lessons learned

Nomad women use traditional spindles to spin cashmere into yarn. It is important to introduce easy to operate new devices, e.g. spinning wheels and small electronic spinning devices in order to improve the quality and make a more uniform yarn.

2.4.3 **Component 3. Develop sustainable market chains that link fiber producers and processors with buyers**

2.4.3.1 Study on cashmere marketing and value chain

Survey methodology

Data were collected in the two main Cashmere producing provinces of Kerman and South Khorasan through structured questionnaires and interviews. Two main processing mills in Semnan and Khorasan Razavi province and the four main marketing cities of Kerman, Sirjan, Birgand, and Mashad were visited and interviews conducted with key people. Data on nomad

cashmere goat herd management and marketing strategies had been collected earlier using an ICARDA structured questionnaire. Information was compiled on quality and quantity of cashmere, selling season/month, factors important to make decision of cashmere price, means of transport, kind of payment, type of agreement with buyer/seller, market accessibility, type of sorting/storage, packaging, processing machines: scouring, garneting, dehairing, combing and etc, challenges, education, training and customs.
Price information for the value chain analysis was obtained from different sources (actors) along the value chain, and cross-checked. Prices for raw cashmere were obtained from farmers, district, provincial and national level assemblers and the exporters, and cost-benefit margins were calculated accordingly. Export prices for raw and dehaired cashmere were obtained from processors and exporters. Wholesale and final garments were obtained from reviews of different websites. Volumes, cashmere quality, breeds and population of goats were mainly derived by available literature on research results, publications, national census and official statistics. Harvesting, transportation and marketing methods were observed on site by visiting many cashmere goat herds and marketing in main regions. Cashmere processing mills were visited in different provinces.

Cashmere marketing

In Iran nearly all the cashmere is marketed by direct buying. There have been some changes in marketing from time to time and for various parts of the country, but in general no drastic departures from years ago. Perhaps the biggest change has been the general trade practice whereby most of the warehousing of cashmere is near the source of supply. Another change has been the increase in direct buying by processors or manufacturers.
The more important agencies involved in getting the cashmere from the producer to the consumer are: the country buyer, the country assembler or cashmere-warehouse handler or dealer or combination, local cashmere pools, the commission merchant, the broker, and the manufacturer.
In cashmere producing farms which include the eastern provinces of Iran, the local buyers collect cashmere and either sells to a merchant in town or stores in his own facility. Most dealing of this kind is with farms having but limited number of goats. Cashmere is loosely packed in tall narrow polyester bags (90×36×30 cm), weighing about 100-150 Kg per bag.
The manufacturer or country buyer sends his representative through the small towns to dealer or to local warehouses to buy the cashmere. The cashmere purchased may then be shipped to main trading centre (Figure 15), such as Mashad, Kerman and Birjand where it is graded or prepared on the basis of mill requirements and there resold to manufacturer.

Figure 15. Major production, marketing and processing centres of Iranian cashmere

Many local dealers or purchasers of small lots of cashmere may be junk dealers or feed-store operators. Many of these dealers specialize in not only cashmere but other products of the region such as furs, hides, pelts, iron, poultry, or possibly livestock. Usually the cashmere is sold ungraded, at a flat price. However, if some preparation has been done on the fleeces, they may be roughly sorted.

Cashmere pools have operated for years in the fleece-cashmere provinces, but they are becoming more numerous in the Eastern provinces. These pools are usually made up of many growers' clips in a nearby locality that pool their cashmere in one central location and have buyers come and make a price offer. Sometimes the cashmere may be sorted, but more often they are not.

Selling of the cashmere grown in the regions where nomads are predominantly practicing their farming system is quite different from selling that of grown in the small scale rural farming areas. The cashmere merchant or manufacturer sends his agents directly to the nomadic farming areas during the shearing season in spring. This buyer may be a local man living in the range province all year around, or he may be a man sent directly from the country buyer. Some large consumers of cashmere during the last several years have set up permanent buying organizations at central locations in the nomadic areas of eastern cashmere-growing sections. Thus, the buyers are closer to the source of cashmere and effect a saving here and also through direct shipments to mills. Local buyers generally work on commission; which is based on the amount of cashmere purchased, whereas some buyers are normally paid a salary and his traveling expenses. Some eastern cashmere middlemen have purchasing orders form different merchants or mills for specified quantities of various types of cashmere. This is done especially by lager mills, who desire to purchase in advance cashmere suitable for sale requirements, and in such cases the buyer works on a commission. Cashmere producers in the nomadic areas sell unsorted raw cashmere at lower prices than could be expected if the cashmere was sorted at source into quality classes. Nomad cashmere producers do not receive seasonal price information on cashmere

through reliable and up to date sources. Questionnaire cashmere study revealed that 41 and 32% of nomads receive scattered marketing information from traders and neighbouring farms while 14 and 13% received their information from associations and markets respectively (Figure 16).

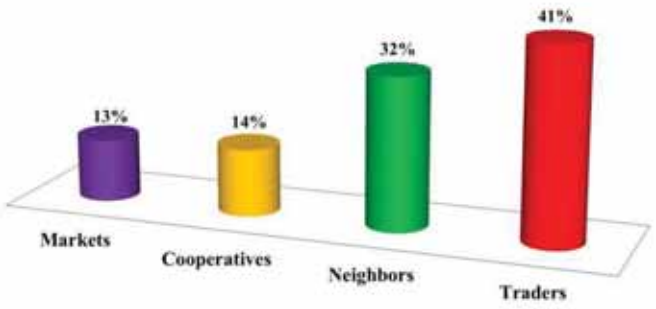


Figure 16. Marketing and price information sources for nomad cashmere producers

After harvesting, cashmere is bought directly from the herders by middlemen and the fibre is stored in warehouses according to colour and fineness. A basic problem of operators of cashmere warehouses in some years especially during drought is to obtain adequate volumes of cashmere for efficient handling. This involves consideration of the sources and availability of potential supplies, the competition of others and transportation facilities and costs. With adequate volumes of cashmere available, other problems include securing adequate protection from losses by fire and other hazards at reasonable costs, obtaining and maintaining suitable facilities and equipment for rendering the essential warehouse and related services efficiently, securing adequate information concerning the quality and commercial value of the cashmere handled, and maintain suitable contacts with market outlets for disposing of the qualities of cashmere handled. The principle centres for the gathering and rough sorting raw cashmere in Iran are Baft, Sirjan, Mashad and Birjand (Figure 17). These centres have long been considered the leading market in Iran. Since 1950s the market established itself near the production areas, with more shipments going directly to mills. Mashad continues as the centre of cashmere industry as most of the large manufacturers, exporters, dealers and selling agents and warehouse dealers are located there. Khorasan Razavi province with Mashad city as its centre having common border with Afghanistan play an important role in processing and marketing of Afghan cashmere industry.

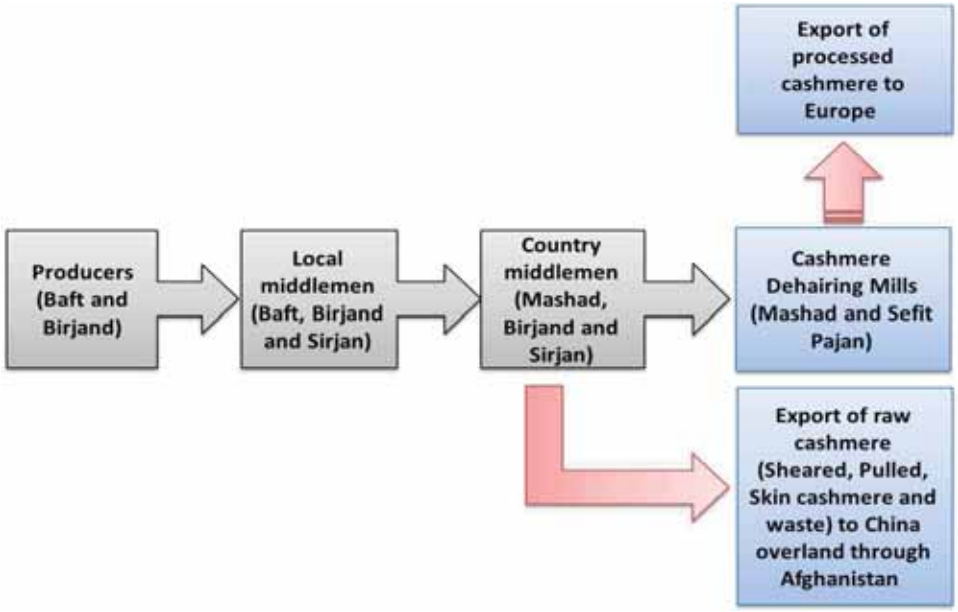


Figure 17. The principle centres for the gathering and rough sorting raw cashmere in Iran

In 2006 total scouring capacity of seven Iranian cashmere processors was 4985 tons. These processors had 429 employees with an asset of 6725 milliard rials (US$672 million dollars) (Table 28). While total capacity of 8 Iranian dehairing processors was 1844 tons with a total asset of 10492 milliard rials (1049 million dollars) and 383 employees (Table 29). The majority of Iranian processed dehaired cashmere is exported to England, Italy and Belgium for further added value chain processing.

Table 28. Total Scouring capacity, assets, employees, date of issued licence and physical advance of cashmere processing company

Province	Name of company	Capacity (Tons)	Proces-sors (no)	Total Asset (1000 USD)	Employees (no)	Year licence issued
Eastg Azarbaijan	Pashmineh negin	800	1	80	17	2001
	Total	800	1			
Razavi Khorasan	Iran Cashmere	150	1	1750	169	1988
	Majid Golpour	1200	1	1151	20	2005
	Total	1350	2			
Semnan	Sefit Pajan	900	1	580	90	2005
	Total	900	1			
Ghazvin	Farsh Pars	630	1	2050	53	2003
	Total	630	1			
Kerman	Kerman Kork	105	1	937	50	1998
	Total	105	1			
Lorestan	Khosro Rezaei	1200	1	177	30	2001
	Total	1200	1			
Total Sum		**4985**	**7**	**6725**	**429**	

Table 29. Total dehairing capacity, asset, employee, date of issued licence and physical advance

Name of company	Capacity (Tons)	Processors (NO)	Total Asset Thousand USD	Employees	Year Licence issued
Razavi Khorasan Provinnce					
Iran Cashmere	150	1	1750	169	1988
Kerman Samen	44	1	405	20	2000
Kork Samen No. 2	48	1	212	5	2001
Kork Nawa	85	1	889	23	1998
Mohamad Reza Daniali	15	1	200	6	2003
Mohamad Naser Arefian	400	1	1235	70	2006
Total Semnan Province	571	6			
Pajan Sifit	1273	1	5800	90	2005
Total sum	**1844**		**10492**	**383**	

Export market

Cashmere stored in warehouses eventually finds its way to dehairing factories in Iran and to spinning and weaving mills in China, Italy, England and Belgium. Iranian mills buy some of their cashmere direct from growers, but some of it is purchased from dealers. Local mills in Mashad and Semnan scour and dehair about 30% of the locally produced cashmere and 29% of Afghanistan clip. Almost all this processed cashmere is exported to European countries for making tops and garments. Distribution pathway of raw cashmere shipments from Iran to the major importing countries are presented in Figure 18. World trade of Iranian cashmere is accounted for principle cashmere-importing countries of China, England, Belgium and Italy. China is not only a heavy producer but also a major importer of Iranian raw cashmere. The Iranian government has from time to time taken action to encourage the export of processed cashmere as the added value of this type of fibre is much higher than exporting raw cashmere.

Figure 18. Distribution pathway of raw cashmere shipments from Iran to the major importing countries.

The Afghan cashmere which is dominantly brown (Thieme, 2000) is traditionally transported to Belgium through Iran (Figure 18). Verviers, in Belgium, used to be the main market centre for cashmere, as it was suited in the core of the textile centre in Europe. Nowadays, the role of Verviers as the main market place has diminished, but for Afghan cashmere Verviers is still a major destination through Iran.

Iranian traders play an important role in the export of Afghanistan raw and dehaired cashmere to Verviers, which may explain why most of the cashmere production and trading is still taking place in the northwest west of Afghanistan (Thieme, 1996; Altai Consulting, 2005) close to Mashad city in Iran. Cashmere from Afghanistan is being processed in Mashad scouring and dehairing facilities and then transported to Europe through Iran. Iranian processors have established relations with certain Herati exporters in Afghanistan, who supply these dehairing facilities.

Distribution pathway of raw cashmere shipments from Iran to the major importing countries are presented in Figure 18. The Figure shows that a large percentage of the exports go to China and some goes to countries on the European continent. Majority of exported raw cashmere to China is transported in containers containing 10 MT or 20 MT of cashmere in pressed bales. Transportation is predominantly through overland through Afghanistan to China.

From gathering centres raw sorted cashmere is also sent in bales by trucks or by train to Bandar Abbas and Khoramshahr, the main Iranian exporting ports in the Persian Gulf. From these ports baled raw cashmere is shipped to Italy, Belgium and England. However about 1/3 of raw Iranian cashmere stock goes to Semnan and Mashad for processing. Processed cashmere also finds its way to the same Persian Gulf ports to be exported to England and Italy.

Cashmere prices

The overriding influence on the price is the mean fibre diameter. For example, Iranian and Afghan cashmeres have diameters 2-3 μm greater than Chinese cashmere (Petri, 1995) and are 40-50 % cheaper (Phan and Wortmann, 2000; Schneider, 2011). Colour is also an important factor, white being the most valuable because it can be used not only as it is but can be dyed to the pastel shades which are often required for knitwear. Brown is the least valuable colour because it can only be dyed to dark shades.

Iranian cashmere price had large fluctuations and increased from 25 dollars in 1972 to 110 dollars in 1988 and decreased to 60 dollars in 2006 (Figures 19 and 20). The Schneider Group market indicator for cashmere suggests that the cashmere price has levelled out after a period of increase. Price indicators for cashmere in The Wool Record, a textile trade magazine also support this observation.

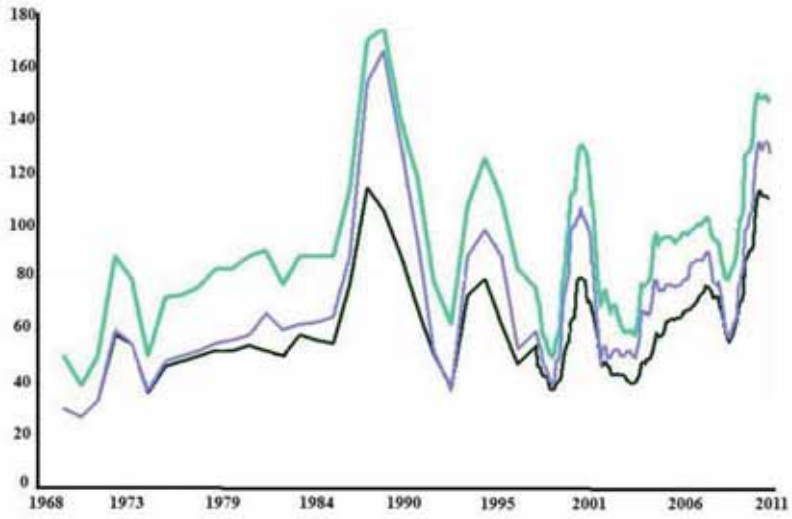


Figure 19. Cashmere price of China, Mongolia and Iran over time. Chinese cashmere is continuously sold at a higher prices than Mongolian (second highest) and Iranian cashmere (Adapted from Schneider, 2012).

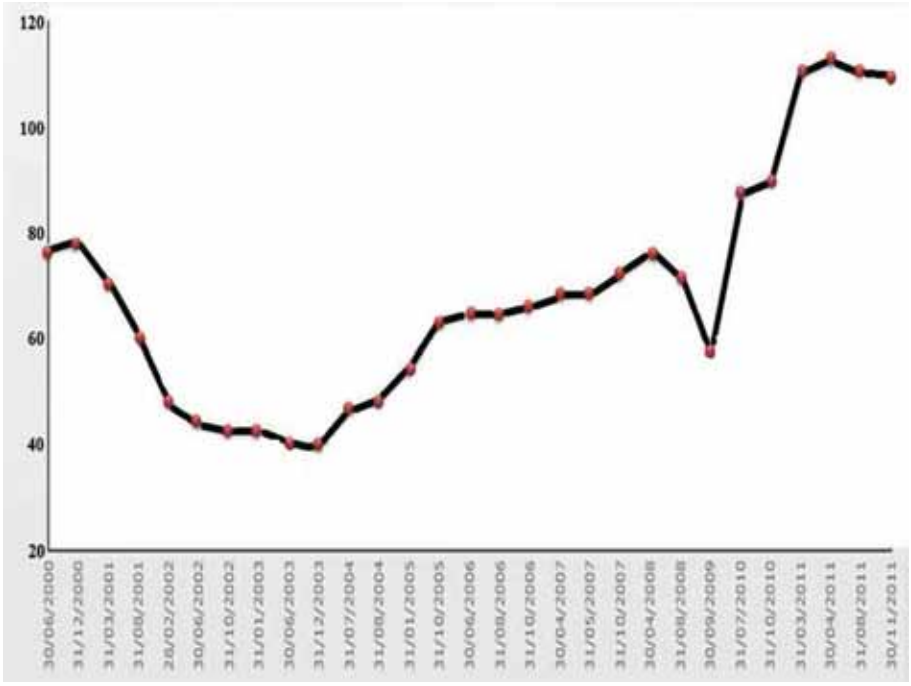


Figure 20. Cashmere price of Iran over time (Adapted from Schneider, 2012)

Cashmere value addition

Value added to cashmere in the several stages of processing mean that the final price for clean, dehaired and spun cashmere can be up to four times the raw greasy price received by producers. Value added along the different stages of the value chain is shown in Figure 21. This figure represents the transformation of price paid by local dealers per kg of raw cashmere to farmers to international market price of final product such as garments. Production of cashmere in Iran takes place in selected provinces. At the lowest section of the value addition chain considerable potential exists to expand production of cashmere to goat farms in other provinces.

At present no price differential is paid to the producers for fine cashmere, as a major portion of cashmere produced is exported without any added value through processing. As a result of the current marketing system and lacking infrastructure nomad producers do not achieve good prices and have little incentive to produce better quality cashmere. In Mongolia and China cashmere producers in the rural areas sell unsorted raw cashmere at lower prices than could be expected if the cashmere was sorted at source into quality class. As a result, these producers gain better prices and have an incentive to produce better quality cashmere.

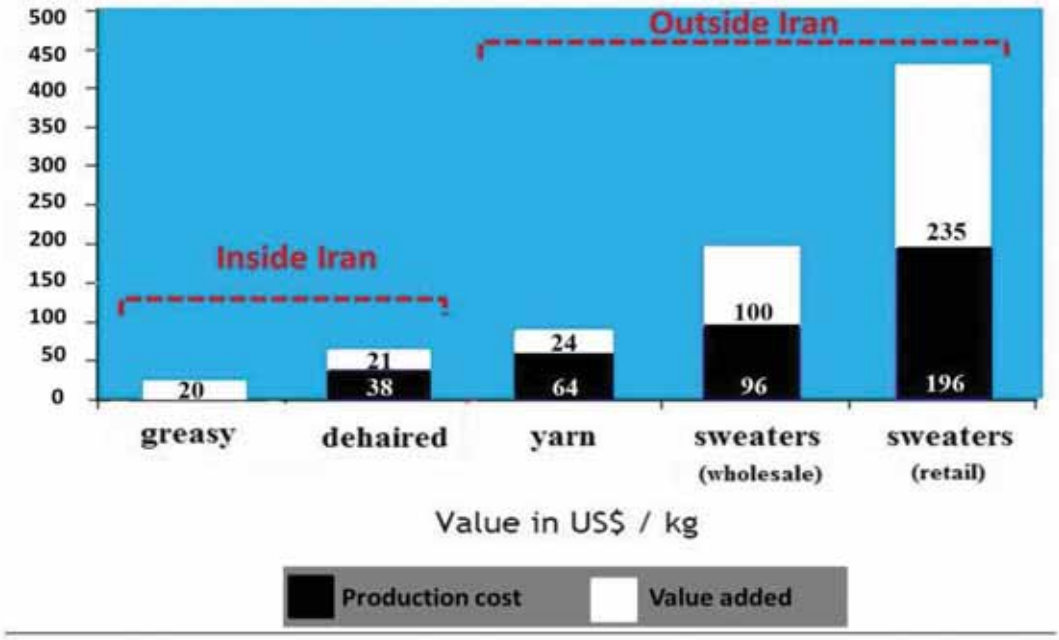


Figure 21. Cashmere value addition within Iran

Value addition takes place at different stages of the production chain, with the highest added value activities at the upward section of the chain. Currently Iran is engaged with the cashmere production, harvesting, scouring, dehairing, carding and combing; the low to medium added cashmere value activities at the downward section of the chain. Figure 22 shows cashmere value chain of harvested at farmer, assembly and exporter levels. Despite 50% unavoidable loss from washing and removing the outer guard hair from cashmere, the value is doubled by weight after this stage. Thus after scouring and dehairing one kg of raw greasy cashmere is transformed to four times its initial value. Major bur and grease seed contaminants of cashmere result in serious price penalties and so do the guard hair levels. Any undesirable contaminant, that will either affect the quality of the final product or will have to be removed, reduces the economic value of the cashmere. Burrs or excessive vegetable matter in the fleece also have to be removed. Urine and certain types of soil and vegetable matter contain substances which stain cashmere permanently. These affect the dyeing and value of the cashmere and the quality of the final product. Precautions must be taken to limit such stains, particularly urine stains.

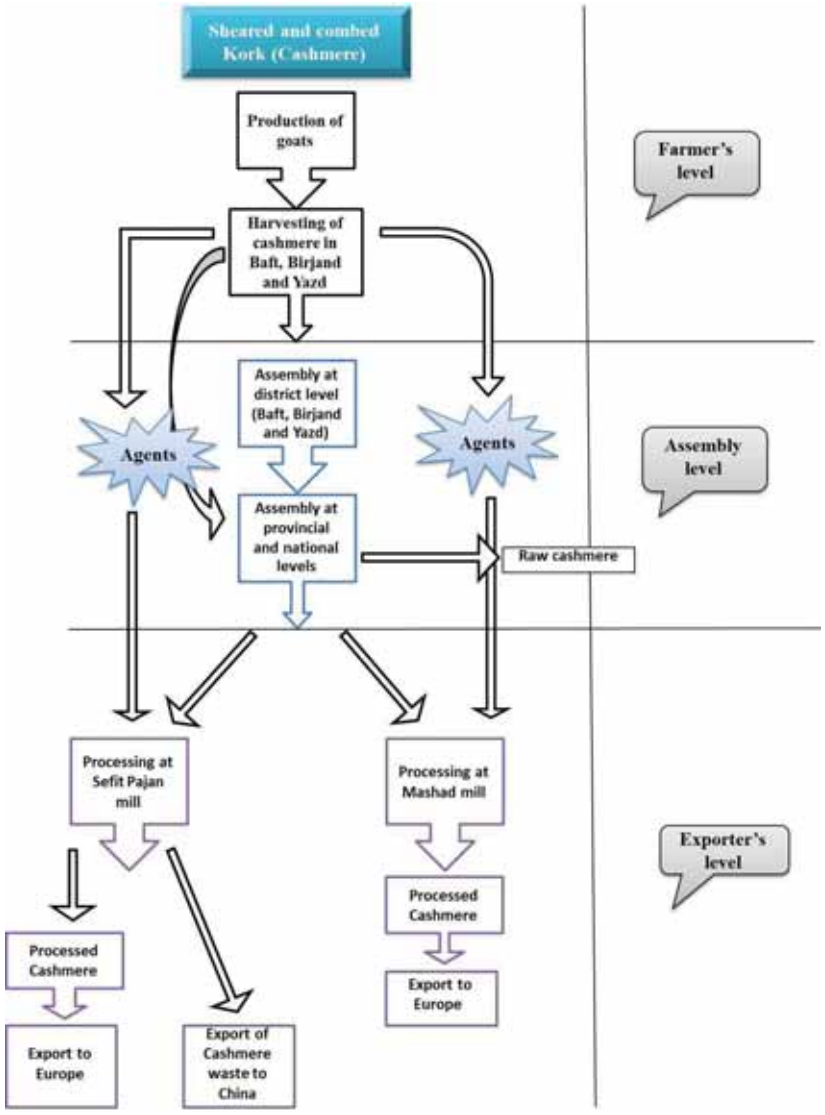


Figure 22. Value chain of harvested cashmere

Sorting and grading (classing) are judged subjectively and could have a substantial effect on cashmere value addition provided the correct methods are used. The simplest description of good classing is uniformity within each class of length, fineness and degree of contamination (guard hair, vegetable matter and stain). Classing, therefore, must separate the different parts of the fleece which differ noticeably in one or more important characteristics. The finest yarn which can be spun largely depends upon the cashmere fiber diameter or fineness, traditionally expressed in terms of 'quality or quality counts' and these are related to the minimum number of fibers in the yarn cross-section.

Moreover, sorting the clip in fiber diameter lines would certainly improve cashmere quality; cashmere fleeces from one year old goats and that of fine older goats should be kept separate from the coarser cashmere fleeces after harvesting and before packaging.

There are many middleman in Kerman, Mashad and Birjand cities operating either as an agent of an exporter on commission-basis or as independent middlemen, or often as a combination of

both. In the main province centres, traders sort the cashmere based on colours and quality. Training for middleman and cashmere producers should include proper methods of classing fibre to improve the quality and quantity which in turn increase added value of Iranian cashmere. As there are several colour recognised nationally and locally, farmers are advised to sort their cashmere based on these colours as it is simple to do so at the farm. Separated colour could be sold as separate lots, particularly white and pale coloured cashmeres as these are potentially more valuable. Iranian cashmere contains colours of white, grey, dark brown and black, as well as nudes and fawns, which are not found in Chinese or Mongolian cashmere. The sorted product could be sold according to colour.

Although cashmere is shed in the spring and can be manually combed out then, Iranian goat owners in Kerman province and farmers in Afghanistan shear their goats 1-2 months after onset of shedding and sell the whole fibre, containing both rough outer hair and the inner fine cashmere, to local or travelling merchants. This raw fibre in Iran is generally known as *Kork*, and in Afghanistan it is referred to as *bahari*. Results from previous studies indicate that 30% of cashmere is lost during shedding season and if not harvested it would be wasted (Ansari-Renani et al., 2011b). Goat owners in Khorasan Razavi province of Iran comb their cashmere goats during shedding season at the beginning of spring. Introducing combing would increase the weight and commercial value of cashmere.

Cashmere processing

Major processing centres of Iranian cashmere are Semnan and Mashad cities (Figure 23). Belgium has the only large-scale European facility for disinfecting raw animal fibre, particularly important in the case of cashmere originating in Afghanistan due to the risk of anthrax. Increasingly buyers have entered the Afghan market. By 2006, more Chinese buyers had appeared in Herat and the price for cashmere increased by about 10 % over 2005 prices.

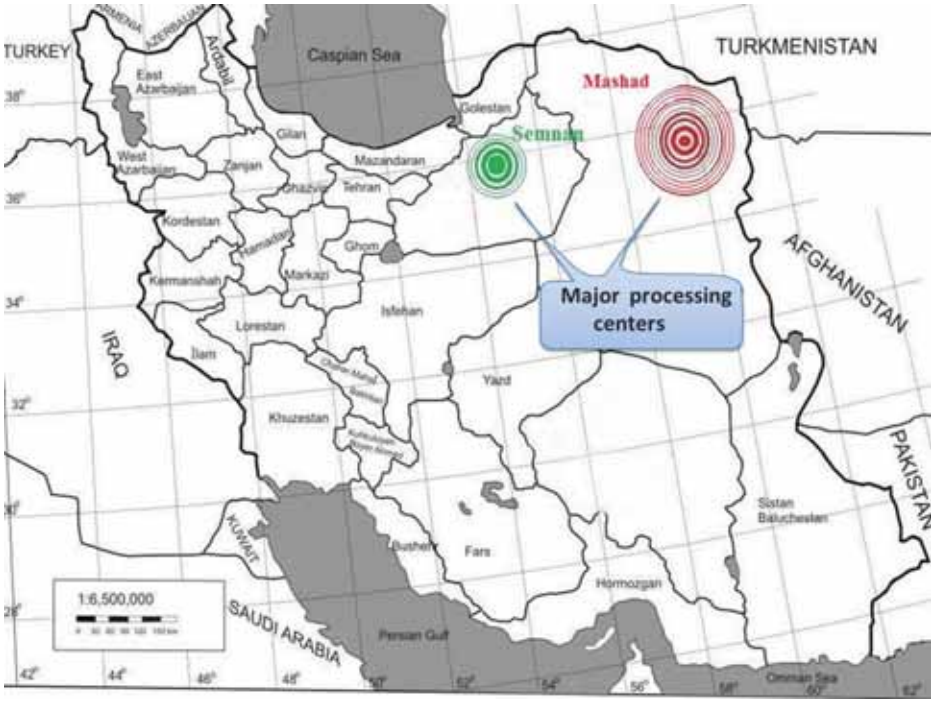


Figure 23. Major processing centres of Iranian cashmere

Raw cashmere is processed in several stages: hand dehairig, scouring, machine dehairing, spinning, weaving or knitting, manufacturing and finishing. Cashmere may go through all or only some of the stages. It is quite usual for cashmere to be moved through several countries during the processing route from raw cashmere to finished garment.

Carding

Carding constitutes the last operation or process in which the cashmere fibers can be properly opened. It is considered just as important a process as spinning, because a good even yarn cannot be spun from uneven, improperly carded cashmere. The principle aim of the opening of the cashmere is through rotating cylinders or rollers covered with card clothing that are provided with wire teeth working point against point and rotating in the same direction.

Dehairing

In a modified Iranian cashmere processing the guard hair is removed by carding and dehairing ending up with cashmere fiber (noil) free of hair. It must be pointed out that in normal worsted combing the noils are the by-product of the top, whereas in cashmere dehairing the noils represent the valuable end product. The various patents reveal that the dehairing is accomplished by a modified carding process, employing breaking, cutting, blowing, and suction devices.
The losses in dehairing are considerable-form 30 to 75 % based on the scoured stock-with an over-all yield of 20 % for the poorest quality and hot higher than 50 % for the best quality on the grease basis.

For coating fabrics, Iranian and Afghanistan cashmere, with a hair content around 3 %, is primarily used. In Iranian combed undehaired cashmere and shorn raw undehaird cashmere the hair content is about 1 and 50% respectively. The price is in direct relationship to the hair content; the lower the hair content, the higher the price.

To considerably increase the added value of its original raw material, Iranian mills dehair about 30% of total country cashmere production; all the processed cashmere is exported to Europe. Raw cashmere from Afghanistan is also processed by the same Iranian mills and is directly exported to Belgium in Europe from Bandar Abbas shipping port.

Cashmere dehairing machine. Sefit Pajan processing mill in Semnan province, October 2011.

Cashmere dehairing machines. Mashad processing mill in Khorasan Razavi province, October 2011.

Quality control tests

To the processor of cashmere testing is of great advantage in assessing quality, value, defects or other characteristics. In any testing procedure, the technologist must constantly evaluate his results in terms of precision and reliability. Unless the sample is truly representative of a lot, such information may have little merit or may even be misleading with regard to the lot from which it was drawn. Hand-drawn specimens (up to 50 or more) are drawn randomly, taking the same amount. In the processing plant laboratory tests are done for scouring, vegetable matter,

grease content, moisture content, guard hair percentage, fineness and length. After passing quality tests and meeting required standards, processed cashmere is hand over to baling section. Feedback on the quality is often obtained from the customers, in particular from direct sales customers.

2.4.3.2 Lessons learned

The value of the product (cashmere) from Raeini breeds is not fully recognized within Iran. Given that cashmere is quite an expensive product, surprisingly little objective information has been compiled and published. The little information that is available on Iran cashmere industry and marketing, dates from the early years of the establishment of the industry. Because of the limited objective information on cashmere processing and marketing, it is highly important to investigate and study market shortcomings, failures and successes for raw and processed cashmere.

The productivity of nomad herders has to be improved, which is possible only if the system is partly commercialized through market outlets and pricing policy offering nomads more incentives.

2.4.4 **Component 5: Linkages (business, scientific and cultural) between the pilot communities and the global communities of producers, processors and consumers of fiber and fiber products.**

The national project team has developed several cross- national and between countries linkages:

1. Linkages were developed with two main cashmere processing mills in Semnan and Mashad provinces to provide required dehaired cashmere for yarn making by nomad women at the pilot site of cashmere project.
2. A linkage was established with one dyeing plant in Kerman province to enable the use of natural dyes for the yarns in the future.
3. A linkage was developed with a small weaving plant to make hats, gloves and socks from cashmere yarn of the project.
4. The paper on "cashmere quality of Raeini goats" was published online in the journal Small Ruminant Research (Small Ruminant Research, doi:10.1016/j.smallrumres.2011.11.003)
5. Two draft papers were prepared to be published in international journals:
   - Nomadic pastoralism in southeastern Kerman province of Iran.
   - A value chain and marketing analysis of Iran cashmere industry.

3 Progress towards grant purpose and goal

The project continued to build capacities of sheep and goat producers and women's groups in fiber production, processing and marketing. The following major accomplishments were achieved in these two areas during the reporting period:

3.1 Progress in improving fiber production through breeding

The project team succeeded in importing frozen semen from the United States to Tajikistan. This was a very demanding process with multiple logistical hurdles that were successfully resolved due to close collaboration and timely action of the project team. Although the semen arrived a week later than planned, the team and the producers still managed to successfully organize the breeding activities, with a professional assistance from Ramid Aliverdi of Iran who helped the Tajik team with the insemination.

The import of frozen semen and production of crosses between American and Tajik Angora goats will provide important stimulus for long-term improvement in Angora goat breeding and mohair quality. Access to imported semen and work with American & Tajik Angora crosses will inspire farmers to invest additional time and resources into their flocks and strengthen their collaboration with Tajik scientists on all aspects of Angora goat production. Attention to mohair fineness and the problem of kemp and medullation among farmers will gradually increase, and so will the volume of quality mohair that can be processed by rural women into quality yarn for export. The semen will continue to be used after the project completion and contribute to breeding improvements for many years to come.

In Badakhshan the project team organized community breeding with the imported Altai bucks. Organizing community breeding nucleuses was also a major accomplishment that will improve the productivity of local flocks. The new crosses of local and Altai goats are expected to produce more meat and fiber than the existing goats and thus contribute to increases in income and improvements in livelihoods of the village households. The crosses will produce more cashmere and cashgora fiber for local processing, allowing the production of yarn and knitted products to expand. The community breeding system developed in the pilot region can be applied in other livestock sectors and replicated in other regions.

In Kyrgyzstan the project team is working with household sheep farmers to improve homogeneity and productivity of their flocks. The farmers were provided with higher quality rams and trained to apply selection strategies for their breeding animals that will improve quality of semi-fine wool and allow them to produce more and better lambs. The semi-fine wool produced in the flocks can be used for traditional felt products. At the same time the team continued working with large Merino sheep farmers to establish a source of steady supply of high quality Merino wool for the women groups that is essential for luxury products.

In Iran the breeding program has been implemented as planned and reliable recording scheme has been done which will allow the project team to analyze the progress achieved in improving fiber quality and other traits. A plan for simplifying the recording has been designed that will be implemented in 2012/2013 and should make it easier for the nomad farmers and the NARS to continue the breeding program after the phasing out of the project.

3.2 Progress in fiber processing and marketing

The major accomplishment in fiber processing was organizing first large-scale fiber processing in the Asht region. The project team started to work with women to dehair, scour, card and spin 400 kg of fiber that was purchased in April 2011. This was the fist attempt at scaling up the project and moving from producing small batches of yarn by individual spinners to producing much larger batches (around 100 kg of fine yarn for the US market, over 200 kg of coarser yarn for the Russian market) by organized spinner's groups.

Progress was also accomplished by the knitting group that started to produce sophisticated, luxury clothing that can successfully compete on international markets. Secondly, the project started to work on producing woven blankets from adult mohair on a new loom imported from Canada. Products of this design and quality are being produced in Tajikistan for the first time.

In Badakhshan the project was able to test cashgora and cashmere spinning. The preliminary results show that the cashgora fiber will be excellent for spinning yarn and making luxury knitwear for export. This is a very positive result for women at the pilot sites who produce mostly cashgora goats. The women will be able to add value to fiber harvested from their own goats by making yarn and products. They will also learn how to improve fiber quality and volume through the community breeding program.

In the process of working with households and farmers on breeding, animal husbandry, fiber harvesting and processing, the project team developed collaborative ties with hundreds of women and men in the pilot villages and was able to build mutual trust and understanding that is essential for delivering on the project objectives. The project was also able to establish productive collaboration with other organizations such as Cesvi and Aga Khan. It plans to collaborate with Aga Khan on several activities, including the production of spinning wheels and assistance with fiber dehairing in Afghanistan.

In terms of marketing, the project developed new contacts with buyers of fair-trade yarn and products such as ClothRoads that want to purchase yarn and other handicrafts made by the groups. The project website "adventureyarns.com" also helped in promoting interest in the project and the products among potential customers and the general public.

In Kyrgyzstan, the main accomplishment was the development of new products (chairmats, slippers) that helped the women's groups compete on the regional and international market and increase sales and income. Institutional capacity, access to raw materials and markets, and skill sets of the women's groups were increased, also contributing to increases in their revenues and incomes.

In Iran, first trainings on yarn making with a small group of nomad women have been conducted and equipment has been ordered to support the group to achieve better quality yarn in shorter time. A cashmere market study helped to understand the current marketing and processing system. It will also help to analyze the feasibility of yarn processing in Iran.

4 Shortcomings and problems encountered in grant implementation and actions taken

4.1 North Tajikistan

The process of strengthening and building up the capacity of women's groups begins by identifying and eliminating weaknesses and bottlenecks in the processing and marketing chain. The project identified the following problems that need to be addressed in 2012.

4.1.1 Streamlining the Mohair processing activities

Currently, the project team has no difficulty finding buyers for the yarn at a wholesale price of $140/kg. The bottleneck is on the supply side. Mohair processing activities need to be streamlined and improved to increase yarn production, satisfy the demand and increase spinners' income. During the upscaling process the project team faced multiple new challenges such as having to develop business accounting, improve organization of the spinning groups and introduce a new dehairing method to increase efficiency and lower costs. The team also needs to strengthen the capacity of women's groups to communicate with buyers and export their products. It is very important to confront and resolve these issues as early as possible to ensure the sustainability of the groups and the long-term success of the processing activities.
The main challenge in upscaling processing the project encountered was dehairing mohair – the initial dehairing process was too slow which delayed yarn production. The team and the women's groups had to introduce a new dehairing method to speed up the process. Another problem were long blackouts in the pilot villages after the government started rationing electricity in the beginning of September. Lack of electricity would have prevented the women from spinning in winter months. The project purchased a solar panel from the proceeds from sample sales to remedy the problem. The women's group is now able to spin using solar power.

4.1.2 Training of women groups in business accounting

The women's groups need to develop an accounting system for fiber processing. As explained earlier, the women are not used to recording information about the processing activities (how much and what kind of fiber was distributed for cleaning, what were the expenses for dehairing & scouring, what is the current fiber and yarn inventory, etc.). Given that bookkeeping is essential for further development of the yarn business, the project needs to find an accountant who would be able to keep records for the groups. The team identified several potential candidates and will work with the women to select the most qualified accountant.

The women are also uninformed about their rights and obligations vis-à-vis existing business and taxation laws, which are often sketchy, and do not know how to defend themselves against corrupt practices of tax officials, which are widespread. Once their business grows, they will need assistance in this area. The project plans to identify professionals and institutions that can assist the groups in navigating the legal system and protect them from abusive practices of some governmental officials.

4.1.3 **Assistance to women groups in arranging export and developing linkages with buyers**

Another weakness of the processing groups is that the women lack language and computer skills and cannot communicate directly with potential buyers. The project needs to remedy this problem and find ways to create strong linkages between international buyers and the women's groups to ensure that communication, information and money can move smoothly between the producers and the buyers and that there is trust between the two parties.

Based on the team's assessment, it is unlikely the women who are currently most skilled in producing yarn and can lead the yarn-making business will be able to learn Russian, English and computer use. This means that they need an assistant who can represent them on the international markets and mediate between the groups and foreign buyers. Candidate for this job needs a set of skills that are rare in Tajikistan – he or she has to know Uzbek, Tajik, Russian and English, have good computer skills and also communication and business skills. He or she has to be willing to work with rural women in remote villages, which does not carry much prestige, and has to learn about yarn and fiber processing and be trusted by the women's groups. A woman candidate would be more suitable for this job but it is challenging to find suitable women candidates because the traditional Tajik culture does not support women in acquiring these skills. The project team and the women's groups plan to focus on finding suitable candidates to fill this job in 2012.

4.1.4 **Find buyers who have the capacity to work with the women groups on product design**

Close linkages with buyers are important not only for product marketing but also for product design. Tajik knitters will not be able to develop designs for high-end western markets and need to work closely with buyers who can assist them in this area. It is important that the groups work with buyers who know the market and can give them a clear guidance in terms of design and quality standard. The project will search for fair trade buyers who have experience in working with artisan groups in developing countries and have the capacity to work with the groups on product development. The ClothRoads company in Colorado, USA is a good example of such a buyer.

4.1.5 **Develop financing system**

The spinners and knitters are poor and have no capital to invest in their business. The project team needs to help them develop sustainable sources and mechanisms of financing fiber purchase and processing. The project plans to 1) leave a rotating fund for the women so they have initial capital for continuing the business; 2) train the groups in managing the investment funds together with a board of trustees, 3) look for other investment and credit sources for the groups, and 4) explore micro-finance options available in Tajikistan.

4.1.6 **Work with the community to strengthen women-led businesses**

It is important to create a space for women-led business in the context of gender roles and traditions some of which can create obstacles for business development, especially for women. For example, the expectation that a woman's priority is always the household, childcare and

management of demanding family events (holidays, weddings, funerals) can be in direct conflict with her aspiration to develop a business. The project needs to work creatively with the women, the community and the women's families to carve a space that facilitates business development of individual women and women's groups. This can be accomplished by identifying issues that hinder the women's entrepreneurial advancement, discussing these issues with her family and community, and collaborating on creative solutions that open new opportunities for the women without creating friction within the family and the community. In short, it is important to make the family and the community stakeholders in the economic and social advancement of women. One of the best and safest ways to accomplish this is by assisting women to become wage earners who contribute to the family budget. This is the project's key objective.

4.2 **Badakhshan**

The project is Badakhshan encountered the following problems that will be addressed in 2012:

4.2.1 **Setting up an effective breeding scheme**

In Badakhshan the team encountered challenges in setting up an effective community breeding system while accommodating the preferences of the goat producers, as described in the report. The team was able to work with the community to overcome most of the issues and the breeding system was established.

4.2.2 **Designing fiber purchasing system**

In order to compete with Chinese buyers, the project needs to design a fiber purchasing system that will be operated by village households. The system must be convenient and well organized so the families have the incentive to sell fiber to the project for local processing. The project plans to organize this system in spring 2012.

4.2.3 **Assistance in fiber dehairing**

The shortcoming in processing in Badakhshan is the delay in finishing the dehairing facility in Faizabad where the project plans to dehair fiber. The dehairing plant was expected to start operating in summer 2011 but the equipment was not yet fully installed in winter 2011. The Aga Khan Foundation that monitors the progress on the plant confirmed that the dehairing was expected to begin in winter or early spring of 2012. While waiting for dehaired cashgora fiber, the project team worked with the groups to spin dehaired Afghan cashmere. The project needs to arrange fiber dehairing in Afghanistan as soon as possible so the spinning groups can start yarn production on a large scale in 2012.

4.2.4 **Spinning equipment**

Similar to spinners in Asht, the women in Badakhshan are interested in working on electric spinning machines. The project plans to supply them with 20 machines in winter 2012 and

develop a local production of the machines with the help of the Aga Khan Foundation.

4.2.5 **Develop financing system**

Similar to northern Tajikistan, the project has to develop the organization and management of the spinning groups. It also needs to search for sources of funding for yarn production and marketing given that the spinners and knitters are poor and have no capital to invest in their business. The project plans to use experiences from northern Tajikistan to organize spinners in Badakhshan. The methods of financing used in Badakhshan would be similar to those in northern Tajikistan: a rotating fund as an initial source of capital and micro-finance options. The team plans to collaborate closely with the Aga Khan Foundation that has a permanent presence in the region on developing sustainable organization and financing of the spinning and knitting groups.

4.3 **Kyrgyzstan**

4.3.1 **Problems in achieving consistence in product quality and maintaining high product standards in some groups**

A shortcoming has been the uneven progress of the groups and artisans within the groups. Some groups, in particular the At-Bashi group, have difficulties achieving high standards in product quality. This is due to the lack of oversight and quality control on the part of the group leader, and also because not all group members have equal talents and skills in felting. Groups that have more talented felters and engaged leaders have the capacity to motivate all group members to produce high quality products. Groups that have less involved leaders and fewer talented felters have difficulties meeting the standards especially for export products.

The project discussed these problems with all groups and worked to change the management of the At-Bashi group to increase product quality. Given the importance of group leaders and talented artisans in long-term advancement of individual groups, the team plans to focus on supporting those leaders and artisans who are most self-motivated and capable of achieving success in handicraft production after the completion of the project. After investing equally in all groups for two years, the project has to focus on supporting “the winners” – motivated, talented women who have the most potential to establish successful businesses and provide opportunities for other women in their communities to join them, earn income and acquire new skills after the end of the project. These women can take over the role of the project in developing successful, sustainable handicraft businesses in their communities.

4.3.2 **Absence of regular markets for the products**

Another problem is the lack of stable orders for products. The project team is working to resolve these issues. It is necessary to strengthen the marketing component of the project. The project team will allocate more effort and resources to develop sustainable local, regional and international markets for the products in 2012 and 2013. This includes the development of products for specific markets – expensive “light” products such as felt and silk scarves for

export, and products such as chair mats for regional markets. In order to expand marketing, the project will search for wholesale buyers who can work directly with the groups.

4.3.3 **Absence of specialists for on-site maintaining and serving the equipment such as wool carding machines**

In order to maintain equipment procured by the project, the project team currently needs to invite specialists from another region to the pilot sites. The project needs to train local Naryn specialists in maintaining the felting machines and other equipment.

4.3.4 **Decrease in the number of women in some pilot groups**

The number of women in some groups decreased as some members moved, fell ill or could not find time for felting due to changes in family circumstances. It is necessary to support new women who want to join the groups and also include artisans from Kulanak village who have expressed great interest in participating in the project and have a developed local organization that can help them excel in producing high quality handicrafts in the remaining two years of the ICARDA project.

4.4 **Iran**

4.4.1 **Supporting the breeding program**

The displacement of goat herds between and within provinces at long distances makes it quite difficult to keep track of the goats and to implement the recording scheme (birth dates, weaning weight, ear tagging the new born and etc). It required to actively involve the nomad breeder in record keeping right from the start which is important for the future of the program.
At present no price differential is paid to the producers for fine cashmere, as a major portion of cashmere produced is exported without any added value through processing. As a result of the current marketing system and lacking infrastructure nomad producers do not achieve good prices and have little incentive to produce better quality cashmere.

4.4.2 **Organizing the cashmere processing with nomad women**

Organizing women processors is difficult due to their mobility and can be only achieved through good planning and key persons that maintain the communication among the nomad women and with the project team. To buy the raw material for spinning (dehaired cashmere) at the processing plants is very expensive and thus makes spinning a high risk investment. Other means of dehairing procedures such as installing small dehairing machine at the project site in the nomad regions could be more feasible and economical.

4.4.3 **Lack of quality standards in cashmere marketing in Iran**

The marketing study revealed that one factor that strongly affects the quality of cashmere is the lack of information on grades, grading and prices. So far sorting and grading (classing) are judged subjectively by the traders. If more objective methods were used, value could already be added at this step. The simplest form of good classing is to achieve uniformity within each class of length, fineness and degree of contamination (guard hair, vegetable matter and stain). Classing, therefore, should separate the different parts of the fleece which differ noticeably in one or more important characteristics.

5 Other events and relevant issues during the reporting period

All relevant events were described in the report on pilot sites.

6 Summary and recommendations

6.1 Major accomplishments and main constraints during the reporting period

Overall, the project is on target regarding proposed activities in breeding and fiber processing.

There have been only minor changes in the number of participating farmers and women since the last progress report (Table 30). In Kyrgyzstan it was decided to include a new women artisan group (Kulana group) as in the other four groups the number of women had decreased.

Table 30. . Number of beneficiaries at the four project sites

Beneficiaries	Northern Tajikistan	Badakhshan	Kyrgyzstan	Iran	Total
No of women groups	17	9	5	1	30
Total no of women	96	180	65**	15	331
No of herders/farmers	25	154	12	31	222
Total no of goats/sheep[a]	4413	447	1512	7745	14112

[a] Goats in Tajikistan and in Iran, sheep in Kyrgyzstan; **number needs to be validated, 15 additional women from the new group but some decreases in numbers in the four "old" groups.

6.1.1 **Sogd, Northern Tajikistan**

Accomplishments:

1. Importing frozen semen from the US and implementing artificial insemination in October 2011.
2. Organizing processing of 400 kg of mohair into yarn in the Asht region.
3. Establishing accounting system for mohair processing groups.

4. Starting production of woven blankets from adult mohair in Taboshar.
5. Developing new knitted products and setting up knitting groups in the Asht region.
6. Test-marketing products and developing new market outlets such as the CloathRoads Co.
7. Purchasing a solar panel for spinners so they use solar energy for spinning.

Constraints:

1. Tajik specialists need further training to inseminate goats using frozen semen.
2. Tajik producers need to invest more resources in systematic breeding.
3. Mohair dehairing and other aspects of upscaled processing need to be improved.
4. The spinners and knitters have no capital to finance processing. Financing and accounting methods for women's groups need to be developed.
5. The spinners and knitters do not know English or Russian and do not have computer skills. The project needs to train a representative who can successfully mediate between them and foreign buyers.

6.1.2 **Badakhshan, South-East Tajikistan**

Accomplishments:

1. Organizing nucleus mating with imported Altai bucks in pilot villages in September-October 2011.
2. Vaccinating nucleus goats at pilot sites in September 2011.
3. Establishing spinning and knitting groups at pilot sites.
4. Producing samples of knitted products from Afghan cashmere and cashgora.
5. Planning fiber collection and dehairing in 2012.
6. Establishing good collaborative ties with Aga Khan Foundation (AKF).

Main Constraints:

1. Due to a variety of constraints it was challenging to build breeding nuclei according to the original design. The project team had to improvise and alter the original plans to accommodate the needs and constraints of the goat producers.
2. The production of cashgora yarn was delayed due to the delay of completion of a cashmere dehairing facility in Afghanistan.

6.1.3 **Naryn, Kyrgyzstan**

Accomplishments:

1. Household sheep farmers have been provided with improved rams and trained in sheep breeding.
2. Existing products were improved and new products for regional and international markets were developed.
3. New products were successfully marketed, increasing producers' income.
4. The project team organized a contest for best products and offered training fellowships to leading artisans.

Main Constraints:

1. The link between small scale sheep producers and quality products produced by women artisans is weaker than at the other project sites as the luxury felt products can be only produced with fine Merino wool which is produced by large specialized sheep farmers.
2. Some groups make slow progress because of lack of internal leadership (in management, design, marketing).
3. The groups need help to find wholesale buyers and receive stable orders for their products.

6.1.4 **Kerman, Iran**

Accomplishments:

1. The breeding program in the eight nomad goat herds has been continued as planned.
2. Breeding bucks have been selected based on fiber fineness and mating in the nucleus groups within the herds was carried out as planned.
3. A cashmere market study revealed the main marketing channels and in-country processing capacity which will help to identify the scope for price incentives for finer cashmere.
4. Training of nomad women in spinning has been initiated at small scale.

Main Constraints:

1. Due to their mobility the organization of nomad breeder and processors is difficult and requires a good communication network
2. Only dehaired cashmere can be used for luxury yarns and the price at the factory is high which limits the scope for adding value.
3. The current cashmere marketing within Iran provides no incentive for finer fiber, while the world market price realtes to fiber fineness. .

6.2 **Recommendations**

More specific recommendations and follow-up actions are described under section 4. Below some more general recommendations across sites are stated.

Work with the producers:

- Breeding programs have to be consolidated so that they can be sustained under the responsibility of national research centers after the project ends.
- Recording schemes have to be simplified and fiber testing as it is costly so it has to be reduced to the minimum.
- Farmers have to be fully involved and trained in the selection of bucks/rams and breeding females.
- The incentives for farmers to continue breeding need to be clearly established.
- Improvements in animal performance and income from the flocks through breeding and other practices should be documented.
- Production of fine fiber has to be increased.

Work with the women processors:

- The supply of women groups with required raw material has to be organized in a sustainable way, in particular access to dehaired cashmere and cashgora at a reasonable price.
- The supply of women groups with equipment, dyes, etc. and technical know-how should be well established.
- The organizational structures of women groups needs to be fully developed.
- Technical guidelines/reference material should be made available to the women groups.
- The economics of processing should be fully evaluated.

Marketing:

- The project marketing website has to be completed for felt products as well as cashgora yarns.
- Market channels for fine fiber and all fiber products should be further developed.
- Participation of women groups at important fairs should be sustained.
- Knowledgeable and interested partner organizations – where available – should be involved in the project activities to provide support after the project ends.

7 Annex

Annex 1. Questionnaire for producer survey at the project sites in Kyrgyzstan

1. Sex: Male Female

2. Nationality: _____

3. Age: below 25 years up to 30 years up to 40 years
   up to 50 years over 50 years

4. The number of family members: _____ people

5. Major occupation:
   _____

6. What is the status of your farm?
   a) household b) registered farm c) agricultural cooperative
   d) other _____

7. Total area of your farm _____ ha

8. What kind of agricultural products do you produce?
   a) _____ b) _____
   c) _____ d) _____

9. Why do you produce agricultural products?
   a) for selling b) to feed livestock c) other _____

10. Which types of livestock do you keep and what is the flock size?
    Cattle _____ heads Small ruminants_____ heads
    Poultry _____ Other _____

11. Why do you keep small ruminants?
    a) to provide my family with the meat products b) to generate income
    c) other _____

12. Selling of which products from small ruminants generate a good profit?
    a) meat b) wool c) pelt d) offspring e) other _____

13. How do you sell agricultural products?
    a) barter b) wholesale c) for cash d) other _____

14. Who is the major buyer of your agricultural products?
    a) state b) private companies c) wholesalers d) middlemen e) others _____

15. How do you price your products?
    a) find out prices at the market b) offer my own price c) negotiate the price with a buyer

16. Do you join other farmers to sell products?
    a) yes, to deliver products to the market b) yes, to sell together
    c) no d) other _____

17. For what did you spend major part of income last year?
    a) for family needs b) for feed and seeds c) to buy equipment and fuel
    d) to buy livestock e) for renting of land f) to hire workers g) other_____

18. Where did you get your income from last year?
    a) from selling livestock products b) from selling crops
    c) from provision of services to other farmers d) from remittances from abroad e) other

19. Where do you the produced wool?
    a) we sell to wholesalers and middlemen b) use for the household
    c) process (wash, card) and sell d) other
    _____

20. Do you know about products made from wool?
    a) yes b) no c) if yes, please specify
    _____

21. Would you like to participate in our project?
    a) yes b) no c) if yes, what do you suggest_____
    _____
    _____

Annex 2. Questionnaire for women felters involved in the project activities in Kyrgyzstan

1. Nationality: _____

2. Age: below 25 years up to 30 years up to 40 years
up to 50 years over 50 years
(please underline)

3. The number of family members: _____ people

4. Major occupation: _____

5. What is the status of your farm?
a) household b) registered farm c) agricultural cooperative
d) other _____

6. Total area of your farm _____ ha

7. What kind of agricultural products do you produce?
a) _____ b) _____
c) _____ d) _____

8. Why do you produce agricultural products?
a) for my family b) for selling c) to feed livestock
d) other _____

9. How do you sell agricultural products?
a) barter b) wholesale c) for cash d) other _____

10. Please advise your income sources for the last year

a) from sales of the livestock products, Kyrgyz Som

#		live	meat	pelt	wool	milk	fermented mare's milk	eggs
1	sheep							
2	goats							
3	cattle							
4	horses							
5	poultry							
6	other							
Total:								

b) from sales of crops

#		kg/S	bale	tons/S	total quantity sold	income
1	wheat					

2	barley					
3	alfalfa					
4	natural hay					
5	potato					
6	carrot					
7	other products					
Total						

c) other sources

#		total	salary	pension	allowance
1	from state service				
2	rent for land				
3	rent for the agr. equipment				
4	remittances from abroad				
5	provision of maintenance services				
6	tailoring				
7	other sources				
Total					

d) from sales of the products made within the Project, Kyrgyz Soms

#	Name of the product	costs per piece	price per piece	quantity	total income
1	shyrdak				
2	ala kiyiz				
3	pillow				
4	chair mat				
5	felt shoes				
6	slippers				
7	souvenir toys				
8	other product				
9.	other product				
Total					

11. For what did you spend major part of income last year?
    a) for family needs b) for feed and seeds c) to buy equipment and fuel
    d) to buy livestock e) for renting of land f) to hire workers g) other_____

12. For how long have you been involved in our project?
    a) from the beginning of the project,
    b) we have been working as a group before the project

13. How much time do you spend for work in our project?
    a) several hours a day b) every day c) several days a week d) occasionally

14. What is your workload in our project?
    a) it is limited by production of several products b) I undertake all orders from the project

15. Where do you get materials for the orders (products)?

a) from reserves (already procured) b) from own (household) reserves

c) I use the newly procured materials

16. How do you sell the finished products?

a) we send them to the markets abroad b) sell at the local market

c) we use barter deals d) other _____

Annex 3. Questionnaire for women felters not involved in the project activities in Kyrgyzstan

1. Nationality: _____

2. Age: below 25 years up to 30 years up to 40 years
up to 50 years over 50 years
(please underline)

3. The number of family members: _____ people

4. Major occupation: _____

5. What is the status of your farm?
a) household b) registered farm c) agricultural cooperative
d) other _____

6. Total area of your farm _____ ha

7. What kind of agricultural products do you produce?
a) _____ b) _____
c) _____ d) _____

8. Why do you produce agricultural products?
a) for my family b) for selling c) to feed livestock
d) other _____

9. How do you sell agricultural products?
a) barter b) wholesale c) for cash d) other _____

10. Please advise your income sources for the last year

a) from sales of the livestock products, Kyrgyz Som

#		live	meat	pelt	wool	milk	fermented mare's milk	eggs
1	sheep							
2	goats							
3	cattle							
4	horses							
5	poultry							
6	other							
Total:								

b) from sales of crops

#		kg/S	bale	tons/S	total quantity sold	income

1	wheat					
2	barley					
3	alfalfa					
4	natural hay					
5	potato					
6	carrot					
7	other products					
Total						

c) other sources

#		total	salary	pension	allowance
1	from state service				
2	rent for land				
3	rent for the agr. equipment				
4	remittances from abroad				
5	provision of maintenance services				
6	tailoring				
7	other sources				
Total					

d) from sales of the products made from wool, Kyrgyz Soms

#	Name of the product	costs per piece	price per piece	quantity	total income
1	shyrdak				
2	ala kiyiz				
3	pillow				
4	chair mat				
5	felt shoes				
6	slippers				
7	souvenir toys				
8	other product				
9.	other product				
Total					

11. For what did you spend major part of income last year?
a) for family needs b) for feed and seeds c) to buy equipment and fuel d) to buy livestock
e) for renting of land f) to hire workers g) other_____

12. How do you sell the finished products?
a) sell at the local market b) we use barter deals c) other_____

13. Do you know about products made from wool?
a) yes b) no c) if yes, please specify

14. Would you like to participate in our project?
a) yes b) no c) if yes, what do you suggest_____
_____