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

**IFAD Grant 1107 – ICARDA**

***Women from the Dasht village, Badakhshan Tajikistan, with combed cashgora fiber, May 2011.***

## Fourth Progress Report

**1 January – 30 June 2011**

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## List of Acronyms

| | |
|---|---|
| AKF | Aga Khan Foundation |
| ASRI | Animal Science Research Institute |
| BS | Baft Station |
| CAC | Central Asia and the Caucasus |
| CACSARC-kg | Central Asian Craft Support Association's Resource Center - Kyrgyzstan |
| CCPP | Contagious Caprine Pleuropneumonia |
| CESVI | Italian, "Cooperazione E Sviluppo", cooperation and development |
| CIDR | Controlled Internal Drug Release |
| CRD | Completely Randomized Design |
| 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 |
| INTA | Instituto Nacional de Tecnología Agropecuaria (National Agricultural Research Center in Argentina) |
| KGSoms | Kyrgyz Soms |
| NC | Nomadic Condition |
| NGO | Non-Governmental Organization |
| OFDA | Optical-based Fibre Diameter Analyser |
| PGF2A | Prostaglandin Faa |
| PI | Principal Investigator |
| PMSG | Pregnant Mare's Serum Gonadotropin |
| UK | United Kingdom |
| US | the United States |
| USA | the United States of America |
| USD | US Dollars |
| USAID | United States Agency for International Development |

# 1 Project activities in brief

The project team worked on developing mohair, cashmere and wool value chains in Northern and South-East Tajikistan, Kyrgyzstan and Iran. The key activities at the pilot sites included:

Sogd, Northern Tajikistan:

1. Preparing a breeding plan for artificial insemination with frozen semen of American Angora goats during the fall 2011 mating season.
2. Organizing centralized purchase of kid and adult mohair in Asht and Gafurov region in April and May 2011.
3. Organizing mohair dehairing with women's groups in Asht and Gafurov region.
4. Developing new knitted products and setting up knitting groups in Asht region.
5. Producing samples of woven products from adult mohair such as carpets and blankets.
6. Developing new market outlets for yarn and products in Europe and the United States.

Badakhshan, South-East Tajikistan:

1. Purchasing combed cashgora and cashmere fiber at pilot sites in May 2011.
2. Vaccinating all goats at pilot sites in May 2011.
3. Evaluating, tagging and registering female fiber goats for breeding nuclei.
4. Organizing the breeding nuclei and sending them to summer pastures with the imported Altai bucks.
5. Developing breeding schemes for the goats remaining in the pilot villages for the fall 2011 mating season.
6. Establishing spinning and knitting groups at pilot sites.

Naryn, Kyrgyzstan included:

1. Characterizing sheep producers at pilot sites, evaluating sheep production and wool quality and identifying wool producers.
2. Visiting pilot artisan groups in Naryn region, evaluating progress and specific needs of each group.
3. Promoting sustainable institutional development of pilot groups through organizational, material and technological support.
4. Improving current products and developing new products for local and export markets, conducting specialized trainings focused on improving overall quality and design of selected products.
5. Organizing contest for best products and offering training fellowships to leading artisans.
6. Organizing test-marketing of products on local and international markets.

Kerman, Iran:

1. Completing the sampling for a full base database on cashmere quality for evaluating breeding progress.
2. Recording the first offspring from the nucleus breeding schemes in the eight nomad breeding flocks.
3. Fiber sampling for comparative assessment of nucleus females versus base populations in the eight breeding flocks.
4. Selection of breeding bucks for the nucleus flocks for the mating season in 2011 based on fiber quality and other traits jointly by herders and the project team.
5. Planning of a cashmere marketing study to create better marketing opportunities for quality framers for the nomads.
6. Collection of high quality combed cashmere from flocks for dehairing to initiate test spinning.
7. Identifying a team member to lead the work with nomad women.

There have been some changes in the number of participating farmers and women in Badakhshan and in Kyrgyzstan since the last progress report. In Badakhshan the project team has now formed the

breeding flocks and selected 447 breeding females from 154 households in seven out of the nine villages. The number of women involved in the nine groups increased from 166 to 180. In Kyrgyzstan it was decided to work with 12 farmers instead of 14 as two farmers in At-Bashi with large flocks were not interested. The project will focus on Merino or Tian Shian ewes in the flocks, therefore the number of sheep only includes these ewes. In Iran a pilot nomad women group will involve the female household members (approximately 15) belonging to the eight breeding herds.

**Table 1.** Number of beneficiaries at the four project sites

| Beneficiaries | Northern Tajikistan | Badakhshan | Kyrgyzstan | Iran | Total |
|---|---|---|---|---|---|
| No of women groups | 17 | 9 | 4 | 1 | 30 |
| Total no of women | 96 | 180 | 55 | 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

# 2 Project Activities in Northern Tajikistan

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

### 2.1.1 Improving Angora goat breeding through imported genetics

The Khodzhand team focused on designing a breeding plan for the fall 2011 mating season. The objective is to inseminate selected nuclei females with frozen semen of American Angora bucks imported from Texas and establish production of quality breeding males at pilot sites.

The introduction of imported genetics is expected to speed up improvements in the quality of Tajik mohair: eliminate kemp fibers; decrease in fiber diameter and increase homogeneity and weight of mohair fleeces. Such improvements are expected to have a long-term positive impact on mohair marketing and processing: improvement in mohair quality is expected to raise the value of Tajik mohair on domestic and international markets, and higher quality fiber will be cheaper to process into yarns and textiles for export. Producers can expect the current mohair prices to double if the quality of Tajik mohair matches the quality of American mohair. Women's groups that process mohair into yarn can expect an increase in productivity and earnings if they work with more expensive, but higher quality fiber.

The project studied the relationship between price and quality of Tajik and American mohair. The results show that American mohair is on average twice as expensive as Tajik mohair on the international market. For example, while Tajik farmers earned on average $7-8 for 1kg of mohair in 2011, American farmers earned $15/kg[1]. In addition, American goats produce more than twice as much mohair per year compared to Tajik Angora goats: 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. This means that Tajik famers are losing substantial revenue by producing low quality goats.

The prices of Tajik and American mohair reflect the processing qualities of the two fibers. American mohair, which is largely kemp-free, finer and more homogeneous than Tajik mohair, is much cheaper

[1] The actual price advantage was even higher for American farmers, given that the clean yield of Tajik mohair is at least 15% higher than the yield of American mohair. That means that 1kg of scoured Tajik mohair equals only 850g of scoured American mohair.

to process into expensive, luxury yarns and textiles then cheap Tajik mohair. The project calculated that the production cost of 1kg of luxury yarn would decrease even if the price of raw fiber increased by 100%, provided that the fiber was fine, uniform and kemp-free like the American mohair. In short, the cheap price of Tajik mohair does not outweigh the processing costs, given that it requires dehairing to eliminate kemp and short fibers. The dehairing process is expensive[2] and the yield of Tajik fleeces is low after dehairing. These calculations imply that not only Tajik farmers, but also women who earn income from fiber processing would benefit from improved mohair quality, even if the price of the improved fiber was much higher. In addition, greater numbers of goats with quality mohair would increase the supply of raw material available for processing and provide additional earning opportunities for spinners and knitters.

Higher quality of American mohair can be partially attributed to feeding and animal husbandry. However, selective breeding practiced by American Angora goat breeders plays a major role in continuous improvements of goats and fiber. As shown in the photos below, Angora goat breeding in the United States and Tajikistan produced not only different types of mohair, but also different phenotypes of Angora goats.

***American Angoras in full fleece at an Angora goat show, Texas 2010.***

[2] 1 kg of washed, quality Tajik mohair yields 300 g of high quality, clean fiber after dehairing. 1 kg of washed American mohair yields 900 g of high quality fiber, without dehairing. Dehairing 1 kg of Tajik mohair costs $11 (approximately 1/5 of the production cost of 1 kg of yarn)

***Tajik Angora breeding bucks at a breeding farm, April 2009.***

To conclude, Tajik mohair producers and processors cannot improve mohair quality and incomes without first improving the quality of Angora goats through selective breeding. In fact, without investment in a new breeding program, the quality of Tajik mohair will continue to decrease. That is why the breeding component of the ICARDA/IFAD project is paramount to the long-term sustainability of the value chain and Angora goat production in Tajikistan in general.

#### *2.1.1.1 Assessment of Tajik mohair*

The project used multiple methods to assess the quality of Tajik mohair and the results of the assessment served as a basis for designing the new breeding program. The methods included collection and laboratory analysis of fiber data, visual assessment of goats and fleeces, and a comparative processing experiment using Tajik and American kid mohair. Laboratory tests and fiber analysis (using OFDA 4000) yielded information about fiber characteristics of Tajik mohair. The experiment in mohair processing clarified how specific deficiencies in fiber quality translate into additional costs and technological obstacles in processing. During the experiment, 5 kg of high quality American and 5 kg of high quality Tajik kid mohair was processed into yarn. The experiment had shown that nearly 100% of fibers in the American kid fleeces, which were kemp-free, fine and homogeneous, could be processed into luxury yarns and textiles that met the project export standard. The Tajik fleeces could not be processed into luxury yarn without manual dehairing which separates kemp fibers and short fibers from the rest of the fleece. As described in detail in a previous project report, dehairing increases the production cost of 1 kg of yarn by 1/5 (i.e. dehairing cost is 1/5 of the production cost). Moreover, dehairing considerably lowers the yield of fiber available for processing into expensive yarn. The yield of clean fiber that can be spun into luxury yarn after dehairing 1kg of Tajik mohair is only about 300 grams. The remaining 700 grams has to be processed into cheap yarn for the Russian market. In comparison, 1 kg of American mohair yields about 900 grams of fiber suitable for processing into luxury yarn. The price of luxury yarn is 5-6 times as high as the price of cheap yarn sold to Russia. This means that a spinner can add much more value to a high quality fiber, and earn a much higher income.

***Shearing Angora goat kids on a private farm, April 2011.***

The comparative processing experiment confirmed that American mohair fleeces contain Angora goat hair of uniform length and fineness – i.e. are homogeneous. Tajik mohair fleeces contain a variety of fibers – hairs of different lengths, kemp and medulated fibers, short, cashmere-type down fibers and also dead and dry fibers. The heterogeneity of Tajik mohair creates multiple challenges during processing: kemp and medulated fibers increase coarseness and short and dead fibers cause shedding. Secondly, the majority of Tajik mohair is relatively coarse. The centralized purchase of kid mohair organized by the project in the spring 2011 confirmed that a bulk of Tajik kid mohair is coarser than American kid mohair and only about 1/5 of Tajik kid mohair clip is fine enough to be spun into fine yarn.

#### *2.1.1.2 Why is the quality of Tajik mohair lower than American mohair and how to improve it?*

How to explain the prevalence of fiber deficiencies such as kemp in view of their costs to Tajik producers and processors? What do American producers have that allows them to keep improving their Angora flocks and mohair quality that is missing in Tajikistan? The simple answer is threefold: 1) strong linkages to global markets; 2) extension and scientific support; and 3) producer's associations and networks that help to coordinate breeding, marketing and other activities that support the sector.

Production of quality Angora goats and mohair cannot exist without good market linkages, extension & science, and producers' organization. In fact, Angora goat production in Tajikistan was also built on these types of support: during the Soviet period, Tajik Angora producers had access to the Soviet market, received extensive scientific and extension support from the government, and were organized into state farms and cooperatives that collaborated on breeding and other activities. Currently, this support system is broken – Russia's mohair processing sector amounts to a fraction of its former size and its demand for mohair has decreased substantially. This means that Tajikistan needs to start developing linkages to other markets. Furthermore, extension and scientific support for Tajik mohair producers is minimal due the lack of governmental funding and ineffective relationship between the government and private farmers, including Angora goat farmers. Finally, private producers who are

replacing state farms are isolated and unorganized, and grassroots-level organizations that serve rural communities and farmers are only developing. The Angora goat breeding tradition also present a problem: research had shown that the selection of Tajik Angora goats was driven by the requirements of Soviet textile industries that demanded strong mohair and did not consider the problem of kemp. As a result Tajik mohair has the deficiencies outlined above that make it less competitive on global markets.

Tajik producers have limited means to eliminate such deficiencies without external assistance. While mohair producers in other countries focus on eliminating kemp and increasing fiber fineness, and are supported by sophisticated extension systems in their efforts to improve fiber quality, Tajik mohair producers are largely unaware of quality demands on global mohair markets and continue to operate in a limbo between the Soviet past and the market-driven presence. Many producers lack breeding strategy and market information and continue to supply low quality mohair to local traders who resell it for low prices to China, Turkey and Russia. It does not help that the Tajik government has yet to demonstrate the will and capacity for a meaningful intervention on behalf of the Angora goat sector. In addition to lacking market information and governmental support, Tajik producers do not have breeding animals with the desired fiber characteristics. Kemp free, homogeneous, fine-haired breeding bucks are very rare in Tajikistan and it would take a very long time to eliminate fiber deficiencies using local breeding stock only.

***Tajik breeding bucks have coarse fleeces with kemp fibers, Haidarali farm, April 2011.***

After outlining the multiple obstacles facing Tajik mohair producers, it is important to focus on their competitive strengths that make the support of Tajik Angora goat sector a worthwhile cause. Firstly, Angora goat production in key mohair-producing countries such as South Africa, USA and Australia has been decreasing because of rising costs of inputs such as land and labor, and because mohair processing has moved from the USA and South Africa to China. Instead of being processed locally, American mohair is first exported to South Africa, where it is purchased by Chinese buyers together with South African mohair.

In Tajikistan, inputs necessary for Angora goat production are very cheap – labor costs are low, and the cost of pastureland suitable for Angora goat production is minimal given that the land is not

suitable for agriculture or other livestock. Furthermore, Angora goat breeding has a long history in Tajikistan. There are around 200,000 – 250,000 Angora goats in the country, and the conditions for Angora goat production in the Asht and Gafurov region in Northern Tajikistan are excellent. Another advantage is that Tajikistan is the only country in Asia that produces mohair besides Turkey (which has low quality goats and fiber) and it borders China – the largest buyer and processor of mohair fiber. Russia, Turkey, China and India are all interested in Tajik mohair and active on the market.

***Chinese buyers purchased large quantities of the lowest quality Tajik mohair for $4.30 per kg, April 2011.***

Sales of mohair represent an important source of revenue for producers in Northern Tajikistan. For example, 200,000 goats can bring around $1,000,000 in revenue in fiber sales to a very poor region, if we calculate that each goat produces 1kg of mohair that is sold for $5. Based on interviews with Tajik mohair producers, Angora goat production is profitable and a single goat brings about $10 in profits. The profitability is the result of low production costs and relatively good prices for mohair especially during the last couple of years. Prices of mohair are expected to remain relatively high due to the fallen world supply and increasing prices of all natural fibers. Under these conditions, improved mohair quality and prices could provide additional income for farmers and create earning opportunities for poor rural women many of whom currently process mohair for sale.

These are some of the main reasons why the ICARDA/IFAD project invested in developing a breeding program centered on introducing imported genetics of American Angora goats in Tajikistan. This program is expected to provide a new direction for the development of the Tajik mohair sector, speed up improvements in mohair quality and also promote development of other institutions that support Angora goat producers. For example, the import of frozen semen is linked with the project support for the Tajik Livestock Institute and its extension activities. Access to American genetics gives the Institute and its scientists a concrete means to improve the breeding stock and organize extension support. Scientists from the Institute are developing the breeding plan, organizing the insemination work and receiving training in using frozen semen. In the process they are strengthening linkages with private producers who show a great interest in participating in the new breeding program. The scientists are also promoting networks among producers and the formation of associations that could represent producers' interests vis-à-vis the government, and facilitate

collaboration on mohair marketing, breeding, exhibitions of goats and fiber and other activities. The import of new genetics and support of the ICARDA/IFAD project is also increasing the awareness of the Tajik government in the importance of Angora goat production for farmers and women in northern Tajikistan. The introduction of new genetics thus serves not only the purpose of improving fiber quality, but is a catalyst for the reorganization of the Angora goat sector.

***Dr. Matazim Kosimov showing an Asht farmer photos of American Angora goats, April 2011.***

### *2.1.1.3 Breeding activities planned in Northern Tajikistan*

The project is importing to Tajikistan frozen semen of eight American Angora bucks that were purchased in July 2010 and collected in September-December 2010. The bucks were purchased at an auction in Sonora, Texas, after completing a performance test administered by the Texas A&M University (Table 2). The bucks were tested for a variety of attributes including fiber diameter, kemp content, fleece weight and body weight. The project team selected bucks with a maximum kemp content of 0.1%, with medulated fiber content of 0.4% or less, and with an overall test score of 110 or higher. The team also selected one buck with a very high clean fleece weight and two bucks with very low FD. The plan was to obtain bucks from at least four different sources 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 American Genetics and Biologicals at Bryan, Texas. In total 1812 doses of semen were collected and will be shipped to Tajikistan in summer 2011. The ICARDA/IFAD project linked the Tajik team to an Iranian scientist, Mr. Aliverdi, to assist them with the full insemination process. Mr. Aliverdi is a highly experienced in oestrus synchronization and artificial insemination with fresh and frozen semen and will train the Tajik inseminators. He will make a preliminary visit to the site in September and participate in the insemination in October 2011. It is expected that his assistance will increase the conception rates which is crucial to obtain as many live offspring as possible.

The artificial insemination will take place at the artificial insemination center of the “Dulana” breeding farm at the Asht region. The Dulana farm is the main breeding center of Angora goats in

Northern Tajikistan. It is located at the foothills of the Kuraminsk mountain range – an area with excellent conditions for Angora goat production. The farm has approximately 15,000 Angora goats that are organized into flocks based on gender, age and overall ratings. This includes a flock of registered breeding bucks that are used during insemination with fresh semen organized by the farm in October each year. In addition to the insemination facility, the farm has facilities for sorting and bailing mohair. It organizes mohair pooling, sorting and sale each season.

**Table 2.** Key characteristics of bucks preselected and purchased for semen collection at an auction in Sonora, Texas

| Tag ID | Source | Number of straws[1] | 180 days adj CFW[2] (lbs) | AFD[3] (mic) | Med[4] (%) | Kemp (%) | Index | Comment |
|---|---|---|---|---|---|---|---|---|
| 6 | Naumann | N/A | 9.7 | 32.7 | 0.3 | 0.0 | 123.8 | Low FD with very low med/kemp |
| 7 | Naumann | N/A | 8.6 | 30.7 | 0.3 | 0.0 | 115.2 | Low FD with very low med/kemp |
| 9 | Naumann | 311 | 10.2 | 30.9 | 0.0 | 0.0 | 127.0 | Low FD, high index, without med/kemp |
| 19 | Cerulean | 225 | 13.1 | 34.4 | 0.3 | 0.2 | 156.7 | Top index |
| 20 | Cerulean | 137 | 11.3 | 35.2 | 0.3 | 0.0 | 120.4 | Good CFW, very low med/kemp |
| 21 | Cerulean | 141 | 12.9 | 36.0 | 0.3 | 0.0 | 135.9 | Good CFW, good index, very low med/kemp |
| 23 | Haby& Coates | 371 | 11.0 | 32.6 | 0.0 | 0.1 | 112.8 | Good CFW, very low med/kemp |
| 25 | Haby& Coates | 12 | 11.2 | 35.4 | 0.0 | 0.0 | 124.6 | Good CFW, good index, without med/kemp |
| 45 | Ross | 289 | 9.1 | 30.3 | 0.3 | 0.1 | 115.5 | Added. Low AFD |
| 48 | Ross | N/A | 13.2 | 42.3 | 0.0 | 0.0 | 120.0 | High fleece weight without med/kemp |
| 62 | Belk | N/A | 13.8 | 43.8 | 0.0 | 0.0 | 116.8 | High fleece weight without med/kemp |
| 59 | Speck | 326 | | | | | | Added by visual inspection |

[1]N/A indicates that finally these bucks were not be purchased by the project at the auction; [2]adj CFW= adjusted clean fleece weight; [3]AFD= average fiber diameter; [4]Med= medulated fibers

The farm has strong cooperative ties with private farmers in the region who graze the cooperative flocks based on a contract with the farm, together with their own goats. Many farmers use the farm's breeding bucks and artificial insemination services and sell some of their mohair through the farm.

The farm was selected for the insemination work because of the quality of its female goats, capacity to organize artificial insemination, collaborative ties with private farmers, and long-term prospects in promoting Angora goat breeding in the pilot area.

***Inseminating goats with fresh semen at the Dulana farm, October 2010.***

The team plans to select 400 females from several flocks of private farmers, from breeding flocks of the Dulana cooperative farm, and from females owned by the Livestock Institute, and inseminate them with the imported frozen semen in October 2011 (Table 3). The ovulation of the females will be synchronized. The progeny will be monitored by the scientists and used for long-term breeding improvements.

**Table 3.** Preliminary list of farmers whose females will be inseminated with imported semen

| No | **Name** | **Farmer's location** | **Number of selected does** | **Color of goats** | **Comments** |
|---|---|---|---|---|---|
| 1 | Gafur | Dulana | 80 | White | Main participant |
| 2 | Akhmad | Dulana | 40 | White | Main participant |
| 3 | Kamol | Dulana | 40 | White | Main participant |
| 4 | Nemat | Mullomir | 50 | White | Main participant |
| 5 | Tirkashali | Markhamat | 40 | White | Probable candidate |
| 6 | Makhmudali | Markhamat | 20 | Dark | Probable candidate |
| 7 | Khaydarali | Oshoba | 40 | Dark | Probable candidate |
| 8 | Turgunboy | B. Gafurov | 20 | White | Probable candidate |
| 9 | Anarboy | B. Gafurov | 20 | White | Probable candidate |
| 10 | Livestock Institute (supernucleus being established) | Khujand | 50 | White | Main participant |
| | **Total** | | 400 | | |

### *2.1.1.4 Veterinary support for Angora goat farmers*

The project team assisted farmers in containing an outbreak of Contagious Caprine Pleuropneumonia (CCPP) that affected Angora goats at the pilot sites. In 2010-2011 a large percentage of goats in Northern Tajikistan were infected with CCPP. The disease also impacted Angora goat flocks of farmers who participate in the ICARDA/IFAD project.

At the end of December 2010 farmer Mamarasulov Khujan (black nucleus in B. Gafurov district) and other farmers informed the project scientists that they observed several sick goats in their flocks. The disease was affecting only goats. The veterinary authorities of the province tried to hide the information about the disease for a long time and did not identify a concrete diagnosis for this disease.

The project scientists contacted the Veterinary Institute in Dushanbe. A team of scientists from the Veterinary Institute led by the Director, Professor Mirzoev came to the project site in Markhamat village in the Asht district to assess the situation.

Three infected goats that had not been treated were slaughtered for autopsy and testing. External inspection and viscera autopsy preliminarily confirmed the assumed diagnosis of CCPP. Laboratory analyses of organs and tissues conducted by scientists of the Veterinary Institute in Dushanbe later revealed that the strain was of another type than the classic CCPP. The material from Asht was sent to Moscow.

*Collection of materials for the Moscow laboratory*

The project scientists helped to treat the goats with injections of antibiotics (tetracycline) which helped to prevent a high mortality in goats. However, a relatively high number of Angora does aborted after injection of antibiotics (Table 4).

**Table 4.** Data on infected goats of nucleus farmers

| No | Farmers' name | Total number of goats | Number of infected goats | | % of abortions in does |
|---|---|---|---|---|---|
| | | | total | including does | |
| ***Nucleus Flocks*** | | | | | |
| 1 | Khujan Mamarasulov | 108 | 28 | 11 | 54 |
| 2 | Usarboy Kholmatov | 158 | 12 | 4 | 75 |
| 3 | Tirkashali Urunboev | 116 | 14 | 5 | 60 |
| 4 | Makhmudali Turaev | 85 | 3 | 0 | 0 |
| ***Control Flocks*** | | | | | |
| 1 | Ikromali Mirzoakhmedov | 65 | 48 | 30 | 70 |
| 2 | Eryigitov (associate) | 14320 | 6580 | 2816 | 68 |

The epidemic caused significant mortality and abortions of goats in the region. However, the losses would have been even more severe had the project scientists not intervened by alerting the national veterinary authorities and helping farmers to obtain and administer vaccines. The event shows the importance of a support system that includes extension personnel whom the farmers can contact in the time of crisis, and that can mobilize governmental support on behalf of the producers. By encouraging close collaboration between the farmers and local scientists, the ICARDA/IFAD project is helping to develop such a system at the pilot site.

It is clear that CCPP poses a serious threat for the health of goats in the country reinforced by the inefficient measures undertaken on prevention of its consequences. According to the data of the

Veterinary Institute CCPP has spread in North Tajikistan through imports of goats from South Tajikistan to the Asht district and originated from Afghanistan.

A serious problem is that the two responsible parties, the Veterinary Authority and the Research Institute of Veterinary, do not harmonize their activities for disease prevention and control. The Veterinary Authority received financial support from FAO to study and protect the health of small ruminants. The first stage of their pilot project includes analytical research. Apparently they had developed a vaccine against CCPP and conducted experimental vaccination in four goat flocks at the state farm Eryigitov in the Asht district of Sogd province. However, the vaccine produced in Turkey did not give the expected result. Most probably the type of CCPP occurring in Northern Tajikistan is different from the classic type. When asked by Matazim Kasimov how they explain that the number of sick goats observed in the vaccinated goat groups was not much different from the non-vaccinated control flocks, the response was that the efficiency of their vaccine was about 68%. However, according to Dr. Kasimov, this figure seems to be unrealistic. On the other hand the Veterinary Research Institute (Director Professor Davlatali Mirzoev) is also undertaken efforts to develop their own vaccine with participation of a veterinary institute in Moscow.

As long as no effective vaccine is available, most farmers when they observe a sick goat use antibiotics of the tetracycline group, “Notex” which has been the most efficient measure in preventing the death of goats. Our project team has conducted trainings for farmers and informed them about the disease, its prevention and treatment. It is necessary to mobilize farmers, households, local veterinarians and middlemen trading goats (shuttle traders) for prevention of CCPP and other contagious diseases outbreaks. They should know and timely inform the relevant institutions when they observe goats with CCPP symptoms in order to isolate the goats or location and stop migration (or trade) of goats. Early information about outbreaks will help the project scientists to react promptly and undertake required measures.

### 2.1.2 Establishment of a new market for fine kid mohair

The project focuses not only on improving fiber quality through breeding, but also on developing a new market for quality fiber. During the 2011 shearing season the project team purchased around 400 kg of quality fiber for processing into yarn and products. The new purchasing system has been introduced to avoid shortages of raw mohair experienced by spinners’ groups during previous years. In 2010, for example, the demand for mohair was strong and farmers sold their clip to traders early in the season in April and May. Spinners were unable to find quality mohair for the rest of the year and could not produce yarn for the project. To avoid mohair shortages in 2011, the project organized purchases of quality kid fleeces at the mohair markets and on private and cooperative farms. The team visited mohair markets in Khodzhand and Asht and a number of private and cooperative farms in the Asht, Gafurov and Matchinsk region. During the farm visits the scientists evaluated goats, sorted and purchased kid mohair, and conducted training on fiber quality assessment with farmers.

***Cooperative farm Kushatov sold fine kid fleeces to the project, April 2011.***

The mohair purchasing campaign gave the project team not only the opportunity to buy fiber for spinners but to strengthen relationships with Angora goat producers. The team made visits to new farms and established new contacts with farmers, visually assessed and compared goats and fiber on different farms, discussed the project agenda to improve breeding and fiber quality through imported genetics, showed farmers photos of Texan Angora goats whose semen will be used in Tajikistan, and allowed farmers to compare their fleeces with samples of American mohair fleeces. All these activities contributed to strengthening collaborative ties between the project team and the farmers and promoted farmers' interest in breeding, improving fiber quality and supporting local mohair processing.

***Dr. Matazim Kosimov discussed fiber quality with a farmer near Dulana, April 2011.***

## 2.2 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

### 2.2.1 Organizing mohair purchase at pilot sites

As discussed earlier, although over 60 women have been trained in spinning yarn for the project, many of them were unable to find enough raw material in 2010. Due to a high demand for mohair in 2010, traders who work for larger exporters bought Tajik mohair clip immediately after shearing in April and May and there was no quality mohair available on the market after mid May. As a result the spinners had no access to fiber and could not produce enough yarn. To avoid raw material shortages in 2011, the project organized centralized mohair purchase followed by processing and marketing activities. The activities included:

- Purchase 400kg of quality kid mohair during the spring 2011 season (April - May).
- Organize centralized dehairing of all fleeces (May – September).
- Distribute dehaired fiber to spinners to produce yarn (September – November).
- Collect 100kg of yarn from spinners, dye the yarn and prepare it for export (November).
- Export yarn and distribute it to yarn shops in the USA and Europe (November – January).

In April and May 2011 the project achieved its goal of purchasing 400kg of mohair for processing. Lead women spinners from Gafurov and Asht region received funds for mohair purchase and have been actively involved in helping the project team select and buy kid mohair on markets and farms.

### 2.2.2 Organizing mohair dehairing at pilot sites

As planned in 2010, the project organized mohair dehairing at the pilot sites to eliminate kemp and other undesirable fibers. Dehairing is done manually, by combing kemp and short medullated fiber out of the fleeces. This leaves only the finest, longest and softest fibers that can be processed into fine yarns.

***Women in Oshoba village discuss fiber dehairing, May 2011.***

The project team set up four dehairing groups in Asht and one group in the Gafurov region. Each group includes 4 – 6 women. The group leaders receive several kg of raw mohair from the project on lottery basis, given that the raw mohair purchased from different sources has some variation in quality. They distribute the fiber among women within their group. Each woman dehairs her fiber and the quality is monitored by the group leader. After all women in the group finish the dehairing, the group leader coordinates with the team the purchase of the clean fiber. The women are paid 50 somoni (approximately $11) for 1kg of dehaired fiber[3].

The project team purchases dehaired fiber from the women approximately twice a month and delivers them new fiber at the same time. The women dehair fiber purchased on individual farms separately, and after the dehairing separate the fiber into three groups: cleaned fiber, "waste fiber" and fiber that was too difficult to clean ("remnants"). The project collects and weights these three types of products and packages them in a single bag labeled with the fiber source – name of the farmer or market where the fiber was purchased. All bags will be evaluated based on the yield of clean fiber and its processing qualities (softness, shedding, luster). The project team will use the processing test results to compare and rate fiber produced by different farmers. The test results will be recorded, analyzed, discussed

[3] As explained in the previous report, a dehairing test had shown that it takes about 4 days of part time work to produce 1kg of dehaired fiber ready for spinning. This means that at 50 somoni ($11) per kg, a woman can earn about 70 cents/hour. Although this wage is not high, the work is very easy and can be performed by unskilled women. Women who participated in the dehairing experiment confirmed that 50 somoni for 1kg of dehaired fiber was an attractive wage for them, especially given that they could do the work at home when they had free time.

with farmers and translated into long-term breeding objectives. The first fiber yield results recorded in June 2011 are presented in Table 5.

**Table 5.** Data on clean fiber

| No | Farmer | Cleaner | Total raw fiber (g) | Clean fiber (g) | Waste fiber (g) | Remnants (g) | Comments |
|---|---|---|---|---|---|---|---|
| 1 | Usmankul | Manzura | 8,000 | 2,621 | 1,680 | 1,800 | "medium" kid |
| 2 | Usmankul | Manzura | | 1,265 | 1,678 | 1,185 | "fine" kid |
| 3 | Khadzibulo | Gulchechra | 3,700 | 1,207 | 990 | 1,111 | "fine" kid |
| 4 | Gafor | Saodat/Shirinoi | 8,500 | 1,303 | 980 | 1,600 | "fine" kid |
| 5 | Market | Mukhardas | | 407 | 180 | 335 | "fine" kid |

After all fiber is dehaired in September, it will be blended and carded together to produce uniform tops. The clean mohair tops will be processed into luxury yarn by selected spinners, each of whom will receive 5kg of tops for yarn production. The waste fiber and the remnants will also be carded and processed by spinners into cheap yarn for the Russian market. The spinners' groups are already being organized in Asht and Gafurov region. Processing costs of both types of yarns will be calculated and the proceeds from selling these yarns recorded.

### 2.2.3 Developing production of knitted clothing

The project continued to work on developing the knitting component in 2011, and progress has been made on producing luxury knitwear – shawls, hats and sweaters – from the Magic Mohair yarn. The team delivered knitting books, patterns, knitting needles and samples of hats and sweaters marketed in the USA to the pilot site. It collaborated with the lead knitter, Ms. Dilorom from the Alma village, on producing samples of products based on the imported samples and knitting patterns. The lead knitter is producing high quality, marketable models and training other knitters.

The most successful prototypes to-date were models of scarves, sweaters and hats. The project plans to produce and test-market some of these products in luxury stores in the USA in winter of 2011, and further develop the production of luxury hats, sweaters and other items in 2012.

*Mrs. Dilorom, a lead knitter, produces many quality samples of knitted products, May 2011.*

### 2.2.4 Developing new products from adult mohair: carpets and blankets

In order to produce luxury yarn for clothing, it is necessary to use only kid mohair (fine mohair from 6 months old or yearling goats). The project is also developing new methods how to add value to coarser adult mohair by making knotted and woven carpets and blankets.

On the production of knotted carpets the project collaborates with carpet weavers in Afghanistan. In 2010 the project conducted training in carpet making through a FAO grant administered by CACSA. CACSA invited a carpet weaver from Kabul, Afghanistan who worked with Tajik women in Khodzhand to make quality mohair carpets. Although the trainees made progress in acquiring new carpet-making skill, additional training will be needed to develop carpet production that would yield carpets of "Afghan" quality. The competitive advantage of Tajik carpet makers is their access to relatively cheap mohair that can be used to produce high-quality, luxury carpets. However, they need to work on improving their skills, with additional help from Afghan trainers who come from a much stronger carpet-making tradition.

The Afghan trainers demonstrated that Tajik mohair could be processed into beautiful carpets. The project team sent mohair yarn to Herat and Kabul and received excellent carpet samples from both locations. The project plans to organize additional training for Tajik women in 2012 and work on producing carpets of similar quality.

The project also works on developing the production of woven carpets and blankets. Through the FAO training program, it imported a weaving loom from Canada that can be used to weave a variety of products. The team located Tajik women who know how to weave on this type of loom in Asht and collaborates with them on developing production of shawls, blankets and woven carpets. It also plans

to invite a trainer from Kyrgyzstan who is proficient in working with this loom. She will train Tajik weavers to make woven shawls and fabrics. First samples of first woven products will be made in September 2011.

***The project plans to use an abandoned weaving shop in Asht to produce quality mohair rugs, May 2011.***

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

### 2.3.1 New market linkages for yarn and products developed in the USA and Europe

The project worked on developing new market linkages with buyers. It began to establish linkages to American and European wholesalers who are interested in purchasing larger amounts of yarn. This includes an American wholesale company called "Clothroads", based in Colorado that buys fairly-traded, handspun yarns. Clothroads ordered 3kg of naturally coloured 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 fall 2011.

Another company interested in purchasing Tajik mohair yarn is an Italian fair trade company based in Perugia. The company plans to organize an exhibit in Italy in October 2011 where it would feature the Tajik mohair yarn. It expressed interest in purchasing 10kg of the yarn in September 2011. The company representatives visited the project site in May 2011. They were invited by CESVI, an Italian NGO working in Tajikistan.

Other interested buyers include a wholesaler in Vienna, Austria who ordered yarn samples in 2010 and was very pleased with her customers' response. She would like to order more yarn once available. The project also received inquiries from buyers in Canada and Peru. Currently, the project team has no problem with finding buyers for the yarn at a wholesale price of $140/kg. It needs to work on increasing production to satisfy the demand. The centralized system of raw material purchase and dehairing applied in 2011 is expected to increase yarn production to 100kg in by the end of this year.

This will allow increasing sales and making further progress on developing the marketing and distribution network in 2011 and 2012. Table 6 provides an overview of the sales of yarn and knitwear since March 2009.

**Table 6.** Yarn and Product Sales (March 2009-September 2011)

| 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 |
| 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) | | | $1346.48 |

The project plans to begin advertising the yarn and knitted products through the updated website "adventureyarns.com." The site features the yarn and products available, and a description of the project activities.

## 2.4 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 effects of women's family status on their capacity to earn and retain income from yarn production. However, due to the lack of raw fiber in 2010, the earnings from spinning and knitting have been relatively small for most women. In 2011 the project purchased 400 kg of mohair and will be able to produce 100 kg of yarn. This means that spinners and knitters will be able to earn higher incomes than in 2010. In the fall of 2011 the project plans to interview women about the effects of the income from spinning and knitting on their livelihoods.

## 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.

Multiple cross-national linkages (in science, commerce, know-how and culture) are being developed and supported by the project. This included new linkages between Angora goat farmers, scientists, women spinners and knitters, American Angora goat producers, American and European yarn buyers and knitters and the general public.

1. It linked Tajik Angora farmers and scientists to Angora breeders in Texas, USA. Texan farmers learned about the project and Angora goat production in Tajikistan. Tajik farmers will receive semen from Texan Angora goats and were able to examine American Angora fleeces, see photos of American goats and discuss Angora goat production in the USA.
2. It creates new linkages between Tajik farmers and women spinners by encouraging mohair purchases directly from farmers. This is essential for strengthening direct feedback on mohair quality to encourage improvements in breeding. These linkages also strengthen the raw material supply network for women processors.
3. It promotes linkages between Tajik and international goat breeders, Tajik farmers and the government. These ties strengthen extension support and promote the development of institutional framework that is necessary for a long-term development of the Angora goat sector.
4. It linked Tajik spinners with knitters and 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. The project is also creating new linkages between Tajik knitters and buyers and consumers of knitted products.
5. The project linked Tajik mohair producers and carpet-makers with carpet-makers in Afghanistan to enable production of luxury carpets from Tajik mohair in both countries.
6. It linked Tajik spinners, knitters and weavers with spinners, weavers and fiber processors in Kyrgyzstan, Uzbekistan and the United States. Such linkages will allow the women to learn new skills in terms of fiber processing and design.

The project plans to strengthened these linkages and create new contacts through the new website developed in March 2011. The project also began developing ties to persons and communities that support handicrafts and fair trade such as the Hand/Eye magazine (http://www.handeyemagazine.com/) that published an article about the Tajik spinners in the June 2010 issue. A knitting magazine "Yarn Market New" published a version of this article in an October 2010 issue.

## 2.6 Risks and ways forward

One of the key objectives at the Sogd site is to organize efficient and economical production of luxury mohair yarn and knitwear and set up export linkages for these products. The yarn production and marketing business consists of several components each of which has to be effectively organized, managed and financed:

1) fiber purchasing (organized by spinning groups, farmers and mohair traders; financed from a revolving fund)
2) fiber dehairing, washing, and carding (organized by lead spinning groups; financed from a revolving fund)
3) spinning (organized by lead spinning groups; financed from a revolving fund)
4) knitting (organized by lead knitting group; internally financed)
5) export/shipping of yarn and products (organized by spinning and knitting groups, with the help of export support staff; financed by pre-payment from buyers; other financing options are under review).

The project team plans to further develop each of these activities and the linkages among them to set up a sustainable production and marketing chain that can function without the organizational and financial support of the IFAD-ICARDA project. It is expected that key local collaborators trained by the project will continue to be involved in yarn production and marketing and will provide organizational and communication support to producer groups after the project ends. Based on lessons learned during the first half of the project, the following technical, organizational and financial issues need to be addressed to minimize risks and maximize sustainability of all components of the export chain.

1. Fiber Purchasing:
   a) Financing the fiber purchase.
   To begin processing, women who run the spinning business need funds to purchase fiber during shearing in April-May. About US$ 4,000-5,000 is enough to organize the purchase of 500 kg of quality mohair (including transport), accounting for variation in mohair prices. The project needs to ensure that revolving fund is available for fiber purchase, supported by an accounting and management system. The fund will be built from profits from yarn and product sales in the course of the project. The ownership and management of the fund will be designed by the project team together with key stakeholders, specifically women who operate the yarn spinning, knitting and weaving business. Designs for managing such fund will be explored in 2012-2013.

   b) Improving organization of fiber purchasing.
   The project began to establish a fiber purchasing system in 2011 in collaboration with the lead spinners' group. The project staff plans to support the spinners' group in taking a lead role in fiber purchasing in 2012. It is expected that the spinners' groups will be fully equipped to organize fiber purchase at the end of the project.

2. Fiber Preparation:
   a) Financing fiber preparation.
   Fiber preparation also needs to be financed from the revolving fund at the end of the project. It will cost approximately $3,100 to process (dehair, scour and card) 500 kg of mohair. 500 kg of raw fiber will yield approximately 150-175 kg of dehaired, scoured & carded luxury fiber, and 200-250 kg of undehaired, scoured, carded "waste" fiber. The project will update these figures at the end of the processing cycle currently underway.

   b) Improving fiber dehairing, scouring and carding.
   Dehairing is the most challenging operation in fiber processing. The project is currently testing two dehairing methods. Based on the results, it will work with the spinners' group to select the most efficient method in 2012. The project will also work with the spinners to improve scouring and explore the option of purchasing a carding machine for mohair for the group. (Currently the groups rent a carding machine to prepare mohair for spinning).

3. Spinning:
   a) Financing spinning.
   The spinners' groups will need at least a portion of the funds to finance spinning. It will cost around US$ 3,800 to finance the spinning of 175 kg of luxury yarn (based on existing estimates, 500 kg of raw kid mohair can be processed into approximately 175 kg of luxury yarn and 250 kg of low quality yarn for the Russian market). Given that the spinners need to be paid before the luxury yarn is sold, the spinning needs to be funded from the revolving fund. Yarn for the Russian market can be sold at the local market and the production of this yarn does not require pre-financing.

   b) Finding alternative energy sources to power spinning machines.
   The key challenge in spinning is the 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 project plans to research alternative energy sources (such as solar batteries) to power the electric spinning machines used by the groups.
   The project has delivered four New Zealand Ashford wooden spinning wheels to the site, and purchased two electric spinning machines for the spinners. Although some women prefer the spinning wheels (and several local models have been produced based on the imported models), 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.

4. Knitting and weaving:
   a) Yarn, design and training:
   The knitting and weaving business requires three inputs: quality yarn, design and training. The project works with the knitting and weaving groups to develop several exportable products (hats, sweaters and blankets) based on fashionable design. It also helps the groups to find sources of yarn (locally produced and imported) that can be used to make these products. The lead knitters are starting to train other women and the interest in knitting among rural women is very high.

   b) Financing knitting and weaving:
   It is expected that the knitting and weaving groups can rely mostly on self-financing given that they can sell high-end products immediately after they are finished and, unlike the spinners, do not need to purchase large quantities of yarn at once. Knitted garments and woven blankets made from local, handspun yarn can be exported to stores and wholesale buyers in smaller quantities. Garments made from quality commercial yarn can also be sold on local and international markets in small numbers. The project plans to train the groups to accumulate funds from the sales of knitted products to finance the purchase of yarn. Methods of financing knitting and weaving groups will be explored in 2012.

5. Export of yarn and products:
   a) Financing the export of products:
   The project team plans to work with the groups to develop financing for the shipping of export of products. One possible method is arranging with the buyer to pay for shipping, or using the pre-payment received from the buyer to pay for shipping. The project team will discuss these options with the buyers interested in purchasing Tajik mohair yarn.

   b) Linkages to buyers:
   The project needs to ensure that the spinning, knitting and weaving groups receive adequate assistance to access export markets and form linkages to buyers. This includes selecting and training a person with good understanding of the spinning and knitting business, computer access, knowledge of English and good communication skills who can help the spinners, knitters and weavers communicate with buyers and fulfill orders. One possible candidate is the husband of the lead weaver, Alisher Kosimov, who has many of the skills needed to fill this role, and a personal interest to support his wife in her new business.

The project team will develop a business plans based on estimated costs of fiber processing, packaging and transport and the expected revenues from yarns and knitted products. The plan will also include the accumulation of a revolving/investment fund so that the women groups have the required cash for buying the raw material in spring aand funding the different process steps up to the yarn.

The activities described above are directed at strengthening the groups of women processors. The most important way to strengthen the groups is by helping them to become private, women-owned businesses or cooperatives. Although local NGOs can offer these groups some support in the future, this support can by no means replace linkages to markets and orders for their products. It is essential that the groups become sustainable, for-profit businesses run by the women who are responsible for receiving and fulfilling orders, managing the finances and allocating the revenue. Unless the spinning, knitting and weaving groups make profits and generate good incomes for their owners and members, they cannot succeed.

Although the local NGOs, specifically NAU, is providing some assistance to the groups in terms of internal organization, planning and management, it also uses the groups for its own purpose, namely to solicit funds from donors for sustaining mainly their own organization. Their role in the future needs to be further discussed. However, it is clear that none of the local NGOs have a good understanding of fiber production, processing and marketing to be able to provide good advice and leadership to the groups in the future. This makes it even more important to make the groups self-reliant and sustainable in all technical aspects during the remaining time of the ICARDA project.

# 3 Project Activities in Badakhshan, Tajikistan

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

### 3.1.1 Improving production of fiber goats in Badakhshan

Goat production is a key source of livelihood for rural households in Badakhshan. Goats can survive in this region better than any other livestock and their meat and milk provides a key source of protein for rural families. Some goats also produce fiber that can be sold to traders in the spring when there are no other agricultural products ready for sale. Households in the eight pilot villages can keep only about 10-15 sheep and goats and 1-2 cows due to limited pastureland, housing and winter feed. Given that the numbers of animals produced in this area cannot be easily increased, the productivity of each animal is very important.

***Woman from Andarob village with her small flock of goats, October 2010.***

The project research has shown that the productivity of goats and other livestock in the pilot villages is low due to problems in breeding, feeding and veterinary care. These key aspects of animal husbandry are not well organized at the community level. For example, villagers do not practice any selection of breeding animals and do not produce quality breeding males. Neither do they collaborate on winter feed production or jointly vaccinate their animals. The absence of selective breeding and insufficient winter feed limits goat productivity and the absence of vaccination can lead to losses of livestock. For example, in 2010 households in some pilot villages lost 50% of their goat flocks due to contagious pleuropneumonia that could have been prevented by vaccination. Such losses impact food supply and family assets[4] and expose poor Pamiri families to more deprivation.

After identifying shortcomings in the existing goat production system and discussing the findings with households and local leaders, the project team began collaborative activities focused on improving breeding and other aspects of goat husbandry. The objective is to improve productivity per goat by breeding quality, dual-purpose goats that are good meat, milk and fiber producers. Goat fiber will be used to establish a value chain focused on producing luxury yarns and knitted products for export in order to generate additional sources of income for rural women. Parallel activities include vaccination of goats and castration of non-breeding males. The project is also discussing how to organize winterfeed production with village leaders.

### 3.1.2 Developing a breeding plan at the pilot sites

The project team had imported eight Russian Altai fiber goats to Badakhshan in 2010 for breeding purposes. One buck died shortly after arrival from internal injuries caused by fighting with other bucks. The remaining bucks were distributed to goat-producing families in pilot villages. All bucks survived the winter at the pilot sites and will participate in the mating in 2011.

[4] Animals each household owns serve as a form of "savings" as they can be sold and turned into cash at a time of need.

***Altai buck "Vasja" in Khaskhorog village after shearing, May 2011.***

Although the bucks arrived late for the 2010 mating season (most of the females had been already mated by the time the bucks arrived) some of them managed to mate and produce offspring (Table 7). The progeny of the imported bucks are easily identified by the goat producers given that they differ from local kids in terms of fiber, hoofs and other characteristics. All the progeny will be tagged and registered by the team in the summer and fall of 2011.

**Table 7.** The number and birth weight of kids obtained from imported Altay bucks

| # | Site | No of kids | | | Av. birth weight (kg)* | |
|---|---|---|---|---|---|---|
| | | total | male | female | male | female |
| 1 | Dasht | 11 | 7 | 4 | 3.8 | 3.6 |
| 2 | Khaskhorug | 5 | 3 | 2 | 3.7 | 3.5 |
| 3 | Andarob | 6 | 4 | 2 | 3.6 | 3.4 |
| 4 | Snib | 9 | 6 | 3 | 3.6 | 3.4 |
| 5 | Garm-chashma | 4 | 2 | 2 | 3.7 | 3.5 |
| 6 | Kukhilal | 6 | 4 | 2 | 3.6 | 3.5 |
| | **Total/Average** | **41** | **26** | **15** | **3.7** | **3.5** |

*Liveweights taken from birth up to 5 days of age

***Woman in Andarob village with an offspring of Altai buck, May 2011.***

To use the Altai bucks effectively, the project has to work on developing a new community based breeding scheme. Traditionally, households in the pilot area stall their livestock from December to February, graze them around the village until the end of April and take them to summer pastures from May to the end of September. Breeding takes place randomly at the summer pastures and after the goats return to the villages in September. As explained in the previous report, the households do not produce quality breeding males but keep a few bucks uncastrated. These bucks are generally chosen at random, without consideration of their weight, breed, fiber quality or other criteria. In fact, superior bucks are often castrated as they are expected to be good meat producers[5]. The lack of quality breeding animals and of a breeding strategy is costly to all villagers: their animals are neither good fiber producers nor good meat producers and some show signs of inbreeding.

The problem of ineffective breeding cannot be resolved at the household level but only at the community level as it exemplifies a collective action problem. Individual households that have only a few female goats do not have the incentive to produce breeding males because the costs would be privatized (i.e. absorbed by a single household), while the benefits would be "socialized" (i.e. benefit all households whose females would be inseminated during the breeding season when all village animals graze together). This issue can be resolved only through creating a community breeding

[5] Old, large castrates are highly valued as they are slaughtered during weddings and other ceremonies.

system that distributes the cost of producing breeding males across all households that use them. Developing such as system is one of the objectives of the ICARDA/IFAD project, and creating a breeding nucleus with the imported bucks is the first step in the process.

The original breeding plan designed by the project for the 2011 breeding season was the following: select and tag the best fiber-producing females at each pilot village and send them to summer pastures with the Altai bucks. The nucleus would be cared for by an experienced shepherd paid by the project. It would stay at the summer pastures throughout the breeding season until all females were mated (approximately the end of October). After that the nucleus would return to the village, the females would be distributed to their owners and the bucks would return to their caretakers. The team also planned to work with the villagers on selecting the best local males and castrating all other males. The best local males would then be used to mate with the non-nucleus females.

#### *3.1.2.1 Implementing the community breeding plan*

The breeding plan included several activities that had to be negotiated with the village households and successfully implemented: 1) selection and tagging of females for the breeding nucleus; 2) selection of pastures for the nucleus; 3) selection and hire of a qualified shepherd, trusted by the villagers and the project team; 4) collection and transport of Altai bucks and tagged females to the pastures; and 5) selection of quality local bucks to mate with non-nuclei females and castration of other bucks.

The first step in the plan was to select and tag the best nucleus females and the best local males for non-nucleus mating. The team began to select the breeding animals in May 2011 prior to the departure of the village flocks to mountain pastures. The selection and tagging was combined with vaccination of all goats against small pox. The project team, which includes an experienced veterinarian, vaccinated all goats in all villages against goat pox and during the vaccination selected, tagged and recorded female and male goats that produce good cashgora or cashmere. At the time of vaccination the team also distributed medication against parasites to all households and explained the women how to treat their goats.

***Vaccinating and tagging goats in goats in Khaskhorog village, May 2011.***

Combining free vaccination with tagging and selection of the best fiber-producing females and males proved to be a very effective method to form the breeding nucleus. Women were willing to bring their flocks of goats for vaccination, and allowed the team to select and tag their fiber goats at the same time. The tagging of goats is often met with hesitancy in Tajikistan as some farmers believe the government (or some other agency) may take away the tagged goats to set up a kolkhoz (i.e. a Soviet-style state farm). Although a couple of villagers were spreading this kind of rumor, most people at the pilot sites trust the project team and were not worried that the project will claim rights to the tagged goats and try to confiscate them later.

The goats were selected based on the testimonies of their owners regarding their fiber production and visual assessment by the project team. The village women know each goat in their small flock very well and were able to provide accurate information regarding fiber production to the team.

#### *3.1.2.2 Influence of local conditions on the community breeding plan*

The process of vaccinating and tagging goats was shaped by specific conditions in each village. In some villages women were eager to tag their goats for the breeding nucleus whereas in other villages they were more hesitant. Their attitude depended partially on the degree of information they had about the project, the level of village organization, and also on the availability of good summer pastures near the particular village. For example, the Andarob village is located in the center of the dzhamoat, is easily accessible and the Andarob women are well informed about the project. The project has a close contact with the dzhamoat leader whose office is in Andarob, and the Andarob village leader is very supportive of the project. In addition Andarob has an active women's leader who collaborates with the project and distributes information to the women. Finally, Andarob does not have access to the best summer pastures. These are some of the reasons why the Andarob women were well informed and ready to tag their goats and send them to good summer pastures with the nucleus. The tagging and vaccination in Andarob was simplified by the availability of pens that were used to contain the village goats during the procedure. This meant that the team did not have to visit all households individually to treat and evaluate their 500 goats.

***Selecting and tagging goats for breeding nucleus, Andarob village, May 2011.***

The situation at another pilot site, the Garmchasma village, was very different. The village is further away and does not have a local leader who could mobilize the population on behalf of the project. Under these conditions it was much more difficult to inform all villagers about the vaccination and the need to keep their goats in the village on a specified date (as opposed to sending them to pastures). Unlike Andarob, Garmchasma has access to good summer pastures for their livestock. In addition, it is located next to a hot spring and many tourists arrive there in the summer. The women in Garmchasma have the option to send their goats to good summer pastures, or leave them in the village, milk them and sell the milk to tourists or hotels. For these reasons, women in Garmchasma were less willing to tag and send their goats to summer pastures with the nucleus. The third large pilot village, Khaskhorog, is further away from the other villages and has a relatively large flock of fiber goats. The Khaskhorog residents wanted to have their own breeding nucleus as opposed to sending their selected goats to summer pastures together with goats from other villages. The farmer who takes care of the Altai buck in Khaskhorog does an excellent job and shows a great affinity for the buck. He was afraid to send his buck with the other animals to the mountain pastures and let some other person care for him.

The Dasht village, which is close to Andarob, also has a large flock of goats, many of which are fiber goats, and good summer pastures. The women in Dasht are very active in fiber collection and processing and were wiling to tag their goats. However, similar to other villages, the Dasht households also wanted to keep many of their tagged goats in the village for milking. The Dasht village has good summer pastures and after discussions with the leader of the dzhamoat the project decided to use the Dasht pastures for the nucleus.

***Herding village goats for vaccination and tagging, Dasht village, May 2011.***

The other villages (Sist, Snib, Devloch and Khuilal) have much smaller flocks of fiber goats and Khuilal, Devloch and Sist are further away. The project vaccinated all goats in these villages but tagged fewer female fiber goats in Snib and Sist and no goats in Khuilal and Devloch. Given the complex logistics of creating the nucleus and combining goats from different villages, the project team decided that only goats Andarob, Dasht, Khaskhorog and Garmchasma would be placed in the nucleus. Based on the results of the initial breeding experiment in 2011, goats from all villages will be selected for nucleus breeding in 2012.

Overall, the project vaccinated over 2,500 goats in 9 pilot villages and distributed 1,500 doses of anthelmintic drugs to all households (Table 8). The team tagged 447 females from 7 pilot villages. The nucleus flock will be treated against contagious pleuropneumonia in fall.

**Table 8.** Data on tagged and vaccinated goats at pilot sites

| Village Name | Approx. no of goats | No of women whose goats were tagged | No of goats tagged |
|---|---|---|---|
| **Garmchasma** | 774 | 38 | 83 |
| **Vozd** | | 7 | 26 |
| **Andarob** | 504 | 32 | 96 |
| **Dasht** | 333 | 32 | 101 |
| **Snib** | 333 | 12 | 26 |
| **Devloch** | 209 | | |
| **Khuilal** | 270 | | |
| **Sist** | 333 | 7 | 10 |
| **Khaskhorog** | 288 | 26 | 105 |
| **Total** | **3044** | **154** | **447** |

### *3.1.2.3 Collecting tagged females for the breeding nucleus*

Vaccination and tagging of goats was finished at the end of May. The following step was to collect the tagged females and the Altai bucks and send the breeding nucleus to mountain pastures with a hired shepherd. This process also had to be negotiated in view of local practices and preferences. Under the existing summer-grazing system, villagers send some of their goats to mountain pastures and each household keeps 2-3 female goats in the village for milking. This means that each village has one flock in the mountains, and one in the village. The flock that moves to the mountains consists mostly of castrates and females that are not the best milk producers. The villagers take turns to graze the village flock and also the flock in the mountain pastures as opposed to paying a shepherd to graze the goats for them. This means that every day member(s) of one family have to make a long trip to the mountain pastures to monitor the flock. This may testify about the lack of organization but perhaps also about the lack of cash that would have to be collected from all households if a shepherd was to be hired. Some villages in the region hire a shepherd for to go to summer pastures with the village flock. The team has to do additional interviews to understand why this practice was not adopted in the pilot villages.

The project team originally planned to create one or two breeding nuclei that would include quality fiber-producing females from several villages (approximately 200-250 animals total), and hire a shepherd to take the Altai bucks and the females to summer pastures. A shepherd from the Andarob village, Kosymbek Shogunbekov, was hired based on consultations with the villagers and the dzhamoat leader. During summer the nucleus will be kept on "Nekzan@ rangelands and on "Chashmai Daroz" in autumn till the end of the mating season. However when trying to put together the nucleus the team learned that the women want to keep many of the selected and tagged females in the village for milking as they are not only good fiber producers but also good milk producers. The project team was not fully aware of the extent of this practice and did not know that the good fiber-producing goats are also those who produce larger quantities of milk.

This division of tagged females into a nucleus flock and a village "milking" flock created several hurdles. Firstly, the nucleus flock became much smaller and currently includes only 150 out of 446 tagged females. 70 females come from Andarob and 80 females from Dasht. Garmchasma and Khaskhorog did not contribute their goats to the nucleus. The women in Garmchasma wanted to keep

their goats in the village for milking, and Khaskhorog is still negotiating about having its own nucleus. The project and the villagers still need to cross the quality, tagged females that remained in the villages with the Altai bucks. The team is now discussing setting up another, village-based, breeding nuclei in September that would include the tagged females that remained in the villages, some of the Altai males and some quality local males. The team is considering setting up these village nuclei especially in Garmchasma and Khaskhorog, villages with relatively large flocks of fiber goats that were not included in the "mountain pasture" nucleus.

#### *3.1.2.4 Castration of local males and selection of breeding bucks for non-nucleus females*

Creation of a second nucleus in two villages will be possible given that the villagers castrated all or nearly all their male goats. The team confirmed this during vaccination and examination of village flocks. This means that there will be no adult breeding males in the village flocks and the tagged and non-tagged females will be available for breeding. As noted earlier, the project team plans to create two breeding groups in two villages that have the capacity to organize selective breeding and have a large number of tagged fiber goats (Garmchasma, Khaskhorog). The tagged females will be grazed with some of the Altai bucks[6] and with the best local fiber bucks, and the other (non-tagged) females will be grazed with other quality local males. The team selected several local males for breeding last year. These males will be 1.5 years old and will be used this mating season (they are currently at the mountain pastures with the nucleus flock). During the vaccination and tagging in May 2011, a few fiber-producing male kids were selected for breeding and can be used next year. In addition, the team plans to bring quality males from a nearby region that has Altai crosses.

Castration of local males has been so successful that there might be a shortage of breeding males in 2011 if the project does not import few additional males from another region. The project team suggested to households to castrate their males unless they were good fiber producers, and the households followed this advice. Convincing the families was easy because they themselves prefer to castrate all their males if a veterinarian is available. They use castrates for meat production and non-castrated males are the least productive animals in their flock: unlike castrates, they are not slaughtered for meat and unlike females they do not produce offspring or give milk. The preference of the local population to castrate their male goats will make it easier for the project to implement the community breeding plan. However, the project will have to make sure that there are enough quality males available to inseminate the nucleus and non-nucleus flocks in each village.

## 3.2 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.

### 3.2.1 Fiber collection at pilot sites

At the Badakhshan pilot site, women participate in all project activities – they take care of the livestock, harvest fiber, spin yarn and knit products. In the spring of 2010, women participated very actively in combing their goats using cashmere combs provided by the project. 164 women from nine village participated in the combing. In 2011 the project organized comb production locally and made sure that all households had combs. However, the fiber market was much more active in 2011 and many women sold sheared fiber to Kyrgyz traders as well as combed fiber to the project.

[6] Not all Altai bucks need to remain at the mountain pastures given that there are only 150 females there and we have seven bucks.

#### *3.2.1.1 High demand for cashgora and cashmere fiber at pilot sites in 2011.*

The 2011 fiber season was characterized by a strong demand for all fibers. This can be explained by the sharp increase in cotton prices which pulled the price of all the other fibers up. Chinese buyers became very active on the Central Asian fiber market, including Tajikistan. In Badakhshan they financed Kyrgyz traders who travelled to all the pilot villages to buy cashgora and cashmere. Although the Kyrgyz come to buy fiber each year, they usually pay 8-10 somoni/kg ($2). In spring 2011 they started by offering 25-27 somoni/kg ($5.50) for sheared cashgora and by the end of May increased the price to 40 somoni ($9). Also, this year there were many more groups of Kyrgyz buyers than last year, and some of them were hired and paid monthly salaries by a Chinese company. They transported the fiber to Osh, Kyrgyzstan where it was pressed and sent to China.

The high demand for fiber affected the project activities in a variety of ways. Firstly, women in some villages did not wait for the project team to arrive and sold their fiber to Kyrgyz buyers early in the season. They did it because they needed cash and because the Kyrgyz travelled constantly through the villages, visited individual households numerous times and were pressuring them to sell. However, the presence of the project on the local fiber market also affected the Kyrgyz buyers. Some women were not willing to sell fiber to them, and the project clearly helped to increase fiber prices because it provided competition for the Kyrgyz. The Kyrgyz were eventually forced to increase the price to $40 somoni/kg to convince more women to sell fiber to them instead of waiting for the project team. The Kyrgyz also started buying combed fiber for up to 50 somoni.

#### *3.2.1.2 Collection of fiber in pilot villages*

The project team arrived to Badakhshan at the beginning of May and started buying fiber for 100 somoni/kg ($22). The project can afford to buy fiber for this price because it will be used for value-added processing into luxury yarns and knitwear as opposed to resale. The buying conditions in each village were different. In the Andarob village, which is in the center of the dzhamoat, most women sold their sheared fiber to the Kyrgyz in April and had very little fiber to sell to the project in May. The project collected only 5.612 kg of fiber in Andarob this season. In Garmchasma many women also sold fiber to Kyrgyz traders for 22-27 somoni ($5-$5.50) in early April. The women openly regretted that they did not wait for the project to sell combed fiber for 100 somoni/kg ($22). In Sist, Snib and Khuilal the situation was similar – only some women waited with combed fiber for the project team. Most women sold sheared fiber to the Kyrgyz buyers in April. This shows that the women are in great need of cash and prefer to sell for lower prices earlier as opposed to higher prices later. Some women also claimed they were not completely sure that the project team was coming (although the team tried to communicate its intensions to purchase fiber in 2011 as clearly as possible to all women). Secondly, the women were not sure what the project would pay for the fiber (how much more than the Kyrgyz buyers). Thirdly, the Kyrgyz were offering much higher prices than ever before and were very aggressive in trying to convince the women to sell.

***Collecting fiber in Dasht village, May 2011.***

However, in a couple of villages women combed their fiber and did not sell it to the Kyrgyz traders. In Dasht, for example, women sold 17.518 kg of fiber to the project, 12.718 kg more than last year (Table 9). It is partially because the Dasht village cannot be reached as easily as Andarob or Gamchasma, and the Kyrgyz buyers were not working directly in the village. They worked through a local buyer who supports the project and was informed about the team's intention to buy fiber in the beginning of May. Also, many women in the Khaskhorog village did not sell their fiber and waited for the project. This may be because the family that takes care of the Altai buck in Khaskhorog is very supportive of the project and may have influenced the decision of Khaskhorog women not to sell their fiber to Kyrgyz buyers. All women who waited and sold fiber to the project for 100 somoni confirmed they made the right choice.

**Table 9.** Number of goats combed in 2011 and quantity of combed fiber purchased by the project in 2011 and 2010 in the pilot villages

| Village | No. of women | No. of goats combed | No. of female goats | No. of castrate goats | 2011 Purchased fiber (g) | 2010 Purchased fiber (g) |
|---|---|---|---|---|---|---|
| Garmchasma | 16 | 51 | 25 | 18 | 6360 | 11690 |
| Snib | 5 | 19 | 4 | 7 | 2520 | 4390 |
| Dasht | 22 | 123 | 69 | 60 | 17518 | 480 |
| Sist | 6 | 23 | 4 | 16 | 3110 | 4050 |
| Andarob | 10 | 38 | 19 | 13 | 5612 | 23870 |
| Khaskhorog | 20 | 88 | 43 | 35 | 11622 | 7590 |
| Khuilal | 7 | 40 | 22 | 12 | 5200 | 8090 |
| **Total** | **86** | **382** | **186** | **161** | **51942** | **60160** |

### *3.2.1.3 Improved fiber quality in 2011*

In 2010 the project paid women for fiber on the basis of quality. Fiber combed from individual goats was sorted into five categories based on fineness and cleanness – absence of guard hair, vegetable matter and other contaminants. The payment scale ranged from 70 somoni for #1 fiber, 50 somoni for #2, 35 somoni for #3, 15 somoni for #4 and 5 somoni for #5. The project also organized training in combing led by women who had the most experience in combing goats and sold the highest quality fiber to the project in 2010. The differentiated pay and the training clearly paid off – fiber collected in May 2011 was of much higher quality in terms of cleanness and low percentage of kemp than fiber collected in 2010: in 2011 82.5 % of fiber was category #1 compared to only 46% of fiber in 2010 (Table 10).

**Table 10.** Distribution of 2011 fiber based on quality

| Village | Category #1 (g) | Category #2 (g) | Category #3 (g) | Total Fiber (g) |
|---|---|---|---|---|
| Garmchasma | 5940 | 420 | 0 | 6360 |
| Snib | 2070 | 20 | 430 | 2520 |
| Dasht | 16568 | 950 | 0 | 17518 |
| Sist | 1720 | 1100 | 290 | 3110 |
| Andarob | 3860 | 1512 | 240 | 5612 |
| Khaskhorog | 8200 | 3012 | 410 | 11622 |
| Khuilal | 4490 | 710 | 0 | 5200 |
| **Total** | **42848 (82.5%)** | **7724 (14.8%)** | **1370 (2.7%)** | **51942 (100%)** |

Five of the imported Altai bucks were combed in 2011. These bucks produced much higher quantity of fiber than local goats – 467 grams on average, and up to 630 grams of combed fiber from the Khaskhorog buck (Table 11). The local goats produced on average 136 grams of combed fiber per goat. In 2010 the average was 128 grams of fiber per goat.

**Table 11.** Fiber collected from Altai bucks

| Village | Fiber combed (g) |
|---|---|
| Garmchasma | 518 |
| Snib | Not combed yet |
| Dasht | 480 |
| Sist | - |
| Andarob | 320 |
| Khaskhorog | 630 (combed) + 530 (sheared) |
| Khuilal | 390 |

### *3.2.1.4 Dehairing in Afghanistan*

The project is preparing to dehair the fiber in Afghanistan in September 2011. The dehairing plant in Faizabad is almost complete and the project coordinator plans to visit the plant in September and organize the dehairing. After the dehairing the fiber will be distributed to spinners' groups that are currently being formed. The groups will spin the fiber in winter 2011-2012.

## 3.2.2 Organizing spinning and knitting groups in the spring 2011

The project has been selecting spinners in all villages to form spinning groups. The village leader in Andarob and his wife, who is an excellent spinner, have been very helpful in organizing spinning

groups and collecting samples of yarn from spinners from all pilot villages. They have shown the best samples to the project team and the team distributed 1 kg of dehaired cashmere (purchased from Afghanistan for experimental spinning) to each of the lead spinners. The cashmere yarn will be compared with the cashgora yarn in terms of quality and price, and samples of products will be knitted from both yarns. Based on the results, the Badakhshan women could spin cashgora as well as cashmere yarn and make knitted products from both yarns. Dehaired Afghan cashmere will be readily available from Faizabad or Herat, and it will be very interesting to compare the cashmere yarn and products with the local cashgora yarn and products. The project team expects that the cashgora products will compare very favourably with the cashmere products both in terms of quality and price.

The project is also collecting knitted samples of Jurabe sock and patterns from the women. The Pamiri Jurabe are well-known among American designers and are expected to have a high export potential. Hundreds of unique patterns used in the Jurabe represent a valuable piece of Pamiri culture and can be used in a wide variety of knitted products. Until now, the Pamiri women could not fully utilize their traditional knitting skills because they did not have access to fine, high quality yarn. Earlier they knitted the Jurabe socks from local coarse sheep wool, and more recently they started using cheap, acrylic yarns imported from China. The art of hand knitted Jurabe can be fully appreciated by western buyers if the socks are made from soft, natural yarn such as the cashgora yarn the project plans to produce. The knitters will start producing cashgora Jurabe and other knitwear for export and for the local tourist market in the spring 2012. The women's groups and the village leaders actively support the project activities, including yarn spinning and knitting, and the project team is optimistic about being able to organize quality yarn production and export of yarn and knitted products at the pilot sites.

***Women in Andarob plan to make Jurabe socks using old patterns, May 2011.***

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

The project continues to work on multiple components of the fiber value chain with the Pamiri women. This includes vaccination of goats, selection of fiber goats for breeding nuclei, combing goats, buying fiber and organizing spinning and knitting groups. The next step in developing the value chain is fiber dehairing planned for September 2012. The dehaired fiber will be processed in winter 2011-2012 and the first samples of yarn and products will be sold in 2012. Linkages with buyers established in the context of the mohair value chain will be used to sell cashgora yarn and products from Badakhshan.

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

The earnings of women who sold fiber to the project in 2010 and 2011 were recorded. The project plans to keep recording all income women earn from selling fiber, yarn and knitted products. After all processing and export components of the cashgora value chain have been established and spinners and knitters start earning income from exporting their production, the project plans to interview the women to collect information about changes in their earnings and livelihoods.

## 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

The project works on developing new linkages between the Pamiri communities and fiber producers, processors and buyers, starting with local linkages that can support cashgora goat breeding, fiber collection and processing. For example, the project has established good working ties with the Aga Khan Foundation in Khorog, which is planning to produce electric spinning wheels for the project based on a model imported from Northern Tajikistan. The project also developed a new website that describes the activities in Badakhshan and is starting to advertise first samples of cashgora yarn and Jurabe to potential buyers in the United States. It will strengthen these linkages once the first products from cashgora fiber are produced and marketed in 2012.

## 3.6 Risks and ways forward

The yarn processing and export model designed for the Sogd Province will be adapted to the conditions in Badakhshan. The project plans to work with the women in Badakhshan to set up a fiber purchasing system that will be funded initially by the IFAD-ICARDA project and later from revolving funds managed by the women groups. This fund will be complemented by export profits. The design of the fiber purchasing system for Badakhshan is being developed and will be discussed in the next progress report.

Regarding fiber processing, the cashgora fiber needs to be dehaired at a dehairing plant in Faizabad. The project plans to help spinners to arrange the dehairing in winter 2011/2012. The dehairing will be funded from project funds in 2011/2012, and then from revolving funds.

After dehairing, the women can process the fiber into yarn and knitwear. As noted earlier, the project expects to obtain first samples of dehaired casghora yarn in 2012, and will calculate the processing and sale prices once the samples are produced. The project plans to use the marketing linkages developed for mohair in Sogd to market the cashgora yarn produced in Badakhshan.

The knitting groups in Badakhshan will be focused on using the cashgora yarn to make socks, hats, gloves and other knitwear using the traditional Jurabe patterns unique to the Pamirs. The project expects that these products will be in high demand on the local and international market. However, prior to developing the knitting groups, the yarn production system needs to be fully organized.

As noted earlier, the project has developed good ties with the Aga Khan Foundation (AKF) in Khorog and plans to continue collaborating with AKF on a variety of activities including fiber dehairing, local production of spinning wheels and business training for the spinning and knitting groups.

# 4 Project Activities in Naryn, Kyrgyzstan

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

### 4.1.1 Identify and evaluate farmers – potential suppliers of fine and crossbred wool for felting groups.

The project team surveyed farms at the pilot sites to assess sheep and wool production and to identify farms that produce Merino and crossbred wool suitable for felting. The team visited farms in "Lakhol" and "Min-Bulak" villages in Naryn district, in "At-Bashi" and "Acha-Kaindy" villages in At-Bashi district, the registered sheep farm "Sabaaji" in the Kochkor district and farmers in the "Orgochor" division of the Jeti-Oguz district. Between January and March 2011 the scientists visually assessed sheep, identified sheep breeds and discussed the project objectives with sheep farmers.

A total of 23 sheep farmers were studied. This includes 14 farmers at the project sites with a total flock of 1,750 sheep, one farmer with 1,100 sheep in the Kochkor district and 8 farmers with a total flock of 1,393 sheep in the «Orgochor» division.

Most farmers in the project villages raise primarily sheep of mixed breeds and a variety of wool types. Only G. Usupbaeva in Lakhol village keeps a pure flock of the typical Tian-Shan breed. The team monitored wool productivity of Tian-Shan adult and young ewes in Lakhol and Min-Bulak. Local coarse wool sheep were not included because they produce low quality, coarse, non-uniform wool. There is no demand for coarse wool and this type of wool is not marketed.

The average lambing percentage of 69% for the five farmers at "Lakhol" site was low due to the very low performance of the ewes in one flock (Table 12). The highest rate – 93 lambs per 100 ewes – was obtained by M. Asanaliev. There is a lack of proper feeding and poor animal husbandry, including uncontrolled mating of ewes.

**Table 12.** Assessment of phenotypic characteristics of sheep and identification of sheep breeds in Lakhol village

| Farmer | Ewes' age group | No of ewes | Including | | Obtained lambs | | | | Harvested wool, kg | | Sold Som /kg |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | TSh[1] | LC[2] | Total | Incl. | | per 100 ewes | Total | per ewe | |
| | | | | | | TSh | LC | | | | |
| G.Usupbaeva | adult | 55 | 55 | | 49 | 49 | | 89 | 242 | 3.1 | 105 |
| | young | 23 | 23 | | | | | | | | |
| N. Akunov | adult | 40 | 34 | 6 | 20 | 13 | 7 | 50 | 95 | 2.8 | 95 |
| R.Kasmaliev | adult | 40 | 32 | 8 | 35 | 24 | 11 | 88 | 140 | 2.8 | 100 |
| | young | 25 | 18 | 7 | | | | | | | |
| M.Asanaliev | adult | 30 | 10 | 20 | 28 | 12 | 18 | 93 | 54 | 2.7 | 100 |
| | young | 20 | 10 | 10 | | | | | | | |
| Y.Sydykov | adult | 50 | 50 | | 45 | 45 | | 90 | 225 | 3.0 | 100 |
| | young | 25 | 25 | | | | | | | | |
| **Total** | | **313** | **257** | **56** | **177** | **143** | **36** | **69** | **756** | **2.9** | **101** |

[1]TSh=Tian-Shan breed; [2]LC=Local coarse wool

For households at the "Min-Bulak" site, sheep production is a secondary activity – families produce sheep mainly to satisfy their own need for lamb meat. This is why they keep crossbred semi-fine wool and indigenous coarse wool (non fat-tail) sheep. The lambing rate is with 48 lambs per 100 ewes very low (Table 13). The harvested wool can be described as crossbred semi-fine wool, with a fiber length of 7-8 cm, fineness of 56 and 58$^{th}$ quality standard (Soviet fiber classification system), and a low fiber density. Farmers do not sell wool but use it locally to produce coarse felt products such as nomad's tent (yurta) and traditional rugs (shyrdaks).

**Table 13.** Assessment of phenotypic characteristics of sheep and identification of sheep breeds in Min-Bulak village

| Farmer | Total sheep flock | Including | | Obtained lambs | | Harvested wool, kg | |
|---|---|---|---|---|---|---|---|
| | | TSh | LC | Total | Per 100 ewes | Total | per ewe |
| A. Musaev | 30 | 10 | 20 | 18 | 60 | 25 | 2.5 |
| O. Ismadiyarov | 20 | 17 | 3 | 8 | 40 | 46 | 2.7 |
| S. Musaev | 30 | 28 | 2 | 9 | 30 | 69 | 2.5 |
| Zh. Samakov | 30 | 21 | 9 | 17 | 57 | 53 | 2.5 |
| E. Musaev | 65 | 60 | 5 | 32 | 49 | 160 | 2.7 |
| T. Asenov | 25 | 19 | 6 | 12 | 48 | 44 | 2.3 |
| **Total** | **200** | **155** | **45** | **96** | **48** | **397** | **2.6** |

The project activities, which are focused on processing wool into felted products for export, contributed to an increase in the price of quality wool at the pilot sites: the prices increased 1.5-2 times. In addition, farmers became more interested in breeding and improvements of wool quality. Four rams of the Tian-Shan breed were procured to homogenize the flocks and target sheep wool improvement. These rams will be used during the mating season in November 2011 in the flocks of the farmers at "Lakhol" and "Min-Bulak" sites.

The project team also works with Merino sheep breeders who produce fine, white wool highly demanded by felting groups. This includes the «Sabaaji» farm in the Kochkor district which is typical in terms of flock structure and produces fine Merino wool. The team classified 142 yearling ewes at the farm and confirmed that the animals correspond to requirements of Kyrgyz fine-wool breed.

About 56% of ewes whose fleece density was manually assessed had "dense" or "very dense" fleeces. Assessment of fiber length of young ewes showed the following distribution: 13.5 cm – 23 ewes (16.2%), 12 cm – 32 ewes (22.5%), 10 cm – 29 ewes (20.4%), 9.5 cm – 40 ewes (28.3%) and 9 cm – 18 ewes (12.6%). Assessment of fiber fineness showed that 109 ewes (77%) had wool of the 60$^{th}$ quality standard (23.1-25 micron) and 33 ewes (23%) had wool of 64$^{th}$ quality standard (20.6-23 micron). Regarding fleece color, 81 ewes (57.1%) had light cream color, 33 ewes (23.2%) white color and 28 ewes (19.7%) cream color.

Thus, the physical and technical characteristics of wool produced on the registered farm "Sabaaji" correspond to requirements for the fine Merino wool. That is why the project procured 100 kg of sorted, fine Merino wool from farmer U. Abdurasulov and distributed it to artisans in Lakhol site (40 kg) and Min-Bulak (60 kg). Both fine Merino wool and crossbred wool samples from the flock were collected for analyses using OFDA 2000 equipment. In April 2011 the project team conducted training for 6 farmers at the "Min-Bulak" site on basic principles of sheep breeding using theoretical explanation and practical demonstration.

## 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

### 4.2.1 Enhancing project sustainability through institutional development of the pilot groups.

Since the project implementation started in Kyrgyzstan, «CACSARC-kg» Public Foundation has worked on the formation of four pilot groups in Naryn oblast, trained them in new felting techniques, design and marketing, and promoted their products on regional and international markets. In November 2010 «CACSARC-kg» organized training for pilot group leaders and activists in Bishkek. During the meeting the groups discussed their strengths and weaknesses, opportunities and risks, and ways of enhancing the groups' institutional development in 2011.

During the meeting, the groups identified the following weaknesses:

- absence of premises suitable for felting (3 out of 4 groups did not have permanent working premises);
- absence of special equipment for felting (felting table etc.);
- poor knowledge of design;
- absence of regular channels for selling;
- absence of advertising;
- remote location and isolation from communication channels;
- seasonal occupation of women in agricultural work which is the major source of income in villages.

The project team worked with the pilot groups to address these shortcomings in 2011. At the beginning of 2011 only one group ("Ak-Bairak", At-Bashy village, At-Bashy rayon) had its own premises for felting, the other three groups worked at the house of their group leader or rented rooms for trainings at local schools. In the first half of 2011, all groups obtained or rented premises. The "Cheber Koldor" pilot group (Acha Kaindy village, At-Bashy rayon) obtained two rooms with a total area of 40 square meters from the local administration. The rooms were provided temporarily free of charge. "Uz-Nur-Aiym" pilot group (Min-Bulak village, Naryn rayon) rented 4 rooms with a total area of 100 square meters for 500 Kyrgyz som per month (about $12). Lakhol village pilot group in Naryn rayon rented a small house with 2 rooms with a total area of 25 square meters for 500 Kyrgyz som per month ($12).

CACSARC-kg together with the ICARDA/IFAD project helped the groups organize and equip their premises and supplied them with felting tables. At-Bashy and Acha-Kaindy groups received 4 tables each (because these groups produce 2 m long scarves); Lakhol and Min-Bulak groups were given 2 tables each, which is sufficient for producing chair-mats and slippers. The premises were also supplied with wallboards for advertisements, methodical materials, drawings and charts.

Considering that the artisans had difficulties finding certain types of quality raw materials (natural silk, dyes, high quality wool tops for scarves), small quantities of these raw materials were purchased for the pilot groups using proceeds from selling their products in the USA in 2010. The artisans received Turkish dyes chosen according to color scheme recommended by Dr. Liba Brent (enough to dye about 6 – 7 kg of the wool); the At-Bashy and Acha-Kaindy groups that work with merino wool received silk and wool tops for scarves.

Under the guidance of the project team, the groups are starting to specialize in producing a specific assortment of products with a good marketing potential. The At-Bashy and Acha-Kaindy groups work with merino wool to produce a wider assortment of products including chair-mats, pillows, slippers and scarves. The Min-Bulak and Lahol groups work with cross-bred wool and produce chair-mats and slippers. Individual group members are also starting to focus on specific types of products and some women are taking leadership in product development and design. For example, in At-Bashy rayon there are two talented young women, Tologon Kyzy Meerim, a teacher with higher education (At-Bashy village) and Umut Malikova, a 4th year student of design (Acha-Kaindy). Both women have good artistic skills and understand the basics of design and color combinations. They excel in designer work and development of product samples and provide consultations to other artisans in their group. Each group has a person responsible for dyeing and specialists trained to work on wool-carding and felting machines.

Due to the support of the ICARDA/IFAD project and their own initiative, all four pilot groups currently acquired or rented premises for felt production. Four groups received felting machines and two groups received wool-carding machines through the project. All groups were provided with worktables, various tools for felting, raw materials (wool, dyes and silk) and methodical and visual aids corresponding to the assortment of their products. The artisans are gaining skills in developing new product samples that can compete on local and international markets. Search for new markets and development of a marketing plan for each group is a topical problem that requires urgent analysis and solutions in order to stimulate the development of craft business in the Naryn area.

### 4.2.2 Improvement of products produced by pilot groups.

#### *4.2.2.1 Purchase of quality product samples for pilot groups*

In order to succeed in marketing their products, the pilot groups have to be trained in making products that distinguish themselves from other felt handicrafts in terms of quality and design. Given that the groups are very isolated and far away from urban centers where new designs are being developed, the project team helps them with innovative designs, technologies and quality product samples. The groups were given samples of products made by well-known local artisans to expand their sample database and inspire them to develop new ideas for improving their own products. These included samples of marketable felt products (scarves, pillows) purchased from leading designers including Aidai Asangulova, Kamala Abdykadyrova and Anara Chakaeva. The groups will work on making products of comparable quality.

***Samples of scarves for pilot groups produced by Kamala Abdykadyrova.***

The project team also supplied the groups with unique design patterns and trained them in producing original, marketable products such as two-sided ala-kiyiz chair-mats in contemporary design. No other artisan group in Kyrgyzstan produces these types of products, which gives the pilot groups a competitive edge. The attention these products receive on the local market is a great source pride and encouragement for the groups that promotes their ambition to further improve their craftsmanship and product assortment. The project team plans to test-market these new products in the USA in winter 2011.

Another product the groups focus on are felt slippers that can have a good marketing potential locally and internationally if the design is improved. In order to improve the quality of felt slippers the groups produced in 2010, Liba Brent brought them a sample of Danish felt slippers that are marketed by the "Orvis" company in the USA. With the help of CACSARC-kg, the artisans started working on developing a shoe form that could be used to make similar types of slippers. As explained later in the report, the artisans achieved a considerable progress in producing a new form of slippers inspired by the Danish model. Producing this new, improved model of felt footwear allowed the groups to

overtake many experienced felting groups that have been producing and selling felt slippers in Kyrgyzstan and abroad for a long time.

#### *4.2.2.2 Trainings on improving product quality and fulfilling requirements of export orders*

The project organized several trainings for the groups focused on producing selected felt handicrafts (seat mats, scarves and slippers) that are expected to find good markets locally and internationally. The groups concentrate on producing specific types of products that allow them to best utilize their raw materials and skills. They were trained to pay close attention to all product details, especially common requirements of export orders.

***Training in At-Bashy village, April 25-27, 2011***

The At-Bashy group was trained in making chain-mat seats as samples of export products. The trainer was Kenjekan Toktosunova. During the training, the participants produced two-sided ala-kiyiz chair-mats based on designs chosen by the trainer, while taking into consideration the following export requirements: quality of raw materials, size, weight, design, color combinations and quality of work.

***Training participants in At-Bashy village.***

Each participant produced a set of chair-mats and the trainer checked all quality parameters. Trainer Kenjekan Toktosunova is well experienced in producing products according to order and explained in

detail all preparatory steps for implementing an export order. In particular: specific weight of wool for each sample (all chairs in a set must have the same weight); preparation of templates; transformation of templates into design patterns, etc.

During the training the artisans worked in groups and at the end of each day they discussed their work. Each group assessed the products of other groups, made their comments and worked with the trainer to correct mistakes and achieve the required results.

***Training in Acha-Kaindy, April 25-27, 2011***
The "Cheber Koldor" group was trained to make silk and felt scarves as samples for export production. The trainer was Elvira Abdyldaeva, a young designer from the Studio of Tatiana Vorotnikova who is an internationally known designer. Silk and dyes were brought from Bishkek.

***The trainer shows samples of scarves for export designed by the T. Vorotnikova Studio.***

***Trainer Elvira Abdyldaeva helps artisans design scarves.***

The artisans learned a silk dyeing technique, and then they made pre-felt from merino wool and designed templates for scarf ornaments. The trainer explained the main requirements regarding raw materials, design and quality of scarves made from silk and felt. She emphasized the usage of quality of wool and the correct application of wet felting technique to ensure that the ornaments felted into the silk do not come off – which is a common problem if felting is not done properly.

***Trainings on product quality at Acha-Kaindy village.***

The scarves made during the training featured nice color combinations and quality workmanship. The price for such scarves in Bishkek and at the regional markets is 900-1000 KGSoms ($20-22), but at the local market in Naryn oblast the maximum price is 700 KGSoms ($15.50). The project will assist the artisans to sell the best scarves on the regional and international market.

***Scarves produced at the training in Acha-Kaindy village.***

***Training in Min-Bulak village, 14-16 May, 2011***

Similar to At-Bashy, the Min-Bulak group was trained in making two-sided ala-kiyiz chair-mats as samples for export. The trainer was Kenjekan Toktosunova. The group previously produced only stitched felt chair mats with traditional ornaments and the production of ala-kiyiz chair mats with non-Kyrgyz ornaments was new to them.

The group used their own, quality crossbred wool which was dyed during previous training and carded on a wool carding machine in At-Bashy. The training module was similar to the training in At-Bashy – the trainer explained what are the requirements for export products and how to make samples according to specific parameters. The groups discussed and compared the samples produced, assessed their shortcomings and how to improve the samples to meet the export requirements.

***Training in Min-Bulak village.***

The group achieved very good results. Their chair-mats were distinguished for a nice design and quality craftsmanship.
General conclusions and recommendations of the trainings:

- The artisans in all groups are well organized and motivated to succeed.
- Common weaknesses were: development of design and choice of color combinations.
- For scarves it is necessary to use twice-cleaned wool or tops; for chair mats it is possible to use one-time cleaned merino and crossbred wool.

#### *4.2.2.3 Training on wool processing and felting using wool carding and felting machines in Lakhol village, 26-28 June, 2011*

In 2010, the artisans of the Lahol village group mastered the production of chair-mats that meet export requirements. Artisans Gulmira Usupbaeva, Mairamkul Usubalieva and her daughter Cholpon can fill any order for chair-mats quickly and according to quality standards.

***Mairamkul Usubalieva and her daughter Cholpon, leading artisans of the Lakhol group.***

Given that the Lakhol group works with crossbred wool, it decided that chair mats and slippers would be their priority production.

The group received from the project a wool-carding machine and a felting machine in autumn 2010. They installed the machines on their premises in spring 2010 but have not started using them. The project decided to conduct a training on launching, operating and maintaining the machines for a group of women and men in Lahol village.

The trainer was Kulbar Toksombaeva, an artisan from Kyzyl-Tuu village, Issyk-Kul oblast of Kyrgyzstan, who is highly experienced in processing wool on a carding machine and making felt on a felting machine. She was assisted by her husband Sapar Ismailov who is the constructor and producer of felting machines, including the felting machines produced for the project groups.

The training was attended by 10 participants. On the first day of the training they disassembled the carding machine, cleaned and lubricated its parts, then re-assembled and adjusted it. The participants learned how to assemble, disassemble, adjust and regulate the machine. Ilimbek wished to undertake the responsibility for the technical maintenance of the machine.

***Training in using a wool carding machine in Lakhol village.***

On the second day the participants learned how to card wool using the wool carding machine. They processed 20 kg of raw wool which yielded 12 kg of clean wool after scouring and carding. The

capacity of the carding machine is 100 kg per day. This opens good opportunities for artisans of the Lahol group to develop a new business based on providing wool carding services to other artisans in the area. The artisans themselves were greatly impressed by the capacity of the machine and the high quality of wool carding. The only concern is the proper usage and maintenance of the machine. The participants received detailed instructions and consultations regarding its operation and maintenance.

***Practical training in wool carding in Lahol village.***

On the third day of the training the trainer demonstrated the work of the felting machine using the carded wool. The participants learned how to use the felting machine and felted 2 layers of felt.

***Preparation of wool for machine felting.***

Recommendations of the trainer:

- To observe strictly all the parameters of the wool put into the carding machine – the wool must be thoroughly washed and dried;

- To lubricate the machine regularly;
- To periodically adjust and regulate the wool carding machine;
- To use only three-phase electricity.

The most serious concern is that the carding machine is currently located in the same room as the felting machine. Operating the felting machine causes vibration which takes the carding machine out of alignment. In addition, hot water used for felting increases humidity on the premises which is bad for the parts of the carding machine. The group will be required to find a new location for the carding machine to keep it in good condition.

#### *4.2.2.4 Contest among the artisans for the best product sample*

According to the project work plan, a contest for the best chair-mat set was announced in May 2011 to promote creative competition among artisans of the pilot groups. All artisans were invited to participate in the contest individually. The jury will evaluate the products in early September and the evaluation will have two phases. During the first phase the best chair-mat set will be chosen in each group, taking to consideration the design, quality of wool, quality of felting technique etc. Producer of the best chair mat set in each group will be awarded a prize of 100 USD. During the second phase the jury will chose the winner – producer of the best product among the four winners in their corresponding groups. In addition to the prize of 100 USD, the winner will be invited to participate in the Central Asian Crafts Fair in Almaty, Kazakhstan in November. The winner's trip to Almaty will be partially funded from the proceeds from sales of felt products in the USA in 2010.

#### *4.2.2.5 Fellowship for leading artisans in the studios of leading designers*

Twelve group leaders and successful artisans who demonstrated good understanding and creativity during the trainings were offered a fellowship in the studios of successful designers in Bishkek. The purpose of the fellowship was to provide the artisans with the opportunity for an in-depth practical study and to improve their professional skills and know-how acquired during the trainings. Upon consultation with Dr. Liba Brent, felt slippers and felt scarves were chosen as the main theme of the fellowship training.

The project invited a designer Olga Potapenko, who graduated from the Leningrad Technological Institute, faculty of footwear design and technology, to lead the fellowship program focused on slipper production. She prepared in advance sample forms for different sizes of slippers based on the Danish model recommended by Dr. Liba Brent.

***Sample of Danish felt slippers used a model to develop a new slipper prototype.***

The fellowship participants had received training in hollow-shape felting of slippers in 2010. Regretfully, slippers produced during the training were based on existing models and had defects typical for these kinds of products in Kyrgyzstan: they did not have a well-shaped foot form and looked like shapeless galoshes. The fellowship program tried to remedy this deficiency and produce an improved model of slippers in two techniques: stitched felt slippers (trainer Olga Potapenko) and hollow-shape felting technique (trainers Shauhat Rahvatulin and Kenjekan Toktosunova).

***Production of slippers in hollow-shape felting technique.***

The plastic boot forms available for making the hollow-shape slippers (vis photo below) were grinded to approximate the Danish slipper form and then used to felt the new slippers. Natural leather materials were used for soles. The artisans worked with great inspiration because they understood that they created a new and unique model of comfortable and aesthetically looking slippers and became pioneers in this field of production in Kyrgyzstan. In the course of the process it was necessary to grind the plastic boot forms many times and it was a test for them to meet the standard.

***Developing a new model of felt slippers based on a Danish sample.***

***Developing a new model of felt slippers based on a Danish sample.***

The artisans worked in groups. Two groups produced hollow-shape felted slippers, and the other two groups mastered the stitched technique. Together they produced 15 pairs of slippers. Out of those, 2 pairs (stitched and felted) were taken by each group as samples, and 7 pairs were purchased (using proceeds from product sales in the USA) for a marketing experiment.

***Samples of slippers produced during the fellowship training in Bishkek.***

Two artisans Tologon Kyzy Meerim (At-Bashy village) and Umut Malikova (Acha-Kaindy village) received fellowship training on improving the scarf felting technique conducted by a designer Kamala Abdykadyrova.

***Meerim and Umut making a felt scarf.***

They worked with wool tops and produced two felt scarves of a new design under the supervision of designer Kamala Abdykadyrova.

***Scarves made during the fellowship training.***

During their work in the studio of Kamala Abdykadyrova the women mastered the basics of design and color combinations and learned how to choose wool for scarf production.

On the last day of the fellowship, 4 artisans (one from each group) participated in a seminar on

packaging design and techniques conducted by Saori Nakatani, a Japanese designer of packaging and a volunteer at CACSARC-kg. The other participants continued making slippers, and at the end discussed and analyzed the merits and shortcomings of each pair of slippers. Each participant evaluated her own work. Seven pairs of slippers were selected for a marketing experiment and the remaining slippers were taken by the artisans as samples for their future work.

The main results of the fellowship training included:

- The artisans considerably updated and improved their knowledge and skills in the production of felt slippers in both stitching and hollow-shape felting techniques;
- The artisans understood the real importance of product characteristics such as: design, shape, quality of wool and quality of work;
- The artisans learned to critique their own products, to find defects and to correct them by themselves;
- Two artisans from At-Bashy rayon improved their knowledge of designing felt scarves.

***Group photo of artisans at the training.***

### *4.2.2.6 Monitoring the improvement of products made by the pilot groups*

Dr. Liba Brent and project manager Svetlana Balalaeva conducted monitoring of all four pilot groups on-site in May 2011. They examined the work premises and operation of the equipment in each group. The mission focused on assessing the quality of wool processing and the assortment, design and quality of products. Dr Liba Brent conducted consultations on these issues in each group and showed samples, visual aids, schemes, patterns and photos.

The process was conducted in an interactive mode; Dr Liba Brent and Svetlana Balalaeva answered many questions of the artisans that showed they understood the importance of creating quality products and were highly motivated to succeed in developing successful small businesses. Dr. Liba Brent made comments concerning the assortment and quality of products and provided consultations.

***Consultations on color combinations***

Dr. Liba Brent brought and distributed among the groups color schemes which are popular with interior designers in the Western countries. She examined the dyed wool the groups had and gave recommendations concerning the use of colors for specific types of products. Some colors were deemed undesirable for any kind of product. The groups were given a catalogue of Turkish dyes

«Victoria» and certain colors were recommended to them for dyeing wool. Later the groups were supplied with these dyes.

***Chair mats produced in Lakhol village.***

***Discussing color combinations in Lakhol village.***

### *Consultations on design*

Dr. Liba Brent examined products (chair mats, scarves) of all groups and noted the effective use of design in most products. She recommended that the artisans develop more creative approaches when using existing patterns to design chair-mats, eliminate very small design elements and use more stylized ornaments. Regarding scarves, two approaches were recommended – classical design with quiet color tones and ornaments such geometrical patterns, flowers, leaves etc., and extraordinary design using mixed colors and abstract patterns.

***Consultations on design in At-Bashi village.***

***Discussing design, felting technique and color in Min-Bulak village.***

***Consultations on the shapes of products***

This consultation focused on the form of felt slippers. The slippers produced by the pilot groups and in Kyrgyzstan in general do not meet design standards of international markets where major footwear companies such as “Keen” and “Acorn” started producing fashionable felt slippers during the last several years. Dr Liba Brent explained in detail the requirements of western consumers vis-à-vis felt footwear, showed photos of felt slippers produced by leading US companies and demonstrated Danish slippers purchased by her as samples. This helped the artisans to understand what they need to improve in order to successfully compete on western markets.

***Discussing felt slipper improvements in Min-Bulak village.***

***Learning about slipper form in Min-Bulak village.***

***Consultations on the quality of raw materials – wool and silk***

The artisans received recommendations on the required quality of wool and the degree of cleaning for different kinds of products. Only thoroughly cleaned, fine merino wool or tops can be used to produce soft scarves that can be sold on export markets. Other problems of felt and silk scarves such as wrinkling were also discussed. As a whole, the mission was very important for further success of the project.

*Felt & silk scarf production in Acha Kaindy village.*

*Dyed wool for felting in Min-Bulak.*

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

### 4.3.1 Test-marketing felt products on the regional market

In the first half of 2011 efforts were made to expand local and regional markets for the products produced by the Naryn artisans. Products of the "Ak-Bairak" artisans were given for sale to a handicrafts shop located in the Centre of Bishkek which was opened with the support of Eurasia Central Asia Fund to support disabled people producing handicrafts. Some products produced by artisans of Naryn oblast were also given for sale in the souvenir shop at the Tourism Centre opened in Balykchy town (Issyk-Kul area) with the support of USAID. The groups also sold some of their

products at the local markets. Prices at the local markets are lower than in Bishkek or at the regional fairs.

The main expectations of the artisans are associated with the International Annual Festival "OIMO" which will be held on 24 July-2 August 2011 in Bishkek and in Cholpon-Ata (recreational centre on lake Issyk-Kul). Representatives of all four pilot groups (eight persons total) are invited to the Festival. There they plan to sell products of their groups at a large Regional Crafts Fair organized within the Festival program.

It should be noted that Kyrgyzstan has the most advanced design schools among the countries of Central Asia. The range of felt products made in Kyrgyzstan is quite wide and the products are of good quality. Especially artisans located in the capital city of Bishkek were able to establish a successful export of felt handicrafts and clothing to Europe, Asia and the USA. This environment fosters a high level of competitiveness among artisan groups. The pilot groups sponsored by the ICARDA/IFAD project and assisted by CACSARC-kg made a considerable progress in producing products that can compete on this market. Especially two types of products developed by the Naryn groups under the guidance of the project – two-sided alakiyiz chair mats and slippers of the improved form – have proven their competitiveness on the local markets and have good prospects to compete on regional and international markets. This proves that even disadvantaged artisan groups – located in remote areas and isolated from markets, information and design centers – can develop into competitive businesses if provided with targeted, focused assistance in product and business development. This assistance in turn depends on the existence of support institutions such as CACSARC-kg that has worked effectively with the artisans since the beginning of the project.

### 4.3.2 Test-marketing felt products in the USA.

In 2010 the project sold felt products for $768 in the USA. The income is being used to support the pilot groups. Some products made in 2010 are still in the US and will be test-marketed together with the 2011 products in winter 2011-2012. During her visit to the pilot groups Dr. Liba Brent selected samples of chair-mat sets, scarves and slippers for test-marketing in 2011-2012. The results will be reviewed in the next report.

The project team analyzed the results of product test marketing in the USA in 2010, and made relevant corrections in terms of assortment, design, color shape and size of products. These corrections were reflected in trainings of pilot groups conducted in 2011.

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

The artisan groups' product sales have been increasing as a result of the trainings and consequent improvements in product quality, and the group leaders have been collecting data on earnings from handicraft sales. The project will present the income data at the end 2011, and begin interviewing the artisans about the effects of their work and earnings on their livelihoods.

## 4.5 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 began developing multiple new linkages between artisans of the pilot groups in the Naryn region and Kyrgyz designers, and buyers of handicraft products.

1. It linked the Naryn artisans with professional Kyrgyz designers who provided consultations and conducted trainings on developing high-quality new products.

2. It linked women processors with constructors and suppliers of quality equipment for wool processing and felting; the project helped the women obtain wool processing and felting equipment and learn how to use it.
3. It linked women artisans with buyers from the UK, namely the Collins Gallery under the University of Strathclyde in Glasgow, whose representatives visited At-Bashy rayon in March 2011 and placed an order with the "Ak-Bairak" and "Cheber Koldor" groups for felt shyrdaks and other traditional products. Kyrgyz designers will participate in an exhibition-fair at the Collins Gallery in August 2011, organized by CACSARC-kg. The groups are currently working on fulfilling this order.
4. It linked women artisans with leaders and specialists of the ICARDA/IFAD Project "Improving Livelihoods of Smallholders and Rural Women through Value-Added Processing and Export of Cashmere, Wool and Mohair"», who visited the Project pilot groups in Kyrgyzstan in April-May 2011.
5. It linked the pilot groups of At-Bashy rayon with scientists and ethnographers from the Russian Ethnographic Museum (St. Petersburg) who visited At-Bashy and Acha-Kaindy villages during their ethnographic expedition in Kyrgyzstan.
6. It promotes linkages between the Naryn women felters and buyers of felt handicrafts on the local, regional and American markets, with a focus on developing markets for the new products such as the newly designed felt slippers, chair mats, scarves and pillows.

***ICARDA team visiting Min-Bulak village.***

***ICARDA team visiting Acha-Kaindy village.***

# 5 Project Activities in Iran

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

### 5.1.1 Baseline study and establishing a database on fiber quality at the pilot site

Characteristics of the nomadic production system from the baseline survey were presented in the last progress report. The data are being further analyzed to be presented as a journal paper.

***Nomad guide, Mr. Hamid Mousapor with a quality cashmere buck from Mr. Sohrab Mousapour's nucleus flock, May 2011***

***Typical landscape, in which cashmere goats are grazed, in this case Dadmuhammad's flock, May 2011***

***Nomad woman helping to direct the goats into the pen, Sohrab Mousapour's flock, May 2011.***

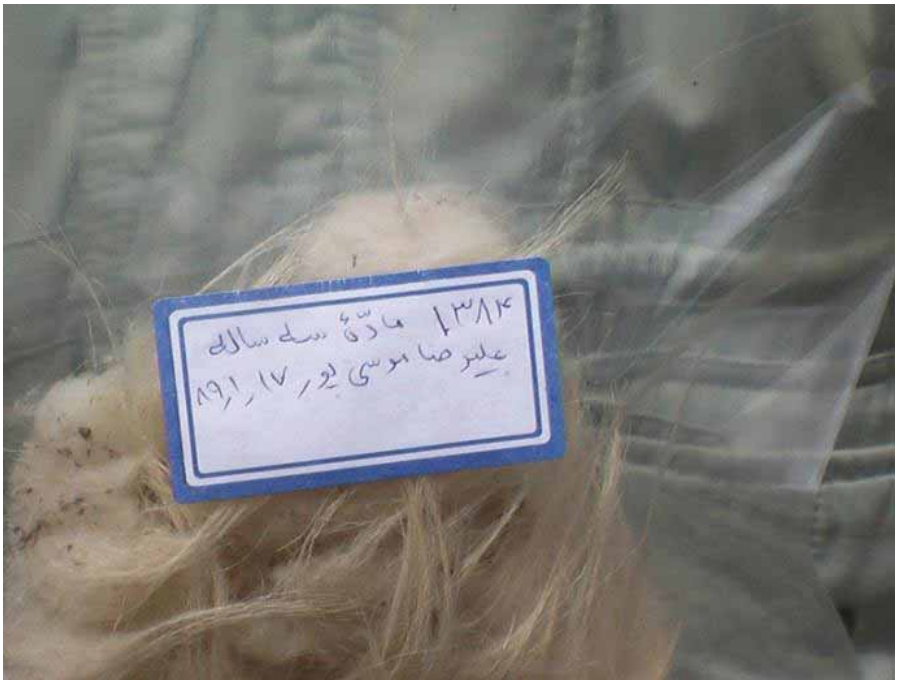
***A typical Raeini cashmere goat flock owned by Ebadullah Mousapour kept inside a fenced pen, June 2011***

The laboratory and statistical analysis of the cashmere samples collected in April 2010 as part of the baseline studies was completed. The purpose of the baseline sampling was to establish a database on fiber quality as the basis for developing appropriate strategies for breeding, marketing and yarn making. The analysis showed that Raeini cashmere is mostly white, has an excellent staple length and fibre curvature but is relatively coarser than Chinese and Mongolian cashmere. The overall means and

standard deviations were for fleece weights 507±183 g, cashmere yield 56.5±12.2%, mean fiber diameter 19.7±1.5 µm, fiber diameter standard deviation 4.5±0.6 µm, fiber curvature 62.9±8.5 ˚/mm and staple length (SL) 54.2±7.0 mm, respectively. Flock effect was significant for all traits except for staple length indicating the potential to improve cashmere quality and the need for adopting proper management and selection methods. Detailed results are presented in a paper that was submitted to Small Ruminant Research which has been accepted for publication. They will also be presented as a poster at the Tropentag in Bonn in October 2011

In order to estimate the year effect on cashmere quality, cashmere sampling was repeated in 2011 with a smaller number of animals. The same animals as in the baseline sampling in 2010 were sampled in the eight nucleus breeding flocks repeating the same sampling scheme, i.e. 4 animals of each sex (male and female) and age class (1, 2, 3 and 4 years) per flock. In each flock 4 male and 4 female animals representing the young age class were added; in total 256 samples were taken.

***Mid side fleece samples taken in Mr. Alireza Mousapour's flock during the repetition of the baseline sampling, April 2011.***



***Labelled fleece sample to be sent to Alrun fibre Laboratory in Almaty***

***Conclusions from the baseline studies (survey and cashmere quality database):***
Nomad farmers are not organized and rely on their individual experience and knowledge. Even though they have not received much assistance from extension specialists, they have been able to keep the Raeini goat breed as pure as possible due to their good management knowledge. Their efforts have resulted in hardy, white goats with a good body size, good cashmere producing ability and reproduction characteristics. The Raeini cashmere can be characterized as long and highly curved. However, to capture higher prices on international markets the fibre diameter has to be reduced. Significant differences were found between goats and between flocks indicating the potential to improve cashmere quality by adopting proper selection and management methods. This may be achieved through selection of goats with finer cashmere taking care of maintaining the excellent cashmere staple length and curvature. 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. Furthermore, nomad producers do not comb their goats to harvest shed fibres, instead they shear 1-2 months after onset of shedding. Results from previous studies indicate that 30% of cashmere is lost during shedding season and thus wasted. Introducing combing would increase the weight and commercial value of cashmere.

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. There are no cooperatives operating on the basis of either state or private farms. The nomad producers and small-scale domestic traders are not aware of world market prices for different cashmere quality classes. This means that the breeding program should be supported by creating new market linkages with traders or the newly established factory in Semnan and Mashad (see component 3).

Nomad families using cheap family labour are well positioned to producing quality goats and cashmere. All family members are involved in raising goats, men do the hard jobs like shepherding, shearing and feeding the goats and women are involved in milking and processing.

However, there are also government policies that affect the family income and the level of cashmere production including the right to use the rangelands for grazing goats and development of extension services. Farmers' decision in cashmere production will be affected by government support to local

nomad cashmere producers, goat farmers and local processors and exporters' organizations will have a pivotal role in supporting such activities and stimulates producers' interest in cashmere production.

Although nomad farmers still have cheap access to rangeland and benefit from free labour, which makes goat farming profitable, below mentioned obstacles need to be resolved in order to develop a sustainable cashmere production:

1. The government needs to develop range management policies. Long-term objectives of nomad goat farming system should be developed. Government policies are geared toward smallholder farming systems and sedentarisation of nomads in small cities, while nomads tend to continue present nomadic farming system in which flock mobility between and within provinces is a major component.
2. A reasonable balance of market pricing should be maintained between cashmere and other goat products such as meat. Presently a kilogram of boneless meat is sold at US$15.00 while a kilogram of raw cashmere is sold at a price of US$25.00. A Raeini goat produces 11-13 kilograms of carcass while only producing 600 grams of raw cashmere. Therefore a Raeini goat farmer earns US$165.00 for producing meat while only earning US$15.00 for producing cashmere/goat/year.
3. There are no clear and transparent marketing systems. In such systems dealers and merchants benefit most and the cashmere producers benefit least.
4. Lack of good extension and training services. Countries with developed cashmere production such as China provide good extension services and marketing support to producers.

## 5.1.2 Improving breeding and animal husbandry practices focusing on fiber quality

### *5.1.2.1 Developing the Baft Raeini goat breeding program*

The survey undertaken in Baft during October 2009 helped to understand the nomad Raeini goat production system and the fiber quality analyses of samples taken in April 2010 helped to identify strengths and weaknesses of Baft cashmere. Given that fine, long and highly curved cashmere is highly valued on the world market (finer, curved and longer cashmere is sold at price 2-3 times higher than coarse, short and less curved cashmere), there is a need to decrease the fiber diameter in Raeini cashmere while maintaining the cashmere staple length and curvature.

In order to produce cashmere fiber suitable for small scale processing and/or for fetching higher prices in the regular market it became apparent that an appropriate breeding program was necessary. The governmental breeding station in the region has been distributing bucks sporadically. The bucks were selected for high body weight and fleece weight but not for fiber quality. A regular participatory breeding program has never been implemented. Therefore its design and implementation resulted in a major challenge. A target nomad farmer population and their goats were identified and an initial breeding design was proposed and comprehensively discussed with regional officials and professionals and eventually also with farmers and shepherds. The system was based on the flocks run jointly by the extended nomad families. A total of 8 such flocks started the program. In each flock a nucleus with the 40 best females and 2 best males was established in April/May 2010. Initially it was proposed to use one buck from the breeding station but farmers preferred to select both nucleus bucks amongst their own. It was planned to progeny test these bucks in order to replace the inferior one with a new candidate (Figure 1).

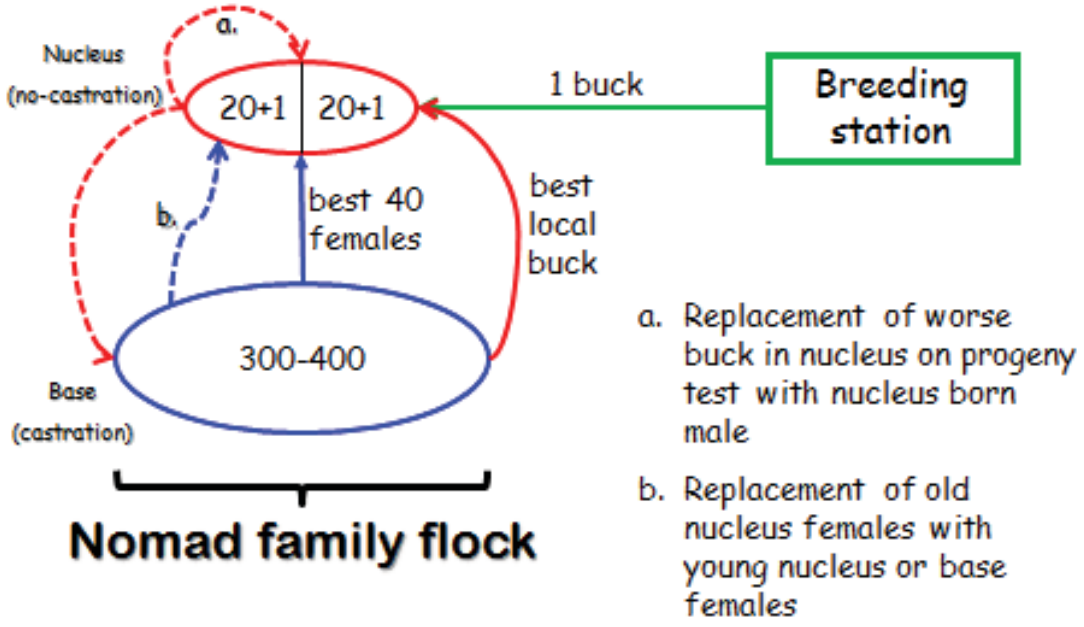



**Figure 1.** Initially proposed breeding system for each of eight nomad extended family flocks.

The establishment of a nucleus in each flock required two mating groups. Again, several options were discussed and eventually 5 nomads preferred pen mating and 3 preferred separate grazing during mating. Some fencing inputs and feed were supplied by the project.
In April/May 2010 nucleus foundation animals were selected and in June/July first mating took place. In order to identify the progeny from each buck, assigned females were painted in blue or red.

***One part of Dadmuhammad Mousapur's nucleus females marked with blue color for mating with a superior buck, May 2011.***

First nucleus progeny was born in November/December. Full genealogy was recorded. In January/February 2011 fleece samples were taken from male candidates and tested in the Bariloche

Fiber Laboratory (Argentina). In April/May 2011 bucks for the second mating in the nucleus were selected on an index calculated as the sum of the standardized deviations of cashmere yield and cashmere fiber diameter from age group means. Bucks with top indices were visually inspected by the farmer who chose the best for mating in June/July 2011.

The breeding program in the 8 flocks is well established. The challenge is to progressively make it self-sustainable. For this to happen genetic progress must be high and extra costs must be kept low. For example it will be necessary to further discuss and adjust the breeding objective by considering all traits of interest to the farmer (meat and fiber quantity and quality) and by setting the right emphasis on each trait including adaptation to the environment (longevity, health, easy care). In order to make the program cheap, fiber analyses and recording must be minimized. For this a simplified system is proposed for the future. In this system only top male progeny in the nucleus requires fleece analyses (Figure 2).

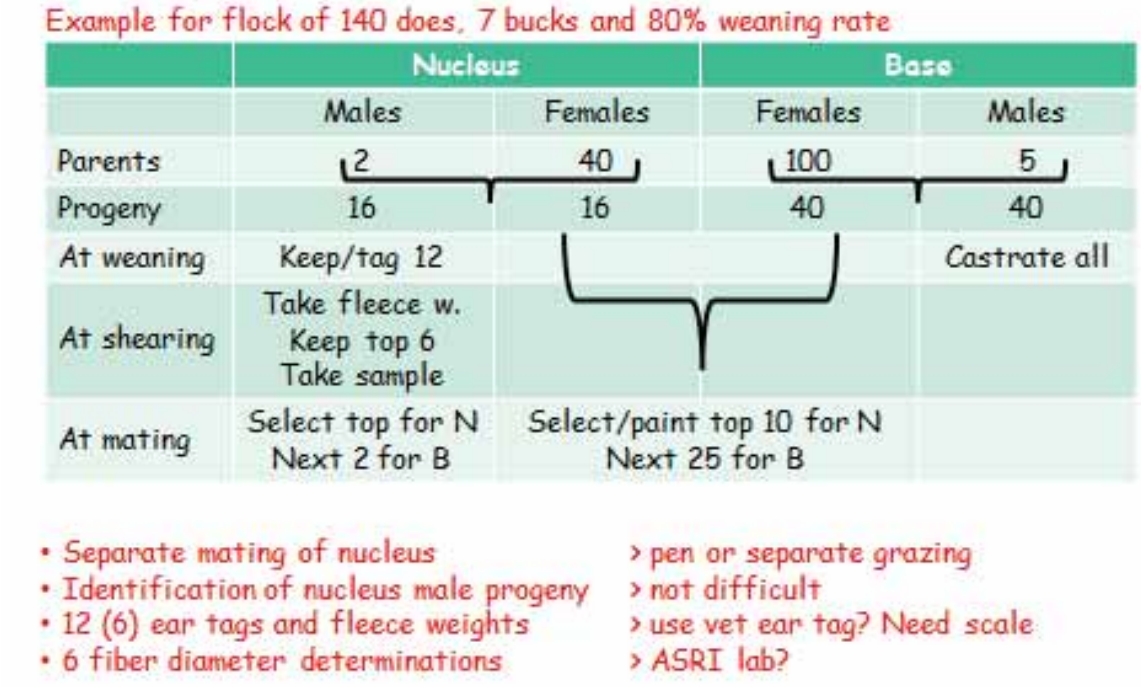



**Figure 2.** Simplified selection system for each of eight nomad extended family flocks

In the long run we expect a largely self-sustained improved buck supply system for nomad flocks with higher fleece weights and lower cashmere fiber diameter in nucleus and base flocks. We also expect nomad farmers to be sensitive to further genetic improvement proposals and other project interventions. Clearly the formation of these nucleus schemes is a useful "rehearsal“ for genetic improvement programs, and an opportunity to train operators, consolidate breed or strain genotypes while achieving genetic progress in the desired traits.

### *5.1.2.2 Implementation of the breeding program during the reporting period*

The first offspring from the nucleus females was born in November/December 2010. The national project team visited the nomad farmers in the winter grazing area in Hormozgan province near the Persian gulf to ensure proper recording of birth dates and birth weights by the herders in December 2010 and March 2011. Recording of the pedigree and ear-tagging of the progeny was completed when the nomad flocks had returned to Baft region. Body weights were measured at birth by the farmers.

***Alireza Mousapour holding a kid after ear-tagging in April, 2011***

To identify superior bucks for the nucleus flocks for the mating season in 2011, fleece samples from ten adult and ten young males from each flock were taken in the eight breeding flocks at the winter grazing site beginning December 2010. The sampling included the bucks that had served the nucleus females in 2010. The samples were sent to Almaty fibre lab for analysis and the results on fiber diameter and cashmere percentage were used to build an index to select the best three adult and three young bucks in each flock.

***Mid side fleece samples taken from bucks for selection of nucleus bucks in January 2011.***

The project team including Joaquin Mueller and Barbara Rischkowsky then visited each flock from 4-5 May 2011. Jointly with the owner and other family members, the pre-selected bucks were examined

and the best young and adult buck were selected based on body size, conformation and the owners' preference (note the structure of the nucleus flocks in Table 14).

***National Project Team, Dr. Barbara Rischkowsky and the farmers during the selection of the nucleus bucks, May 2011.***

***National Project Team and Dr. Joaquin Mueller during the selection of the nucleus bucks,May 2011.***

***Bucks with colored ears or body were not selected for breeding purposes, May 2011.***

**Table 14.** Does and bucks used in the nucleus flocks in 2010 and pre-selected bucks in 2011

| **Name of Farmer** | **Ear tag numbers of does and bucks** | | | |
|---|---|---|---|---|
| | | **Does in the nucleus flocks** | **Bucks used in 2010** | **Pre-selected bucks for 2011 mating*.** |
| Mehrab Ghassemi | Green | 1665-1669 | 1693 | 1337 |
| | | 1671-1680 | | 1335 |
| | | 1682-1686 | | 1336 |
| | Red | 1643-1650 | 1692 | 1394 |
| | | 1652-1659 | | 1393 |
| | | 1661-1664 | | 1396 |
| Mahmud Ghassemi | Green | 1241-1260 | 1777 | 1304 |
| | | | | 1308 |
| | | | | 1306 |
| | Red | 1221-1240 | 1778 | 1312 |
| | | | | 1317 |
| | | | | 1314 |
| Mohammad Mousapour (Namdar) | Green | 1621-1640 | 1642 | 1324 |
| | | | | 1327 |
| | | | | 1328 |
| | Red | 1601-1620 | 1641 | 1332 |
| | | | | 1248 |
| | | | | 1331 |
| Ebadullah Mousapour | Green | 1711-1730 | 1597 | 1360 |
| | | | | 1367 |
| | | | | 1363 |
| | Red | 1688-1700-1710 | 1689 | 1104 |
| | | | | 1358 |
| | | | | 1357 |

| Name of Farmer | Ear tag numbers of does and bucks | | | |
|---|---|---|---|---|
| | Does in the nucleus flocks | | Bucks used in 2010 | Pre-selected bucks for 2011 mating*. |
| Dad Mohammad Mousapour | Green | 1751-1770 | 1772 | 1349 |
| | | | | 1350 |
| | | | | 1352 |
| | Red | 1731-1750 | 1771 | 1341 |
| | | | | 1082 |
| | | | | 1349 |
| Alireza Mousapour (Rostam) | Green | 1781-1800 | 1775 | 1373 |
| | | | | 1370 |
| | | | | 1377 |
| | Red | 1781-1800 | 1774 | 823 |
| | | | | 1363 |
| | | | | 1370 |
| Sohrab Mousapour | Green | 985-995 | 997 | 1382 |
| | | | | 1383 |
| | | | | 1389 |
| | Red | 951-980 | 996 | 1268 |
| | | | | 1265 |
| | | | | 1267 |
| Alireza Mohammad Gholi Mousapour | Green | 1281-1300 | 1780 | 329 |
| | | | | 324 |
| | | | | 326 |
| | Red | 1261-1280 | 1779 | 1006 |
| | | | | 1019 |
| | | | | 332 |

*The buck numbers shaded in grey were selected for the mating season 2011

The forty females for the nucleus in each flock in 2010 had been selected based on visual assessment of fleece quality, body size and conformation. To ensure that these nucleus females are superior to the base population in fiber quality and to evaluate the accuracy of the visual assessment of fiber quality, the fibre quality of does in the nucleus will be compared with those in the base herds. In April 2011 192 samples were taken from females from the base and nucleus populations of each breeding herd.

### 5.1.3 Introducing better cashmere harvesting methods

In total 200 small and 80 larger combs from Afghanistan were distributed to cashmere producers and family members in spring 2010 and 2011. At the same time farmers were trained on how to use these combs.

***Cashmere shedding is very common in Raeini goats at the end of winter and beginning of spring.***

Most nomads did not use the combs for cashmere harvesting in spring 2011 except for a few goat owners that tested the combs for the project. From these famers the project bought some good quality cashmere to be dehaired in a processing factory. It is clear that cashmere harvesting through combing will only become interesting for goat owners if they can achieve a better price for the combed cashmere or if the combed material can be used for value addition by the women.

***Alireza Mousapour is holding a sheared female goat. He also used the long combs to comb some of his goats, May 2011.***

One flock owner from the baseline sample group tested the two types of combs (small and large) more intensively for the project to determine which comb is more efficient and handy to use for the future. He combed female and male animals in different age groups in ten days intervals. Measurements

taken were cashmere weight, combing time, staple length, fibre diameter, percentage of cashmere and hair fibres (detailed results will be presented in the next report).

## 5.2 Component 2: Work on formation and capacity building of women's groups to develop cashmere processing at pilot site

Steps have been taken in collaboration with the Agricultural Department of Baft and the Nomad organization of Agriculture Ministry to organize nomad woman groups with the aim of adding value to cashmere in Baft. Several meetings took place at Agriculture Department in April 2011. This activity faces many challenges:

- Frequent displacement and migration of nomad families within and between provinces of Kerman, Hormozgan and Busher.
- This is the first initiative on value addition to cashmere targeting nomad women.
- Nomads suffer from poor market incentives, and lack of communication with other cashmere producers both within Iran and abroad.

The national project team trained the farmers on the value of cashmere and the benefits from combing in addition to shearing. Those interested in spinning should collect cashmere fleeces from one year old goats and that of fine older goats separately after harvesting and before packaging. The cashmere will then need to undergo a number of processing stages such as skirting, scouring, dehairing, spinning and knitting or weaving. Even though nomad women know how to spin fibres into yarns using traditional spindles, this has been only practiced with wool and not with cashmere.

***Mrs. Keregar from National Project team is discussing yarn making with Mrs. Masoumeh Mousapour in Alireza Mousapours nucleus herd, August 2011.***

***Mrs. Karegar is discussing yarn making with two nomad women in Mehrab Ghassemi's nucleus herd, August 2011.***

Dehairing cashmere also provides a challenge as there is no dehairing system in the area. There are two options for dehairing raw cashmere produced by nomads: organizing a centralized dehairing system by having a contract with Semnan (Pajan) cashmere processing factory to dehair or by providing each Nomad cashmere producing farm unit (composed of 3-5 families) with a small dehairing machine. The project team is presently studying different options for adopting a proper dehairing system that would match well with nomadic system. The next step would be to distribute the dehaired fibre to spinners at the pilot site.

***Traditional method of yarn making using spindles.***

## 5.3 Component 3: Develop sustainable market chains that link fiber producers and processors with buyers

Currently, farmers have limited access to cashmere markets. Preliminary studies by the National Project Team have revealed that Iran exports most of its cashmere in its raw form. With the exception of two factories in Semnan and Mashad cities, no processing of cashmere takes place within Iran. Most of the value of cashmere is therefore captured outside Iran. Two types of cashmere exist in Iran, the more quality shorn cashmere harvested of live animals during spring, and the lower quality skin cashmere harvested of the skin of slaughtered goats. Dealers and local merchants tend to blend the two types together to produce an average product. However it would earn a better price in the international markets if the two types are kept separated.

***Cashmere is sold to traders and stored to be transported later, August 2011***

Local middlemen buy cashmere from nomad farmers in Baft at the farm a price of US$ 25 per kilogram and sell all cashmere to local traders. No quality control is done when the cashmere is purchased from the nomads; it is entirely based on trust. The local traders store the cashmere and transport it to Semnan and Mashad processing factories and elsewhere using trailers.

***Cashmere is transported to Semnan and Mashad to be processed, August 2011.***

At present, little data is available on the marketing of Iranian cashmere. Therefore, the project team has planned a study to characterise the cashmere marketing system in Iran, and to identify the constraints currently limiting value addition to Iranian cashmere. The study will be carried out from September to November 2011 in the main cashmere producing areas namely Kerman, South Khorasan and Razavi Khorasan provinces. Structured questionnaires will be used to interview key actors, namely middlemen, shopkeepers at district and provincial level, main manufacturers and main exporters.

## 5.4 New linkages developed by the project

The Project Team has developed several new cross-national and between countries linkages:

1. It linked nomad woman spinners to the Agriculture and Natural Resources Research Center of Kerman Province.
2. It linked the national project team to scientists in the Animal Science Department of Kerman Bahonar University through presenting and discussing a paper on Raeini goats in the National Seminar on Management of Livestock and Poultry in the Tropics held in Kerman Bahonar University on 17 August 2011 (Annex 1).
3. It linked two national project teams: Mr. Ramin Aliverdi-Nasab the Artificial Insemination expert from the Animal Science Research Institute, will visit Tajikistan to support the Khujand team for the AI on Mohair goats. Two visits are planned, a preparatory visit from 3-6 September and a visit from 15-25 October 2011 to inseminate the goats. Mr. Aliverdi and Dr. Kosimov jointly planned AI program in Khujand (Table 15).

   **Table 15.** Time schedule for the artificial insemination in October 2011 in Northern Tajikistan planned jointly by Mr. Aliverdi and Dr. Kosimov

| Item | Day | Time | Date | Person |
|---|---|---|---|---|
| **Group 1** | | | | |
| Sponge or CIDR pouting | 0 | 08-10 AM | 08/10/2011 | Matazim |
| PMSG + PGF2A | 9 | 10-12 AM | 17/10/2011 | Aliverdi |
| Sponge remove | 11 | 10-11 AM | 19/10/2011 | Aliverdi |
| Heat detection | 12 | 15-17 PM | 20/10/2011 | Aliverdi |
| Artificial insemination | 13 | 07-10 AM | 21/10/2011 | Aliverdi |
| **Group 2** | | | | |
| Sponge or CIDR pouting | 0 | 08-10 AM | 09/10/2011 | Matazim |
| PMSG + PGF2A | 9 | 10-12 AM | 18/10/2011 | Aliverdi |
| Sponge remove | 11 | 10-11 AM | 20/10/2011 | Aliverdi |
| Heat detection | 12 | 15-17 PM | 21/10/2011 | Aliverdi |
| Artificial insemination | 13 | 07-10 AM | 22/10/2011 | Aliverdi |
| **Group 3** | | | | |
| Sponge or CIDR pouting | 0 | 08-10 AM | 10/10/2011 | Matazim |
| PMSG + PGF2A | 9 | 10-12 AM | 19/10/2011 | Aliverdi |
| Sponge remove | 11 | 10-11 AM | 21/10/2011 | Aliverdi |
| Heat detection | 12 | 15-17 PM | 22/10/2011 | Aliverdi |
| Artificial insemination | 13 | 07-10 AM | 23/10/2011 | Aliverdi |

4. It links the Iranian project team scientists to the national and international research and development community through presenting results from the baseline studies through a) a poster to be presented at the Tropentag, 2011, University of Bonn, Germany (http://www.tropentag.de/2011/abstracts/abstracts.php?showtime=1#Subgroup_3a); b) a paper

submitted to Small Ruminant Research Journal (accepted, soon online). It is planned to publish two other papers (*Characterisation of nomadic livestock system in Kerman province, Iran* and *Role of women in management of livestock in nomadic farming system*) and a book in Persian language (*Iranian cashmere goats).*

## 5.5 The way forward

In order to secure the future of Raeini goat farming and cashmere production, the project team believes that nomads will need to develop a system for efficient marketing of cashmere and value addition. This will require an effective development of farmers' and women organizations at the target sites, which will also enable them to share knowledge, techniques and experiences to increase the income from cashmere by value addition.

As reported first steps have been taken to organize a cashmere producing cooperative for nomad women with the aim of producing and further processing cashmere yarn at the project site in Baft. This organization will be formed in close collaboration with the "women farmers department" of Kerman province agriculture organization and the "nomad department" of Baft city. All interested women from the nucleus and other herds can join the "nomad women cashmere producers' cooperative". The cooperative will have the following objectives:

- Selling of higher quality raw cashmere directly to the processing factory in Mashad or Semnan;
- Production of yarn using traditional spindles, simple manual spinning wheels or electronic spinning machines which will be imported from Tajikistan;
- Finding a market for cashmere yarn or finished products on international markets, e.g. cashmere yarn and products will be presented through the marketing website of the IFAD-ICARDA cashmere project (www.adenturesyarns.com).

# 6 Across country knowledge dissemination

A project website was prepared (http://www.icarda.org/cac/fiber/) making all relevant information and knowledge generated by the project available to a wider audience, such as progress reports, presentations, technical guides, upcoming events, etc. Maps of the project locations will be uploaded soon (Annex 2). The project website is complemented by a marketing website (http://www.adventureyarns.com/) that has already been described earlier in this progress report (section 2.3).

## Annex 1. Effect of Nomad displacement on cashmere characteristics of Raeini goats

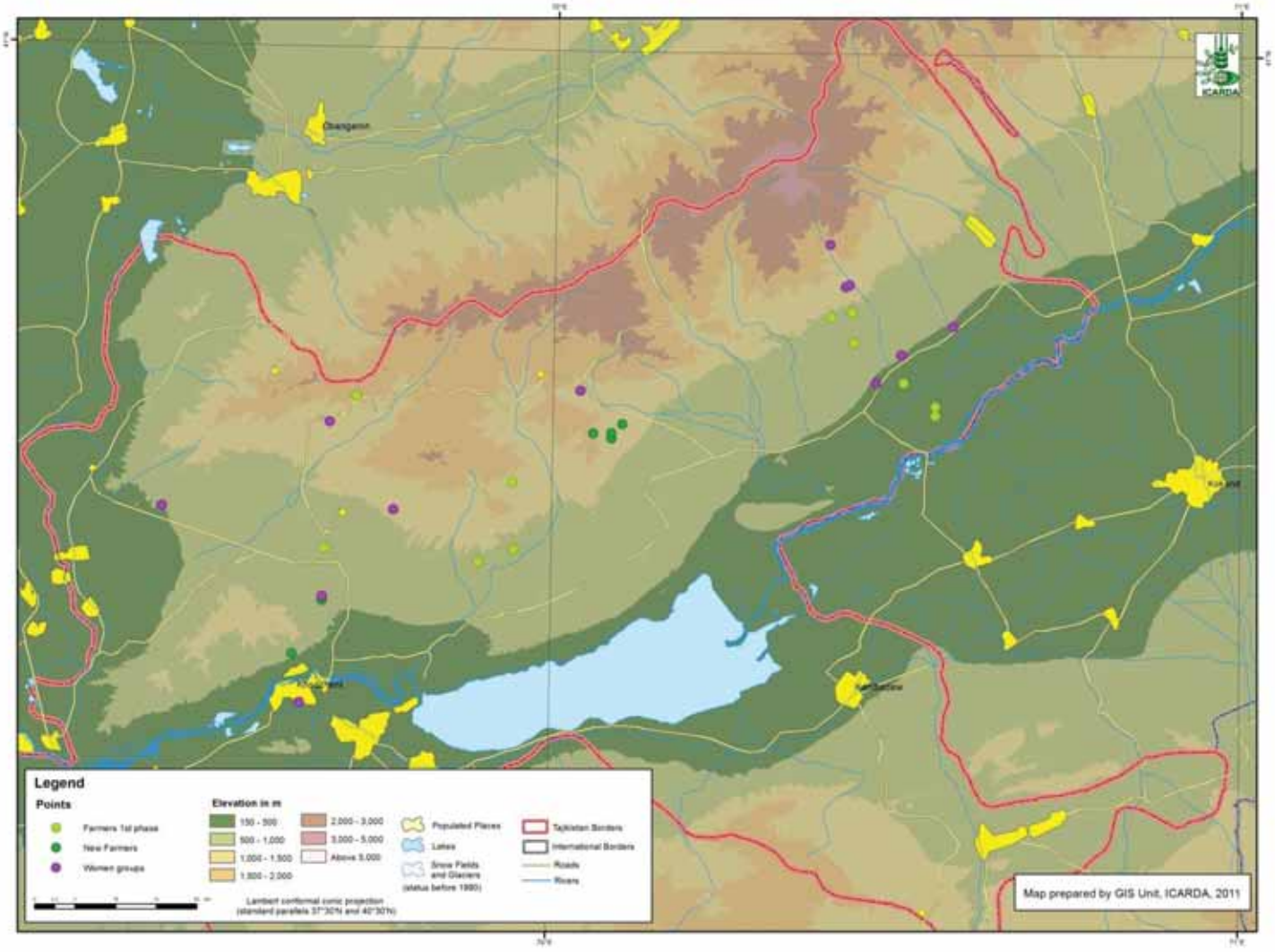
Abstract presented at the National Seminar on Management of Livestock and Poultry in the Tropics in Kerman

The object of this study was to comparative fibre qualitative and quantitative characteristics of Cashmere of Raeini goat at Baft station (BS) with those raised in nomadic condition (NC). Cashmere fibres was sampled from 66 and 119 goats (male with aged 2 years old) from BS and NC respectively. Cashmere characteristics include diameter, dandruff, cashmere and hair percentage and cashmere length measured and Statistical model for this research completely randomized design (CRD). Mean cashmere length, cashmere and hair percentage, dandruff percentage, cashmere diameter and coefficient of variation of diameter in BS and NC were (53.4±0.8, 54.1±0.8 MM), (62.1±1.6, 54.4±1.1 %), (29.9±1.6, 39.9±1 %), (8.9±0.6, 6.0±0.5 %), (19.2±0.1, 19.8±0.1 micron) and (22.9±0.3, 22.5±0.3) respectively. From view of cashmere quantity, cashmere and dandruff percentage in BS goats was significantly ($p<0.01$) higher than NC goats and hair percentage was lower in BS goats. Fibres diameter in BS was significantly ($p<0.01$) lower than NC goats. The phenotypic correlation between diameter with coefficient of variation of diameter ($r = -0.158$) and cashmere with hair ($r = -0.936$) and cashmere with dandruff ($r=0.259$) were significant.

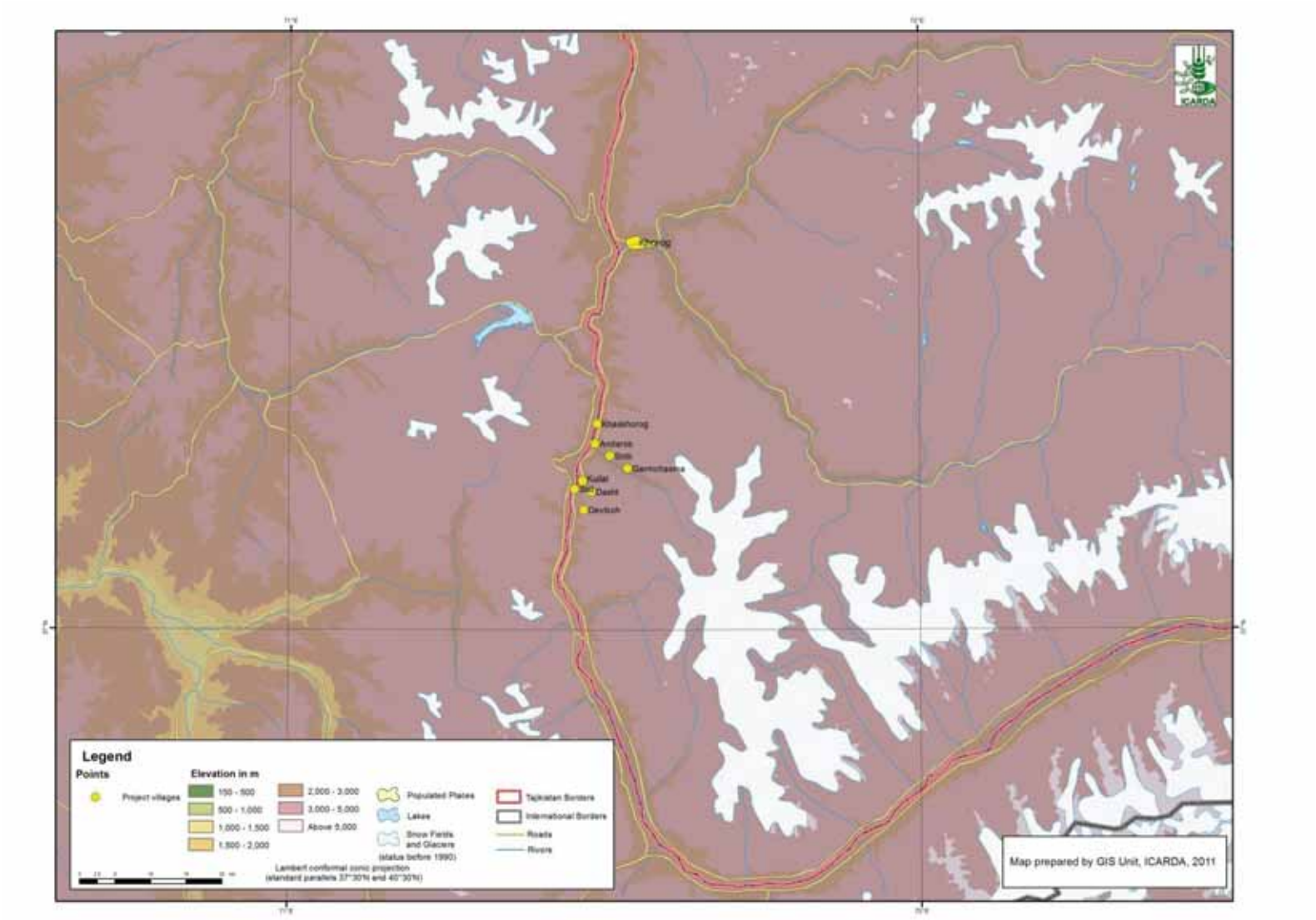
*Keywords: Raeini goat, Management system, Diameter, Cashmere and hair percentage, Cashmere length*

## Annex 2. Maps of the project sites

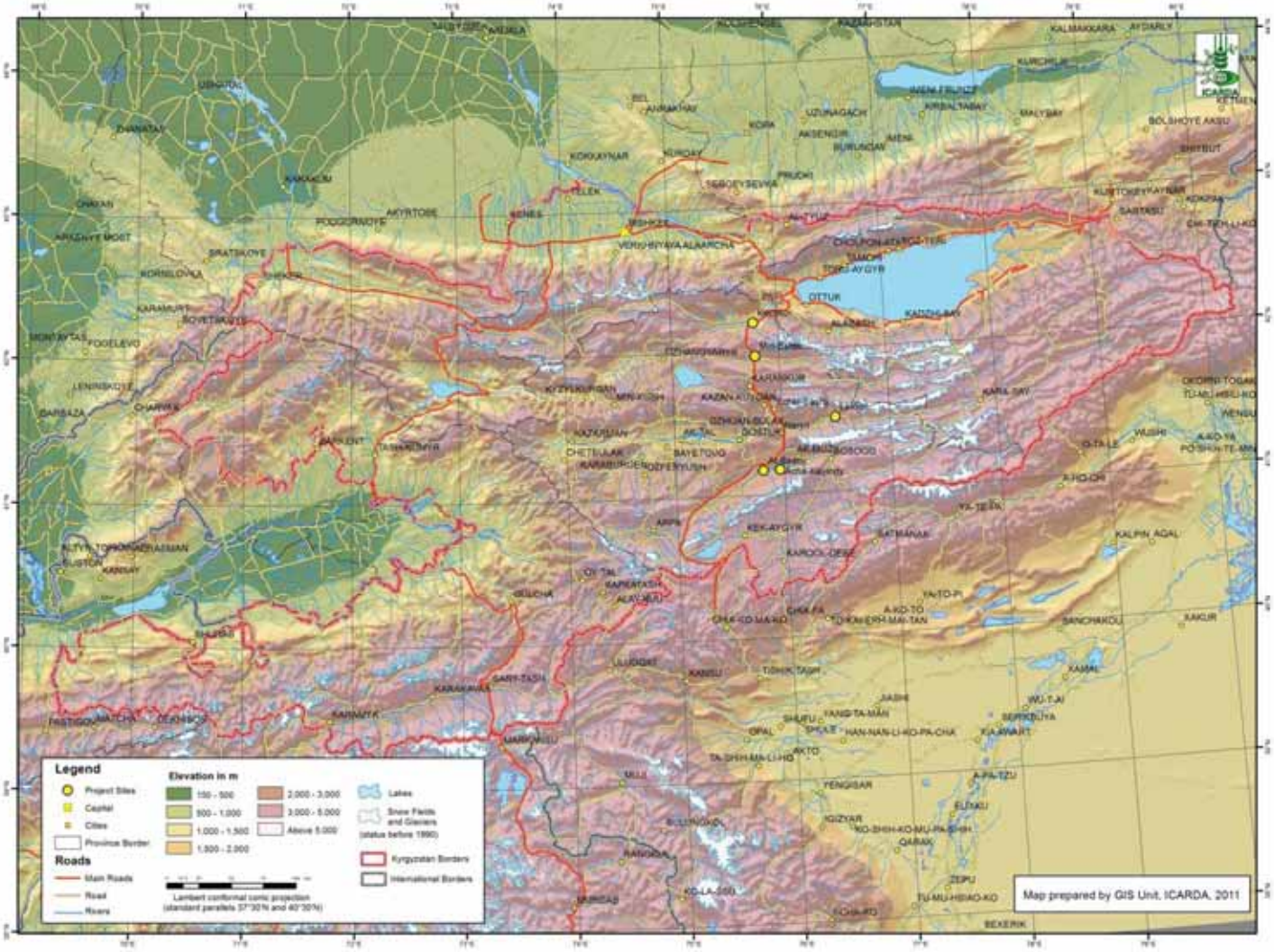
**Map 1**. Overview of project sites of the IFAD-ICARDA project in Tajikistan , Kyrgyzstan and Iran



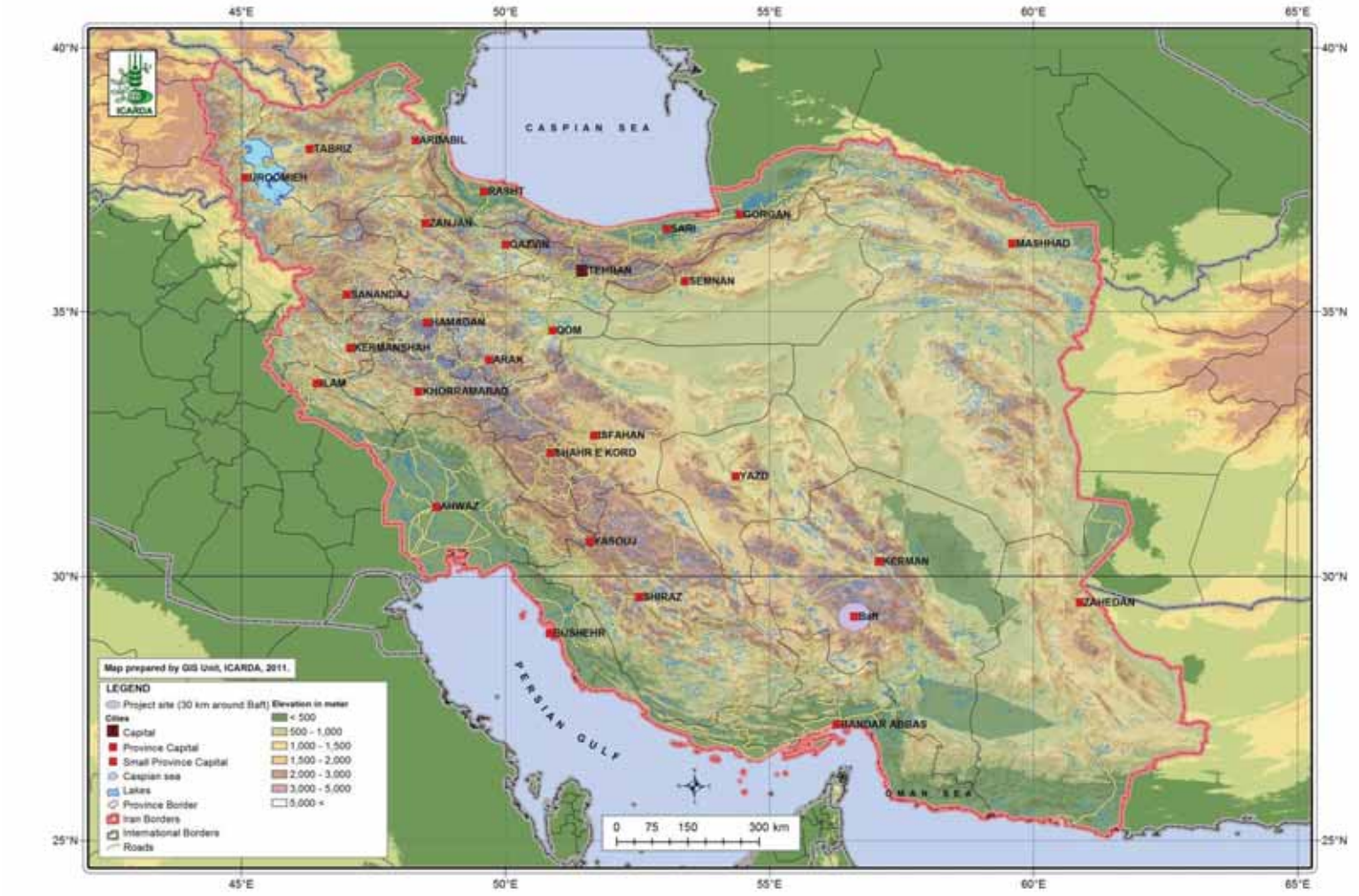

**Map 2.** Project site in Northern Tajikistan (individual goat farmers and women groups)




**Map 3.** Project site in Badakhstan, Southeastern Tajikistan (project villages)




**Map 4.** Project site in Naryn Province, Kyrgyzstan (project villages)




**Map 5.** Project site in Kerman Province, Iran (rangelands around Baft city)