

REPORT

Small ruminant meat value chain rapid assessment in Sogd province, Asht and Gafurov districts, Tajikistan



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1 Introduction

Agriculture continues to contribute significantly to economic stability and growth in Tajikistan, accounting for roughly 30% of GDP each year and comprising 45-66% of the labor market (World Bank, 2014; EDB, 2013). The sector accounts for more than 30% of exports, and rural areas are home to around 80% of the country's population contributing to households' subsistence (Tajstat, 2012).

Agricultural production relies on three main resources: land, labor and animals. Livestock has been recognized as an important contributor to sustaining rural livelihoods. Small ruminants are important sources of income, food security and employment in rural areas. They contribute to the cash income of all farm categories, namely households, private farmers and landless laborers in Tajikistan. Thus, enhancing small ruminant production will support an equitable rural development

Tajikistan is a highly mountainous country, with 93% of its surface area taken up by a complex of east-west and north-south mountain ranges forming the Tyan-Shan and Pamir mountains. Sughd province consists of mountainous terrain and has sufficient pasture-forage resource for rearing small ruminants mostly for goats. Tajikistan has 3,097,000 heads of sheep and 1,826,000 heads of goats (Tajstat, 2013). Tajik Angora is the dominant goat breed in Sogd province and Angora goats are predominantly found on the right bank of the Syr-Darya River. The population of Angora goats and their crosses with other local goats is about 500,000 heads. Annual mohair production in these districts reaches 150-180 metric tons, accounting for more than 70% of the total production in the country.

Under traditional management goats satisfy 70-80% of their annual feed demand from pastures. The majority of the pastures grazed by goats are located on rocky slopes such as Kurama, Mogoltav and Syr-Darya pasture areas of Tajikistan (the entire right bank of the Syr-Darya River), a total area of over 450,000 ha (Ovchinnikov et. al, 1977). This is recognized as a specific agro-climatic zone of Tajikistan characterized by mostly poor pastures with low productivity in a dry harsh continental climate and is considered the main habitat for Angora goats; it is not suited for most other livestock species without additional feeding. Administratively, the area covers Matcha, B.Gafurov and Asht districts.

The small ruminants have a large socio-economic importance for the livelihoods of farmers living in the mountainous areas of these particular districts. They are considered important assets, which can be sold at any time to meet the immediate cash needs of the household. Goats provide a variety of products and by-products, such as mohair, meat and milk, skin, horns and also manure. These products are consumed, sold or locally processed.

Livestock production in the recent past was concentrated mainly in the public sectors (state, collective farms). As a result of gradual market reforms the share of households and private farms in small ruminant production has increased and most collective and former state farms have been

dissolved and the herds privatized. About 95% of small ruminant are now kept by the private sector by households and dehkan farms.

To comply with modern market conditions productivity of small ruminant production in the private sector and the performance of the major value chains need to be increased to enhance its contribution to the livelihoods of farmers. Thus, the purpose of the value chain assessment is to characterize small ruminant production, marketing, input supplies and processing and thereby identify intervention areas in production and marketing research and development with the potential to improve the efficiency of sector. Specific objectives were:

- to assess the core functions and their role of actors in the small ruminant value chain;
- to map major marketing routes and channels of small ruminant products;
- to identify key constraints and opportunities faced by producers;
- to identify key intervention areas for improving and further development of the value chains.

2 Study methodology

2.1 Site selection procedure

Sites were selected based on geographical characteristics (mountainous and flat terrains) to cover the two typical production systems (rangeland-based and livestock-crop systems) of the region. Two districts, namely Asht and B. Gafurov, were selected because of the large number of small ruminants concentrated in the districts and four villages from each district were identified.

2.2 Sampling of respondents

To collect information for the small ruminant value chain assessment, both secondary and primary information sources were used. Specific methods included focus group discussions and key informant interviews; visual observation was also used to collect primary data in local settings such as schools or jamoat centers of the sampled villages. The source of secondary information was district offices of agriculture, veterinary station and statistical agency. Moreover, relevant literature and documents were reviewed to provide background information on previous and current production system before and after reforming.

2.3 Key procedures for data collection

Focus group discussions were conducted with two groups of up to 10 men and women in each of the villages, mainly with sheep and goat producers. Checklists (CL) were used for the focus group discussions with Producers (PRCL) and other key informants. Key informants interviewed were experts in livestock extension, livestock researchers and NGOs (EXCL), veterinarians (VTCL), feed

suppliers (FSCL), credit providers (CRCL), traders (TDCL), processors (PCCL, e.g. butchers, restaurant workers), transporters (TRCL). A total of about 23 key informants were interviewed. For each section of the results the source of information is indicated by reference to the checklists used.

3 Characterization of the study sites and communities

3.1 Description of the study areas

Location and geomorphological distribution of the study areas. The study area is located on the right bank of the Syr-Darya river in the northern part of Tajikistan in Soghd (or Sughd) province, in two districts: Asht (villages: Marhamat, Oshoba, Garvon, Dulona,) and B. Gafurov (villages: Somgar, Uyas, Kurgonteppa, Kichik Olchali). It borders with Tashkent province/oblast in the north, with Namangan and Ferghana provinces of Uzbekistan on the east.

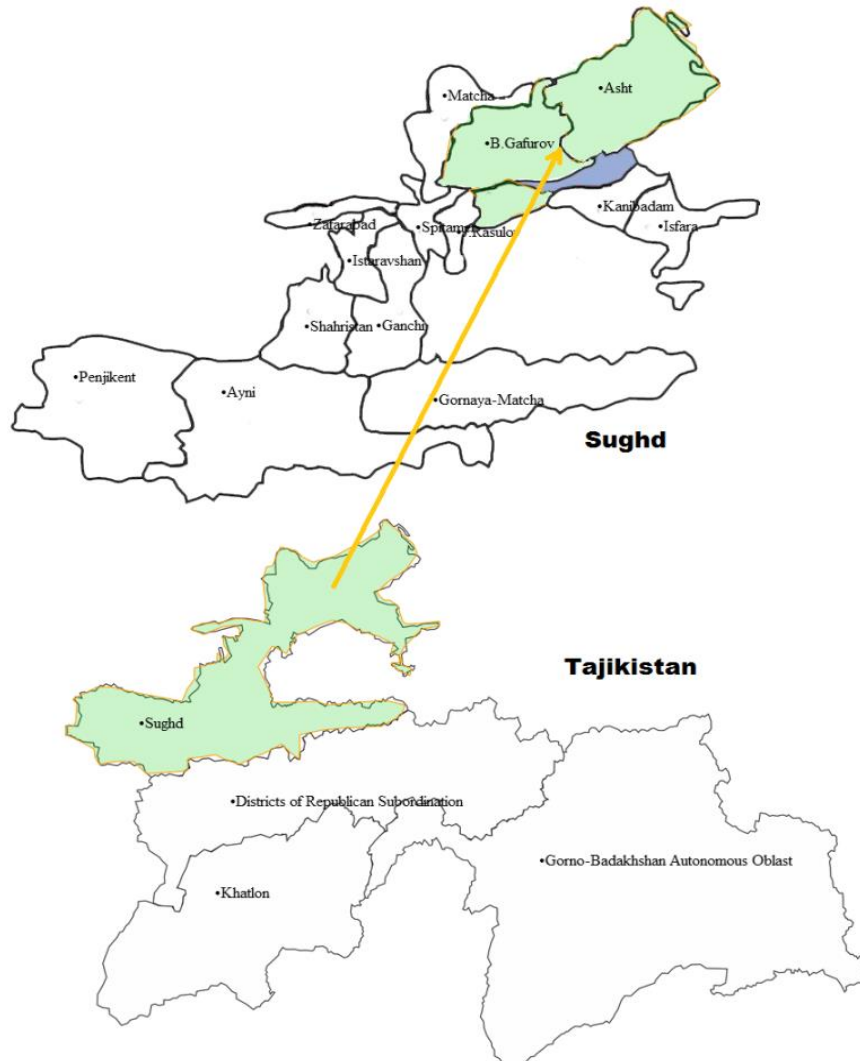


Figure 1. Location of Asht and B.Gafurov districts

The southern slope of the Kurama pasture area can be divided into the following geomorphological zones:

- **adirs (hills) and low foothills** are located at an altitude of 1000-1800 meters above sea level and consist of sparse deserts and semi-savanna sibirjak and wormwoods (*Artemisia*);
- **midlands** are situated at an altitude of 1800-2500 meters above sea level and have fragments of semi-savanna in the lower parts, cades in the middle and the prickly grass in the upper parts;
- **highlands** are located at an altitude of 2500 to 3700 meters above sea level and are composed of prickly grass zones with fragments of cryophyte flora.

Pasture and water resources. The most important agricultural land use is pastures which are grazed by mainly goats and sheep. Many springs are found in the mountainous territories of the summer pastures which are sufficient as water sources for small ruminants during the whole summer grazing season, but in the autumn and winter pastures water is less easily available. There is also a shortage of irrigation water for crop cultivation in the flat territories. Therefore, there are only orchards or vegetable fields near the springs. The best economic use of the low productive pastures and in some cases hayfields in the region is through rearing sheep and goats is economically advantageous. As additional forage crops mainly sorghum, corn and alfalfa are being cultivated.

Climate. The average temperature on the flat zones during winter is -3 to -5°C, snow depth is 3-7 cm, sometimes up to 10-15 cm. Every 3 to 5 years there is a period of heavy frost with night temperatures dropping to -25°C, and a snow depth reaching 20-30 cm. The number of days with air temperatures equal and above 10°C is 160-220 days. The temperature in summer is high and can reach up to 35-45°C. Average annual rainfall is 300-400 mm, but there are frequent dry years with rainfall between 100 and 300 mm. The high temperatures in summer are accompanied by a lack of moisture. Depending on the year the soil begins to dry up at the beginning of March or latest by April, and it remains dry throughout the summer and early autumn. Crop cultivation is only possible with supplemental irrigation.

3.2 Main livelihood strategies (PRCL¹)

The main livelihood strategies of the rural communities are rearing livestock and processing of livestock products and where possible crop cultivation. The farming system is mixed crop-livestock, but dominated by livestock production. In the study area mainly Angora goats, sheep and cattle are kept. Crop cultivation includes horticulture, vegetables, forage production, as well as cotton where irrigation is available.

¹ Producers' checklist.

The rural population depends mainly on two sources of incomes for their sustenance: 1) remittance from economic migrants who have left Tajikistan to find employment in Russia and other CIS countries; 2) income generated from the sale of animals and their products (meat, mohair, milk, skin, horns and manure) and some crops. The opportunity for crop production depends on the availability and access to irrigated land. The farmers living on flat terrain (villages Marhamat, Oshoba of Asht district and Kurgonteppa, Somgar of B. Gafurov district) have access to some irrigated land and hence are involved in crop production. On mountainous terrain crop production is limited. On mountainous terrain (villages Dulona, Garvon of Asht district and villages Kichik Olchali, Uyas of B.Gafurov district), erratic rainfall, lack of water for irrigation, and limited arable land severely limits potential for crop production.

All livestock products produced are consumed in the households, and sold or locally processed to make value-added products. Small scale processing of products is common; most important is processing of mohair (yarn and knitted products) and rural households sell these products throughout the year on domestic markets or export it to foreign markets. Mohair is the most valuable local product and rural women are engaged in processing in many households. Of lesser importance is the income generated from processing of cow's milk (cheese, yogurt, butter and kurut), of which the surplus is sold on local markets.

Other source of cash income is from the sale of fruits and vegetables from household plots, orchards and some processed products (dried fruits, conserved bottled fruits and vegetables). A minor part of the population receives income from activities in the service sector (trade, repair and construction, taxi drivers, hairdressers, catering etc.).

Over the last 10 years, there has been a change in the relative importance of the mainstays of the populations. Russia as a big labor market for Central Asian countries has attracted the younger generations to earn money for their livelihoods. From each household at least one or two persons work in Russia to support their family. This situation has significantly affected the livestock numbers in different types of farms and the farming activities. According to focus group discussants, the number of small farms who keep 20-50 animals are decreasing. As their children work outside the country, managing the animals becomes difficult for the aging farmers. In contrast, the pastoral farmers whose income and well-being are highly dependent on livestock are increasing the numbers of animals and expanding small ruminant production.

3.3 Dynamics in the organization of agricultural production

The 'Soviet agriculture' in Tajikistan was characterized by dominance of large collective and state farms (kolkhoz and sovkhov), which controlled 99% of agricultural land during the soviet period. The dominance of large collective farms began to wane after the transition to market economy and serious land reform measures began to be implemented in Tajikistan after 1995. The main transition has been away from collectivized agricultural production systems and towards dekhan (peasant) farms, and to land rights which are held by individuals or groups of individuals in a

private ownership arrangement. The number of large collective farms continue to decrease by restructuring, land distribution and establishment of relatively small private dehkan farms whose number is increasing (Table 1).

Table 1. Changes in the organization of agricultural production systems in Tajikistan, 2008-2012

Year	2008	2009	2010	2011	2012
No of dehkan farms	30,842	37,958	51,372	58,313	73,806
Proportion (%) headed by:					
Men	87.7	88.8	89.4	89.7	92.2
Women	12.3	11.2	10.6	10.3	7.8

Data from Tajstat (2012)

Table 1 shows the change in absolute numbers of dehkan farms from 2008 to 2012, as well as the gender aspects of ownership. Agricultural production is divided into three main categories currently operating in the study area and generally in Tajikistan. According to the official definition (Tajstat, 2014), the following three structures are distinguished:

- **Agricultural enterprises** include collective and state farms, inter-farm unions, leased enterprises, agricultural cooperatives, agricultural firms, and subsidiary farms (run by a factory or an organization).
- **Dehkan farms** is an independent business entity created by a family or individual citizen, engaged in production, processing, storage and sale of agricultural products based on the use of property, land and other natural resources held as private property, lifetime inheritable possession or lease.
- **Households ('population's plots')** include citizens' private farms/plots, collective orchards and vegetable gardens, and summer house (dacha) plots.

Agricultural enterprises. In the study areas of two districts there are only 6 *agricultural enterprises* (e.g. PC Kushatov, JSC Urunhojaev, JSC Hamzaliev in B.Gafurov district and state breeding farm Eryigitov, JSC Kalinin, JSC "Ittifok" in Asht district). In these farms on average 7 000 head (2500-13200) of sheep and goats are kept, of which 85% are angora goats. Also few not large (20-180 heads) herds of cattle are kept. They have from 8 up to 54 000 hectares of pasture and arable land to grow forage and other crops. However, based on the opinion of livestock expert interviewed, who referred to the resolution of the local authorities, some of these agricultural enterprises are under the disbandment and reforming.

Dehkan farms. This category is newly formed of management that is most consistent with a market economy. In the study area the size of herds of sheep and goats have broad amplitude (50-1000 heads) and an average of 100-150 heads. Numbers of larger dehkan farms having more than 500 heads of animals are only several tens. The majority of them are hereditary breeders and experts in their field. The revenue from the production of small ruminants for farmers in this category is the main source of livelihood.

Households. With this farming mainly engaged majority of the rural population from ancient times and have a wide social status (civil employees, doctors, teachers, workers, pensioners etc.). In households the size of herds of animals is usually 40-50 heads. The resulting income from household plots is mainly as additional source of family budget. Forages are harvested from household plots also uses table canteen waste and often purchased.

Agricultural enterprises have access to several thousands of hectares of irrigated land and pasture. Dehkan farms have certified land areas which are often not very sufficient for them. Households have usually very limited resources, a small number of animals and small areas of arable land mainly used for the production of food for the household and forage crops) adjacent to the settlements. Dynamics of the number of small ruminants in all categories of farms in recent past years are shown in Table 2.

Table 2. Number of small ruminants (heads) in all farms categories in Tajikistan and Sogd province at the end of year

Years	All farm categories	Agricultural enterprises	Households	Dehkan farms
Sogd Province				
2005	954409	143792	728653	81964
2006	980853	126922	761898	92033
2007	1181527	124821	962376	94330
2008	1193378	103109	976252	114017
2009	1181833	85186	965797	130850
2010	1192044	81681	973973	136390
2011	1265616	76445	1055259	133912
2012	1304565	66148	1092321	146096
2013	1358221	65947	1143123	149151
Tajikistan				
2005	3053625	492240	2335265	226120
2006	3165142	457229	2446165	261748
2007	3798427	438396	3058822	301209
2008	4146763	379924	34033900	362939
2009	4200184	343679	3457010	399495
2010	4394192	310128	36357889	228275
2011	4618595	287226	3845831	485538
2012	4732477	272285	3931132	529060
2013	4923638	282790	4077100	563748

Data from Tajstat (2014)

From 2005 to 2013 there has been a steady increase in the number of sheep and goats, both in the province and in the country (Table 2). Due to the reforms, the number in agricultural enterprises shows a decreasing trend while the number in households and dehkan farms has increased.

4 Characterization of sheep and goat production

Small ruminants are important assets for rural households and specialized livestock farmers. Small ruminants are kept primarily for fiber and meat but also as a form of liquid capital. Sheep and goats are sold whenever producers need cash to buy clothing, agricultural inputs, and other animals and also to cover school and medical expenditures or to raise money for ceremonial, cultural and religious events.

In the study area the small ruminant production system is extensive with two types of rearing/keeping: year-round grazing and semi-stalled production. Only meat type livestock are fattened in intensive year-round stall-fed production systems.

Year-round grazing is characteristic for farmers whose main activity is small ruminant production. They keep their animals year round on pastures with exception of harsh weather (deep snow, heavy frost). Such periods might last 10-25 days in a year. During the harsh days the animals are fed with hay, camelthorn (*Alhagi camelorum*) and other shrubs, alfalfa hay, sorghum, barley and wheat straw which were preserved for the winter. Winter feed stocks are also used as supplementary feed on other winter days. In very rare cases animals (especially sick or weak and young animals) are fed with supplementary/concentrated feeds such as barley, wheat, crushed corn etc. This production system is characteristic for the mountain and foothill areas. The main source for winter feeds are local markets and natural hay from own plots and gardens.

The semi-stalled small ruminant production system is common for small scale farms which account for about 60-65% of the total production. Some small scale farmers graze their goats in summer on remote mountain pastures by hiring a shepherd and in the autumn-winter-spring period graze on pastures near the village. On warm days the sheep and goats are gathered in the morning to browse in nearby pastures and in the evening they come back to the village and are redistributed to the owners/households. However, the area of autumn-winter-spring pasture near the villages is limited, and all village flocks are grazed there either by hired shepherd or in some areas by the owners taking turns. Due to overgrazing these pastures are severely degraded with low biomass coverage and yields. In the late fall and winter also crop fields "angar" are used for grazing (after harvesting of agricultural crops: alfalfa, corn, melons, and vineyards and orchards) mainly by households engaged in field crop cultivation. However, it is also common in some settlements that producers rent crop field after harvest for grazing their animals on the crop residues. According to goat producers from Oshoba village, a crop field of about 3 ha can be rented for 1200 TJS and could be grazed for approximately 20 days.

In most cases goat flocks are grazed separately from sheep, but in sheep herds often some goats are found in different proportions, or at least a few goats to lead the sheep herds. Herd sizes depend on available land, most common are herds between 200-500 heads, only very few herds reach up to 1000 heads. Typically, 70-75% of the annual consumption of feed for goats and sheep are obtained from the pasture.

Large herds go to summer pasture in a distance of 10 to 50 km from May onwards and return beginning of autumn. Shepherds are usually hired by the owners, but in some places household members take turn to take joint herds for grazing. In contrast to herds kept by agricultural enterprises, household and many private farms do not manage their herds well with regard to controlled mating, selection of breeding goats, kidding/lambing, or veterinary care.

4.1 Sheep and goat breeds and breeding practices

4.1.1 Types and proportion of sheep and goat breeds (PRCL + EXCL²)

In the study areas sheep and goats are reared traditionally and proportions of them are: 70-80% goats and 20-25% sheep. Tajik type of Angora goats form the basis of goat production with up to 85% of the population in the study area, the rest are local goats “Jaydara” (10%) and other crosses of imported dairy and meat goats (up to 5%). The predominant sheep breed is a local sheep “Jaydara” with about 93-95%, there also crosses with the Gissar (Hissar) sheep breed (5-7%). Angora goats are mainly kept for mohair and meat, sheep are kept for meat and fat tails; there is nearly no demand for the coarse sheep wool.

4.1.2 Breeding practices on sheep and goat (PRCL + EXCL)

Small ruminant breeding practices differ among the farm types. The emerging private farmers who rear their animals year-round on pastures observe an optimal mating period (20-25 October in most cases). About 1-1.5 month before mating males are separated from the common herd and supplemented before reintroducing them for mating. Lambing/kidding starts from the end of March, when biomass on natural pastures becomes available so that the kids grow under good conditions. Some of these farmers also undertake selection of the best males of their herds for future use and castrate the inferior males. The selection of Angora goats is undertaken based on the value of the fleeces (weight and quality) and considers the size of animals. In the selection of Jaidara sheep the main criteria is size of animal and form of the fat tail. Farmers with relatively large livestock herds (300-500 heads) wean the kids and lambs from their mothers about 1-1.5 month before mating with the aim of improving the condition of the does and ewes. Such activities require additional labor or costs such as hiring temporary workers which is not affordable for every farmer, but ultimately it is economically advantageous. Based on the information from producers, many farmers do not exchange their bucks or rams with each other. They also do not engage in production and sale of pedigree breeding buck and rams.

In households, with few exceptions, there is no consideration of special requirements and selection of male animals. They also do not castrate genetically undesirable males.

It should be noted that, according to the livestock experts, for the last few years scientists of Sogd Branch of the Tajik Livestock Research Institute with assistance of ICARDA promoted the

² Experts' checklist.

exchange of best productive bucks or sales among farmers who know each other and the condition of their flocks well, and also implemented elements of organized breeding programs. In some sheep herds an unorganized crossing of Jaydara with larger rams of Gissar breed is carried out.

4.1.3 Challenges and potential interventions related to breeding (PRCL + EXCL)

Table 3. Key challenges/constraints

Constraint 1	Inadequate skills and lack of organized breeding and recording (animal pedigrees)
Constraint 2	Poor quality animals are kept
Constraint 3	Limited access to high performing bucks and rams with known pedigree
Constraint 4	Lack of public policy for monitoring and developing the sector, in particular Angora goat breeding

Table 4. Solutions suggested to address the constraints/challenges named above

Constraint 1-2-3	Solution 1	To identify and train high potential farmers on breeding of elite animals and effective management of herds
	Solution 2	Collaborate with scientific research institutions to coordinate breeding and selection work in the region and to create new improved forms of pedigree/breeding network
Constraint 4	Solution 1	Relevant agencies need to develop a comprehensive and specific monitoring and recording program to take necessary actions to improve the small ruminant production sector
	Solution 2	Organize regular stakeholder for a at district level to discuss the major small ruminant production problems to find common solutions

4.2 Housing of sheep and goat (PRCL + EXCL)

Housing is important to protect the animals from predators, the cold, precipitation (ice, snow, rain) and storms. In the study areas in year-round pasture grazing system sheep and goats are housed in animal houses/barns built using locally available materials, such as stone or stone-clay walls with height of 1.5-2 meters and capacity for 150-600 heads. Houses are usually fenced by tree branches, metal wires or stone walls. Its roof is made from tree branches, rush and clay and on roof stocked roughage feed for winter period. Such houses used by pastoral farmers and are located away from the village, in the gorges protected from the wind and near to the springs.

In semi-stalled pasture grazing system the small ruminants are housed in small houses/barns constructed on household plots of small scale farms. Peculiarity of households is that mostly they keep different species of animals of different ages in one house. Based on FGD information, it is mainly due to small area of household plots. There is risk for damage of kids/lambs by older animals.

Almost all houses have free-range yards, fenced with stone-clay walls, tree branches or metal cages. Except cold winter days the door between free-range yards and animal house remain open to allow animals go out at nights in hot summer days.

The houses/barns are cleaned periodically by farmers and the manures are used as fertilizer. The compacted part of the manure are turned over by pieces, lay out and after drying use as fuel in winter. According to experienced farmer's opinion, regular cleaning of the house helps to improve the condition of animals. Disinfection is usually carried out in case of ticks and other parasites.

In soviet period the vast majority numbers of livestock were kept in large collective and state farms and the breeding of animals was by developed plan and established system. Households usually got breeding pedigree bucks from collective farms. Currently, majority of the total livestock in the country are concentrated in households and emerging private farms and their bucks use for reproduction are mainly related to the worst genetic quality. The further development of livestock sector is following to chaotic breeding, as a result occurs a deterioration of the national herd. Consequently, there arise new other problems.

4.3 Feeds and feeding

4.3.1 Types of feed of sheep and goat (PRCL + EXCL + FSCL³+PCCL⁴)

As indicated above the major source of feeds for small ruminants in the study areas is pasture. During interviews two systems were distinguished, year-round grazing and semi-stalled grazing systems used. Small ruminants are being highly-grazing animals, rely on grazing of pasture. They under the traditional rearing conditions 70-80% of their annual feed demand satisfy from the pastures. Pastures are open, not tethered and borders are conditional. Pasture forage is almost in all areas of the sites the same except for some differences in the botanical composition of the vegetation. In the mountain summer pastures the set of forage has a rich botanical composition and in the winter pastures relatively this rate is low.

³ Feed suppliers' checklist.

⁴ Processors' checklist.

4.3.2 Sources of feed of sheep and goat (PRCL + EXCL + FSCL)

As indicated above the major sources of feed for small ruminants in the study areas is pasture. During interviews identified that there are year-round pasture and semi-stalled pasture grazing systems used. Small ruminants are being highly-grazing animals, rely on grazing of pasture. They under traditional rearing conditions 70-80% of their annual feed demand satisfy from the pastures. Pastures are open, not tethered and borders are conditional. Pasture forage is almost in all areas of the sites the same except for some differences in the botanical composition of the vegetation. In the mountain summer pastures the set of forage has a rich botanical composition and in the winter pastures relatively this rate is low.

The sources of winter feed reserves are pasture, small household plots, cropping areas and market. Winter feed reserves are mainly roughage stovers, including hay (alfalfa, hay grasses, sorghum, and hay from the family of the ferula), straw (wheat, corn, barley) and waste industrial crops (cotton seed hulls, sunflower). Grains (corn, barley, wheat, oats) and cereal waste, and also waste of oil crops (oilcake and meal) are the main concentrated feeds to provide supplementary feeds only in harsh period of winter. Discussants also highlighted that extra nutrition provides to pregnant and sick animals to avoid foetus loss and death in lean period. Because of the irrigation water scarcity and cropland insufficiency not all farmers are able to cultivate forage crops and there is no tradition of making silage. According to focus group discussants, on average land owned by a household is 10-15 sotok (hundred square metres). Some farmers from the lowland flat terrain where irrigated water is available have croplands with an area of 2-5 ha.

4.3.3 Quality of feeds of sheep and goats (PRCL + EXCL + FSCL)

Based on the information obtained from farmers the quality of feeds of sheep and goat in the sites is not high. Pasture as a main source of feed for small ruminants has very low biomass.

Degrading grazing lands and depletion of feed resources are reported in the study area resulting from the increase of livestock population and climate change (lack and not on time precipitation). Only in spring time the quality of the pasture biomass gets better with green cover ephemerals and other plants on the pasture, which also depends on precipitation. Starting from that time up to September animals gain relatively better body weight.

As farmers indicated, in most farmers cases the quality of winter feed reserves (roughage stovers, alfalfa, hay grasses, sorghum, ferula hay, straw of wheat, corn, barley) is low, they are spoilt. The reason is not having cover or roof on the reserved winter feeds. They are mostly kept outside, on top of the animal houses. The farmer discussants said this was due to lack of finance for making roofs.

4.3.4 Knowledge and utilization of feeds (PRCL + FSCL)

Most of the producers have simple knowledge of traditional way of feeding animals. Some of them had a practice from their before workplaces in kolkhoz and sovkhoses on making silages, concentrated feeds and even making feeding ration for animals in different age and physiological conditions. Currently the producers follow traditional and simple feeding techniques. But some of them are aware of new technologies of feed preparation, reservation and feeding. They highlighted that such technologies more cost demanded.

4.3.5 Availability/Scarcity of feed over seasons (PRCL + EXCL + FSCL)

The availability of feed in pasture depends on season and its rainfall. In the study areas usually rainy season is in spring starting from March and lasts to April and early May (Figure 2). Coming to June rainfall decreases. From the second decade of March green grasses are getting available for the animals. Grasses grow immediately after the rains and warm temperature. Coming to May the availability of feed in the pasture improves quickly and sheep and goat go to summer pasture. The grasses grown during the rainy season will support the animals for some months after the rain stops. Summer pasture period is usually from May to August-September, it depends on weather of the year. Mostly pasture grasses are more abundant for the period from end of April to mid of July.

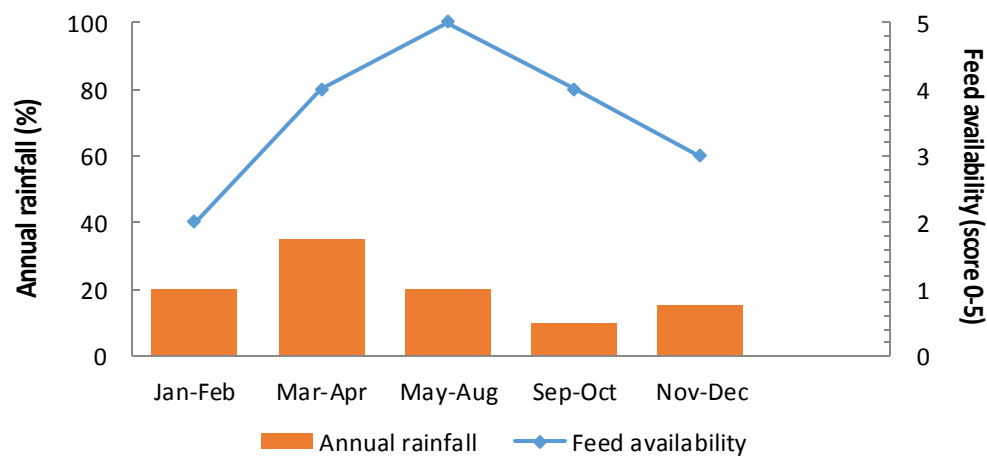


Figure 2. Average seasonal distribution of feed availability relative to the rainfall pattern

Table 5. Seasonal feed calendar (averages from the FGD in the villages)

	Season 1	Season 2	Season 3	Season 4	Season 5
Months of the season	Jan-Feb	Mar-Apr	May-Aug	Sep-Oct	Nov-Dec
Percentage of the annual rainfall received in the season	20	35	20	10	15
Feed availability in the season (Score 1-5; 1= Low & 5= High)	2	4	5	4	3

4.3.6 Feed supply: market places, market actors (sellers and buyers), price trends, market information, transportation of feed, rules and regulations (EXCL + FSCL)

In every center of region there are several daily and weekly working markets where different type of feeds are sold, such as cereals, combined and concentrated feed, granules and hay etc. According to the feed suppliers answers the main market actors are regular feed sellers from the same region in daily markets and other re/sellers come from larger cities like Khujand in weekly markets. Also in this market some farmers from flat areas plays as an actor selling their own feed produces (barley, maize etc.), but their role is less significant.

The source of feeds/feed ingredients are feed and flour producing enterprises (named Sakhiy, Farovon, Realbaza etc.) in larger cities which mainly imports wheat from Kazakhstan. Feed suppliers indicated during interviews that they ensure the quality and sustainable supply of feeds as they have agreement with feed producing enterprises in the cities. The feeds are available year round in the sites.

Buyers are animal producers from different villages in the region. They buy feeds mostly for feeding their animals in harsh periods of winter, week and pregnant animals, and also for fattening the animals. Buyers assess quality of feeds, feed ingredients and supplements only with observation.

Table 6. Seasonality of high market supply and demand

Types of traded feeds	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Months of high demand												
1. Grains (barley, maize etc.)	+	+									+	+
2. Waste of industrial crops (cotton seed hulls, oilcake sunflower etc.)	+	+										+
3. Roughage stover (alfalfa, hay grasses, sorghum etc.)	+	+							+	+	+	+
Months of high supply												
4. Grains (barley, maize etc.)							+	+	+	+		
5. Waste of industrial crops (cotton seed hulls, oilcake sunflower etc.)									+	+	+	
6. Roughage stover (alfalfa, hay grasses, sorghum etc.)						+	+	+	+			

Table 7. The average selling price of different feed items across months

Types of traded feeds	Average price in TJS/kg											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Barley	1.8	1.7	1.6	1.5	1.4	1.4	1.4	1.3	1.3	1.5	1.6	1.7
Maize	1.8	1.8	1.6	1.6	1.5	1.5	1.5	1.4	1.5	1.6	1.7	1.8
Wheat	2.0	2.0	1.9	1.9	1.8	1.8	1.8	1.7	1.8	1.9	1.9	2.0
Wheat bran	0.8	0.8	0.7	0.7	0.7	0.6	0.6	0.6	0.7	0.7	0.8	0.8
Cotton seed hulls	1.0	1.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.9
Oilcake	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.7	1.8	2.0
Combined feed	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3
Alfalfa	1.5	1.4	1.3	1.2	1.1	1.0	1.0	1.0	1.2	1.4	1.4	1.4
Hay	1.0	1.0	0.9	0.8	0.8	0.7	0.7	0.7	0.9	1.0	1.0	1.0
Straws	0.75	0.6	0.6	0.6	0.5	0.5	0.4	0.4	0.5	0.6	0.7	0.75
Camel-thorn	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.4

*Rate in April, 2015: 1 USD = 5.7 TJS (Tajik somoni)

4.3.7 Challenges and potential interventions related to feed and feeding - (PRCL + EXCL + FSCL)

Degrading grazing lands and depletion of feed resources are reported in the study area resulting from the increase of livestock population and climate change (more erratic rainfall).

Table 8. Key challenges / constraints

Constraint 1	Lack of certification for pasture lands
Constraint 2	Degrading grazing lands and depletion of feed resources

Table 9. Solutions suggested to address the constraints/challenges named above

Constraint 1:	Solution 1	Address to the relevant agencies and institutions on the basis of specific monitoring to take necessary action to improve the situation
	Solution 2	Establish small ruminants producers association to be powerful in terms of juridical issues for future development
Constraint 2:	Solution 1	“Pasture should find its own user”/obtain the certificate of the pasture land and be confident for future development of sector through preventing of overgrazing and rational use of resource
	Solution 2	Improve knowledge and skills on effective and rational use of the pasture with relevant agencies and institutions. Introduce improved forage species.

4.4 Diseases and animal health care for sheep and goat

4.4.1 Major sheep and goat diseases and pests - (VTCL⁵ + PRCL + EXCL)

Small ruminant disease has significant negative influence to production in Asht and B.Gafurov districts. The main diseases observed in the area are: infectious *pleuropneumonia* IPP (*kora upka* in local language, symptoms: sudden rise of temperature, difficulty in breathing, cough), foot-and-mouth (*oksok* in local language, symptoms: ulceration of the hoofs and around the mouth, animals get lame), plague (*Pasteurella pestis*), goat pox, anthrax, and *pasteurellosis*. Parasites, such as ticks, lice (*Anoplura*) and helminthes such as liver fluke, lungworm and intestine worm also affect sheep and goats. These diseases and parasites cause significant losses in production and productivity.

Some farmers believe the reason for lung diseases is climate change. Over the last six years summer season came dry with very less precipitation and pastures get dust cover. Also district veterinarian pointed that dusts might enhance occurring lung disease. He says because before they did not frequently face such diseases when precipitation was on time in the seasons.

4.4.2 Availability (informal and formal) of veterinary services for producers, processors, and traders (VTCL + EXCL + PRCL + TRCL⁶ + PCCL)

In the study area there is no regular deworming campaigns. Only in some cases if there is risk of serious infectious diseases then vaccination campaigns will be organized by public veterinary centers. Other time veterinary services made for sheep and goat and castration in the study areas only by request of the farmers. Based on discussions with animal experts and veterinarians, some farmers themselves quite able to manage in their flocks vet activities. Women are also engaged in some vet activities from those households whom husbands and older sons in Russia.

⁵ Veterinarians' checklist.

⁶ Transporters' checklist.

Animal health services in the study area are provided by public veterinary station available in the district center and from *jamoat* animal health workers/veterinarians. There are also informal provided animal health services by some retired private veterinarians who were working in *kolkhoz* and *sovkhoses* in soviet period. District veterinary stations function under the provincial animal health center. There is no animal health clinic or posts at *jamoat* level. In *jamoats* selected for this study is assigned only one veterinarian to each *jamoat* in some cases with one assistant. There is not said to be a shortage of medicines. Health workers / veterinarians in *jamoat* level provide all necessary medicines for selling. Also some farmers prefer to obtain medicines from the informal sellers because of cheaper price. A shortage of vaccines for diseases such as *pasteurellosis* and infectious *pleuropneumonia* IPP (*kora upka* in local language) is, however, reported to be the major problem. According to district veterinarian, last year when infectious *pleuropneumonia* IPP occurred, the vaccines were not available in district, even in provincial veterinary center. Vaccines prepare only in Dushanbe in capital city and also will be imported from other countries. The role of veterinarians is to serve the community by providing preliminary veterinary services. However, they were not working effectively due to resource limitations, such as absence of veterinary clinics or posts in *jamoats*, lack of equipment and transport. If animal has serious health problem clinical veterinary services can be provided only in district's veterinary station which is 60-70 km from the study areas. Veterinarians hire vehicles which make the vet service expensive and in consequence not all farmers can afford it.

4.4.3 Adequacy and affordability of veterinary services (VTCL + EXCL)

Based on discussions with experts from the Asht and B.Gafurov districts veterinary stations, it appears that the district's veterinary service coverage is inadequate, due to financial constraints and poor infrastructure, as well as lack of human resources. But it is revealed that in the area in order to meet demand there are interested individuals among the local people to establish private health clinic or posts in every *jamoat* which will work under the rule of district veterinary station.

4.4.4 Challenges and potential interventions related to animal health care (VTCL + EXCL)

The revealed challenges related to animal health care in the sites are poor infrastructure (only one veterinary station to serve the whole district, there is no diagnostic equipment, not enough animal health extension workers and no animal health clinic or posts at *jamoat* level), inefficacy and inadequate veterinary service coverage, shortage of vaccines and lack of transport facilities for veterinarians.

Table 10. Key challenges / constraints

Constraint 1	Poor infrastructure and insufficient veterinary service coverage
Constraint 2	Shortage of vaccines
Constraint 3	Lack of transport

Table 11. Solutions suggested to address the constraints/challenges named above

Constraint 1	Solution 1	Establishment of clinics or animal health posts with the necessary human resources in each jamoat to increase accessibility of health services for farming communities
	Solution 2	Identify previous kolkhoz farmers who can treat sick animals in their village; they will assist the community to prevent the outbreak of major diseases.
Constraint 2:	Solution 1	Create a commission in handling production of sufficient doses of vaccines at national level and set up a proper distribution system
	Solution 2	Search alternative ways of providing/importing vaccines
Constraint 3:	Solution 1	Encourage and support the local interested individuals to establish private animal health clinic or posts in every jamoat
	Solution 2	

5 Credit supplies

5.1 Types and sources (formal and informal) of rural credit (CRCL⁷)

There are four formal credit sources in the study area: Microlending Organization (MLO) “Imon International”, Open Joint Stock Company (OJSC) “Bank Eskhata”, Microcredit Deposit Organizations (MDO) "Arvand" and Open Joint Stock Company (OJSC) “Agroinvestbank”. These banks are providing financial services to the economically active rural residents for agriculture and different sectors. Credits for agricultural activities are issued to physical persons, dehkan farms and legal persons for running agricultural activity at the territory of the Republic of Tajikistan that have their own sustainable and perspective agro-business, with experience of successful agricultural activity, availability of own capital and ability to present the bank sufficient credit security.

⁷ Credit suppliers’ checklist

5.2 General features of credit terms and conditions (CRCL, PRCL)

This section describes rules and regulations that influence availability and access to credit. To be eligible for credit, sheep and goat producers must develop their own business plan with help of an extension agent. Also must own goat housing and forage and be willing to use veterinary services.

Credit is given after the risk assessment and approval of the business plan by the credit expert and steering committee. The maximum amount that a farmer can get credit is up to 10 000 USD with an annual from 24-28% interest rate. Loan term for the first time customers receive up to 12 months, for repeat customers if repays the first loan without difficulty then up to 18-24 months. The system requires collateral to guarantee loan repayment. It depends on the amount of the given credit, up to 1000 USD one collateral and up to 5000 two collaterals should sign. In case credit amount is high, as a security the bank require to accept the following: goods in circulation; homestead; real estate; golden items; equipment; deposit; vehicle; agricultural machinery; harvest of the borrower.

As livestock production has risk, the loans were generally considered more suited to those involved in livestock trade than those in production. Methods of repayment: monthly payment by the method of annuity; monthly payment by equal allotment; quarterly payment (interests are paid off monthly).

During the discussions it emerged that many farmers are reluctant to take out credit from the banks, due to the high risk in sheep and goat production, loan conditions are inconvenient, while the interest rates are not affordable for smallholder farmers. The most important issue with regard to rural credit services is the level of understanding of the community about its terms and conditions. Most of the farmers are not clear what type of credit is available, and what they have to do to get access to credit. Mainly credits are used in business oriented sectors of agriculture by animal traders, feed suppliers and transporters and processors. KIIs revealed that there are other informal sources, farmers obtain credit from moneylenders for goat rearing and fattening purposes. Focus group discussants indicated that they obtain credit from relatives and neighbors. Relatives usually borrow money from each other, without charging interest. Sometimes do jointly business, benefit or loss is shared.

6 Marketing of live sheep and goats

6.1 General features of sheep and goat marketing and markets (PRCL + TDCL⁸ + EXCL + FSCL + PCCL)

Sheep and goat marketing describes all involved marketing activities necessary to move a product from producer to consumer. In the study areas, the collection of animals is carried out mainly by butchers and farmers who do sheep and goat trading as a sideline. Live sheep and goats are collected from producers and transported to nearby markets. There are about six livestock markets in the study areas. Bulok, Appon, 22-Solagi markets are located in the territory of Ahst district and Kayrakum, Somgar, Dulana markets are located in the territory of B.Gafurov district. Livestock markets have their unordinary features other than permanent stationary markets. Livestock markets are not open every day, buying and selling is carried out periodically once a week with duration of 5-6 hours in early mornings. Markets are at open places, there are no special facilities and counters. The majority of animals brought to the market are small ruminants, then cattle, chicken and horses. During the KII discussion it was revealed that there is no export of animals to outside the country. Animal trade is carried out only in domestic markets within district and sometimes between neighboring districts.

6.1.1 Buying

Producers/farmers buy sheep and goats to replace old ewes and does for breeding. Old animals are fattened and sold or slaughtered at family events such as weddings or funerals. For replacement usually producers buy young female sheep and goats. They check the animals' teeth and determine age. Usually producers do not buy bucks at the market due to low productivity. Very rare good productive and pedigree bucks are available. If they want to maintain bucks usually they buy from or barter with relatives, from neighboring producers after disease free assurance. According to focus group, there are some farmers who do not sell and change their bucks with others, causing some inbreeding. It is revealed that such farmers do so due to cultural issues, prevent their herds from diseases and also do not like to spread their bucks. The major sources of animals for the producers are market, small traders and other producers. As indicated by KII, producers buy from each other. They buy animals during the winter seasons and when some farmers face serious feed shortage. They never sell animals during the end of spring and summer season unless they face serious cash shortage or are offered an exceptionally high market-price. This is mainly because they know that better availability of feed during such seasons will enable the animals to improve their body condition and fetch better prices later on.

Market demand for different classes of animals (age and sex) is different in the areas. For instance, old ewes are preferred by the butchers due to their lower price and higher carcass quantity (high meat yield) as compared to other classes of animal. Castrates and fattened animals

⁸ Traders' checklist.

are preferred by individual consumers and small traders during holidays like Qurban Eid and Navruz and also for family events like weddings etc.

6.1.2 Selling

It was reported that sheep and goat producers sell their animals at their farm gate, village market and district markets. Producers/farmers usually sell their sheep and goats to meet cash demand for different purposes (to buy school clothes or to pay medical care or to raise money for cultural festivity and family events such as weddings or funerals). They consider goats as cash in hand since they can easily sell them. In the study areas most of the small ruminant producers (70%) sell their sheep and goats in the district livestock market, 20% of them sell in their farm gate and 10% within the village markets (Figure 3). It is not common for pastoral farmers to go to markets as they live in highlands, focus groups reported that the majority of pastoral farmers prefer to sell their animals there at farm gate.

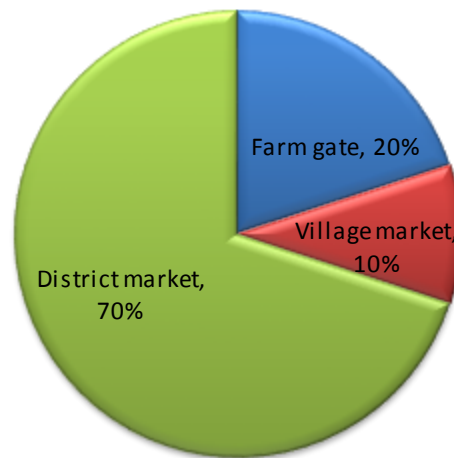


Figure 3. Places where producers sell their animals

When selling in the market, bargainers mediate between buyers and sellers, charging 5-8 TJS per animal from each buyer. Most of the time bargainers do it for free as a hobby, they get pleasure from such activities. The price of animals not much varies with the place of sale, it is minor. For farm gate/village selling, the main buyers are butchers and collector farmers. Producers sell in villages if too far away from market, if they need cash or when the animal is old or sick sell to butcher (Table 12).

Table 12. The trait preferences of different buyers, according to KII

Buyer type	Trait preferences	Purpose of buying
Producers/farmers	Breed, age, sex, healthy, coat colour; Does, ewes and young female animals	Reproduction
Butchers	Size of carcass, body weight, age, sex; Old, fattened animals, castrates	Slaughtering and selling meat
Restaurants	Size of carcass, bodyweight, age, sex; Old, fattened animals, castrates	Slaughtering and processing
Local consumers	Size of carcass, bodyweight, age, sex; Fattened animals, castrates	Household, family event and cultural festivity consumption
Small traders	All types	Reselling

Producers sell animals to other producers, butchers, restaurants, local consumers and small traders (Figure 4), who reputedly offer better prices for animals. Producers sell culled old ewes to replace them with young breeding stock. Young female goats, for example, are in high demand by producers buying them for restocking and fetch good prices. Butchers and restaurants need old or fattened animals, castrates usually they buy cheap ones. Local consumers need fattened animals, castrated male goats and sheep for household consumption, for holidays and cultural festivities or family events such as weddings and funeral etc.

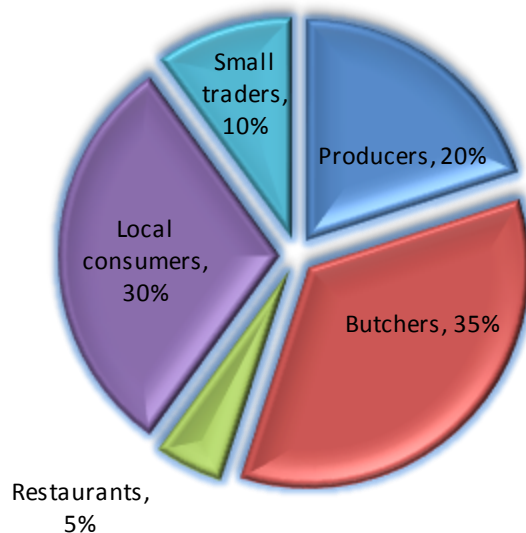


Figure 4. Buyers of sheep and goats from producers

Despite the high market demand and the corresponding sheep and goat price during the different social and religious festivals, producers usually cannot wait for such periods due to pressing cash needs in different times of the year. The financial needs are higher in spring (March, April) when agricultural inputs and air/railway tickets are purchased by seasonal workers for going to Russia (at least one member from each household). Also they sell to reduce flock size and to minimize the difficulties for old parents and problem of overcrowding and competition for the scarce resources. Supply of sheep and goats are high during these months, i.e. demand is lower, and hence the price is lower during this period. This is good time for small traders who have money and purchase animals for considerably cheap price due to higher financial needs of sellers and lean condition of animals after harsh winter. Small traders gave bought animals to shepherd for summer pasture and bring them back with better body condition in end of August and September when demand is higher. However, as it was reported by traders that this kind of business has risk of animal losses due to predators in summer mountain pastures and diseases.

6.2 Seasonal patterns of live sheep and goat demand and supply (including price patters) (PRCL + TDCL + EXCL + PCCL)

Table 13. Price pattern of small ruminants in the market often used to purchase sheep and goat (how high or low)

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Sheep price												
Very high										+	+	
High									+			+
Average			+	+	+	+	+	+				+
Low	+	+										
Very low	+											
Goat price												
Very high							+	+	+	+		
High						+					+	
Average				+	+							+
Low	+	+	+									
Very low	+	+										

Again for producers the financial needs are high in September, when the academic year starts, for school-related expenditures and also for purchasing winter feeds. At this period sheep and goats are returned from the summer pasture and have good body condition which will have good demand and price offer as well. But at this time demand is also relatively higher than other seasons of the year. Higher demand can be explained by returned migrants from seasonal work from Russia. Majority of weddings and other family events are carried out in this period. Small traders will have good price offer and benefit reselling the animals bought in spring for cheaper price (Figure 5a, 5b). The market information available to small ruminant producers is very limited and most is generated either through visits to the markets before engaging in any transaction or from other farmers.

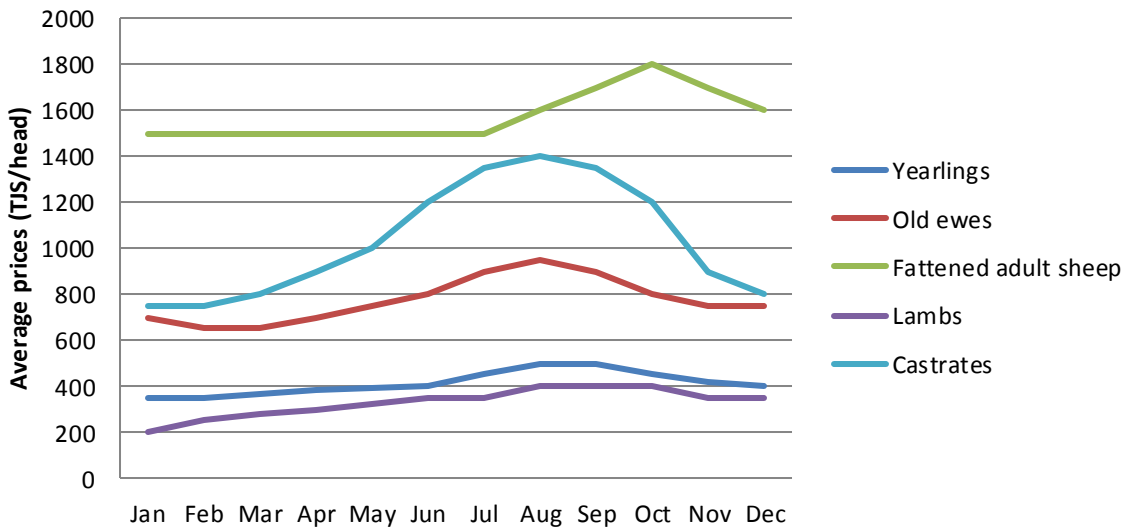
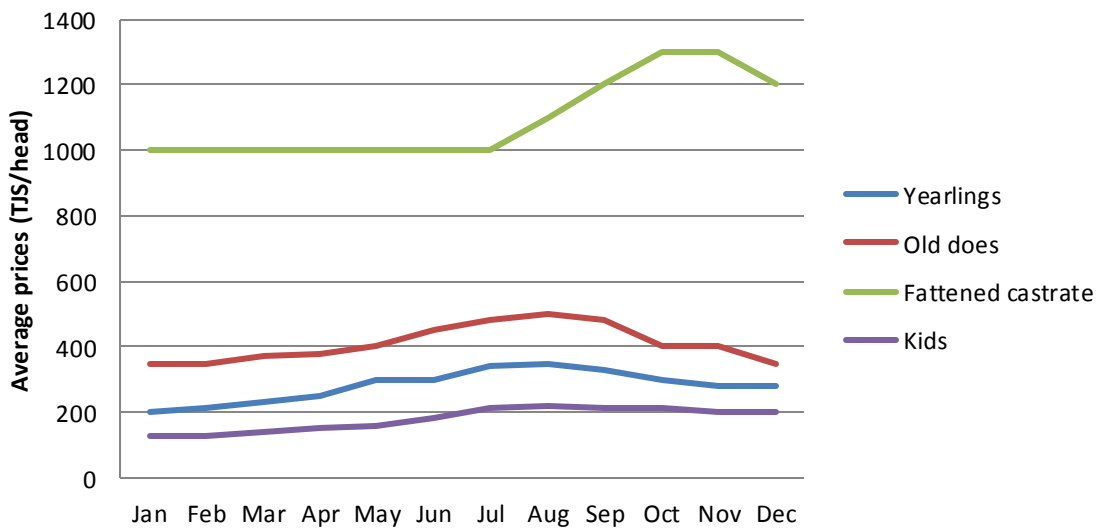


Figure 5a. Average prices of different classes of sheep over the year



5b. Average prices of different classes of goat over the year

Figure

6.3 Main actors and their key roles in live sheep and goat marketing (all checklists)

The main actors in the live sheep and goat marketing include i) Producers; ii) Small traders; iii) Restaurants; iv) Butchers; v) Individual consumers; and vi) Transporters.

i. Producers

Inherited large pastoral and smallholder farmers are the only producers of sheep and goats. They use traditional breeding, feeding and housing methods to produce sheep and goats and nowadays after reforming the kolkhoz and sovkhoz soviet system do not receive adequate support from the extension system. They sell animals to meet financial needs for household expenses, such as buying products for household consumption, to cover school related expenses, buying agricultural inputs such as veterinary medicaments, fertilizer and seed (where cropping areas are available), and buying medicine if necessary for household members. Sheep and goats also serve as a source of cash to purchase railway/air tickets going to Russia for seasonal work. Producers sell their animals at farmgate, in the village and district markets (Somgar, Bulok and Appon). They sell both in bulk (if they are selling more than one animal) and on an individual basis. They prefer to sell their animals to other producers and local consumers, since these generally give better prices than traders and butchers, who try to negotiate and force down prices. Animal prices usually rise during cultural and religious festivities and when seasonal workers return from Russia since they are seeking to buy large number of animals at a time.

ii. Small traders

Small traders also purchase animals directly from producers mainly in bulk and on individual basis from farmgates, village and district markets and sell them to other producers, butchers and consumers. Most of small traders are household farmers, who perform the trade as a sideline and many of them are involved in other business activities in addition. These traders sometimes transport the animals from production areas or village markets using Hyundai Porter, Daewoo Labo or Gazel trucks. However, more often, they trek the animals to district markets (which is over 70 km from production areas). In the larger district markets (Somgar, Bulok and Appon) they buy 30-50 sheep and goats in bulk at a time and sell them on individual bases, in case better price offered they sell in bulk as well. The traders add place-time value to the animals. In people the financial needs are higher in spring (March, April) when agricultural inputs and air/railway tickets are purchased by seasonal workers for going to Russia. Supply of sheep and goats are high during this period, i.e. demand is lower, hence the price is lower during this period. This is good time for small traders who have money. They usually operate using their own capital and sometimes receive credit from the banks. They purchase animals for considerably cheap price due to higher financial needs of producers and lean condition of animals after harsh winter. Small traders have bought animals to shepherd for summer pasture and bring them back with better body condition in end of August and September when demand is higher. However, as it was reported by traders

that this kind of business has risk of animal losses due to predators in summer mountain pastures and diseases.

iii. Restaurants

Restaurants in the study area buy mainly older ewes and does and castrated male sheep and goats because they are regarded as having a larger proportion of meat and old ones are cheaper. They process them into different dishes. Restaurants buy from producers directly and from butchers. Their major suppliers are butchers and they supply whole carcass or part of it at their doors. Butchers supply meat of infertile does and ewes and castrated sheep and goats because these yield more meat than young animals and have better body fat coverage, which makes a better quality kabob and shashlik (meat threaded onto skewers and grilled).

iv. Butchers

The butchers in the study areas slaughter sheep and goats and sell raw meat to various consumers. The butchers are the major buyers of animals for producers. The producers sell 35% of their marketed animals directly to butchers. They buy animals at the farmgates and from their immediate surrounding markets. Butchers buy bigger sheep and goats in good condition to slaughter and sell. They prefer fattened, castrated ram or buck of 40-50 kg body weight and the number bought varies according to their market size.

v. Individual consumers

Individual consumers are market actors who buy small ruminants for household consumption. As they have direct access to buy from producers, producers sell 30% of their marketed animals to them. Also they buy from butchers and small producers. Consumers generally prefer infertile does and castrated bucks, due to their greater proportion fleshy carcass.

vi. Transporters

In order to deliver animals purchased from producers to consumers in different areas use three modes of transportation: transporting by light cars, trucking or trekking. Usually local consumers and restaurants do not purchase in bulk, they do only on individual bases 1-3 animals and usually use own/rent light cars for transportation. Small traders and butchers when they purchase in bulk more animals, use Gazel, Hyundai Porter and Daewoo Labo mini trucks for transportation or use trekking on foot. These mini trucks carry 30-40 goats. The mortality rate is higher when animals are transported by mini trucks than when they are trekked on foot.

6.4 Marketing channels for live sheep and goats (all checklists)

The marketing channels for live sheep and goats in the markets of jamoats and districts were quite short. Generally, the common outlet for small ruminant producers was nearby village and district markets. Most farmers in the study areas were selling to butchers (35%), to local consumers (30%), to farmers/producers (20%), to small traders (10%) and to restaurants (5%) in

nearby village and district markets. The main target markets were Bulok and Somgar where the demand for sheep and goats is high and has the highest number of small ruminant joints in the study areas. In the study areas there is no export and import of live sheep and goats. These were the only channels utilized. Live sheep and goats marketing channels begins at the farm gate and flow out through various paths to reach consumers. The study identified major channels, through which sheep and goats reach final consumers.

Channels are:

- Producers → Local consumers
- Producers → Restaurants → Local consumers
- Producers → Small traders → Local consumers
- Producers → Small traders → Farmers/Producers
- Producers → Small traders → Butchers
- Producers → Butchers → Local consumers
- Producers → Butchers → Restaurants
- Producers → Farmers/Producers (for breeding)

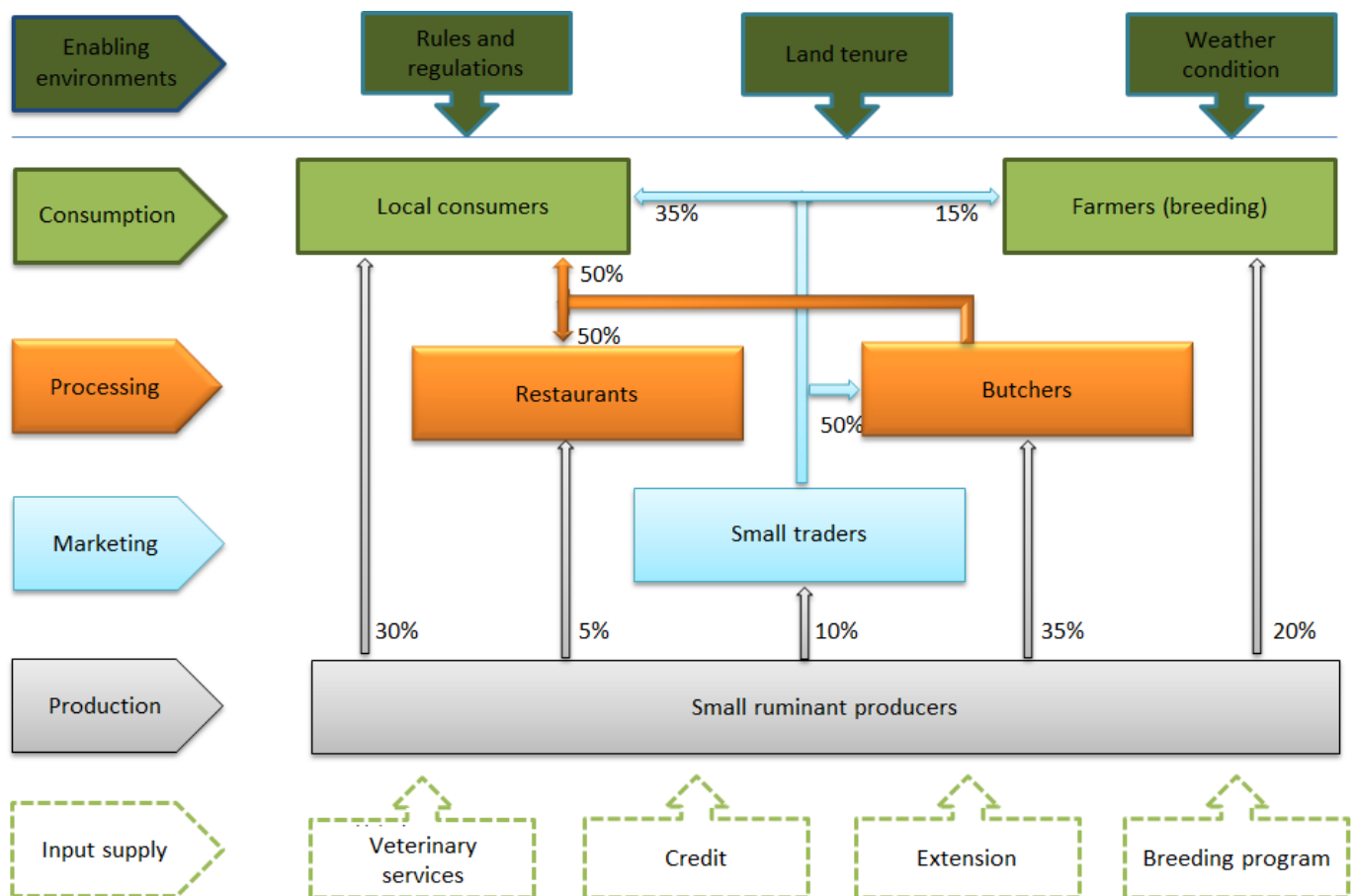


Figure 6. Marketing channels of small ruminants

- Producers → Local consumers

Local consumers in the study area have good access to buy directly from producers. This is a channel in which local consumers (people in rural communities) buy goats to slaughter for household consumption. The consumption pattern of local consumers is different. In rural areas local consumers buy and slaughter animals and consume some parts at home and rest part conserve either by drying salted meat or frying meat and put them into oil. Mainly consumers buy slaughter animals for special festivities, such as, Ramadan, Eidi Qurban, Navruz and New Year. Some households also buy slaughter animals for special occasions, such as weddings and other ceremonies. Also relatives of wedding holders buy animals for gifting them. The type of animals bought by local consumers varies according to levels of household income and the occasion for which the animal is required. It was reported that the number of consumers is increasing and relatively animal price has increased substantially in recent years.

- Producers → Restaurants

Local restaurants are one of the few actors who can buy live sheep and goats from small ruminant producers directly. They can either buy at Bulok, Somgar markets or village markets. Both producers and restaurants benefit, since there are no intermediaries the margin they share is correspondingly greater.

- Producers → Small traders → Local consumers

As indicated in the marketing channels, producers sell about 10% of their marketed animals directly to small traders. These traders sell 35% of their animals to local consumers. This mainly happens on holidays such as, Ramadan, Eid Qurban, Navruz and also in autumn when seasonal workers return from Russia.

- Producers → Small traders → Farmers/Producers

The producers get replacement stock only rarely from the markets. They usually buy animals for replacement stock from other producers whom they know. Some producers also buy slaughter animals from the small traders for household consumption if they do not have culled animals in their herd.

- Producers → Small traders → Butchers

The animals bought by small traders from producers are sold to butchers as well. Sheep and goats butchers are the other domestic consumers. Butchers prefer to slaughter mature animals with better body condition, especially castrates. Small traders supply only better quality mature animals to butchers when they are not available at the markets. Butchers sell raw meat and the edible internal parts of an animal, such as the heart, liver, tongue and head and legs as well. In some cases butchers sell dried meat in the intestine (kazi) and minced meat (farsh). Six and eight somoni price difference was reported in the study areas per kg of dried meat and minced meat.

- Producers → Butchers → Local consumers

The butchers are main buyers of animals in production areas. Small ruminant producers sell 35% of their marketed animals directly to butchers. The butchers buy animals at the farm gates and from the immediate surrounding markets. Butchers buy bigger sheep and goats in good condition to slaughter and sell. Small households with smaller number of family members usually buy meat from butchers according to their needs. After slaughtering and dressing, butchers hang carcasses by the hind legs on hooks and retail in a room (local name – gusht dukon). Local consumers have the freedom of selecting the parts to be cut from the hanging carcass.

- Producers → Butchers → Restaurants

Butchers are the major buyers of animals directly from producers. Restaurants buy slaughter animals either directly from farmers or meat carcass from butchers. As illustrated in Figure 7, their major suppliers are butchers. Restaurants buy whole carcass or part of it at their doors from butchers. Butchers supply meat of infertile does and ewes and castrated sheep and goats because these yield more meat than young animals and have better body fat coverage, which makes a better quality kabob and shashlik (meat threaded onto skewers and grilled). Restaurants process meat into dishes such as kabob, shashlik, cutlet, damlama etc. and sell them to their customers. There is a difference of about TJS 70 between buying from producers.

- Producers → Farmers/Producers (for breeding)

The producers buy young female sheep and goats for replacement purposes or to start sheep and goat breeding. The producers usually buy animals from other producers whom they know. They get breeding character asking the animal's historical background for productivity/prolificacy, colour, meat and fiber potential. Since their major objective is future breeding, farmers go for young animals with a good pedigree and good external body constitution. Price setting is done through negotiation between the two parties. Based on information from respondents, farmers may pay higher prices compared to traders and butchers.

6.5 Marketing routes for live sheep and goats (all checklists)

Major routes for sheep and goat marketing are indicated in Figure 6. As there is no export and import of live sheep and goats, the marketing route for sheep and goats tends to be simple. Animal trade is interlinked, is carried out only in domestic markets within district and neighboring districts. Of the total number of small ruminants supplied in the study areas 35% go to Bulok market, 25% to Somgar market, 20% to Appon and 10% go to Dulona markets. The major flow comes to Bulok as it is central market in the study area. The main buyers of animals in the markets are butchers, farmers and small traders. Kayrakum town market has the small outflow marketing route towards capital city Dushanbe. According to discussants, despite the long distance traders transport live goats to Dushanbe once in a season. As goat meat has

dietetic quality, it is demanded at the market especially by people who have cardiovascular health problems. In Dushanbe route the volume is not very clear, as estimated it was so minor.

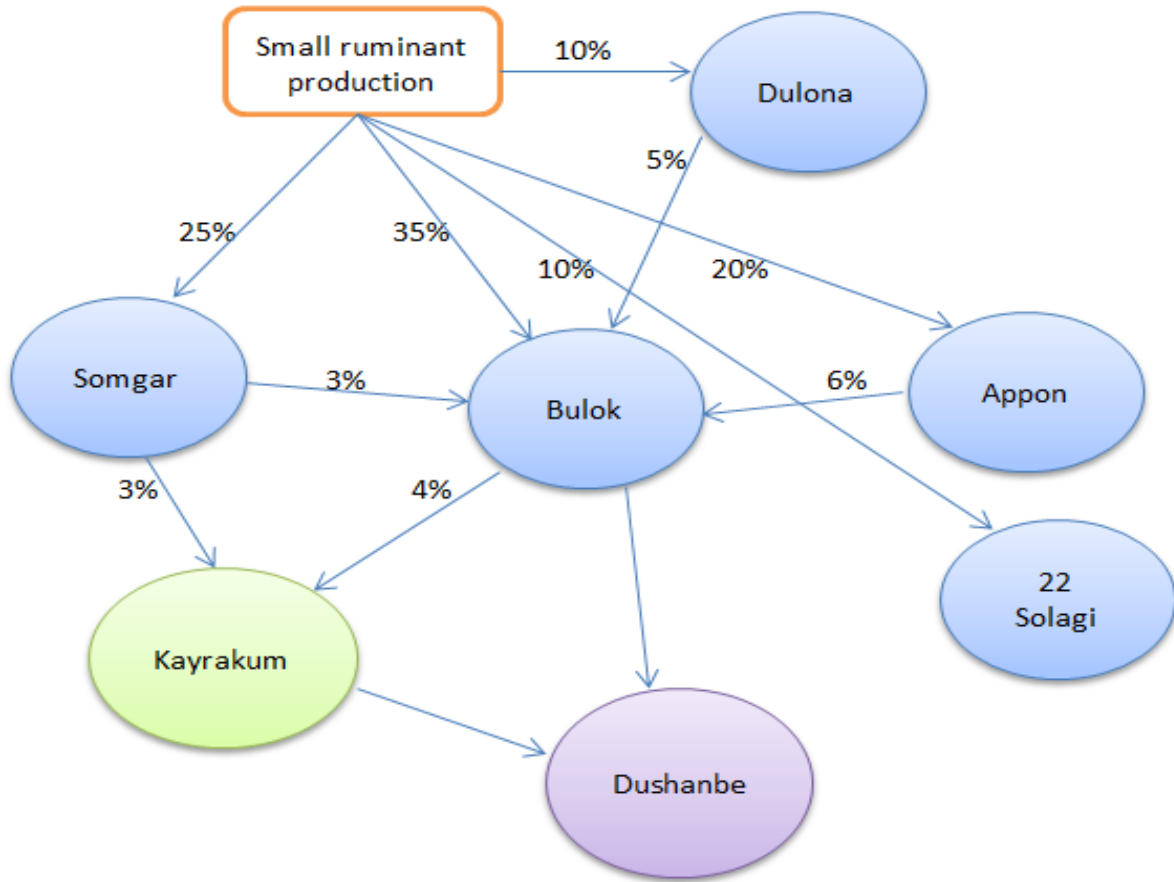


Figure 7. Small ruminant marketing routes and estimated volume

6.6 Key challenges and potential interventions in live sheep and goat marketing

Table 14. Key challenges / constraints

Constraint 1	Lack of necessary facilities for live sheep and goat marketing
Constraint 2	Lack of livestock market information and extension
Constraint 3	Lack of vertical linkages
Constraint 4	Weak horizontal linkages
Constraint 5	Lack of financial resources

Table 15. Solutions suggested to address the constraints/challenges named above

Constraint 1	Solution 1	Support building livestock market infrastructure
	Solution 2	Propose to and encourage either officials responsible for markets or private businessmen/traders to provide coordinated services for formal livestock marketing in the area with necessary facilities
Constraint 2	Solution 1	Capacity development on livestock marketing for extension workers, experts and producers.
	Solution 2	Establish livestock market extension component within the agriculture management office to
Constraint 3-4	Solution 1	Organize regular stakeholder fora at district level to discuss the major small ruminant marketing problems, in terms of management capacity and to strengthen vertical and horizontal linkages between value chain actors
	Solution 2	Establish animal producer marketing cooperatives
Constraint 5	Solution 1	Facilitate and encourage microfinance banks to issue credits with interest rates affordable to the producers
	Solution 2	Establish market price control for the inputs

7 Extension Services, Regulations and Other Institutions

7.1 Sources of information on sheep and goat production and marketing (PRCL + TDCL + PCCL)

The country's extension service in the Soviet period was incorporated within the former kolkhoz and sovkhov system and supported through the centralized state. The specialists trained in agricultural education such as, agronomists, livestock and veterinary experts, economists, construction specialists, mechanical and irrigation engineers, assigned to each kolkhoz and sovkhov. They were equipped with set of trained experts to manage the complete agricultural process and provide extension and advisory services within these big farms. Farmers were bound to follow pre-defined government instructions.

Extension services provided in the study areas mentioned by small ruminant producers were public sector – District Agriculture Department, Sugd Branch of the Institute of Livestock of the Tajik Academy of Agricultural Sciences (SB IL TAAS), District Veterinary Station, and NGOs working on agricultural advisory services that are financed by international donors – APPR Nau, SAS Consulting, SAS Organic, Chesvi, MSDSP etc.

7.2 Training types and sources for sheep and goat producers and marketers (PRCL + TDCL + PCCL + EXCL)

According to key informants, Sugd Branch of the Institute of Livestock of the Tajik Academy of Agricultural Sciences (SB IL TAAS) is only institute in the study areas which is providing consultations on small ruminant production mostly on goat breeding. To improve the quality and productivity of goat production SB IL TAAS with support of ICARDA organization in the community based goat breeding project imported genetic material (frozen semen) of Angora goats from USA. This project has been promoting improved goat breeding technologies by establishing nucleus flocks, introducing elements of pedigree work, flock management and providing artificial insemination with imported semen and supplementary feeds for does in pregnancy periods. Based on the information of goat producer who was participant of the breeding project, the goat producers had useful trainings on selection, flock management, feeding and animal health care and also trainings on value added local processing of goat fibers etc. Small ruminant producers have experienced a lot with all these activities which were in kolkhozes the responsibility of livestock experts with special livestock breeding background.

District Veterinary Station provides veterinary services and awareness about infectious diseases. If farmers have detected the serious diseases in their flocks and jamoat veterinarian will be informed. Jamoat veterinarian checks and writes a statement and report to District Veterinary Station. Based on the report the further actions will be done.

7.3 Availability and adequacy of information on sheep and goat production and marketing (PRCL + TDCL + PCCL + EXCL)

Many NGOs involved in local extension activities were not targeted to small ruminant production, but mostly their target areas were crop production, horticulture, drying fruits and vegetables, bee-keeping, wheat etc. Some NGOs like APPR Nau, Chesvi and MSDSP were working on processing of mohair. They had trained local women groups of fibre processors how to produce quality handicraft garments from mohair. These organizations might not have proper cooperation between them, as a result, duplication of activities happening and are working in the same areas. Most of the existing extension initiatives in Tajikistan are donor driven and NGOs involved in local extension activities are supported through foreign funding. Most of the extension advisory service provided by NGOs was stopped after funding ended. For any NGO or advisory service it is hard to survive alone, majority of small scale farmers are poor and they are not accustomed to pay for consultation yet, as in the past they used to receive it for free from the kolkhoz system. Moreover, public extension service is insufficient due to lack of state support for extension. Agriculture advisory services are considered as promoter of productivity, but are not adequately developed in the study areas and in the country as well.

7.4 Profiling the main institutions with bearings on sheep and goat production and marketing (PRCL + EXCL + COCL)

After collapse of the Soviet Union and after reforms the agricultural extension services are being provided today by various service providers. The main actors in the public sector that provide agricultural extension services to dehqan farms is represented by the Ministry of Agriculture (MoA) and the Ministry of Melioration and Water Resources (MoMWR), local government or councils (Hukumats) universities and research institutions around the country (figure 8) . MoA has agricultural administrative personnel at the national, Province (oblast) and District (nohiya) levels called “Rayosati kishovarzi/Agroprom” (Department of Agriculture). This organization was responsible for the functioning of kolkhozes and sovkhozes, thus it also provided agricultural consultations. But now their role is mostly supervisory (reporting to Hukumats), as well as collecting data for statistical purposes.

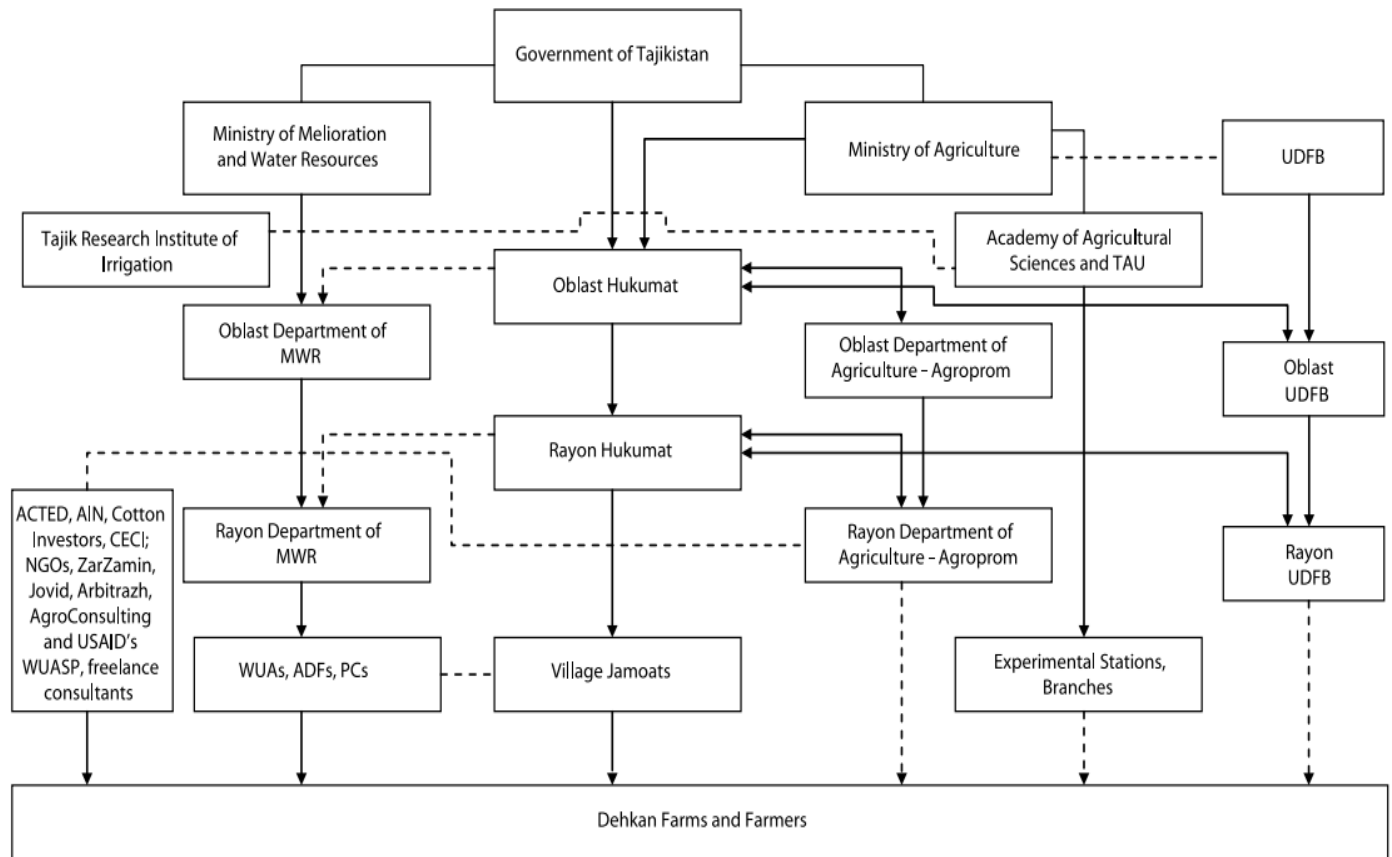


Figure 8. Existing agricultural extension linkages in Tajikistan (case from Sugd Province).

Source: Rakhmatilloev 2008. Notes: WUASP – Water User Association Support Program; ADF – Association of Dehqan Farms; PCs – production cooperatives; MWR – melioration and water resources; TAU – Tajik State Agrarian University; UDFB – Union of Dehqan Farms and Businessmen.

Private advisory services are run by both international and domestic NGOs. Local forms of knowledge exchange and mutual consultation was also common across the sites among producers.

7.5 Main challenges and potential interventions related to information, rules and regulations in sheep production and marketing (TRCL, VTCL, FSCL, EXCL, and CRCL).

Table 16. Key challenges / constraints

Constraint 1	Public extension service is insufficient due to lack of state support.
Constraint 2	Many NGOs involved in local extension activities do not target small ruminant production, their target areas are mostly crop production, horticulture, drying fruits and vegetables, bee-keeping, wheat etc. Extension advisory services provided by NGOs are usually discontinued when donor funding ends.

Table 17. Solutions suggested to address the constraints/challenges named above

Constraints 1-2:	Solution 1	Organize regular stakeholder fora at district level to discuss major extension problems
	Solution 2	Develop a comprehensive extension system with public support that integrates all aspects of agriculture and is sustainable,

8 Key gender issues in division of labor, ownership and decision making in sheep and goat production and marketing

8.1 Patterns in the division of labor (men, women, children) in sheep and goat production and marketing (all checklists)

Role of men and women in small ruminant production and marketing and decision making structures were discussed in focus groups. In the study areas women's typical role within small ruminant value chain is different from locality to locality. Labor allocation in small ruminant production mainly originated from the family members.

Women play an important role in small ruminant production. Women are mainly responsible for milking, processing milk products, processing fibers and selling them in the markets, caring for newborn lambs/kids and sick animals by feeding and watering them and also responsible for household activities. Selling of fiber processed products (yarn, hat, gloves, socks etc.) is an important source of income for females, with proceeds covering miscellaneous household expenditures. It was revealed that rather than women of pastoralists from mountainous areas,

many individual women's livelihood strategies included a mix of formal sector employment. For example, except household farm activities a female may also work as a teacher or a librarian at school or doctor in district hospital and so on.

Despite women's significant role, educational and/or training programs about small ruminant production regarding women in rural areas are far from an acceptable level.

The FGD findings indicate that the women's attitude toward training programs about small ruminant production was extremely positive. Two third of the women wanted to participate in trainings if they took place in their village and others did not want to attend these programs because they were too old and had only a few animals. The most frequent topics addressed by women during the FGD about training programs were general sheep and goat management methods, like milking, feeding, veterinary concerns, marketing of small ruminant production.

8.2 Gender issues in responsibility and decision making in sheep and goat production and marketing (all checklists)

Men are responsible for managing small ruminants such as, herding animals, selection and breeding, feeding, cleaning animal house, health care, marketing live animals and fiber. Also men are expected to be involved in fiber shearing, tagging, giving vaccines, castration and participation in public meetings that relate to small ruminant husbandry. Men control proceeds of the sale of their animals. But women also have some say in how the proceeds are utilized. Mostly decision-making of women takes place at the household level, however men recognized to hold the general structural management of livelihood strategies. But dominance of men over women is not so pronounced in the study areas. Almost all important decisions are taken jointly by both the man and the woman heading the household.

9 Challenges and opportunities in sheep and goat

9.1 Challenges in sheep and goat production and marketing

9.1.1 Technical challenges

Inadequate skills and lack of breeding/pedigree work. After kolkhozes the new forms of management for farmers not appropriate almost all the methods and techniques of the former formation. Under current conditions, the private farmers lack the necessary skills appropriate for breeding animals. Therefore, the strategy of livestock management considered to be chaotic. There is lack of identification and rearing of genetically potential animals and their distribution. They do not have the necessary knowledge to correctly assessing the quality of bucks/rams. Therefore, observed number of males in excess or lack in the herd. For highly productive animals

do not given special attention and not following pedigree records. In general, there is a need for functioning of pedigree/breeding network.

Availability of poor quality animals. At times farmers continue to have poor quality and unproductive females with obvious consequence for the cost of feeding and overgrazing of pasture. Share (percentage) of certain age and sex groups of animals is chaotic and not rational.

Limited access to high productive pedigree backs/rams. There is a tendency to attenuation of public enterprise's role in agricultural production and adequately this role is gradually transformed into private forms of farm management. Simultaneously in new forms of management arisen new problems associated with lack of access to high productive pedigree backs/rams.

Lack of necessary facilities for live sheep and goat marketing. In order to provide coordinated services and encourage formal livestock marketing in the area, there is no special yard for livestock marketing with necessary facilities, such as fencing, protecting roof from raining and sunlight stream, veterinary clinics, watering and feeding mangers, loading and unloading ramps, also auction tribune and weighing instrument.

Lack of vertical linkages. Most producers sell their sheep and goats at the markets within their localities and usually sell the animals to any buyer who offers them better price. There is no export marketing for live sheep and goats in the study areas and producers have no regular customers with longstanding business relations who provide them with reliable market information or advance payment for supply their animals. This is because producers sell animals whenever they need cash, not for market reasons. Thus, there is no vertical linkage between producers and any buyers in the sheep and goat value chain and there is no strong relationship of trust between them. This is mainly because the previous soviet production system was in planned economy, not market-oriented and it is in transition period. The producers are not following demand or the quality requirements of important market actors and as a result, there is low level of transference of skills and information between top and down of the chain. This not facilitates development opportunity of production to expand their business activities.

Weak horizontal linkages. Producers in the area are not organised well. They have no network or well operating small ruminant production marketing cooperatives or association which could help with negotiations for the market price of small ruminant production and organize sales on contractual bases, also with joint purchase to lowering the cost of inputs and services. As reported by respondents, there are a few cooperatives for crop and horticultural production which were organized by NGOs. But they are not strong enough to satisfy the interest of their members due to their weak financial position, lack of business skills and transparency. This is because farmers in kolkhoz and sovkhoz were already got accustomed to planned economy

where inputs and services were provided by the government. This is revealed that small ruminant producers have weak horizontal linkages among themselves.

Lack of financial resources. Due to lack of financial resources the producers are not able to purchase sufficient inputs, such as, supplementary feeds and consequently low prices of outputs (live sheep and goats) which tend to lower small ruminant producers' profit margins, thereby discouraging them from investing more into the enterprise.

9.1.2 Institutional challenges

Lack of public policy on monitoring and development of sector (angora goat breeding). Though there are laws on "Pedigree work/breeding" and "Pasture" actually they do not work at the proper level, at least in the study area. From the relevant agencies on the basis of specific monitoring there is not taken any necessary action to improve the situation.

Lack of certification for pasture lands. Public enterprise's role is attenuated in agricultural production and adequately this role is gradually transformed into private forms of farm management. As it was reported the reforms have not touch and have not brought any results on pasture issues that small ruminant producers are challenging with lack of access to community pasture resource. In the past the producers were using kolkhoz and sovkhos pasture lands. At the present they do not have their pasture land certification due to not distribution of the pasture lands. This resource is currently in the balance of government, forestry. As pasture is the main resource for producers whose main income generating activities are small ruminant production in mountainous areas and where cropland is limited for feed production, distribution of pasture resources and allocation of pasture land certification to relevant people for manifestation of their confidence for development of sector through the rational use of these valuable resources is crucial.

Poor infrastructure, inefficacy and inadequate veterinary service coverage.

There is only one veterinary station to serve district, there is no diagnostic equipment. Also there is no animal health clinic or posts at jamoat level. However, veterinarians were not working effectively due to resource limitations, such as absence of veterinary clinics or posts in jamoats, lack of equipment and as well as lack of human resources. There are not enough animal health extension workers to serve the farming community, by providing veterinary services.

Shortage of vaccines. Vaccination is one of the most important activities of the district veterinary station. The veterinary station provides the vaccines for different diseases including IPP, foot-and-mouth, plague (*Pasteurella pestis*), goat pox and pasteurellosis. However the vaccines allocated for the district do not cover the number of animals, even some are not available, possibly because of lack of vaccines produced at national level or problems in the distribution system.

Lack of transport. District veterinary station has been struggling to have one veterinarian (with one assistant in cases of large territory) in each jamoat with no transport facilities. Veterinarians usually hire transport to deliver services which make the vet service expensive and in consequence not all farmers can afford them.

Constraints of credit service (inflexible system, high interest rate). There four credit service banks operating in the area. However, their high interest rate (24-28%) is not affordable for smallholder farmers. Moreover, the system requires collateral to guarantee loan repayment. Such experiences have created a sense of insecurity among members of society, who are generally reluctant to use credit based on collateral.

Lack of market information and extension. As reported by respondents, one of the important institutional constraints in the area was providing livestock marketing information to pastoral and smallholder producers. The extension system of agriculture management office is supposed to be the major source of information about prices and consumer preferences for the producers, especially comprehensive information about the development of market-oriented livestock production. According to respondents, the current extension system of agriculture management office either lacks livestock market extension component or extension workers operating inadequate at district and jamoat levels.

Lack of livestock extension services. Many NGOs involved in local extension activities were not attentively targeted to small ruminant producers living in rural and around mountainous areas, mostly their target areas were crop production, horticulture, drying fruits and vegetables, bee-keeping, wheat etc. Most of the extension advisory service provided by NGOs was stopped after donor funding ended. Moreover, public extension service is insufficient due to lack of state support for extension.

9.2 Opportunities for sheep and goat production and marketing

Suitability of the target area for small ruminant production. Sheep and goats being highly-grazing animals, under traditional rearing conditions 70-80% of their annual feed demand satisfy from the pasture. Asht and B.Gafurov districts consist of mountainous terrain, have sufficient pasture-forage resource for small ruminant production. The main parts of the pastures used by sheep and goats are located in Kurama, Mogoltav and Syr-Darya pasture-geobotanic areas of Tajikistan (the entire right bank of the Syr-Darya River), a total area of over 450 thousand ha. This area is with its local peculiarity included in one of the special agro-climatic zones of Tajikistan and is recognized as the main habitat for breeding of angora goats. This offers a potential resource for small ruminant production for farmers.

An increasing demand for meat. In the country the demand for meat is increasing due to rise of population and urbanization.

An increasing demand for mohair. There is high demand for mohair and its processed products in domestic also in export markets like Russia, Kyrgyzstan, Kazakhstan, China, Turkey etc. Also is a trend towards processing of the mohair closer to the source.

Support and commitment from the government to increase processing and export of value added mohair products. In Soviet period there was not any factory to process mohair in the country. It was delivering as a raw material. At present time the government is supporting those individuals who are interested in processing of mohair. There is very limited competition in Tajikistan at the moment for establishing processing facilities at higher level.

10 Recommendations

Based on the rapid meat value chain assessment, key research, and development and policy findings intervention strategies are being recommended to address key challenges identified and thereby to improve the efficiency of production and performance of sheep and goat meat value chains.

Recommended interventions to overcome constraints of sheep and goat production (breeding and feeding)

- Identify potential farmers – breeders of pedigree animals with complex (having of livestock, pasture, experience and motivation).
- Training of farmers on effective management of herds to get more benefits from the sale of high productive animals.
- To give skills on implementing of breeding elements (record keeping on productivity, animal assessment, selection of best animals, optimization of the ratio of specific gender and age groups in the herd).
- To coordinate breeding and selection work in the region is necessary to create new forms of pedigree/breeding networks. To do this, at first to create several farms with breeding groups is necessary, which allow access to their improved breeding stock through a decentralized system of breeding. Coordination of breeding work should conduct scientific research institution having the resources of breeding material.
- Develop a comprehensive and specific monitoring to take necessary action to improve the pasture use situation in which the main role of policy mainstreaming should be taken by the state.
- Introduce improved forage species for pasture productivity improvement.

Recommended interventions to overcome constraints of animal health care

- Allocating budget and land for establishment of clinics or animal health posts with the necessary human resources in each jamoat to increase accessibility of health services for farming community and procurement of veterinary clinical and diagnostic equipment. As

indicated earlier, there is only one veterinary station in the district with no sufficient clinical equipment to deliver the services required.

- Support and encourage the local interested individuals to establish private animal health clinic or posts in every jamoat which will work under the rule of district veterinary station.
- Allocate sufficient dose of vaccines to the district to ensure full scale vaccination in the district though proper planning and consultation with provincial and district veterinary center. Handling production of sufficient dose of vaccines at national level and set up a proper distribution system.
- Training of enlightened farmers as community health workers in sheep and goat disease prevention and control. It was reported by respondents that there are some previous kolkhoz farmers who treat sick animals in their villages. If such individuals are identified, trained and equipped, they will assist the community with nonserious animal health problems and castration of unwanted males. This helps to prevent the outbreak of major diseases.
- Provide transportation facilities for animal health workers at the district and jamoat levels to deliver on time services.

Recommended interventions to overcome constraints of credit service

- Facilitate discussion fora between credit service providers (Eskhata Bank, Imon International, Agroinvestbank, Arvand), political leaders, community members and other stakeholders to resolve problems of access of the farming community to credit services.
- Farmers reported that the existing credit system does not fit the reproduction cycle of small ruminant. Support establishment of rural credit with low interest rate and saving cooperatives in the intervention areas through training of leaders in cooperatives management and provision of startup capital.

Recommended interventions to overcome constraints of live sheep and goat marketing

- Capacity development of extension workers, experts and producers in livestock marketing. The current system lacks livestock market extension components at district and jamoat levels to provide formal market information and knowledge to producers. Thus training extension workers, district and jamoat level experts as well as producers about comprehensive information about the development of market-oriented livestock production, especially basic principles of livestock marketing is crucial.
- Organize regular stakeholder forums at district to discuss the major small ruminant marketing problems, find common solutions, and establish animal producer/marketing cooperatives in terms of management capacity and strength vertical and horizontal linkages between value chain actors.
- Support building livestock marketing infrastructure. Support building well designed livestock marketing yards with all necessary facilities and at least basic infrastructures.

Recommended interventions to overcome constraints of extension services

- Many NGOs involved in local extension activities were not targeted to small ruminant production. And most of them were stopped after funding ended. Moreover, public extension service is insufficient in the study areas. There is a need to develop a comprehensive extension system that integrates breeding, feeding, rational use of the pasture, animal health care, marketing and financial aspects of small ruminant production in which the main role of policy mainstreaming should be taken by the state.

11 References

Decree of the Province Governor for № 287 dated 9 December 2013 “On additional measures of reorganization and restructuring of large farms of the Sugd Oblast”.

EDB (Eurasian Development Bank) 2012. Labour migration in the CES: Legal consequences and economic effects of new agreements. Centre for Integration Studies. St. Petersburg: Eurasian Development Bank.

Ovchinnikov P.N., G. T. Sidorenko, O. E. Agagkhanyants, R. S. Badritdinova, N. G. Kaletkina, A. A. Konnov, F. S. Kulik, Z. K. Kurbanbekova, V. K. Lukanenkova, L. F. Sidorov, K. V. Stanyukovich 1977. Pastures and hayfields of Tajikistan. Book. Dushanbe, “Donish”, pp.302

Rakhmatilloev, R. 2008. Extension and Dissemination Strategies in Tajikistan. Tajik Hydromelioration Research Institute report, prepared for IWMI. Dushanbe, Tajikistan.

Tajstat. 2012, 2013. Real sector. Analytical Tables. Republic of Tajikistan. Retrieved from <http://stat.tj/en/analytical-tables/real-sector/>.

Tajstat. (2014). Statistical pocketbook. Tajikistan in figures 2014. Statistical Agency under the President of the Republic of Tajikistan, Dushanbe, Tajikistan.

World Bank. (2014). Tajikistan partnership program snapshot. The World Bank Group Tajikistan. Dushanbe: World Bank.