

Case Study Series

**WATER MANAGEMENT,  
LIVESTOCK  
AND THE OPIUM ECONOMY**  
**Livestock Feed and Products**



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This report is one of seven multi-site case studies undertaken during the second stage of AREU's three-year study "Applied Thematic Research into Water Management, Livestock and the Opium Economy".



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## About the Author

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## About the Afghanistan Research and Evaluation Unit

The Afghanistan Research and Evaluation Unit (AREU) is an independent research organisation headquartered in Kabul. AREU's mission is to conduct high-quality research that informs and influences policy and practice. AREU also actively promotes a culture of research and learning by strengthening analytical capacity in Afghanistan and facilitating reflection and debate. Fundamental to AREU's vision is that its work should improve Afghan lives.

AREU was established in 2002 by the assistance community working in Afghanistan and has a board of directors with representation from donors, UN and other multi-lateral agencies, and non-governmental organisations. Current funding for AREU is provided by the European Commission (EC), the United Nations High Commissioner for Refugees (UNHCR), the World Bank, and the governments of Denmark, Norway, Sweden, Switzerland and the United Kingdom.

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## Glossary

<i>ailaq</i>	summer camp
<i>bazgar</i>	sharecropper, see <i>dehqan</i>
<i>chaman</i>	grassy meadow
<i>dasht</i>	arid/semi-arid plain
<i>dehqan</i>	sharecropper (20/25%)
<i>dough</i>	buttermilk (see Appendix 2)
<i>Eid</i>	Islamic religious holiday
<i>Eid-i-Qurban</i>	the feast of the sacrifice
<i>halal</i>	meat that has been slaughtered according to Islamic law
<i>jerib</i>	unit of land measurement; 5 <i>jerib</i> = 1 ha (2000 m <sup>2</sup> )
<i>kilim</i>	flatweave rug
<i>kishtamand</i>	sharecropper (50%, Herat)
<i>kuchi</i>	nomad
<i>landi</i>	preserved dried meat
<i>mahalla</i>	suburb, area of a city or village
<i>maldar</i>	pastoralist or herdsman
<i>man</i>	measurement of weight equivalent to 7 kg (Kabul), 4 kg (Herat), 4.5 kg (Kandahar), 5 kg (Peshawar), 14 kg (Balkh)
<i>maska</i>	milk product (see Appendix 2)
<i>mast</i>	yoghurt (see Appendix 2)
<i>mushing</i>	field pea
<i>mushing-i-gawi</i>	cow pea
<i>Naw Roz</i>	Persian New Year's Day, celebrated on vernal equinox (21 March)
<i>panir</i>	soft white cheese (see Appendix 2)
<i>qawala</i>	official registration/title deed (for land/pasture)
<i>qawm</i>	extended family, tribe, clan
<i>qurut</i>	small balls of dried yoghurt or <i>chakka</i> (see Appendix 2)
<i>roghan</i>	ghee (see Appendix 2)
<i>roghan-i-zard</i>	yellow fat, clarified butter or ghee (see Appendix 2)
<i>ser</i>	4–7 kg of grain (location dependent)
<i>talkhakh</i>	a vetch

## Abbreviations and Acronyms

DACAAR	Danish Committee for Aid to Afghan Refugees
DCA	Dutch Committee for Afghanistan
EC	European Commission
EU	European Union
FAO	Food and Agriculture Organization
GAA	German Agro Action
NGO	non-governmental organisation
UN	United Nations
UNAMA	United Nations Assistance Mission to Afghanistan
UNEP	United Nations Environment Programme
UNHCR	United Nations High Commission for Refugees
USAID	United States Agency for International Development

## Conversions

50 Afghani (Afs)	approximately US\$1
1 Kabuli <i>ser</i>	4–7 kg of grain (location dependent)
1 Herati <i>man</i>	7 kg (Kabul), 4 kg (Herat), 4.5 kg (Kandahar), 5 kg (Peshawar), 14 kg (Balkh)
1 <i>jerib</i>	approximately half an acre or one fifth of a hectare



# 1. Introduction

This study was undertaken as part of the Afghanistan Research and Evaluation Unit's applied thematic research project "Water Management, Livestock and the Opium Economy", in cooperation with the Danish Committee for Aid to Afghan Refugees (DACAAR) in Ghazni and Herat and German Agro Action (GAA) in Nangarhar and Kunduz.

This report is the third in the research project to focus on livestock issues. The first,<sup>1</sup> based on field research carried out in November/December 2005, described how livestock husbandry is practised in the sixteen study villages in four provinces and seven districts, and among one group of nomad pastoralists.<sup>2</sup> That study highlighted the close relationship between raising livestock and cultivating crops, and the importance to the livestock owner of having access to crop land. It also emphasised the balance that sedentary livestock owners must maintain between feeding their stock on the products and by-products of the cropping system, and the use of common-land grazing. Nomads, although primarily dependent on having access to natural grazing and being able to move seasonally between locations and elevations, are also dependent in certain seasons on fodder and grain procured from settled rural communities near their camps. The second report<sup>3</sup> detailed issues related to livestock production and health, based on field research undertaken in March/April 2006. This report continues focuses on issues related to livestock nutrition and livestock products.

The field work for this study was carried out from 19–28 August 2006, and built on the earlier field work undertaken. Assistance was provided by the DACAAR field offices in Herat and Pashtun Zarghun district. Where relevant, this report includes additional information from experience and observations made in other parts of Afghanistan.

## 1.1 Report structure

The case studies on which this report is based were two contrasting communities in the Hari Rod valley (Pashtun Zarghun district) in Herat Province, Tunyan and Marwabad/Borya Baf, and one group of nomads in eastern Afghanistan, the Khomarikhel, who migrate seasonally between Laghman, Parwan and Panjsher.<sup>4</sup>

Chapter 2 deals with issues related to livestock nutrition, while Chapter 3 deals with issues related to livestock products including meat, milk products and wool (and in the case of goats, where relevant, goat hair and cashmere). Both chapters consider how these issues relate to sedentary and nomadic/transhumance systems.

Chapter 2:

- provides management calendars for the different seasons showing how categories of livestock under different systems and in different situations are maintained on

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<sup>1</sup> Anthony Fitzherbert, 2006, *Livestock Husbandry*, Kabul: Afghanistan Research and Evaluation Unit.

<sup>2</sup> Five in Ghazni, three in Kunduz, three in Herat and five in Nangarhar, along with the Khomarikhel *kuchi* who were met in their winter camp in the Laghman valley (they spend spring and autumn in Parwan and part of the tribe move to the upper Panjsher valley in summer).

<sup>3</sup> Euan Thomson, 2006, *Livestock Production and Health*, Kabul: Afghanistan Research and Evaluation Unit.

<sup>4</sup> The Khomarikhel were first studied in their winter camps in Laghman in December 2005. This case study was conducted in their summer camps in the upper Panjsher valley and Parwan.

a mixture of natural grazing and cultivated or purchased feed, forage and fodder;<sup>5</sup>

- identifies and ranks preferred forage, fodder, grain, pulses and crop by-products, as well as pasture species fed to or grazed by livestock in different seasons;
- explores how sedentary farmers decide how to allocate their available land between food grain, cash crops and fodder production for their livestock; and
- establishes the factors that affect the seasonal use and management of common-land grazing including the open rangeland, wastes, stubbles and crop aftermaths.

The threats and limitations affecting each management system, the capacity for increased productivity, and the extent to which feed and fodder production is currently a constraint of livestock production are considered.

Chapter 3 looks at the different products of livestock husbandry – meat, milk and fibre – in the context of the two settled communities on the Hari Rod and the *kuchi* in eastern Afghanistan, and establishes:

- which products are produced by whom and when;
- the factors influencing production choices for different products;
- how choices are made and how different products are used for consumption, exchange or sale; and
- the ownership of different products and who controls the choice of usage and income.

The report analyses the opportunities and constraints that relate to different products under different management systems, and considers the implication of these for planned livestock development.

## 1.2 Data collection

In Herat, case studies of two settled communities were conducted. Tunyan and Marwabad/Borya Baf are neighbouring communities situated on the right (north) bank of the Hari Rod River about 40 km and 80 km respectively upstream and east of Herat city. Relative access to irrigation water dictates the cropping systems practised in each group of villages, and these in turn influence how livestock are managed and fed, so that some comparison between these two situations can be made. The main agro-economic differences between the two communities are related to their access to irrigation water. Tunyan has little irrigation water, especially in summer, and only one main crop per year is possible. The community is heavily dependent on wheat cultivation. On the other hand, Marwabad/Borya Baf has better access to summer irrigation water, so that wheat, the main winter-sown crop, is followed by several summer crops including rice, maize, pulses (mung and beans), sesame, melons and vegetables as well as fodder crops (clover and lucerne). This demonstrates the differences in situation (which in turn influence livestock production) even within comparatively close proximity. In both communities, milk cows are kept primarily to meet domestic needs rather than to produce milk for sale. In Tunyan, cattle (as well as sheep and goats) remain in the vicinity of the village throughout the year, while in Marwabad/Borya Baf some families practise a form of transhumance – moving their flocks to higher-altitude mountain grazing for

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<sup>5</sup> In this report “feed” refers to grain or other forms of “concentrate feed” such as oil seed cake; “forage” to freshly cut green legume or grass; and “fodder” to dry hay or straw.

part of the summer. In both cases a careful balance is maintained between crop production and the seasonal use of common grazing, and ownership of livestock is very much dependent on having access to crop land to provide winter fodder. Crop production and livestock husbandry are closely integrated.

In contrast to these two sedentary, crop-based, livestock management systems in northwest Afghanistan, the Khomarikhel in eastern Afghanistan neither own nor have access to arable crop land. Traditionally, they have depended for their pastoral livelihood on seasonal grazing, generally according to community rights and customs. However, life is changing dramatically for these nomads. It is now only a minority of families for whom their livelihood is still primarily dependent on their flocks and annual migration between winter camps in the Laghman valley, spring and autumn camps in Parwan and summer camps on sub-alpine pastures in the upper Panjsher valley. More Khomarikhel families rely only partially on their flocks and are increasingly dependent on earning a livelihood from casual labour in and around the cities of Kabul, Jalalabad and even Peshawar in the North-West Frontier Province of Pakistan. These families must still migrate as they have no fixed home or village, but they do this on a more limited basis between Laghman and Parwan where their camps have reasonable access to casual labour opportunities. Within the tribe itself, there are some families who can still be described as being pastoralists and sheep herders, while others increasingly fulfil their livelihoods needs acting as satellites of the urban and peri-urban economy. All still proudly refer to themselves as "*kuchi*".

### 1.3 Research questions

This study considers the differences between the two settled communities in Herat separately from the situation of the nomadic Khomarikhel; little constructive comparison can be made between the settled and the nomadic groups. Both occupy a valid place within the complex farming and livestock husbandry systems practised in the Afghan situation, and they should be considered on their own merits and in light of their own particular constraints. The sedentary livestock ownership observed in Herat is generally subsistence in character: an adjunct of crop farming and dependent on access to crop land. On the other hand, the nomadic pastoral system of the Khomarikhel is a livestock-based economy, largely dependent on seasonal grazing (although the purchase of feed and fodder in certain seasons may be necessary). However, increasingly many nomadic families are becoming dependent on a precarious living on the urban fringes. How might a better understanding of this situation influence the Afghan Government's development policy and thinking? This is a challenge that this report cannot fully answer from such a limited study base, although it aims to illuminate and analyse the situation and its constraints.

#### **Sedentary livestock husbandry: Herat (Pashtun Zarghun)**

In Tunyan and Marwabad/Buriabaf a cross-section of types of livestock owner were interviewed, including small, medium and larger landowners and sharecroppers, as well as shepherds and cowherds. The crop land, houses and livestock facilities of individual farmers and livestock were visited. Herdsmen were interviewed with their flocks and herds.

Interviews were in the form of semi-structured discussions which were kept as informal as possible, and included broader, but related, topics in order to provide greater contextual meaning. DACAAR staff familiar with the area provided much useful background information. Discussions were held with eight livestock owners, two shepherds and one cowherd. In Marwabad/Borya Baf, a particularly useful

interview was held with an experienced “para-vet” (and an owner of livestock himself) working under the auspices of the Dutch Committee for Afghanistan (DCA) Animal Health Programme, who provided insight into local livestock management and production systems. A female field assistant from the DACAAR office interviewed two groups of women in Tunyan and two in Marwabad.

### **Nomadic livestock husbandry: the Khomarikhel, eastern Afghanistan**

The Khomarikhel summer camp is in the upper Panjsher valley on sub-alpine pastures at an altitude of 3,330 m, two hours’ drive upstream of Paryan district bazaar.

Following initial field work undertaken with the Khomarikhel in December 2005 in their winter camps in Laghman, the research team visited the Khomarikhel’s summer camps in the upper Panjsher valley in late August 2006. Semi-structured interviews were conducted with a number of nomad families. Women were interviewed by a female research assistant.

The research team also visited a Khomarikhel camp in Parwan on the Deh Sabz plain near the village of Katachah at an altitude of 1,720 m. This section of the clan is mainly families with few animals who do not move up to Panjsher in the summer and support themselves through casual employment as day labourers in the villages and townships of the Shamali plain and in Kabul itself. Interviews were held with respondents (men and women) who were also taking part in AREU’s household study for the Water Management, Livestock and the Opium Economy research project.

## **1.4 The limitations of the study for general extrapolation**

Broken topography, contrasting altitudes, the range of micro-climates and agro-ecological situations, and differences in access to irrigation water, transport and markets all influence local livestock management decisions and opportunities. In Afghanistan, well-irrigated valleys with intense irrigated cropping adjoin side valleys and uplands where irrigation water is scarce and agriculture is dependent on rainfed farming. Altitude and aspect, rainfall and rain shadow must all be taken into account, and solutions and policies based on “one fits all” assumptions are seldom appropriate. It must be understood that there are risks in drawing conclusions for general extrapolation from individual case studies. Constraints in time and resources confined this study to two groups of villages in the lower Hari Rod valley, where comparatively open winters allow stock to graze outside during the day in all but the worst winter weather. It was not possible to include examples of communities in the higher altitudes of central, eastern or northeastern Afghanistan, where the need to stall-feed livestock through four or five months of bitter winter dictates options and influences livestock management decisions. Nor was it possible to include agricultural and livestock systems from the lower altitudes in northern, eastern or southern Afghanistan where open winters and high summer temperatures influence management practices in both irrigated as well as rainfed situations. Care must be taken when attempting to extrapolate from one particular group of nomads, as, for instance, the situation of the Khomarikhel is not necessarily the same as that experienced by other groups of *kuchi* elsewhere in Afghanistan.

## 2. Livestock Feed and Nutrition

### 2.1 Livestock husbandry: nutrition and production

Although livestock numbers were drastically reduced during the drought years of 1998/1999 to 2001/2002 and have not yet fully recovered, raising cattle, sheep and goats is estimated to make up about 20 percent of Afghanistan's gross domestic product.<sup>6</sup> There are three main systems of livestock husbandry:

- **Sedentary farmers**, who raise livestock as an adjunct to their cropping systems, but who also rely to some extent on common grazing on the open land surrounding the villages;
- **Transhumance herders**, who operate from settled village bases where they grow crops, but part of the community moves seasonally with their flocks between winter settlements and summer grazing camps, usually at a higher altitude; and
- **Nomad pastoralists (*kuchi*)**, whose main livelihood and lifestyle is based on a mobile tented life, dependent on being able to move seasonally with their flocks and baggage animals between different seasonal grazing areas, usually at different altitudes.

#### The feed base

There are few villages in which all households own livestock. In many, only a minority do, because feeding animals through the winter requires access to the products and by-products of crop farming. The bulk of dry fodder is based on the by-products of grain and pulse crops cultivated for human consumption. The importance of wheat straw as the dominant bulk fodder cannot be overestimated – as wheat is cultivated throughout the country, at all altitudes, under both irrigated and rainfed conditions. Quality forage and fodder is provided by the cultivation of legumes and pulses, which are an integral part of Afghan cropping systems and essential to good crop management. Both maize and barley are commonly cultivated as green forage crops. Farmers supporting large households with limited land must carefully balance the need to grow food and cash crops with the cultivation of fodder. Crops that serve both purposes are part of the answer, but fodder crops cultivated specifically to feed cattle and small stock are also important.

The most widely cultivated fodder crops in Afghanistan are perennial lucerne (*rishka*, *Medicago sativa*) and annual Persian clover (*shaftal*, *Trifolium resupinatum*). Both are species of ancient origin which have been cultivated in the Near East and Central Asia for thousands of years. Both crops may be cut and fed as green forage or dried as hay. A number of other legumes and pulses are cultivated; some feed both the human population and their animals, while some are cultivated primarily to feed livestock. Pulses cultivated for human food (with the dual purpose of feeding the human population and livestock) include: field pea (*mushing*, *Pisum sativum*) (two main types of field pea are cultivated: one primarily for human food [*mushing-i-gerdu*] and one with a larger pulse primarily for feeding stock [*mushing-i-gawi*, literally 'cow pea']); lentils (*adas*, *Lens culinaris*); mung bean (*mash*, *Vigna radiata*); chick pea (*nokhot*, *Cicer arietinum*); different species of bean (*Iubia*, *Phaseolus spp*); and broad bean (*baghla*, *Vicia faba*). Among the legumes primarily cultivated to feed stock both as fodder and as pulses are: grass pea (*kulul/patak*,

<sup>6</sup> Not taking into account the narcotics trade.

*Lathyrus sativus*)<sup>7</sup> and several species of vetch (*shokhal/talkhakh*, *Vicia spp*), and others such as *shamlit* (probably *Melilotus officianalis*). The availability of irrigation water, altitude, climate, markets and the cropping system into which they fit dictate which of these crops are cultivated where, and in what combination. The cultivation of fodder legumes and pulses is particularly significant in the highland provinces where winters are long and livestock of all kinds must be housed for between three and five months. These crops fit well into small farmer crop rotations, particularly in the highland regions. Mung beans are widely cultivated as part of double-cropping systems at lower altitudes both commercially as well as to feed the household. Chick peas are mainly cultivated on rainfed land in northern Afghanistan. The straw (haulms) of all pulse crops are useful fodder.

Feeding livestock in rural Afghanistan is highly integrated with the cropping systems and also highly opportunistic – balancing crop base fodder production with natural pasturage. Almost nothing is wasted. The products and by-products of cultivation (straw, crop residues and cultivated fodder) are also often bulked out with a wide variety of wild forbs and grasses collected from the verges of cultivated land, as well as from the waste land, upland meadows, mountains and plains that surround the villages. This dry fodder is collected with considerable effort, and despite its often coarse, spiny and unpalatable appearance, it makes an essential contribution to the winter maintenance of cattle and small stock. Wild grasses and weeds are collected from the cultivated crops and the thinnings from crops such as maize. Even fallen autumn leaves from orchards, vineyards and the poplar trees that line the irrigation ditches are grazed or collected.

Most rural households which own livestock, particularly sheep and goats, rely to some extent on the natural grazing provided by the open country and mountains that surround their villages and over which the community has traditional rights of pasturage. Much of this grazing is seasonal in nature, and it is estimated that only 40 percent of Afghanistan's rangeland is open for grazing during the winter months. Villagers usually have the right to graze their livestock of all kinds on fallows, stubbles and crop aftermaths regardless of individual ownership, particularly where cattle and small stock are grazed communally.

Nomads rely on their ability to graze their flocks freely over the different parts of the open range and mountains to which they have traditional rights, while also purchasing fodder seasonally from the settlements near which they camp. They must make arrangements, such as paying rent or provide some reciprocal service, with settled villagers if they graze their flocks over fallow land and stubbles, to which they do not have traditional rights. In certain instances, the *kuchi* may be compelled to pay rent for rangeland grazing to which settled villages lay claim.<sup>8</sup>

### The products

Cattle are primarily kept to provide the household with milk (fresh and processed), draught power and the occasional animal to slaughter or sell. In most situations household needs are the main priority rather than commercial production; only in certain peri-urban situations is commercial milk production economically viable.

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<sup>7</sup> The pulse of *Lathyrus* is also sometimes consumed by the human population in very poor mountain communities in Badakhshan, such as Wakhan. If consumed in excess it can cause an irrevocable paralysis of the lower limbs known as *Lathyrism*. Vetch (*Vicia spp*) may also be consumed by poor communities and unless soaked for 48 hours to leach the toxins it may also have an adverse effect on health.

<sup>8</sup> For example, the Khomarikhel wintering in Laghman.

Socially, milk is an important medium through which hospitality is shown and neighbourly obligations fulfilled. Possession of an ox or a pair of oxen not only provides the owner with draught power to cultivate his own land, but also with the facility to negotiate favourable sharecropping agreements with neighbours who have spare land.

Sheep and goats are kept to provide the household with milk, as a source of meat and fibre, and as a moveable asset that may be sold to raise cash for household necessities, meet emergencies and finance social obligations. Those who own enough sheep and goats (over 20 or 30 head) may have the ability to manage the flock as a commercial proposition, with a surplus of animals, milk products or wool to sell – but in most rural communities such households are in the minority. Nomads and transhumance herding families (*kuchi/maldar*) who are able to use rangeland grazing in a more seasonal manner at different altitudes may possess larger flocks than settled farmers, but they are also vulnerable to the harsh climate, and most true *kuchi* have no land assets to fall back on. Seasons of drought and poor grazing mean that flocks must be downsized, sometimes to the extent that even young breeding females are sold. For the Afghan *kuchi*, their flocks and the ability to move with the seasons has traditionally underwritten their way of life. Their breeding stock is the basis of their wealth and the annual “off-take” from their flocks in the form of surplus male animals and old females, surplus milk products and wool provide the basis of their cash earnings and livelihood. In recent years, population increase, diminished flock numbers (the result of drought and disease) as well as loss of traditional grazing and increasing conflict with the settled populations have combined to threaten the traditional pastoral life of many *kuchi* groups. Many are now dependent on earnings from casual labour and the non-pastoral economy – and are *kuchi* in name only.

For both villagers and nomads, **baggage and transport animals** – donkeys in particular, and also horses and camels in some areas – are of enormous importance and should not be forgotten as they also need fodder and grazing. Poultry (chickens, turkeys, guinea-fowl and ducks) serve the everyday needs of many rural households, as do rabbits where these are kept by the women. Pigeons are sometimes kept to produce manure for vegetable gardens (common in Herat) or for pleasure, and they have a commercial value that should be noted.

## 2.2 Case studies of two sedentary communities, Herat

### Agricultural/livestock profile: Tunyan

Tunyan (altitude 1,030 m) is a large village divided into four *mahalla* on the north bank of the Hari Rod River, located 40 km east of Herat city. The sixth of eleven villages irrigated from the Atishan canal,<sup>9</sup> Tunyan is chronically short of irrigation water.<sup>10</sup> There are 3,300 *jerib* of crop land, of which a third is cropped each year. Half of the land, farmed by 50/50 sharecroppers, belongs to an absentee landowner, and the rest is divided into holdings of 1–40 *jerib*, but most own 5–10 *jerib*. Crop land surrounds the village and to the north open plains (*dash*t) stretch to the foot of

<sup>9</sup> From top to bottom: Gawashk; Pushtin: Bala Deh-i-Turan; Payan Deh-i-Turan; Aliabad; Qala-i-Namak; Tunyan; Qala Khalisa; Qala-i-Zewar Khan; Qala-i-Sayed Mohammad Khan; Aliabad; Jenda Khan.

<sup>10</sup> The Atishan canal is reportedly entitled to only one day of water out of ten from its source. The Marwabad/Borya Baf communities are entitled to six days out of ten and have their own canal systems. The other three days go to another group of villages on a separate canal. The main source of water is an upwelling of water (a so-called spring) in the braided river bed of the Hari Rod.

the mountains where the community has grazing rights. To the south is the flood plain of the Hari Rod.

### ***Agriculture***

There is one main crop each season. Wheat is dominant, cultivated on a 2/3 year fallow rotation. Within the precincts of the village there are small enclosures in which fodder crops of lucerne, clover, mung, peas, potatoes and vegetables are cultivated in rotation with wheat and barley. There are many mulberry trees for fruit and shade and ash trees for fuel and timber.

### ***Livestock***

Between 50 and 55 percent of households own cattle and/or sheep/goats.

*Cattle:* About 45 percent of families own one or two animals: milk cow(s) and/or offspring and oxen. Cattle are herded communally (two herds) during the day, returning to the family compounds each evening.<sup>11</sup> Households with sufficient fodder tend to keep cattle within the family compound rather than with the herd. There are one or two stock bulls, but these are not good quality. About 20 percent of households own oxen, which are kept at home when not working. Cattle are fed green forage and dry fodder (straw and hay). Milking cows and working oxen may get a supplement of barley/pulse meal.

*Sheep/goats:* About 55 percent of households own sheep/goats. A small number own 40 or 50 breeding ewes, most commonly 5–15 animals. There are eight community flocks organised according to *mahalla* and clan. Each flock has 200–300 animals, of which two thirds are sheep and one third is goats. Shepherds are paid one lamb in ten at weaning, or cash. According to season, the flocks graze the open *dasht*, the Hari Rod flood plain, fallow land and wheat stubbles. Winters are mild and flocks graze out all year except in bad weather. In all but the coldest months the shepherds sleep out, with the flocks assisted by the owners in rotation. Small stock are fed forage or fodder (according to season) to supplement grazing during the autumn, winter and early spring. Animals requiring special feeding for sale or slaughter<sup>12</sup> are kept at home. Breeding rams run with the ewes in Mizan (23 September to 22 October) and lambs are born during Hut (20 February to 20 March). Ewes are milked for between three and three and a half months, with young animals sharing the milk. "American" (Nubian) milking goats<sup>13</sup> are increasingly popular and do not run with the flock.

### **Agricultural/livestock profile: Marwabad/Borya Baf**

Marwabad/Borya Baf (altitude 1,200 m) comprises a group of villages (reported by DACAAR to be about 2,500 households) on the right (north) bank of the Hari Rod River in Pashtun Zarghun, 40 km upstream of Tunyan.

### ***Agriculture***

In Marwabad/Borya Baf there is plentiful irrigation water, sufficient for two crops per season. Marwabad has about 2,000 *jerib*, almost all intensely cultivated. Few

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<sup>11</sup> Ownership of an ox or a pair of oxen gives the owner the right to become a *kishtamand* or 50/50 sharecropper rather than a *bazgar/dehqan* (sharecropper) who only provides labour in return for a 20 percent share of the crop.

<sup>12</sup> It is traditional for families than can afford to do so to slaughter one or two sheep or goats in late autumn and dry the meat (*landi*) for use during the winter. It is also obligatory for those who can afford to do so to sacrifice a male sheep on the Islamic 'Feast of the Sacrifice' (*Eid-i-Qurban*).

<sup>13</sup> "American" (Nubian) milking goats are bought in Herat and imported from Iran, where they were introduced under an American programme in the 1960s.

landowners possess more than 50 *jerib* and most 1–6 *jerib*. Wheat, the main autumn-sown crop, is followed in the summer by a mixture of crops including rice, mung beans, beans, maize, sesame, millet, melons, potatoes and a variety of vegetables. Lucerne is cultivated by some families. Clover is cultivated as a catch crop between mung bean and rice, and may be lightly grazed in the autumn or cut as a green forage or hay in the spring. Some farmers sow a crop of barley in late summer for cutting as green forage in late autumn or early winter. Wheat, rice, millet and pulse straw are all fed to livestock, and lucerne or clover hay is largely replaced by pulse straw. Maize stover may be fed but it is also commonly used as fuel for bread ovens.

### Livestock

**Cattle:** More cattle were kept in Marwabad/Borya Baf in the past, but their numbers are again increasing. The pattern of cattle ownership and management is much the same as Tunyan. Few households own more than one or two milk cows and/or an ox or pair of oxen, and it is exceptional to own a breeding bull. An abundance of good quality crop residue makes it easier to feed cattle than in Tunyan. Cattle are kept at home, managed by their individual owners rather than run out as a village herd.

**Sheep/goats:** There are three systems of flock management in Marwabad/Borya Baf: flocks that remain in and around the villages all year; transhumance flocks belonging to a few families who have rights to summer grazing in the mountains; and transhumance flocks belonging to the Taheri pastoralists (*maldar*), who live as a satellite community in black goat hair tents and take their flocks to summer grazing about 100 km higher up the Hari Rod valley. Goats are preferred to sheep by most of the settled population, and sheep are favoured by those who practise transhumance. The crop land is intensely cultivated and there is only limited opportunity for stubble grazing between one crop and the next. Small stock are dependent on whatever grazing is available on the *dasht* or in the mountain ranges to the north and east. In summer, the humidity within the irrigated area is not considered healthy for sheep. There are reported to be two (possibly three) flocks in Marwabad belonging to the settled population, totalling 1,200–1,500 breeding animals (not counting the Taheri). The Taheri belong to a different clan (*qawm*) to the settled villagers and may originally have been *kuchi* as they are true pastoralists owning sizeable flocks of sheep and goats, but no land. Relations between the two communities are symbiotic and reported to be good, if guarded. Taheri families who remain camped close to the villages find agricultural casual work there. In the winter they move their tents to more sheltered locations at the foot of the mountains, and buy fodder from the villagers in exchange for animals, milk products or labour.<sup>14</sup>

### Feeding and grazing calendar

#### Spring (Bahar) : 21 March – 21 June

##### Cattle

Tunyan: Milk cows graze open land round the village during the day, returning to their homes in the evening. Evening and morning they are fed green forage (clover/lucerne). If no forage available, they are fed straw/hay. Some households prefer to keep cattle at home, in which case they are fed three times a day, or they may

##### Sheep/Goats

Tunyan and Marwabad/Borya Baf: Lambs are born in Hamal. Flocks initially herded on the *dasht*. Best grazing through Hamal and early Sawr are ephemeral grasses ("*tuk*", mainly *Poa spp*). These last about six weeks, but dry off by end of Sawr. Woody species *Artemisia sp (derawneh)* etc. grazed to some extent by small stock in the

<sup>14</sup> Information about the Taheri was provided by the Borya Baf para-vet.

be tethered wherever there is some grazing.

**Marwabad:** All cattle are kept at home rather than communally herded. Fodder and forage is plentiful. Animals are commonly tethered wherever there is herbage to graze, or may be stall fed three times a day on green forage (clover/lucerne) and grasses/weeds collected from cultivated land. If green forage is in short supply it may be bulked out with straw, and milking cows may be fed supplementary feed of barley or pulse (cow pea) meal mixed with damp chopped straw.

**Plough oxen:** Oxen remain at home and are not grazed out with the herd. When not working oxen are fed green forage (clover and/or lucerne) or straw/hay. When working, oxen are fed barley or pulse meal mixed with dampened chopped straw once a day.

first stage of growth.<sup>15</sup> In Tunyan flocks graze weeds on the fallows (*Chenopodium*, *Cruciferae spp* and others). No fallow in Marwabad due to intense cropping. Early Jawza flocks move from the *dasht* to the Hari Rod flood plain where there is an abundance of grasses and forbs between the river channels. In Tunyan the flood plain provides the best grazing until wheat is harvested. Grazing species include perennials such as *Festuca sp*, *Lolium spp*, *Agropyron spp* as well as wood shrubs browsed by goats. They continue to graze the fallow land and the *dasht* to some extent. In Jawza, some owners in Marwabad send their flocks to summer camps in the Paropamissus range. The Taheri *maldar* send their flocks 70 km east to mountain grazing above Chishti Sharif. **Milking regime:** During spring, ewes are brought to the village to be milked every day at about 10am. This takes 1.5–2 hours. If grazing is poor, ewes may be fed green forage (clover/lucerne). When small, lambs remain at home. When they are old enough they are herded separately, but allowed to suckle after milking. Ewe milking finishes late Saratan (July).

### Summer (Tabistan): 22 June – 22 September

#### Cattle

**Tunyan:** Herds of milk cows graze uncultivated and fallow land around the village, including the flood plain of the Hatirud where they are taken in the morning and afternoon to drink and rest. As soon as the wheat is harvested and stacked for threshing (mid Saratan/late June), the stubbles are grazed by all stock. Cattle return home in the evening and get a feed of green forage if available, or weeds and grasses. If cattle kept at home they are fed three times, early morning, noon and evening on fresh green forage, if necessary bulked out with straw. Cattle may be tethered to graze. Poor families often rely on the generosity of richer neighbours to help them with forage.

**Marwabad:** Cattle are not herded, but either stall fed or tethered to graze by the cultivated land.

#### Sheep/Goats

**Tunyan:** The flocks graze the *dasht* and fallows until the wheat is harvested. As the fields are cleared the flocks graze the stubbles.<sup>16</sup> Wheat stubbles and the Hari Rod flood plain are the main grazing grounds through the rest of the summer into the autumn. The fallow land continues to be grazed, but by this season there is little except for relatively unpalatable species such as invasive camel thorn (*Alhagi maurorum/Alhagi pseudalhagi*) which is grazed by goats and to some extent by sheep.<sup>17</sup> The flocks are taken to the river to drink twice a day.

**Marwabad:** Animals not in the mountains are only permitted a few days to graze the wheat stubble before the fields are irrigated, cultivated and sown with a summer crop. Part of the Marwabad

<sup>15</sup> However, these deep-rooted, drought-resistant, woody and often highly aromatic perennials are generally the mainstay of the rangeland and mountain grazing in the autumn and winter, once they have dried off and they are no longer suffused with volatile/pungent oils.

<sup>16</sup> Although there are now some tractors in the Pashtun Zarghun villages, most of the threshing is still done with oxen and donkeys, and the winnowing carried out by hand on windy days. This is a long and laborious procedure that takes several months.

<sup>17</sup> In some areas where there is a shortage of cereal straw *Alhagi* is gathered in the autumn and used as fodder for cattle and sheep during the winter when dry and chopped. In Tunyan it is mainly gathered for fuel for the bread ovens (*tandor*) and local brick kilns. According to G. Gintzburger et al, 2003, *Rangelands of the Arid and Semi-arid Zones in Uzbekistan, France/Syria*, CIRAD/ICARDA, camel thorn hay is "considered to be as good as the best cereal straw", and according to P. O'Donovan & T.J. Barker, 2003, "Hay and Straw in Afghanistan (Fodder Conservation for Long Winters)" (Case Study No. 7), FAO, quoting from Pakistan analyses of *Alhagi sp*, the feed value of whole plant in July is: crude protein 10.20; crude fibre 28.27; crude fat 2.42; and ash 7.48. Leaves and thorns in winter stores: crude protein 10.56 and ash 10.79.

There is an abundance of green forage available from the summer crops, including lucerne, maize thinnings, weeds and pulse straw. Grasses and herbs grow in abundance along the edges of paths, irrigation channels, and the bunds that separate irrigated fields.

Oxen work hard on the threshing grounds throughout much of this period; they are fed green forage at least once a day as well as wheat straw mixed with a little lucerne hay. They are not fed grain or pulse meal as it is not considered healthy in hot weather.

flock is in the mountains and returns in Sonbola (23 August to 22 September). Otherwise there is nowhere for the flocks to go apart from the *dasht* where there is little to graze apart from deep-rooted woody perennials such as *Artemisa spp.* There is a preference for goats in Marwabad.

### **Autumn (Khazan): 23 September – 21 December**

#### **Cattle**

**Tunyan:** The same management pattern continues as in the summer months. Herded cattle graze stubbles and fallow lands and go to the Hari Rod flood plain to drink and rest. At home they are fed evening and morning on green forage, if available, or wheat straw. As the weather gets cold in Qaws (December), herding ceases. Cattle remain at home where they are stall fed three times a day, on straw/hay (clover/lucerne). Some households with spare water and land sow barley in Asad/Sonbola (23 July to 1 September) for a green forage crop cut during Aqrab and Qaws.

**Marwabad:** Green forage has been increasingly replaced by pulse straw as the main feed. Cattle may be tethered out while crops are harvested and threshed. As in Tunyan there is a tradition of cultivating a crop of green barley.

**Oxen:** Working oxen are fed barley or pulse meal (vetch [*talkhakh*] or field pea [*mushing-i-gawil*])<sup>18</sup> mixed with damp straw once a day plus two other feeds of mixed straw/hay early morning and midday. Supplementary feed ceases once cultivation finished.

#### **Sheep/Goats**

**Tunyan:** The flocks continue to graze on the wheat stubbles and fallow land as well as going twice a day to the Hari Rod to drink, rest and graze. The rams are put out with the ewes during the month of Mizan and remain with them until the end of Qaws. They graze the *dasht* on little except *Artemisia*.

**Marwabad/Borya Baf:** The goat flocks continue to graze the *dasht* up to the foot of the mountains. Individual families may graze their animals on rice and pulse stubbles or clover as available until the fields are ploughed for the winter wheat crop.

In both sets of villages, as the weather gets cold towards the end of Qaws the flocks cease to sleep out and return to their owners' houses at night, where they are fed evening and early morning on chopped wheat straw/hay.

**Marwabad/Borya Baf:** wheat/rice straw is commonly mixed with pulse (mung/bean) straw. Fallen leaves (fruit trees) form an important component of "bulk" rather than quality feed for sheep and goats. The ownership of mulberry and other fruit trees can be a great asset for feeding sheep and goats in the autumn.

### **Winter (Zimistan): 22 December – 20 March**

#### **Cattle**

**Tunyan and Marwabad/Borya Baf:** Stall fed three times a day during the coldest months. The feeding regime depends a lot on the wealth of the householder. In Tunyan, those with plenty of fodder mix 50/50 chopped wheat straw and lucerne/clover hay. This varies with availability

#### **Sheep/Goats**

**Tunyan and Marwabad:** Although the sheep/goat flocks continue to be herded around the villages all through the winter while the weather is fine, they return in the evening to their owners' houses. In periods of bad weather they remain housed all day. Sheep/goats receive two feeds of

<sup>18</sup> As little barley, field pea or vetch is actually cultivated in either Tunyan or in Marwabad/Borya Baf, it is procured, generally in exchange for wheat grain with other villages in Pashtun Zarghun district. These are mainly the springline villages along the foot of the Paropamissus range. See Fitzherbert, *Livestock Husbandry*, for information about the community of Ghorak situated along the springline north of Tunyan.

of hay but never exceeds 50 percent.

**Marwabad/Borya Baf:** Pulse straw is plentiful. Some farmers also grow lucerne hay. Milking cows may get an evening feed of (barley/pulse) meal mixed with damp straw in the proportion of 1 kg of meal to 6–7 kg staw for an adult animal. Those who do not grow barley or pulses may exchange wheat or rice with villages that do. Farmers who cultivate sesame may get oil seed cake (*konjoleh*) in return from the private oil presses in the bazaar. It is common in all villages to feed milk cows on leftover dry bread.

Oxen when not working are fed on wheat/rice straw (in Marwabad) mixed with hay or pulse straw.

chopped straw mixed with clover/lucerne hay or pulse straw (mainly in Marwabad), in the early morning and when they return in the evening. If housed all day they receive an additional feed at midday.

**Marwabad:** The transhumance Taheri people move their camps away from the outskirts of the villages to more sheltered locations at the foot of the mountains. Their flocks continue to graze the *dasht*, but are provided with additional wheat and pulse straw, procured from the settled villagers.

### Livestock management choices

Both cattle and small ruminants in the two communities are primarily kept to support household needs. In only two cases is there a small surplus of animals or milk products to sell. Livestock are managed as an integral part of the farming system and fit into rather than dominate the cropping pattern. In the case of small ruminants in particular, a balance is maintained between the use of common grazing land, stubbles, fodder crops and use of the by-products of the cropping system.

Tunyan farmers have two types of crop land:

- **Extensive open land surrounding the village with only limited access to irrigation water.** This is cropped with autumn-sown wheat on a wheat/fallow rotation. There is insufficient irrigation water to grow a summer crop. Wheat fulfills the dual purpose of providing grain for human consumption and straw as the main bulk fodder for cattle and sheep. Those who cultivate wheat also share the right to graze the stubble after harvest.
- **Enclosed land within the precincts of the village with access to irrigation water.** This is more intensely cultivated with legume fodder crops, pulses, potatoes and vegetables in rotation with wheat and barley. Fodder crops such as lucerne and clover are cultivated in these enclosures. Nothing is wasted, including weeds and fallen leaves from the mulberry trees – full use is made of all available resources.

In **Marwabad/Borya Baf** irrigation water is not a serious constraint; cropping is intensive based on autumn-sown wheat followed by a variety of summer crops. Although household needs and basic food security take priority, some income is derived from selling rice and beans. Livestock fit into this system and the by-products of the field crops make up the bulk of winter fodder (although some clover and lucerne is also cultivated). Clover is mainly cultivated as a catch crop and is sometimes ploughed in as green manure. A few farmers with special interest in livestock, such as the para-vet in Borya Baf, cultivate lucerne – but this requires setting valuable crop land aside for several years. Out of a total of 50 *jerib*, the para-vet, with his particular interest in his cattle, has only reserved 1 *jerib* for lucerne.

Throughout the spring, summer and early autumn, when flocks graze the *dasht* or are in the mountains they are managed outside the cropping system. However, for at least three months during the winter they are stall fed on straw and the by-products of the cropping system.

Table 2.1. Livestock management choices: fodder/food crops

Household details/landholding	Livestock ownership	Cropping system and management
<i>Tunyan</i>		
<p><b>HH1: 15 in household</b> 2 <i>jerib</i> of irrigated wheat Small land/stock owner, heavy household obligations Livestock: purely subsistence</p>	<p><b>Cattle: cows + offspring only</b> 2 x milk cows 1 x bull (18-month) 1 x heifer (6-month) <b>2 goats + 2 kids (2 m)</b> Purely to support household with milk and meat 2 male kids to be slaughtered in autumn for <i>landi</i> Aimed to sell 18-month bull to butcher as cannot afford to feed</p>	<p>Crop choices severely limited. Only sufficient water for 2 <i>jerib</i> wheat. No possibility to cultivate fodder. Cattle and goats grazed and fed straw, weeds and grasses collected from edges of cultivation. Must buy additional fodder and grain for cattle, which is difficult. Neighbours help. In circumstances goats better proposition than cows.</p>
<p><b>HH2: 8 in own family + 2 poor brothers and families also in household</b> 2 <i>jerib</i> of irrigated wheat + 100 mulberry trees Small land/stock owner, heavy household obligations Livestock: purely subsistence</p>	<p><b>Goats only</b> 9 goats + 6 kids (4 f, 2 m) Purely to support household with milk and meat 2 male kids to be slaughtered in autumn for <i>landi</i>, but may sell if need cash</p>	<p>Crop choices severely limited. Only sufficient water for 2 <i>jerib</i> wheat. No possibility of cultivating fodder. Keeps goats because they can survive better than other stock on rough grazing and straw.</p>
<p><b>HH3: 25 in household</b> 15 <i>jerib</i> (4 barley; 2 lucerne; 4 clover, 5 wheat) 50% share in 40 <i>jerib</i> wheat Medium/large land/stock owner, heavy household obligations Livestock: some surplus of lambs and milk (ownership of oxen gives access to 50% share of 80 <i>jerib</i> wheat land, of which half cropped each year)</p>	<p><b>Cattle: 1 pair of oxen</b> <b>Sheep and goats</b> 4 rams, 50 ewes + 40 lambs (30 f, 10 m) 3 goats + 3 m kids. Will slaughter 3 m lambs for <i>landi</i>; sell 3 m lambs and 3 m kids, 4 m lambs to shepherd Has some surplus <i>qurut</i> and <i>roghan</i> to sell or exchange</p>	<p>Has limited crop choices. Management practices rational. One of biggest livestock owners in Tunyan, also supports very large household 15 <i>jerib</i> of own land enclosed better access to water, rotated between wheat/barley and fodder. 80 <i>jerib</i> sharecropped land short of water, only possible to crop 40 <i>jerib</i> wheat each year. No option.</p>
<p><b>HH4: 17 in household</b> Owns 30 <i>jerib</i> of which 14 <i>jerib</i> cropped each year (10 <i>jerib</i> wheat; 1 <i>jerib</i> barley; 1.5 <i>jerib</i> lucerne; 1 <i>jerib</i> clover, 0.5 <i>jerib</i> vegetables, potatoes etc.) 100 mulberry trees Medium/large land/stock owner, heavy household obligations Livestock: small surplus of lambs, no surplus milk</p>	<p><b>Cattle: 1 pair of oxen</b> <b>Sheep and goats</b> 20 ewes + 15 lambs (5 f lambs, 10 m lambs) 1 "American" goat + 2 kids Will slaughter 4 m lambs for <i>landi</i>, sell 5 m lambs, 1 m lamb to shepherd + some cash No surplus milk to sell</p>	<p>Has limited crop choices. Management practices rational: 4 <i>jerib</i> of land enclosed with better access to water rotated between barley, vegetables/potatoes and fodder. 26 <i>jerib</i> short of water – only possible to crop 10 <i>jerib</i> each year. No option.</p>
<p><b>HH5: 25 in household</b> Owns 51 <i>jerib</i> of which 31 cropped each year (20 <i>jerib</i> wheat; 4 <i>jerib</i> barley, 3 lucerne, 2 clover, 2 <i>jerib</i> mung)</p>	<p><b>Cattle: cows + offspring</b> 2 x milk cows + 18-month heifer, 2 x 8-month calves (1 bull, 1 heifer) <b>1 pair oxen</b> <b>Sheep and goats</b></p>	<p>Has limited crop choices. Management practices rational. 11 <i>jerib</i> enclosed with good access to water cultivated rotated between barley, fodder and pulses. 40 <i>jerib</i> short of</p>

<p>400 mulberry trees</p> <p>Medium/large land/stock owner, heavy household obligations so no surplus</p> <p>Livestock: subsistence (female lambs and need for ram)</p>	<p>18 ewes</p> <p>13 lambs (10 f, 3 m)</p> <p>5 goats (5 kids all f), 1 m lamb kept as ram, 1 for <i>landi</i>, to pay shepherd + some cash</p>	<p>water only possible to cultivate 20 <i>jerib</i>. No option.</p>
<p><b>HH6: shepherd</b></p> <p>No cultivated land</p> <p>Community shepherd, no land</p> <p>Livestock: subsistence</p>	<p><b>Goats only</b></p> <p>10 goats of his own, but shepherd i/c 400 (300 sheep and 100 goats) all ages – possibly 250 breeding animals producing 200 lambs/kids</p>	<p>Has no cropping choices. No land. Keeps a few goats. Dependent on grazing. But as is, paid 1 lamb in 10 at weaning – (possibly 20 lambs/kids per annum), can sell or exchange for grain and fodder.</p>
<p><b>Marwabad/Borya Baf</b></p>		
<p><b>HH7 (Borya Baf): 15 in household (including father and brothers)</b></p> <p>Owns 50 <i>jerib</i> intensely cropped wheat, fodder, rice, pulses and vegetables</p> <p>Large land owner/serious cattle owner, heavy household obligations</p> <p>Livestock: primarily subsistence, but with improved bull has intention of improving production</p>	<p><b>Cattle: cows and offspring</b></p> <p>3 milk cows, 1 heifer calf (1-month), 1 bull (18-month Friesian, 1 pr oxen</p> <p>9 others – all ages and sexes belong to father and brothers</p> <p>Managed as single herd</p> <p>Not yet using young Friesian bull</p>	<p>Intense cropping. No problems with water. Also acts as para-vet for Marwabad/Borya Baf.</p> <p>Farms 5 <i>jerib</i> of enclosed cultivation (1 <i>jerib</i> lucerne, 2 <i>jerib</i> clover, 2 <i>jerib</i> vegetable/melons etc.)</p> <p>45 <i>jerib</i> additional land, managed with share croppers on 75/25 basis. Wheat followed by rice/pulse etc. rotation. No fodder shortage.</p>
<p><b>HH8 (Borya Baf): 20 in household</b></p> <p>Owns 5 <i>jerib</i> intensely cultivated land (wheat plus fodder, rice, pulses)</p> <p>Small land owner/medium stock owner with limited land, heavy household obligations</p> <p>Livestock: purely subsistence</p>	<p><b>Goats only</b></p> <p>25 goats</p> <p>10 kids (5 f, 5 m)</p>	<p>Intense cropping. No problems with water. Goats kept as low-cost additional support for household. No fodder shortage.</p>
<p><b>HH9 (Marwabad): 15 in household + 2 brothers and families</b></p> <p>Owns 1 <i>jerib</i> and farms 3 more for brothers on 50% basis (intense wheat, rice, pulse etc.)</p> <p>Category: small land owner/stock owner, heavy household obligations</p> <p>Livestock: purely subsistence</p>	<p><b>Cattle: cow + offspring</b></p> <p>1 milk cow</p> <p>14-month bull</p> <p>1 x 2-month heifer</p> <p>1 ox</p>	<p>Intense crop cultivation main activity. No problem with water but limited land.</p> <p>Cultivate wheat followed by rice, beans, maize, melons and potatoes. Cattle kept to support household, not as commercial venture. Supported from residues (straw, pulse haulms etc) plus weeds. No fodder shortage, but exchanges wheat/ rice for barley, <i>mushing or talkhakh</i>.</p>
<p><b>HH10 (Marwabad): 11 in household</b></p> <p>No land but sharecrops 50% of 5 <i>jerib</i>, intense cropping (wheat/ rice, pulses, maize etc)</p>	<p><b>Cattle: 1 ox</b></p> <p><b>Sheep and goats:</b></p> <p>3 ewes + 3 lambs</p> <p>2 local goats, 4 "American" goats</p>	<p>Intense crop cultivation main activity. No problem with water. Shares 50% of the crop with owner of second ox. 5 <i>jerib</i> Wheat followed by 3 <i>jerib</i> mung, 1 <i>jerib</i> mixed vegetables and</p>

<p><i>Kishtamand</i> sharecropper/small stock owner</p> <p>Livestock: purely subsistence (ox along with a neighbour's gives them facility to jointly sharecrop 5 <i>jerib</i> of land)</p>	<p>1 billy and 8 kids</p>	<p>potatoes. Some clover as a catch crop.</p>
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### Management of seasonal grazing

In both Tunyan and Marwabad/Borya Baf, sheep and goats rely for most of the year on being able to graze the open country to which the community has traditional rights, including the *dasht* and the river flats of the Hari Rod.

In Tunyan, livestock owners rely on being able to graze the wheat stubbles after harvest and on fallow land. In Marwabad/Borya Baf, where intense double-cropping is practised, access to post-harvest stubbles is not an option but some families have access to upland grazing in summer in the mountains.

Each community takes advantage of the options available to them. Seasonal use of different parts of the available grazing land, whether on the *dasht*, on the river flats, in the mountains or on the stubbles, is opportunistic rather than consciously managed. They operate as well as they can within the limitations of their situation.

In Tunyan, the *dasht* provides its best quality grazing for about six weeks in spring, when there is a brief flush of ephemeral grasses. Later in the autumn and winter the *dasht* provides coarse, low-quality grazing on woody perennials. After the spring flush on the *dasht* is over, the flocks move down to the Hari Rod flats as the floods subside and grassy banks and *chaman* of perennial grasses become accessible. Grazing on the river flats is combined with whatever rough grazing is available on the fallow land from the previous year's wheat crop. After the wheat is harvested, the stubbles provide the main grazing for the flocks for two months or so, in combination with whatever the *dasht* and the fallow land has to offer. This continues until a shortage of grazing and colder weather make it necessary to provide the animals with fodder. It is a highly opportunistic system dependent on what is available in each season, and there are many factors over which the villagers have little control. As far as possible they maintain a balance between the use of inexpensive grazing and the by-products of the cropping system to support their flocks.

In Marwabad/Borya Baf, cattle are managed in much the same way as in Tunyan. They are generally kept in or close to the house and are almost entirely dependent on the by-products of the cropping system. Small ruminants are managed outside the cropping system for about nine months of the year. The goat flocks exist on whatever poor grazing can be found on the *dasht*, the Hari Rod flood plain and the fringes of the cultivated land. A few families who have access to summer grazing in the high valleys beyond the first ridge of the mountains own flocks of sheep and practise a form of transhumance: once the spring flush of ephemeral grasses on the *dasht* is finished the flocks, accompanied by the owners' families, move up into the mountains for two or three months. They return to the lower elevations as the weather cools in autumn. In winter they return to the villages where the sheep are stall fed on straw and pulse residues.

The Taheri *maldar* are no longer true nomads – rather a pastoral group in a state of transition. Although part of the community still moves their flocks from the low *dasht* in late spring to mountain grazing for the summer, the majority of the tribe now lives as a dependent satellite of Marwabad/Borya Baf. Even the herders are

dependent on the settled villagers as a source of fodder for their livestock during winter. The relationship between the settled villagers and the Taheri is complex and to a large extent symbiotic.

From a pastoral point of view, owners of sheep and goats in both Tunyan and Marwabad/Borya Baf operate within the limitations of their respective physical and social environments. They are vulnerable to a changeable climate, but are also skilled at making the best use of the opportunities in each season. The respective use of limited resources in each case is rational, if difficult to improve. In each community only a minority of households have the ability to manage large flocks of sheep.

### **Feed and fodder as a constraint**

The capacity of a village household to maintain livestock through the winter is limited by the amount of fodder available. This includes a combination of the by-product of food crops (grain and pulse straw) and cultivated fodder crops, often supplemented with wild grasses and plants gathered from the surrounding plains and mountains. Any possibility of increasing fodder production will help to increase a rural household's ability to maintain stock in good condition through the winter, but the possibility of doing so is usually severely constrained by circumstances beyond the farmer's control.

In the two settled communities studied, households keep no more cattle than are required to meet their own household needs. It is a low-cost input/low-level output system, and the cost effectiveness of any suggested improvement must be carefully assessed. Individuals with greater awareness of "quality", such as the para-vet in Borya Baf, consider an investment in breed improvement to be worthwhile, but he appears to be an exception. Even he was only prepared to assign 1 *jerib* of his 50 irrigated *jerib* to the cultivation of lucerne, and relied for most of his winter fodder on straw and pulse residues. The system is based on meeting household food security requirements rather than improving income through increasing milk production – and the possibility for marketing surplus milk is limited. Within the communities themselves, social custom and hospitality practices inhibit the sale of milk to neighbours. In Marwabad there is a small demand for surplus milk products in the local bazaar, but the demand is limited and easily satisfied. There are few commercial incentives to invest in increased milk production.

In theory, there is no reason why it should not be possible to increase the unit yield of forage and fodder legumes in the same way as crop yields have been increased for grain crops such as wheat. However, the additional costs of doing so must be carefully weighed against potential benefits. Farming systems have been developed over generations and have stood the tests of time and adversity in a harsh environment – and farmers are averse to taking risks or investing money for doubtful additional returns. Farmers set their own production targets and, under the circumstances, domestic food security is the priority. Crops such as wheat and pulses serve the dual purpose of feeding people and animals, and annual fodder legumes such as clover fit well into small farmer crop rotations. To set aside a portion of land to grow perennial fodder crops such as lucerne requires a farmer to have access to sufficient land and irrigation water to be able to make this choice – without reducing his capacity to produce grain and pulses needed to feed the household. In certain locations in Afghanistan it is possible to cultivate lucerne as a cash crop, and even sell surplus hay or green forage, but this is not the case in the villages selected for this study.

In Tunyan, no one is able to increase their acreage, nor is there much opportunity at present to increase the supply or reliability of irrigation water. Landholdings are limited and fodder crops must compete for space with other crops and household needs. Limited irrigation water is a problem for increasing fodder production and most farmers are locked into a situation where any meaningful long term improvement is extremely difficult.

Although there is not the same problem with summer irrigation water in Marwabad/Borya Baf, the cultivation of both annual and perennial fodder legumes must compete with a range of food and cash crops in the farmer's decision making process. More fodder legumes could be cultivated and multiple cuts of lucerne obtained in one season, but farmers in Marwabad prefer to use the water to grow irrigated grain and pulse crops and to use the by-products to feed their livestock. Their choice is a rational one: the need to feed livestock takes second place to the need to grow food grains and pulses for human consumption and cash crops.

To be economically viable, the ownership and management of small ruminants depends on having access to free grazing of one sort or another for at least nine months of the year, outside the three winter months.

### 2.3 Case study of nomad pastoralists, eastern Afghanistan

#### Agricultural/livestock profile

The Khomarikhel *kuchi* spend the winter months in a number of camps in the Laghman valley in eastern Afghanistan, migrating to the Shamali plains in Parwan province in early spring. After two months in Parwan, most of the families with larger flocks migrate to summer grazing camps in the upper Panjsher valley, while those with few or no animals remain camped in Parwan in the Deh Sabz and Qara Bagh areas where the men find casual work in the local townships and villages as well as in Kabul. In late summer the Panjsher herders return to Parwan and rejoin those who have remained. They stay in Parwan until Aqrab (early November), then return to Laghman for the winter.<sup>19</sup> About two thirds of the flocks are sheep and one third goats. Being nomads, the transport animals – camels and donkeys – are of vital importance.

*The Khomarikhel kuchi's migration calendar (t=travel)*

1	2	3	4	5	6	7	8	9	10	11	12	1
Hamal	Sawr	Jawz	Saratan	Asad	Sonbola	Mizan	Aqrab	Qaws	Jaddi	Dalw	Hut	Hamal
April	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	March	
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Shamali		Panjsher		Shamali		Laghman (in six camps)					
	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
(t)	(stay)	(t)	(stay)	(t)	(stay)	(t)	(stay)					

A small number of families possess larger flocks and still depend for their main source of wealth and livelihood on these flocks. Sale of surplus animals (ram lambs not required for breeding and old ewes) and milk products (cheese [*panir*], dried yoghurt [*qurut*] and ghee [*roghan*]) provides their main source of income. However, many families now remain in Parwan for the summer as they no longer have sufficient animals to provide a livelihood and are dependent on earning a living from casual labour. The few families who remain in Parwan for the summer (who still own

<sup>19</sup> See Fitzherbert, *Livestock Husbandry*, and Thomson, *Livestock Production and Health*, for more details on the Khomarikhel annual migrations.

reasonably large flocks) experience difficulty in finding adequate grazing on the rangeland and must rent stubbles and/or purchase forage/fodder from the local villagers. In the winter, in Laghman, the grazing is poor and they must buy supplementary fodder from the local villages.

## Feeding and grazing calendar

### *Spring (Bahar) : 21 March – 21 June*

Up to the end of Hut (mid March), while still in Laghman, the Khomarikhel are almost entirely dependent on purchased fodder. The rangeland grazing improves in early Hamal before they move up to Parwan, and straw fodder becomes less essential. Between Laghman and Paghman the most important grazing species are ephemeral grasses (*Poa*, *Hordeum spp* etc., known locally as *wogara*) and various annual forbs. The herdsmen claim these grasses make the greatest contribution to milk production and the condition of their flocks at this time. Some woody perennials such as *Artemisia sp* are also grazed in the early spring, when fresh, but care must be taken as these may cause problems for pregnant ewes, particularly if in poor condition. The main grazing value of many *Artemisia* species is in the autumn and winter when the plants are dry (pungent volatile oils make them unpalatable earlier).

When the Khomarikhel first reach Deh Sabz in Parwan, one group goes to the Dasht-i-Gagar plain at the foot of the Koh-i-Safi range and another group goes to the Watki pass (Kotal-i-Watki) in Qara Bagh district, where the grazing is good. The best grazing at this time is provided by ephemeral grasses, but these dry off by early June. They remain on the Dasht-i-Gagar until the middle of Jawza (first days of June) when those with larger flocks move up to the Panjsher. Families with few animals or those who have problems in Panjsher stay in Parwan for the summer. These families then move down the plain closer to the villages where there they find casual work and may have access to wheat stubbles.

### *Summer (Tabistan): 22 June – 22 September*

#### Shamali group

The quality of the grazing deteriorates as the weather gets hot and the ephemeral grasses dry off. Grazing is confined to deep-rooted woody perennials such as *Artemisia spp*, but in the early summer *Artemisia* is generally unpalatable to most grazing stock. One species known locally as *tarkha* is grazed to some extent, and is thought to have anthelmintic properties. The wheat harvest in the Shamali villages starts in Saratan (22 June to 22 July), providing casual work for *kuchi* men who are generally paid in grain and straw. If relations with the villagers are good, they may also be given permission to graze their stock on the stubbles (*sowra*), although they may be asked to pay rent or perform some labour for this right. As the rangeland grazing deteriorates, stock may have to be fed straw or such forage in the form of weeds and grasses that can be gleaned from the villagers. This is a precarious time for anyone with large numbers of animals, and this situation continues until the end of Sonbola (23 August to 22 September).

#### Panjsher group

*Spring migration (mid to end Jawza):* The journey up the long Panjsher valley can be arduous for the families who move their flocks to the upper valley, and they waste as little time as possible on the road. The whole journey takes about ten days, of which seven are spent traveling up the Panjsher. The lower and middle valley is closely settled, and intensely cultivated land fills the valley floor on either side of the road – so there is little opportunity for the flocks to spread out and graze. They prefer to travel at night and rest by day as there is less traffic and the villagers are indoors. It is necessary to carry fodder for the journey. Although there are grassy meadows (*chaman*) along the river which make good camping places, other groups of *kuchi* are moving up at the same time. While travelling, ewes are milked in sufficient quantities for daily needs only.

*On the summer pastures (15 Jawza to 15 Sonbola):* Once in the upper valley, the situation changes and at an altitude of between 3,000 and 4,000 m, above the line of valley settlements, the mountain slopes provide excellent sub-alpine grazing. North-facing slopes, where the snow lies longest, tend to be better than the south-facing slopes. The Khomarikhel's grazing area is on a north-facing slope overlooking the valley from the south and known as the "Siyamba *ailaq*". The sub-alpine pastures include a rich mixture of valuable grazing plants: grasses include *Festuca*, *Poa*, *Bromus*, *Agropyron* and *Agrostis spp* while forbs include *Trifolium*, *Lotus*, *Medicago* and *Astragalus spp* as well as *Aster*, *Thymus spp* and others. Of these plants, the herdsmen most value the fescues, clovers and medics for milk production and for the good condition of their animals. Sheep are fussy grazers, but there is a

wide choice of plants at this time. During the three months they are camped on the high pastures, each family herds its own flock, and they establish temporary grazing camps in different places. Ewes and goats are milked from Saratan until the beginning of Asad (22 to 30 July), with goats lactating slightly longer than ewes. The main commercial products made at this time are *qurut* and *roghan-i-zard*. In some places, local Panjsheri villagers have cultivated the lower slopes of the mountains previously grazed by the Khomarikhel to grow crops of barley and peas, and in recent years there has been growing tension between the nomads and the settled population over pasturage. This is also a time of intense activity among the local Panjsheri villagers, collecting and storing cultivated fodder as well as wild plants gathered from the surrounding mountains in preparation for winter.

*The return to Parwan – (15 to 25 Sonbola):* About 15 Sonbola the *kuchi* break camp and move rapidly down the valley to Gulbahar (where the Panjsher valley debouches into the Shamali plain) which they reach in about 7 days, preferring to travel at night and rest by day. They carry fodder with them for the journey, which they either gather themselves from the mountains or buy from Panjsheri villagers. They also send several loads of fodder ahead by truck to Parwan to await their arrival. Fodder (lucerne hay, wheat and pulse straw) may be bought for cash or more commonly exchanged for animals or milk products (*qurut* and *roghan*) with local villagers. Traditionally, good relations existed between the Panjsheri villagers along the river and the *kuchi*. Although these older relationships have not entirely broken down, increasing tension is reported between the settled population of Panjsheri and the nomads over rights of pasturage.

### **Autumn (Khazan): 23 September – 21 December**

*In Parwan, Deh Sabz and Qara Bagh:* The Panjsher group return to Deh Sabz towards the end of Sonbola (17 to 22 September) and graze their flocks wherever they can. If possible, they make arrangements with the settled villagers to graze their flocks on grasses and fallen leaves in the orchards and vineyards. There is a charge for this, with rates varying from 1–2 Afs to 5 Afs a vine.<sup>20</sup> They may also rent stubbles and fallows. In this way, they are able to fill a significant gap in the grazing year. During this season, ram lambs and old ewes are sold as well as *qurut* and *roghan* and any wool not already disposed of. Fodder is procured for the journey to Laghman. At this point the activity calendar of the two groups coincides.

### **Winter (Zimistan): 22 December – 20 March**

*The journey from Parwan to Laghman:* Both groups stay in Parwan until 10 Aqrab when the whole clan moves down to the Laghman valley. This takes 7–10 days. There is little decent grazing along the way to Jalalabad in this season, and they must carry some fodder with them, either on camels or by truck. They prefer to travel by night to avoid the traffic, and reach Laghman towards the end of Aqrab (15 to 21 November). Poorer families may go down earlier in search of casual labour in Jalalabad and Pakistan. Once in Laghman they spread out among their six established camp sites.<sup>21</sup> Although families with few animals are more dependent on casual labour, even those with larger flocks send young men, surplus to camp duties, away to find work. The quality of the grazing on the plains and mountains in Laghman is poor in this season. There is some dried grass in the flood washes, but woody perennials such as *Artemisia* make up most of what is available on the mountain slopes. Although it is possible to rent stubble grazing (rice) from settled villagers, relations between the villagers and the *kuchi* are reported to have deteriorated in recent years. Relations are also said to be strained between the *kuchi* and certain Pashai “commanders”. The grazing is insufficient to support the flocks and it is necessary to buy fodder from the local villagers – mainly straw (rice, wheat and mung) and lucerne hay if available. Those who can afford it buy grain (maize or barley) as well as cottonseed cake and a mixture of maize and pulse meal (maize is cheaper than barley). The flocks graze each day on the surrounding *dasht*, but are fed straw/hay morning and evening. The *kuchi* make dome shaped ricks of straw and let the animals themselves pull it from the edges. Some families keep a milk cow to provide a little “off-season” milk, and these are fed once a day on a mixture of damp straw and meal. Milk cows are also fed dry bread purchased from Laghman (Mehtarlam) or Jalalabad bakeries. Working

<sup>20</sup> This practice does not appear to cause serious damage to the vines, possibly because the vine shoots that are grazed will be pruned later. This fills a very important gap in the grazing year for the *kuchi* who stay in the Shamali and respondents said (in late August) that they were just hanging on until they could be let into the vineyards!

<sup>21</sup> Char Bagh, Panj Pai, Shelatak, Dasht-Gul-Ahram, Kaz Aziz Khan and Sangar (see Fitzherbert, *Livestock Husbandry*).

donkeys are fed a little barley and working camels are fed maize or barley meal. Depending on the winter rainfall the *dash*t grazing starts to improve during the month of Hut (20 February to 20 March) and by the time the spring migration starts in Hamal, grazing ephemeral grasses replaces fodder. Lambing starts in Hut and the cycle starts again.

### Management of seasonal grazing

The Khomarikhel *kuchi* still perceive themselves as nomad pastoralists. However, as a group they now find themselves increasingly divided between a minority of families who still own economically viable flocks of sheep and move through the full cycle of seasonal grazing camps, and those poorer families – in the majority – who no longer own viable flocks. They have effectively ceased to be true pastoralists, becoming satellites of the settled urban and peri-urban populations on whom they are dependent for a precarious livelihood. Even families who still possess sizeable flocks send young men, surplus to herding and camp duties, away to earn a living from unskilled work. The Khomarikhel, like the Taheri in heart, are a case of a nomad society in transition. When considering the use and management of seasonal grazing, it is important to recognise that only part of the tribe are still living truly pastoral lives.

According to tribal elders, the Laghman–Parwan–Panjsher–Parwan seasonal cycle has been practised by the Khomarikhel for the past hundred years, since the reign of Abdul Rahman Khan. They claim to have official registration (*qawala*) for their summer pastures in upper Panjsher on the Siyambar *ailaq* dating from the reign of Amanullah Khan. However they do not have any form of official documentation in either Parwan or Laghman that gives them rights to camp and graze their animals, and their position there is extremely vulnerable. Despite a long history of using some of the Laghman camp sites, the relationship with certain local “commanders” is reported to be increasingly difficult. Rent is now being demanded for what was previously free. Also, on the summer pastures in Panjsher to which they have official title, there is increasing tension between the Khomarikhel and the local Panjsheri villagers. The settled population in the Panjsher has increased. In recent years many villages have been re-occupied and the villagers are placing increasing demands on the grazing for their own animals and on the lower mountain slopes to cultivate crops. This problem is only going to get worse, and it is a situation that is not conducive to long-term management planning by either the *kuchi* or the settled population. The nomad life has always been dictated by the seasonal state of the grazing in any particular location, economic necessity and the state of local politics and conflict. A tented mobile life is flexible, but it is becoming increasingly fraught with problems as competition for limited resources increases.

#### *The Panjsher group*

Approximately fourteen Khomarikhel families with flocks of a total of 2,800–3,200 sheep still undertake the full seasonal migration to summer camps in the upper Panjsher valley. While on the summer pastures, they establish a main camp on the Siyamba *ailaq*. From here they spread out to more mobile grazing camps across that part of the mountains to which they have traditional rights of summer pasturage. They decide between themselves who will go where and when, and there seems to be little dispute within the tribe over who grazes where. There does not appear to be a problem with overstocking on the sub-alpine pastures: as observed by the research team (in late August towards the end of the summer grazing season), the mountain grazing in this location is still in reasonably good condition. However, any increase in the stocking rate would have a negative impact on the quality of grazing, meaning that there is probably no additional space in the upper Panjsher for more

Khomarikhel families and their animals. This does not promise much scope for improvement among the poorer sections of the tribe in getting back into the pastoral economy. If the local settled villagers are also now competing for the grazing, this could be a serious problem. In discussion with the families still in Parwan, it was noted that fifteen families had gone to find additional summer grazing in upper Wardak province. At the time of the study there was no news of what they had found or been able to arrange, but this was an indication of the highly opportunistic nature of the nomad life.

In the upper Panjsher, the Khomarikhel summer pastures are on the north-facing slope of the mountains where the snow lies longest and the grazing is generally better than on the south-facing "sunny" slopes. The lower slopes of the mountains are now being cultivated by local villagers to grow poor crops of peas and barley irrigated from a mountain spring. This is a point of dispute between the villagers and the *kuchi* who claim these slopes as part of the grazing land to which they have their *qawala*. There is also increasing tension between the Khomarikhel and the settled villagers over rights to the higher-elevation grazing that does not bode well for either the good management of the grazing or peace on the pastures.<sup>22</sup> The resettlement of the Panjsher valley after years of conflict is leading to greater pressure on local resources as the settled population is increasingly interested in raising their own flocks. At the time of the field work there was a lot of activity gathering winter fodder, which was being stacked up on the houses. The long-term future for the *kuchi* in this area seems very precarious.

Cold weather and the onset of winter compel the *kuchi* to leave the high mountains as autumn approaches; they must move with their stock to warmer valleys. They move as fast as they can down the valley, mainly at night, and they have to carry fodder with them. Finding adequate autumn pasturage in the Shamali plains of Parwan is difficult, and they are highly dependent on the good will of the local settled population for permission to graze their flocks on stubbles and through the orchards and vineyards, for which they must pay rent. They also buy fodder from the local villagers. It is a case of survival rather than management and the situation is becoming more difficult which each passing year.

This is also the time that they must sell all surplus young male sheep and the old ewes that they cannot support through the winter or on the march back to Laghman. They also sell milk products and wool. They need cash in order to supply themselves with food, clothing, fodder and other necessities for the forthcoming winter months.

After they have sold the sheep, the onset of cold weather and shortage of grazing force them onwards down to the warmer valleys in Laghman. The winter grazing on the Laghman *dasht* is generally rather poor, but the climate is mild and fodder in the form of straw is available from the local villagers – provided they have the money to buy it. In Laghman, older established relationships are deteriorating, and where once they were able to camp and graze their flocks free of charge on the open *dasht*, they are increasingly required to pay high "rents" to the local powerbrokers. They remain in the warm Laghman valleys until late March when the hot weather

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<sup>22</sup> This study's respondents admitted that relations are not what they used to be before "the war" or even from when Ahmad Shah Massoud was controlling the valley up to September 2001. A day or two before the research team's visit there had been a dispute on the Margadeh pastures (an hour's walk further up the valley from Siyanbar) between the *kuchi* and local village herdsman. The local villagers had taken two sheep from each of the Khomarikhel flocks as enforced payment. The district governor had been brought into this dispute which was still unresolved, but there appears to be mounting hostility towards the *kuchi*.

forces them to move from the lower altitude up to the Shamali plains, following the spring flush of grass and herbs. As summer approaches, they move on again to the mountain pastures in the upper Panjsher, and so the cycle is repeated. But, for how long will this continue to be possible?

It is not so much a “management” system as a migration cycle driven by climatic conditions and the seasonal state of the pastures at different altitudes. It is a system that is highly vulnerable to breakdown at any point in the seasonal cycle. While the system works, pastures are not unnecessarily overstocked or damaged because the flocks move on before this happens. However, if there is a delay at any point in these seasonal stages it can be very damaging to the grazing environment, and the system is already showing signs of breaking down. For many of the Khomarikhel who now no longer own viable numbers of animals the system has already broken down, and for those who remain camped in Parwan through the summer, life is not good.

### *The Parwan group*

The families who remain camped in the Shamali Plain for the summer (in Deh Sabz and Qara Bagh) now outnumber those who migrate to the Panjsher, and while fourteen families migrate to upper Panjsher, 25 families remain in Parwan for the summer, encamped on the plains of Deh Sabz. About the same number remain camped in Qara Bagh. They remain here, close to the settlements, provincial townships and not far from Kabul, because of the location’s proximity to unskilled job opportunities. The research team were also informed that another fifteen families had migrated to the Jalrez valley in Wardak in the hope of finding summer grazing in Behsud district in the Hazarajat. The fate of this group was not known, but the action indicates a need to find additional summer grazing other than Panjsher where the pressure on the summer pastures is already at its limits. Behsud in Wardak was not previously a traditional summer location for the Khomarikhel, so it will be interesting to follow the outcome of this.<sup>23</sup> Many of the families remaining in Parwan have either lost all their livestock or possess few animals, and must find paid work to support their livelihood. One or two families have larger flocks, but they are facing many problems. The main respondent in the Kur Cheshmeh camp in Deh Sabz is a case in point: he owns a breeding flock of about 100 sheep and goats, but finding grazing during the summer in Parwan is difficult and often leads to conflict with the settled villagers. After the settled villages have harvested their wheat, it is possible to rent stubble grazing in agreement with the villagers, but this is not always forthcoming.<sup>24</sup> Finding grazing in Parwan is increasingly fraught with problems and the *dasht* shows evidence of increasing degradation from both fuel collection and out-of-season grazing.

### **Feed and fodder as a constraint**

Sustained drought from the late 1990s through the early 2000s led to a general deterioration in the stock-carrying capacity of the seasonal grazing lands throughout most of Afghanistan. This, in turn, forced many nomadic families to sell animals and downsize their flocks. Numbers of nomadic animals are still in the process of

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<sup>23</sup> Up to 2005 at least, the Hazara in Behsud were not permitting the *kuchi* to re-occupy summer grazing in Behsud (or indeed almost anywhere in the Hazarajat) due to their perceived support and alliance with the Taliban and their reported behaviour towards the Hazara under the Taliban regime. *Kuchi* attempts to re-enter Behsud had been met with armed resistance by the Hazara. It is not known what the situation was in 2006.

<sup>24</sup> In this case it seems to have deteriorated significantly as the respondent had recently had a violent dispute with villagers over grazing his stock over stubble to which the villagers said he had no right. This had ended in the district court and the respondent was 20,000 Afs (US\$400).

recovery from these drought years, which is happening faster in some areas than others. Over wide expanses of upland Afghanistan, hill slopes that were once grazed have been cultivated for marginal rainfed crops. These grazing lands will take years, if not centuries, to recover. Civil conflict and the breakdown of the unwritten social contract between settled rural populations and nomads pose a serious threat to the traditional nomadic pastoral way of life. In many places the *kuchi* are being excluded from their traditional seasonal ranges. Where this occurs, it increases pressure on other parts of the range. The seasonal use of the rangeland is essential to the health and productivity of the natural grazing, and anything that breaks the cycle is likely to endanger the viability of the system as a whole. In the case of the Khomarikhel, the system on which their traditional way of life is based has already collapsed for a large part of the group, and only a small proportion of the tribe now undertakes the full circle of pastoral migration. The majority of the households are now dependent for their livelihoods on casual unskilled labour at the lowest level of the peri-urban economy. Even those families still able to pursue a viable pastoral life are increasingly dependent on family members earning a part-time livelihood in the non-pastoral economy.

The Khomarikhel are facing difficulties at each stage of their seasonal grazing cycle, and find themselves increasingly in conflict with the settled rural population. Unless something can be done to settle these simmering disputes, it will never be possible to institute management systems to help improve the productivity of the rangelands. The grazing land needs to be protected from the plough and out-of-season grazing by the sedentary population. The government must pay attention to resolving the growing conflict between the settled population and the *kuchis*. However, this will require much greater understanding of the problems faced by all parties.

## 2.4 Feed and nutrition: constraints, opportunities and implications for policy

A case study of two rural communities from the middle reaches of one river basin (the Hari Rod) cannot be taken as a sufficient sample on which to base national policy, but it does draw attention to the issues related to settled mixed arable/livestock farming that are typical of many similar situations in Afghanistan. Neither can a study of one group of pastoral nomads in eastern Afghanistan be taken as an adequate sample on which to base policy affecting all Afghan *kuchi*. However the case of the Khomarikhel is again similar to the situation facing many groups of Afghan nomads at present, and some useful lessons can be learned from it. Only part of the tribe is still living anything like the traditional life of nomadic pastoralists, with their flocks at the centre of their lives and livelihood. The rest (probably the majority) do not own an economic number of animals and are almost totally dependent on the non-pastoral, non-agricultural economy for their livelihoods. It may be that the lives of this section of the tribe are changed for ever, and that they are now oriented in a new direction from which there will be no going back to their previous traditional life. Government policy should take this into account.

### Lessons from the sedentary communities case studies in Herat

It is generally easier to identify constraints than opportunities for development. For the settled villagers along the Hari Rod, there is no shortage of these, including issues related to irrigation water, small landholdings, an uncertain climate and the absence of agricultural services.

As has been demonstrated through the two case studies, the ownership of livestock – whether cattle or small ruminants – is very much tied to having access to crop land either as a landowner or long-term tenant/sharecropper (most commonly on a fairly small scale of operation). The management of livestock is integrated with, and inseparable from, the cropping system. At the same time, and particularly with respect to small ruminants, much depends on maintaining a careful balance between the use of common-land grazing and the products and by-products of the arable farming system. In most situations, farmers make highly rational decisions about how they allocate land to crop and fodder production that reflect the limitations of their land and water. Good systems already exist for rotating grain crops with pulses and legumes. Small improvements are always possible, but the constraints within which most farmers operate need to be recognised within the greater context of policy design.

Most households are still part of an essentially subsistence agricultural system, in which supplying household needs rather than the wider market is the primary focus. Small surpluses that they may have are sold or exchanged, and livestock remain a valuable asset that may be sold in times of need. Livestock husbandry in these circumstances is based on a low-cost, low-input/low-output system that attempts to minimise risk. At this level of production, the system cannot stand many additional costs for which no equal benefit can be discerned – particularly if this involves what might be perceived as unwarranted risk or cost. Under the prevailing circumstances in villages such as those described in this study, it is unlikely that livestock husbandry will ever become a serious commercial proposition. The exception may be among the few families who own large flocks of sheep, but these are likely to remain in the minority. However, much can be achieved through small improvements in health care, feeding, housing and even breeding to improve the quality of the subsistence and food security systems of which they are a part, as well as increasing household incomes from the sale or exchange of small surpluses.

Institutionally, within the Ministry of Agriculture, Irrigation and Animal Husbandry, and the provincial departments of the ministry, livestock husbandry, production and health tend to be organised separately from agriculture and crop production. Irrigation is also dealt with separately from crop production – while for the farmer they are part of an integrated system. Any increase in crop production is bound to affect the quantity and quality of forage and fodder available to feed stock in the winter months. Likewise any activities aimed at increasing the productivity of the livestock is bound to place additional demands on crop and fodder production. Farmers must manage an integrated system in which their livestock – cattle and small ruminants – are an inseparable part, and the ownership of cattle and sheep in most settled situations is closely tied to having access to crop land on a sustained basis. Any policy relating to the development of livestock husbandry and production must take this into account.

The importance of household poultry and rabbits in providing poor households with a regular supply of inexpensive protein needs greater recognition, especially as they make few demands on the land. For poorer families, the potential of certain breeds of milking “house” goats, such as the so-called “American” goats that are increasingly popular in the Hari Rod villages, needs more attention as these breeds do not require much land to support them.

## Lessons from the nomad pastoralists case study in eastern Afghanistan

The case of the Khomarikhel is typical of many groups of *kuchi* in Afghanistan at present, and this study illustrates the constraints and vulnerabilities of their traditional pastoral way of life. It also shows the extent to which they are dependent on the good will and cooperation of the local settled population at almost every stage in their migratory cycle, whether for fodder, for access to pastures or for right of passage.

While a small proportion of the tribe are still able to lead a pastoral life, many are now without economically viable numbers of sheep and are increasingly dependent on the non-pastoral, urban and peri-urban economy for their livelihood as unskilled casual workers. This section of the tribe is reduced to a very precarious life on the fringes of society, without either settled abode or livestock. They may never again manage to re-enter the pastoral cycle, and serious thought should be given to assisting them settle and be able to earn a more rewarding livelihood in the non-rural sector of the economy. It should not be assumed that their future lies in resuming a pastoral life, which is, at the same time, increasingly under threat.

That part of the tribe that still possesses economically viable flock numbers is facing difficulties at every stage in its seasonal cycle of migration between Laghman, Parwan and the alpine pastures of the upper Panjsher. There is little space for any large-scale increase in flock numbers, and the carrying capacity of the summer pastures is already close to its limit. Even though the Khomarikhel claim to have legal title to their section of the summer pastures, they are meeting increasing competition from the settled village populations in the upper Panjsher. There remain serious issues of grazing and camping rights in Laghman and Parwan, to which the tribe have historical claim but no written or legal documentation. In the current situation, it is not possible to establish any long-term management plan or long-term support to the *kuchi* that use this area. Until the issues between the settled and nomad populations are resolved by the Afghan government, conflict and dispute is likely to increase. It is unclear whether the authorities have the power or the respect from all sides to be able to adequately sort out these issues, however it remains the government's responsibility to adjudicate justly in such cases, and it is essential that a legal framework is developed in which the issues can be dealt with in an equitable and innovative manner.

In general, a seasonal migratory system of herding is a sound one in the physical environment such as Afghanistan, and is clearly the reason it developed here in the first place. It means that flocks move onto each section of the grazing area at the optimal time, and move off each section before it is destroyed. A mobile lifestyle is essential for such a system to work. The problems arise when the system breaks down at any point in the seasonal migratory cycle, as is happening among those families who remain all summer in Parwan. Increases in population mean that pressure on the available natural resources, including grazing land, is ever greater, and with it the potential for both environmental abuse and conflict rises.

There continues to be a viable economic place for nomad and transhumance herding systems in a country like Afghanistan, and this form of livestock husbandry still has the potential to provide the country with much of its meat, preserved milk products and coarse wool. However, it is becoming increasingly necessary to establish a respected legal framework within which it can operate if dispute and conflict with the settled population and environmental degradation are to be resolved. It was encouraging to observe that at least the summer pastures in the upper Panjsher valley had

not yet been completely destroyed, and in fact were in surprisingly good condition. But this is unlikely to remain the case if unlimited pressure by both settled and nomad populations is allowed to continue unchecked. In Parwan the rangeland grazing is seriously degraded, and out-of-season pressure is no doubt a contributing factor.

### 3. Livestock Products

#### 3.1 Sedentary crop-based systems

Rural households in Afghanistan tend to be large, and the household's basic needs and food security are the priority. This influences the use made of the products of livestock husbandry: milk, meat and fibre. While the ownership and overall control of a household's livestock usually rests with its head, family members, including women, may own individual animals, play an essential part in their management and undoubtedly have a say in how the products are used (see Table 3.1).

#### Cattle

Throughout Afghanistan, cattle are kept for three main purposes: milk, draught power and meat, in that order.

##### *Milk*

In the village situation, cows provide the household with fresh milk and milk products. Only in certain peri-urban situations are cows kept specifically to produce milk on a commercial basis. The situations observed in Tunyan and Marwabad/Borya Baf are typical of much of rural Afghanistan – where cattle are primarily kept to serve domestic, subsistence and social needs. Not all rural households maintain even a single cow and her offspring, and those that do seldom own more than one or two. This applies even to large landowners.<sup>25</sup>

##### *Draught power*

While plough oxen may be kept to cultivate a family's own land, they also give their owners access to land belonging to others on a more favourable basis as *kishtamand* – 50 percent sharecroppers. Ownership of oxen is not possible for all: they are expensive to maintain and must be kept in good condition for twelve months while actually working for only three or four. It is therefore only a minority of farmers in any village who own a plough ox, and fewer still a pair. Tractors and mobile threshers are rapidly taking the place of oxen in many parts of Afghanistan, although they are still comparatively uncommon in Pashtun Zarghun.<sup>26</sup>

##### *Stock bulls*

Few farmers or livestock owners can afford to keep a stock bull. There is no financial return from service charges between neighbours as this is not socially acceptable and said to be "un-Islamic", and there is therefore little incentive for villagers to own a better quality bull. The para-vet in Borya Baf can be regarded as an exception with his Iranian Friesian-type bull.

##### *Meat*

Meat is a secondary, although, useful by-product of subsistence milk production and draught power. Although the sale or slaughter of old or sick cows or oxen, or the occasional bull calf raised for sale or slaughter, provides a useful (if opportunistic) source of meat or cash, it is not common for villagers to raise cattle with the explicit or primary purpose of beef production. Cattle ranchers and commercial dairy farmers with large herds of cattle are unusual in Afghanistan, except in very specific situations.

<sup>25</sup> For instance, in Tunyan Mian Deh, at least 55 percent of households do not own a milk cow and no more than 20 percent of households own a plough ox.

<sup>26</sup> Fitzherbert, *Livestock Husbandry*.

## Small ruminants

Sheep and goats are raised with the triple purpose of producing milk, meat (or animals for sale) and fibre (wool, hair and fur).

### *Milk*

Milk and milk products are produced for the household and, if in surplus, for sale in some preserved form, commonly as *qurut* or *roghan*. Milk production from sheep and goats is seasonal, and mainly confined to three, or at most four, months of spring and early summer.

### *Meat*

Male animals not required for breeding are raised for meat for the household or for sale if cash is needed to buy other essential commodities, or when in surplus specifically for sale. Farmers with sufficient fodder may buy young animals to grow on or fatten for sale later as a business venture.

### *Fibre*<sup>27</sup>

Mostly small farmers use the wool and hair from their few sheep or goats for their own household purposes. If not needed or in surplus to household needs, it may be sold either in raw or manufactured form. In northern Afghanistan in provinces such as Balkh, Jawzjan and Faryab, flocks may be kept specifically for the production of karakul, but this is a specialist activity.

Livestock of all kinds are also a useful saleable asset in times of domestic need.

## 3.2 Case studies of two sedentary communities, Herat

Every situation is unique, but ownership or breeding of sheep or goats (as opposed to young or “store” sheep purchased specifically to be grown on or fatten for later sale), is usually dependent on having access to both crop land and seasonal common grazing. Even in favourably situated villages, only a minority of households are likely to own large flocks or can be said to be “commercial flock masters”.<sup>28</sup> More commonly a village household keeps a few sheep or goats, primarily to meet the basic needs of the household. It may be necessary at times to sell animals to provide much-needed cash, depending on domestic priorities. The villages of the middle Hari Rod valley such as Tunyan and Marwabad/Borya Baf typify this pattern. In neither community do more than 50–55 percent of households own cattle and/or small stock.

For the purpose of this study, a cross-section of ten livestock owners were interviewed. Of these: four households own a milk cow or two and their offspring; four households own an ox or a pair of oxen; two households own both cows and oxen; seven households own sheep and/or goats; two households own cattle as well as small stock; and three households own only goats.

Access to forage, fodder and grazing, and the balance between these, plays an important part in deciding what type and what number of animals can be kept. Also important to this decision is the number of people in the household, who must be supported, and the likelihood of having any surplus to sell. Individual human prefer-

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<sup>27</sup> Wool, hair, cashmere and in certain parts of northern Afghanistan for karakul or “Persian” lamb skin.

<sup>28</sup> For instance, in Tunyan Mian Deh, 45 percent of households do not own any sheep or goats and most of those that do own only 4 or 5 breeding animals at most, with only one household reported to own 30 head.

ence also plays its part and should not be discounted. Some people prefer to keep a cow, others prefer a few goats (see Table 3.1).

Table 3.1. Livestock products: milk and meat

<i>Household details</i>	<i>Livestock</i>	<i>Product purpose: use or sale</i>	<i>Ownership of animals and products</i>	<i>Additional comment</i>
<p>HH1 (Tunyan): 15 in household</p> <p>2 <i>jerib</i> of irrigated wheat</p> <p>Small land/stock owner, heavy household obligations</p> <p>Livestock: purely subsistence</p>	<p>Cattle: cows + offspring only</p> <p>2 x milk cows</p> <p>1 x bull (18-month)</p> <p>1 x heifer (6-month)</p> <p>2 goats + 2 kids (2 m)</p> <p>Purely to support household with milk and meat</p> <p>2 male kids to be slaughtered in autumn for <i>landi</i></p> <p>Aimed to sell 18-month bull to butcher as can't afford to feed</p>	<p>Milk for household</p> <p>Will sell bull to butcher in autumn to raise cash for household</p> <p>Heifer to be kept as replacement</p> <p>2 kids for household meat <i>landi</i></p>	<p>Male head of household owns</p> <p>Women decide what milk products made</p>	<p>Only for household use</p> <p>Main source of fodder is wheat straw</p> <p>Also runs cattle with village herd</p>
<p>HH2 (Tunyan): 8 in own family + 2 poor brothers and families also in household</p> <p>2 <i>jerib</i> of irrigated wheat + 100 mulberry trees</p> <p>Small land/stock owner, heavy household obligations</p> <p>Livestock: purely subsistence</p>	<p>Goats only</p> <p>9 goats + 6 kids (4 f, 2 m)</p> <p>Purely to support household with milk and meat</p> <p>2 male kids to be slaughtered in autumn for <i>landi</i>, but may sell if need cash</p>	<p>Milk for household and shared with brothers</p> <p>2 male kids for household meat <i>landi</i> unless cash needed</p> <p>As less than 10 lambs/kids, will pay the shepherd in cash</p>	<p>Male head of household owns</p> <p>Women decide what milk products made</p>	<p>Only for household use</p> <p>Main source of fodder: wheat straw plus mulberry leaves</p> <p>Goats run with village flock</p>
<p>HH3 (Tunyan): 25 in household</p> <p>15 <i>jerib</i> (4 barley; 2 lucerne; 4 clover, 5 wheat)</p> <p>50% share in 40 <i>jerib</i> wheat</p> <p>Medium/large land/stock owner, heavy household obligations</p> <p>Livestock: some surplus of lambs and milk (ownership of oxen gives access to 50% share of 80 <i>jerib</i> wheat land, of which half cropped each year)</p>	<p>Cattle: 1 pair of oxen</p> <p>Sheep and goats</p> <p>4 rams, 50 ewes + 40 lambs (30 f, 10 m)</p> <p>3 goats + 3 m kids.</p> <p>Will slaughter 3 male lambs for <i>landi</i>; sell 3 male lambs and 3 male kids, 4 male lambs to shepherd</p> <p>Has some surplus <i>qurut</i> and <i>rogghan</i> to sell or exchange</p>	<p>Oxen give 50% access to 40 <i>jerib</i> wheat</p> <p>3 ram lambs for household <i>landi</i></p> <p>4 lambs/kids + cash to pay shepherd; 6 lambs and 3 kids to sell</p> <p>Females for replacements</p> <p>Milk for household; may exchange some <i>qurut</i> and <i>rogghan</i></p>	<p>Male head of household owns</p>	<p>Sufficient fodder production to keep sizeable flock of sheep with surplus animals to sell</p> <p>In 2005 exchanged 80 kg <i>qurut</i> and 64 kg <i>rogghan</i> with neighbours for wheat</p>

<p><b>HH4 (Tunyan): 17 in household</b></p> <p>Owns 30 <i>jerib</i> of which 14 <i>jerib</i> cropped each year (10 <i>jerib</i> wheat; 1 <i>jerib</i> barley; 1.5 <i>jerib</i> lucerne; 1 <i>jerib</i> clover, 0.5 <i>jerib</i> vegetables, potatoes etc.)</p> <p>100 mulberry trees</p> <p>Medium/large land/stock owner, heavy household obligations</p> <p>Livestock: small surplus of lambs, no surplus milk</p>	<p><b>Cattle: 1 pair of oxen</b></p> <p><b>Sheep and goats</b></p> <p>20 ewes + 15 lambs (5 f lambs, 10 m lambs)</p> <p>1 "American" goat + 2 kids</p> <p>Will slaughter 4 male lambs for <i>landi</i>, sell 5 male lambs, 1 male lamb to shepherd + some cash</p> <p>No surplus milk to sell</p>	<p>Milk for household</p> <p>4 male lambs household <i>landi</i></p> <p>1 male lamb for shepherd + cash</p> <p>5 male lambs to sell</p>	<p>Male head of household owns</p> <p>Women decide on milk</p>	<p>Milk and meat first for household subsistence, but excess ram lambs sold</p> <p>"American" goat equivalent of a cow and cheaper to maintain</p>
<p><b>HH5 (Tunyan): 25 in household</b></p> <p>Owns 51 <i>jerib</i> of which 31 cropped each year (20 <i>jerib</i> wheat; 4 <i>jerib</i> barley, 3 lucerne, 2 clover, 2 <i>jerib</i> mung)</p> <p>400 mulberry trees</p> <p>Medium/large land/stock owner, heavy household obligations so no surplus</p> <p>Livestock: subsistence (female lambs and need for ram)</p>	<p><b>Cattle: cows + offspring</b></p> <p>2 x milk cows + 18-month heifer, 2 x 8-month calves (1 bl, 1 heifer)</p> <p><b>1 pair oxen</b></p> <p><b>Sheep and goats</b></p> <p>18 ewes</p> <p>13 lambs (10 f, 3 m)</p> <p>5 goats (5 kids all f), 1 m lamb kept as ram, 1 for <i>landi</i>. 1 to pay shepherd + some cash.</p>	<p>Milk for household</p> <p>May sell 18 m heifer if not required as replacement</p> <p>8 m bull, will keep until 2 yrs nt decided</p> <p>1 m lamb for ram, 1 household <i>landi</i>, to pay shepherd + cash</p>	<p>Male head of household owns</p> <p>Women decide what milk products made</p>	<p>Milk and meat for large household</p> <p>Excess young cattle may be sold but may keep, undecided</p>
<p><b>HH6 (Tunyan): shepherd</b></p> <p>No cultivated land</p> <p>Community shepherd, no land</p> <p>Livestock: subsistence</p>	<p><b>Goats only</b></p> <p>10 goats of his own, but shepherd i/c 400 (300 sheep and 100 goats) all ages – possibly 250 breeding animals producing 200 lambs/kids.</p>	<p>Milk and meat for household</p>	<p>Own his goats</p>	<p>Milk and meat for household subsistence</p> <p>Gets paid 1 in 10 lambs, sells some</p>
<p><b>HH7 (Borya Baf): 15 in household (inc father + brothers)</b></p> <p>Owns 50 <i>jerib</i> intensely cropped wheat, fodder, rice, pulses and vegetables</p> <p>Large land owner/serious cattle owner, heavy household obligations</p> <p>Livestock: primarily subsistence, but with</p>	<p><b>Cattle: cows and offspring</b></p> <p>3 milk cows, 1 heifer calf (1-month), 1 bull (18-month Friesian, 1 pr oxen)</p> <p>9 others – all ages and sexes belong to father and brothers</p> <p>Managed as single herd</p> <p>Not yet using young Friesian bull</p>	<p>Milk for household</p> <p>Heifer calf replacement</p> <p>Bull as stock bull</p>	<p>Owns some</p> <p>Father and brothers own the rest</p> <p>Primarily for household, may sell odd bull calf</p>	<p>Para-vet</p> <p>Milk for household subsistence</p> <p>Bull's mother from Heart, of Iranian origin (Friesian)</p> <p>Father + brothers appear to defer to the para-vet respecting all</p>

improved bull has intention of improving production				the animals
<b>HH8 (Borya Baf): 20 in household</b> Owns 5 <i>jerib</i> intensely cultivated land (wheat plus fodder, rice, pulses) Small land owner/medium stock owner with limited land, heavy household obligations Livestock: purely subsistence	<b>Goats only</b> 25 goats 10 kids (5 f, 5 m)	Milk for household  The male kids needed for household for the winter as <i>landi</i>	Male head of household owns  Son is shepherd for his and brothers goats  Women decide what milk products to make	Milk and meat for large household
<b>HH9 (Marwabad): 15 in household + 2 brothers and families</b> Owns 1 <i>jerib</i> and farms 3 more for brothers on 50% basis (intense wheat, rice, pulse etc.) Category: small land owner/stock owner, heavy household obligations Livestock: purely subsistence	<b>Cattle: cow + offspring</b> 1 milk cow 14-month bull 1 x 2-month heifer 1 ox	Milk for household shared with brothers  14-month bull being kept for ox  Heifer as replacement	As head of household he owns cattle, but shared with brothers' families  Women decide what milk products to make	Milk for household subsistence
<b>HH10 (Marwabad): 11 in household</b> No land but sharecrops 50% of 5 <i>jerib</i> , intense cropping (wheat/rice, pulses, maize etc) <i>Kishtamand</i> sharecropper/small stock owner Livestock: purely subsistence (ox along with a neighbour's gives them facility to jointly sharecrop 5 <i>jerib</i> of land)	<b>Cattle: 1 ox</b> <b>Sheep and goats:</b> 3 ewes + 3 lambs 2 local goats, 4 "American" goats 1 billy and 8 kids	Ox gives access to 50% sharecrop  Goats kept at home  Milk for household	Male head of household owns  Women decide what milk products to make	Milk and meat for household subsistence

## Milk production

### *Milk products*

Cows, ewes and female goats (does) are all kept to produce milk, primarily for household consumption rather than for sale. Cow's milk is usually consumed boiled and sweetened for breakfast or as *mast*, *dough* or *maska* (see Appendix 2 for details). Sheep and goat's milk may also be consumed as *mast*, *dough* and *maska*, but it is also made into *qurut* and *roghan* for the winter. Some households make a soft white cheese (*panir*) during the first weeks of lactation. For the winter, women

make *gulushir*, a sweet biscuit made by cooking wheat flour with milk, sugar and oil.

The cattle are mainly of an unimproved type; lactations are short, seldom exceeding nine or ten months, and are often much shorter.<sup>29</sup> Although cows may produce a calf each year if they are in good condition and there is ready access to a bull, many only produce a calf every fourteen, fifteen or even eighteen months. As cows may calve at almost any time of year, they can provide useful “out-of-season” milk, while sheep and goat’s milk is mainly seasonal – restricted to the first three or four months of spring and early summer. Native goats lactate slightly longer than sheep. So-called “American” milking goats are increasingly popular in the Pashtun Zarghun villages as they are inexpensive to feed compared to cows, they lactate for up to eight or nine months, and they are capable of producing 3–4 or more kg of milk a day at the peak compared to 1 kg from ewes and possibly 1.5 from the native goats.

*Table 3.2. Milk cow lactations*

<i>Household and number of cows</i>	<i>Approximate duration of lactations</i>	<i>Approximate calving interval</i>
HH1 (Tunyan): 15 in household 2 x milk cows 1 x bull (18-month) 1 x heifer (6-month)	One old cow lactated only 3 months this year and 4 months last  One young cow still lactating	Old cow 18 months Young cow first calf
HH5 (Tunyan): 25 in household 2 x milk cows + 18-month heifer + 2 x 8-month calves	The older cow lactated for 8 months  Younger cow lactated for 10 months	Older cow 10 months Young cow first calf
HH7 (Borya Baf): 15 in household (para-vet) 3 milk cows 1 x small heifer calf, 1 x 18-month Friesian bull	One cow lactated for 11 months One at start of lection  One in calf for the first time Mother of young bull died  Admits that most local cows lactate for only 8–10 months	His cows are particularly well cared for and fed, and he claims that they produce a calf each year, but admits that for most people this is not the case and 15 to 18-month intervals are common
HH10 (Marwabad): 11 in household 1 milk cow + 14-month bull	6-month lection only	Last calf 14 months ago and nowhere near calving yet

### *Beneficiaries and sale*

The main beneficiaries of all milk production from cows and small stock are the members of the extended family living within a single compound. Household needs must be satisfied as a priority. Households having a small surplus of milk generally share it with their neighbours or with guests. There is a strong tradition in Afghan rural communities of sharing milk and milk products such as *mast* and *dough* with guests and neighbours when it is available. In Tunyan and Marwabad/Borya Baf, as in much of rural Afghanistan, the usual custom is for better-off families to keep a cow or two sufficient only to meet household and social needs, and not as a commercial proposition. It is not customary to sell milk to one’s neighbours, and in this context

<sup>29</sup> There is some interest in breed improvement as demonstrated by the Friesian bull owned by the para-vet in Borya Baf.

such a practice is termed *shir faroush* or being a “milk seller” – considered mean and scorned by neighbours and relatives. However, to sell milk products to shopkeepers in a local bazaar or to exchange milk products with neighbours as a favour for grain, for instance, is acceptable. Away from the periphery of the main urban centres, milk cows are seldom kept primarily for commercial milk production.

Only a minority of households, even in favourably situated villages, own sufficient numbers of sheep and/or goats to produce a commercial surplus of milk products. It requires more than 20 or 30 breeding females to produce sufficient surplus *qurut* or *roghan* on a regular basis to make it worthwhile producing specifically for the market. Among the ten livestock owners interviewed in Tunyan and Marwabad/Borya Baf, only one claimed to have *qurut* and *roghan* surplus to household needs. This respondent (HH3) was by far the largest flock owner interviewed in Tunyan (reported to be the largest single flock master in the whole village), owning 50 breeding ewes and three female goats. After meeting the needs of his large household of 25 people, he claimed to have had a surplus, in 2005, of 20 *man* (80 kg) of *qurut* and 16 *man* (64 kg) *roghan*. He did not sell this for cash, but preferred to exchange it with neighbours for wheat grain. In Marwabad, some of the women from better-off households and with easy access to the local bazaar admitted to selling some *qurut* and *roghan* to local shopkeepers. But not every village has such easy access to market outlets and few are able to produce a commercial surplus from their few animals. There is little evidence of any systematic commercial milk production in these Herat villages, and only a few households, such as HH3 mentioned above, own enough sheep and/or goats to trade *qurut* or *roghan* on a regular basis or in significant quantities.

#### *Ownership and decision making*

The effective head of a household usually has the final decision on production, but members of a family group – even sometimes women – may own some animals. From interviews held with four groups of village women, it was clear that in these village communities women are not only responsible for milking cows as well as sheep/goats, they are also largely responsible for deciding what products are made and how they are used. Paraphrasing from the women’s group interviews, the general response was:

*We do the milking and are responsible for dealing with the milk. The men are busy in the fields and do not have time to decide on such things.*

If there is a surplus, men are usually responsible for selling it in Herat or in the Pashtun Zarghun bazaar – but usually on instructions from the women of the household as to what should be purchased with the proceeds. If the bazaar is not too distant, women may trade their produce themselves if they go as a group or with a male relative.

#### **Meat and meat products**

##### *Beneficiaries and sale*

The essential needs of the household must be met before anything else. Few households, even those that are better off, can afford to slaughter an animal on a regular basis. This is reserved for special occasions – religious feasts such as *Eid-i-Qurban* (when religious custom demands that the slaughtered beast must be shared with poorer neighbours), family celebrations such as weddings or funerals, and the New Year (*Naw Roz*). It is common to slaughter one or two young rams or kids in late

autumn for winter. The meat, cut into strips and dried in the sun with salt, is known as *landi* (see Table 2.1). Bull calves raised to become draught oxen are castrated at 2–3 years old, which in itself requires significant resources. More rarely, a bull calf may be retained specifically for breeding, however there is a general shortage of good breeding bulls as it is considered “un-Islamic” to charge one’s neighbours “service fees”. Bull calves may also be raised to slaughter to provide meat for the household’s needs or to sell to raise cash. Individual household situations determine the decisions made. Sick animals are commonly slaughtered before they die so that the meat is *halal* and not wasted, and it may be shared with neighbours or with the poor. Few rural households eat meat on a regular basis, and chickens, turkeys and rabbits provide meat for more informal occasions or for unexpected guests.

### *Decision making*

In most rural villages, it is a minority of households that are able to raise animals surplus to household requirements for sale or slaughter on a regular basis. Occasionally a family may be compelled to sell an animal to raise the cash to pay for a wedding or funeral gathering, to pay debts or simply because they cannot afford to feed the animal through the winter. Among the ten interviews, only two respondents (3 and 4) had excess ram lambs to sell after paying the shepherd and conserving enough *landi* meat for themselves for the winter. The shepherd is a special case, being paid one lamb/kid for every ten raised until weaned (about three months old).

Of the four respondents who owned bull calves or young bulls eight to eighteen months old (all selected completely at random), a full spectrum of decisions was demonstrated: sale (probably for meat); undecided; keeping to be an ox; and retaining as a breeding bull (see Table 3.3).

*Table 3.3. The future of four young bulls*

<i>Household</i>	<i>Bulls</i>	<i>Intention</i>
HH1 (Tunyan): 15 in household Owns 2 <i>jerib</i> of irrigated wheat No fodder crops	One 18-month-old bull	Plans to sell before the winter Insufficient fodder (straw) to keep any longer
HH5 (Tunyan): 25 in household Owns 51 <i>jerib</i> of which 31 cropped (mixed wheat, fodder, pulse and vegetables)	One 8-month-old bull	Undecided. Intends to keep until 18 months to 2 years, probably to be an ox, if strong enough, but possibly to sell. Too early to decide.
HH7 (Borya Baf): 15 in household including father and brothers Owns 50 <i>jerib</i> intensely cropped wheat, fodder, rice, pulses and veg Para-vet working in DCA programme	One 18-month Friesian bull	Retaining as stock bull Purchased mother in Herat when in-calf
HH9 (Marwabad): 15 in household including 2 brothers Owns 1 <i>jerib</i> and farms 3 more for brothers on 50% basis (intense wheat, rice, pulse etc.)	One 14-month bull	Intends to keep as an ox, but will see if they can afford to feed it that long

### *Draught power*

Oxen not only provide draught power to cultivate a farmer's own land, but ownership of an ox provides a small landholder with access to additional land on a favourable 50 percent sharecropping basis as a *kishtamand*, as well as the option of hiring them out. However, oxen are expensive to keep and only those with access to sufficient forage and fodder can afford to maintain an ox or pair of oxen for twelve months when they may only work for three or four months at the most. In many places, tractor power is replacing oxen.<sup>30</sup>

### *Stock bulls*

There is no financial advantage to owning a "stock" bull as it is not customary in most Afghan villages to charge neighbours for servicing their cows.<sup>31</sup> Maintaining a breeding bull requires a certain level of both wealth and interest in breeding. Of those interviewed, only the para-vet in Borya Baf appeared interested enough in breeding to own a bull of improved type.

### *Wool, goat hair and cashmere*

In the Pashtun Zarghun villages, wool is primarily used for domestic purposes such as stuffing mattresses and knitting garments, but some households also weave prayer rugs while others weave tent cloth which is sold to traders in Herat (who in turn sell to the *kuchi*). Those households with larger flocks of sheep may produce enough wool to sell some either to traders who visit the village or in the bazaar. Women appear to have a major say in what is required for the household and what should be done with the wool, even if the men of the household actually sell the final products. Cashmere (the fine under-fur of the common goat) is reported to be the perk of the women of the household, and at present it can fetch 750–800 Afs per kg (US\$15–20) in the Herat bazaar.

Table 3.4. *Wool and hair*

<i>Household details</i>	<i>Small stock details</i>	<i>Wool and fibre: main use</i>	<i>Ownership and decisions</i>
HH2 (Tunyan): 8 in own household + 2 poor brothers and families	Goats only 9 does + 6 kids (4 f, 2 m)	Goat hair and cashmere Hair used for ropes etc. Cashmere sold	Women decide what is to be done Mainly for domestic purposes, but cashmere is women's perk
HH3 (Tunyan): 25 in household	Sheep and goats 50 ewes + 40 lambs (30 f lambs; 10 m lambs) 3 goats + 3 m kids	After household needs met (for mattresses, felt etc.), rest of wool sold (88 kg sold in 2006)	Women decide what wool is needed for household and for what Head of household decides about selling surplus if away from home
HH4 (Tunyan): 17 in household	Sheep and goats 20 ewes + 15 lambs (5 f, 9 m)	After household needs met, sell surplus or women may make tent	Women decide what to be done with wool Head of household will

<sup>30</sup> Fitzherbert, *Livestock Husbandry*.

<sup>31</sup> For instance, the Borya Baf para-vet (HH7) had invested in a Friesian/Holstein cow imported from Iran which he had bought "in calf" in Herat. The cow had given birth to a bull calf before itself dying. The very fine looking 18-month black and white bull will no doubt help to improve the milk-producing capability of his own family's cows and that of his neighbours in Borya Baf, but is not likely to bring additional wealth to the para-vet.

	1 "American" goat + 2 kids	cloths to sell "American" goats produce no fibre	arrange sale if in Herat
HH5 (Tunyan): 25 in household	Sheep and goats 18 ewes + 13 lambs (10 f, 3 m) 5 goats + 5 kids all f	After household needs met, sell surplus In 2006 sold 5 <i>man</i> (20 kg) wool and 0.5 kg cashmere in bazaar	Women decide what to be done with wool and hair Cashmere is women's perk
HH6 (Tunyan): shepherd, no land	Goats only 10 goats of his own, i/c 400 (300 sheep and 100 goats all ages for village)	Use goat hair for ropes and may sell cashmere which is a woman's perk	Women decide what to be done with goat hair and cashmere
HH8 (Borya Baf): 20 in household	Goats only 25 goats + 10 kids (5 f, 5 m)	Use goat hair for roaps and tent cloth May sell cashmere which is women's perk	Women decide what to be done with goat hair and cashmere
HH10 (Marwabad): 11 in household	Goats 2 local goats, 4 "American" goats 1 billy, 8 kids	2 local goats not significant Use hair for household "American" goats produce no useful fibre	Women's decision

### Factors influencing production choices: consumption or sale

This study has demonstrated that the primary purpose of keeping cattle for most settled rural households is to provide milk and draught power as part of a basically subsistence domestic economy. Ownership of cattle in itself indicates a certain level of wealth, as access to crop land is necessary. Ownership of small stock is generally dependent on access to both the products and by-products of crop production and to common grazing land – and on maintaining a balance between these. The scale and nature of this access and the balance between crop production and its by-products influence what type of livestock can be maintained and in what numbers. The size of the household and its needs is the first priority when considering production decisions. Household needs and other social obligations dictate what there may be left to sell for cash or exchange for other necessities. These restrictions leave little room for flexibility.

### Other household livestock: poultry, rabbits and pigeons

#### *Poultry*

Even households that do not have access to land, cattle or small stock may own poultry – mainly chickens but also turkeys, guinea fowl and ducks. These are the responsibility of the women. It is common for the women of several households to club together and select one woman to be responsible for finding a broody hen to raise chicks from eggs that are contributed by each household. Such women, who have special skills in this respect, are known as *zan-i-barakati* or "blessed women". Chickens – both for eating and egg production – are primarily raised to meet household requirements, but may also be used in exchange for grain or other

necessities.<sup>32</sup> As with milk, there are social norms in relation to trading eggs for cash with neighbours. Although surplus eggs may be sold to shopkeepers if the bazaar is not too far away, they are more commonly exchanged for other products such as grain. Turkeys are particularly useful: they are good foragers and do well on the wheat stubbles, providing a substantial quantity of meat for the winter. Turkey meat is particularly enjoyed in autumn and winter after fattening on the stubbles as well as being a good meat with which to break the Ramazan fast or entertain guests. A pair of turkeys can fetch a good price if sold at about two months old.

### *Rabbits*

Many households in Tunyan and Marwabad keep rabbits, and rabbit appears to be becoming more popular as a cheap, plentiful and regular source of white meat on which to sustain large families. As with poultry, rabbits are the responsibility of the women. In both Tunyan and Marwabad/Borya Baf, households were reported to have up to 70 rabbits. Rabbits can breed every 40 days or so and may have 10–12 kits in a litter. A pair of young rabbits is reported to fetch about 100 Afs (US\$2) or 25 Afs when weaned. One woman said that she exchanged a cockerel for a pair of rabbits and now her family can eat meat every day; similar stories were told by other respondents. Little use is made of rabbit skins or fur, although apparently the skins are sometimes cured and used as the membrane for the traditional tambourine or *dareh*.<sup>33</sup>

### *Pigeons*

Many villages in the Hari Rod valley and in other places have pigeon towers – *kaftarkhaneh* – which house flocks of feral pigeons for production of manure for vegetable gardens. In addition, specially bred “tumbler” pigeons are highly regarded by some families who keep small flocks for competitive flying displays. Well-bred birds can be very valuable and it was reported that a pair of such “tumblers” can fetch 3,000–5,000 (US\$60–100) – a valuable asset for their owners. Such pigeons are exclusively owned by men.

## 3.3 Case study of nomad pastoralists, eastern Afghanistan

Traditionally, the nomads' flocks have not only provided the basis of their wealth, way of life, means of subsistence and food security, but also with cash income from the sale of surplus animals, milk products (mainly *qurut*, *roghan* and cheese), as well as wool and goat hair for tents and ropes. Nomad shepherding has not only been a way of life but also a commercial operation, and a viable one that was appropriate to the environments in Afghanistan. Although some *kuchi* families keep a milk cow or two for off-season milk, they are primarily shepherds rather than cattle herders.<sup>34</sup> This study focuses on the products of the flocks. Baggage and transport animals (donkeys and camels) are of enormous importance – without which the nomadic life would not be possible – although some nomad groups are now increasingly using motorised transport. Traditionally the *kuchi* flocks have been Afghanistan's main

<sup>32</sup> In Ghor, Afghanistan Basic Veterinary Workers said that villagers often request to pay for vaccines or medicines for their livestock with eggs, chickens or milk products.

<sup>33</sup> Some inhibitions to eating rabbit exist: this is especially true of Shi'a Muslims, but also sometimes Sunni Muslims as well, who claim that the meat of rabbits and hares is “*makru*” and may not be eaten except in certain circumstances of particular need. In Pashtun Zarghun, such inhibitions may exist among the older generation of villagers, but this seems to be being overcome judging by the increasing popularity of raising rabbits as a way of providing a plentiful and inexpensive source of meat. The rural population in Pashtun Zarghun are predominantly Sunni.

<sup>34</sup> Note should be made here of the *Gujar*, a non-Pashto nomadic people spanning the eastern Pakistani/Afghan frontier, who are transhumanance/nomadic cattle herders rather than shepherds.

source of meat, milk products and fibre. The drought of 1998/99 to 2002/2003 led to serious reductions in flock numbers that left many thousands of *kuchi* families without animals and dependent on aid and the non-livestock economy. They have not yet fully recovered from the effects of the drought – and some never do so.

The Khomarikhel are an example of a nomad tribe that is currently divided between a minority of families who still possess viable flocks and continue to live a nomadic life and those with only few animals (or none at all) who are dependent on the non-livestock economy from which they derive a livelihood as unskilled casual labourers.

## Milk production

### *Milk products*

Milk products are sold only if there is a surplus to domestic needs. Among the Khomarikhel, the commercial production of milk products is limited to those families with larger flocks who go to the Panjsher in summer; only they have any significant surplus for sale as *panir*, *qurut* and *roghan*. The main flock lactation period starts in late Hut/early Hamal (mid/late March) and continues to Saratan (late June/early July). The families who remain in Parwan during the summer are mainly those with few animals who have no surplus milk to sell. These families are largely dependent on the non-livestock economy for their livelihood, with one or two exceptions.<sup>35</sup> It is not easy to maintain commercial numbers of animals productively in Parwan during the summer.

Until the Khomarikhel reach Parwan in the month of Hamal, all milk is either consumed by the lambs and kids or by the families themselves. Once they settle in Parwan for a few weeks spring grazing, white cheese is made for local sale up to the time when those with larger flocks move to the upper Panjsher valley. Once established on their summer pastures, serious commercial milking commences and *qurut* and *roghan* are produced for sale later in the autumn when they return to Parwan. When there are many animals to milk, men as well as women assist with the milking.

### *Beneficiaries and sale*

Sheep and goat milking stops round about the middle of Saratan (July/August), and all surplus *qurut* and *roghan* is stored in the family tents until it is carried back to Parwan in early autumn for sale in the markets in and around Kabul. After the sheep and goats stop milking, families are dependent on their house cows for milk. According to the families interviewed, cow lactations are generally shorter than those of the settled cattle. Sometimes camels may also be milked.

### *Ownership and decision making*

All major production decisions are made by the men if there is any chance of there being a commercial surplus. When milk is produced purely for household consumption, women have more say in what is produced. In the Panjsher camps, where there is more commercial production of *qurut* and *roghan*, women have less say in what is produced than those in the Parwan camps where most families own only a few animals and there is little commercial production.<sup>36</sup>

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<sup>35</sup> The main respondent in the Kur Cheshmeh camp owned 60 breeding ewes and a total flock of about 100 head (of all ages and sexes). These are herded by his three sons. There appeared to be certain reasons why he had not been able to migrate to the Panjsher valley with the others, but he is an exception and was having difficulties with the settled villagers over stubble grazing. Most of the other families camped in this area owned only a few animals, and some none at all.

<sup>36</sup> This information was from interviews with Khomarikhel women.

## Sale of animals

Ownership of animals appears to be concentrated in the hands of men, but a closer social study of the Khomarikhel would be needed to establish if it is possible for women to own livestock in their own right. Among other nomad groups it is not unknown for there to be powerful “matriarchs” who are themselves the proprietors of flocks. However this does not appear to be the case with the Khomarikhel, where the position of the women seems to be particularly weak. One woman summed up the situation when she said, “The only thing we own are the chickens, but the men eat the eggs!”

These nomads seldom slaughter healthy animals for their own consumption; when they do slaughter an animal it is usually because it is sick and unlikely to survive. There are two main seasons when the Khomarikhel sell off surplus animals, although they are also highly opportunistic and prepared to take advantage of a potential sale at any time if the price is right. Young ram lambs of less than three months old are often sold while they are still in Parwan, particularly if they think that it will be difficult to find sufficient good grazing through the summer. Most of the families remaining in Parwan sell off their surplus ram lambs at this time. Some of those who go to Panjsher also sell young lambs before they move. These young animals are sold to local villagers or traders who have the facility to grow them on to sell later in the year. The next critical time for sale is when the flocks return to Parwan in the autumn and before they leave for Laghman. At this time all remaining surplus males and old ewes are sold to traders (*jalab*) and butchers (*kasab*) in and around Kabul. Only essential breeding stock are moved to Laghman as it is not possible to carry any surplus stock through the winter.

## Wool and goat hair

The Khomarikhel make little use of goat hair these days except to make some ropes and saddle bags. Some groups of *kuchi* and *maldar* still live in traditional black goat hair tents, but the Khomarikhel now prefer to live in (much-patched) canvas tents. Apart from a few rough felt rugs (*namad*), the Khomarikhel have little tradition of making carpets or *qilim* and almost all the wool from their flocks is sold to traders in its raw form either while still in their summer camps or once they return to Parwan in the autumn.

## Poultry

Most families keep a few chickens for eggs and the odd bird for cooking and eating. In theory these are one of the few assets over which nomad women have any control, but even this may be minimal as indicated by the statement above.

## 3.4 Livestock products: constraints, opportunities and implications for policy

For the Hari Rod settled communities studied, the emphasis is on meeting household needs, and, as has been demonstrated, livestock of all kinds are primarily an adjunct of a basically subsistence agricultural economy (rather than one that is commercially oriented). The incentives for investment and increasing productivity are different than they would be if farming was more commercially oriented. That does not mean that surplus animals, dairy products and wool are not sold if available and there is a market, but small surpluses are just as likely to be shared or exchanged with relations and neighbours. This applies to dairy products in particular.

Traditionally nomadic pastoralism was about two things: it was a very definite way of life demanding a special lifestyle and people with a distinct culture and tradition; on the other hand flocks were not just maintained as a source of wealth by their mere existence – their value was always in the off-take from the flock in the form of surplus animals for sale, preserved dairy products, wool and hair. The flocks provided the income needed to procure the necessities of life that were not otherwise available to a people who did not possess land or produce crops for themselves. The herding way of life in Afghanistan was always a commercial operation as well as a way of life.

Under current circumstances, only a minority of Khomarikhel families are now dependent on their flocks. Life for these families has changed dramatically – from being pastoralists to being essentially landless satellites on the fringes of the urban and peri-urban economies.

### **Lessons from the sedentary communities case studies in Herat**

As the primary reason for keeping livestock of all kinds in both sets of communities in the study areas in Herat is the sustenance of the household rather than as a commercial operation, and as the commercial possibilities are somewhat limited in the present circumstances, improving household food security should be the first objective of any development programme in the area. Later, as production improves, the need to develop commercial outlets may become necessary. Development programmes should aim initially at relatively low-level, low-cost, low-risk improvements in health care, feeding and breeding, where these are seen to be possible for both cattle and small ruminants.

Although few households own more than one or two milk cows and their offspring, the village cattle as a whole can be taken as a single herd for development purposes. In fact, at least some of the individually owned cattle are herded together for part of the time as a village herd. Matters concerning health and breeding can be dealt with more effectively this way. The same can be applied to small ruminants.

Veterinary care and health facilities can be improved and there is no doubt that improvements in breeding stock can be introduced. The Borya Baf para-vet and his Iranian Friesian bull was an example of a private initiative that can be built on. The fact that tradition is heavily weighed against having to pay for a cow or ewe to be serviced by someone else's bull or ram will have to be taken into account.

If a breed improvement programme is to be effective, there must also be an improvement in feeding and nutrition, and any additional expense that this may involve must be perceived by the livestock owners as worthwhile. This may be more difficult within existing economic constraints. Initially, improvements are likely to be marginal, but they are worthwhile attempting.

More attention should be paid to encouraging farmers, particularly those with limited access to land, to keep a milking goat of the so-called "American" type that is becoming popular in Tunyan. These have the potential for higher pro rata production than a more expensive but less efficient cow.

More attention should be also paid to encouraging and improving household poultry and even rabbit production. Perhaps one of the most significant responses received in the course of the study was from the Tunyan woman who had exchanged a cockerel for a pair of rabbits and now claims to be able to feed meat to her family several times a week at little expense.

While livestock development policy focuses mainly on the health and breed improvement of cattle and small ruminants from a commercial point of view, insufficient attention is paid to positioning livestock as supporting household subsistence on a low-cost basis, as an adjunct to the cropping system. The significance of household poultry and rabbits receives hardly any attention at all.

Every rural household must balance its existing assets and potential for maintaining livestock against a complex set of conflicting needs, in a physical and social environment that does not necessarily provide much possibility for flexibility or significant improvement. However, small improvements in health, feeding and breeding are usually possible. Provided such improvements are low cost and low risk, even small improvements in yield and productivity can make significant differences to a rural household's nutrition and even provide some additional income.

### **Lessons from the nomad pastoralists case study in eastern Afghanistan**

In the case of nomads such as the Khomarikhel, only a minority of families actually own commercially viable flocks, and the pastoral way of life on which the productivity of those flocks depend is increasingly threatened. Already a significant proportion of the tribe is effectively dependent on the non-pastoral urban and peri-urban economies and they may well remain that way. There is little space for additional families and flocks on the Panjsher alpine pastures in the summer over and above the 14 or 15 families that go there currently. The Shamali plains of Parwan offer no possibility of keeping commercial flocks of sheep through the summer months, nor is there much room for additional numbers sheep to winter in Laghman. Tensions between the settled population and the nomads are already nearing breaking point.

It appears that the opportunity remains for at least some of the Khomarikhel to continue to base their economic livelihoods on their flocks and on maintaining a low-cost nomadic management system based on moving between seasonal pastures. The tribe as a whole faces a future that must be based on a mixed set of livelihood options and only partly on a pastoral base. In the long run a mixture of options may be better for the group as a whole.

If it is accepted that a livestock-based economy will in the future remain a viable livelihood base for only part of the tribe, it is possible to concentrate more attention on improving the productivity of those flocks that retain their commercial viability. These are the flocks that are still able to complete the full cycle of transhumance between Laghman, Parwan and upper Panjsher. The need to resolve their legal rights and status and their relationship with the settled populations at each stage has been made clear. This alone will help to initiate long-term development objectives that should include closer attention to entrenching good management practices in breeding, pasture management, feeding and health. These will remain problematic and difficult to achieve while the parties operate in a legal vacuum and with the ever-present threat of dispute and conflict.

## 4. Conclusion

This study has considered the current livestock feeding and production systems in two contrasting situations in Afghanistan: firstly, two sets of communities on the Hari Rod River, 40 km and 80 km upstream and east of Herat city (Tunyan and Marwabad/Borya Baf); and secondly, two sections of a group of *kuchi* in central/eastern Afghanistan, the Khomarikhel. The sedentary and nomadic pastoral systems do not allow easy comparison – each has a different economic base and its own place in the rural economy of Afghanistan. Comparisons within each system are, however, more fruitful.

The two cases of settled communities and the two scenarios of nomads are, in many ways, typical of the situations facing other similar rural settled and nomadic communities in Afghanistan today. While noting the difficulty of drawing broad conclusions for policymaking from such a narrow set of case studies, certain pointers can be discerned in identifying the relative potential for commercial improvement in production.

In the case of settled communities Tunyan and Marwabad/Borya Baf, livestock – whether sheep or cattle – form part of an essentially subsistence agricultural economy. The prevailing conditions – a combination of geography, distance from markets, land, water, pasturage and the priority needs of the rural population themselves – place severe constraints on the potential for serious commercial production of either milk or meat beyond the households' needs. In both Tunyan and Marwabad/Borya Baf, production of essential food crops to sustain the household is the highest priority. In Marwabad/Borya Baf access to perennial irrigation water is not a serious limitation, and there is some possibility of producing crop surpluses to sell. In this case, there is more money to be made from crops, and livestock are mostly maintained on the by-products of cultivation. In contrast, Tunyan faces severe water shortages and crop surpluses are minimal. In both cases, landholdings are generally small and crop choices must be made for very restricted areas. In Tunyan there are some larger absentee landowners, but their land is farmed by many small *keshtamand* tenants and sharecroppers. For this reason, in most households the ownership of cattle and small stock is as part of a subsistence agricultural economy, maintained as cheaply as possible on the by-products of the cropping system and on the free grazing to which the community has access. Only a minority of households possess sufficient animals to produce a commercial surplus or are prepared to allocate more than a limited amount of their crop land entirely to the production of fodder crops. Livestock husbandry in these circumstances is based on the principle of low-input/low-output – sufficient only to meet essential household needs. The incentives for higher-cost/higher-output production scarcely exist, although there are always possibilities for small improvements in feeding, breeding and better health care, provided the additional cost is seen to be worthwhile. A small number of families in Marwabad/Borya Baf and a few families from the satellite Taheri *malدار* community,<sup>37</sup> having access to summer pastures in the surrounding mountains, possess flocks of commercial size. However these are a small minority among the communities and their production system is based precariously on access to low-productivity rangeland grazing which is highly vulnerable to variations in season.

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<sup>37</sup> It should be noted that the Taheri herders now mainly live as satellites of the settled economy of Marwabad/Borya Baf and are in a state of transition from being pastoralists to becoming dependent on the settled non-pastoral economy.

The situation may be different in villages located closer to the urban markets of Herat city, provided they have access to plentiful land and irrigation water. Daily demands for milk products (fresh milk and yoghurt), more intensively produced meat (such as fattened store sheep) or poultry may make investment in these enterprises worthwhile for those who are in a position to specialise. Among all the villages in four provinces being studied as part of AREU's thematic research project "Water Management, Livestock and the Opium Economy", in only one, Qala-i-Naw in the lower Khwaja Umari valley, is there any real potential for such investment. In this case, it is milk production, in which some farmers already find it worthwhile specialising to supply the daily demands of Ghazni city. Some farmers there are prepared to set crop land aside for fodder production and invest in breed improvement.<sup>38</sup>

While the investment advantages inherent in certain locations and situations should be recognised and exploited, in most Afghan villages it will be more important to concentrate attention on small, low-cost initiatives involving better health care for domestic livestock and improvements in feeding and breeding aimed at increasing household food security. The locations for investment in commercial livestock, whether in meat, milk or poultry, must be chosen carefully if it is to be viable. For the many rural communities where high-investment commercial production is simply not feasible, improving domestic food security will be a more appropriate intervention. These two Hari Rod communities demonstrate some interesting examples of how villagers are already looking for ways in which to improve their household diets without increasing costs. The significance of household poultry and the increasing popularity of "American" goats and rabbits has been noted, and these trends deserve more attention.

In the case of the Khomarikhel, only some of the clan continue to pursue a true pastoral life and still possess what might be described as commercial flocks of sheep and goats. Only about fourteen or fifteen families continue to undertake the full cycle of seasonal migration between Laghman, Parwan and the upper Panjsher valley. In fact, it is unlikely that it would be possible for more to do so without placing excessive pressure on the available seasonal pastures at each stage of the migration route, or without increasing the already rising tension between the nomads and the settled populations around use of the same pastures. Most of the tribe are now in a state of transition, increasingly dependent on labour opportunities in the urban and peri-urban economies. These families may never be able to live the lives of true pastoralists again, and they may need assistance in integrating into the non-rural economy.

Still, it remains the case that the main commercial wealth in livestock – with respect to sheep and goats – is in the hands of Afghanistan's nomadic and transhumance pastoralists. The nature of Afghanistan's geography and climate make this type of low-cost livestock production ideally suited to the prevailing environment. The Afghan government needs to give the case of the nomadic and transhumance herders – the main source of meat, milk and animal fibre production in the country – serious consideration. This may mean, among other efforts, the establishment of an effective veterinary service appropriate to the needs of a migratory herding population, as well as a workable and enforceable legal framework in which the rights of both the nomad and the settled farmer are protected and the growing conflict over pastoral resources contained.

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<sup>38</sup> Fitzherbert, *Livestock Husbandry*.



### Laghman Province



Kabul River Valley

Khomarikhel Camp 2

Dasht-i-Panj Pai

Khomarikhel Camp 1

Laghman River Valley

## Appendix 2: Milk Products and Processes

### *mast* (Dari), *masta* (Pashto), *ayran* (Turki): yoghurt

Milk is brought to the boil, but not boiled. When warm, culture (*maya*) is added – usually some of the *mast* from the previous day. It is eaten fresh. Often the fat is separated to make *maska* and/or *roghan*.

### *dough* (Dari), *shombel/schlombe* (Pashto), *ayran* (Turki): buttermilk

After the butterfat is separated from heated milk, the resulting buttermilk may have additional water added as well as herbs such as dried mint and a little salt. A favourite drink in hot weather.

### *chakka*

*Mast* is put in a cloth bag and the surplus liquid is drained off. *Chakka* can be stored for later use or sale.

### *qurut*

*Chakka* is spread out on trays or boards in the sun and dried. Whilst still moist it is rolled into small balls. Some salt may be added. When completely dry it is stored for the winter or it may be taken to the market and sold.

### *maska* (Dari), *ghori* (Pashto)

Butterfat is separated from the heated milk before making *mast*, either by skimming it or by using a hand separator. It may be further churned to make it solidify.

### *sarshir*

Literally the top of the milk skimmed off after heating.

### *qaimaq*

Similar to clotted cream. The milk is boiled and the cream separated and soured a little.

### *roghan-i-zard*

Literally yellow fat: clarified butter or ghee. *Maska* is further heated in a pot until it clarifies. A little salt may be added and then it is left to cool. *Roghan-i-zard* is often stored in a goat skin for later use or sale.

### *panir*: cheese

Usually a simple cheese; not made throughout Afghanistan. Milk is boiled and the fat skimmed off, then it is left to cool. While still warm culture (*maya*) is added. This may be rennet or undigested milk taken from the first stomach (*shirdan*) of a suckling lamb or kid. When the cheese is set, it is cut into slabs and stored in goat skins until needed or sold.

### *maya*

Culture or starter for *mast* or *panir*. Previous batches of *mast*, or dried *mast* for cheese, usually extracted as described above.

### *shir-e-towj*

Colostrum milk heated and eaten with bread.

### Appendix 3: Afghan Solar (*Shamsi*) Calendar

The Afghan solar (*shamsi*) year has the same number of days as a Common Era (CE) or AD year: 365. The Afghan solar year starts on 1 Hamal (New Year, or Naw Roz), which falls on 21 March, and it dates from the year of the *Hijri* (migration) of Muhammad in 621 AD, not from 1 AD. To find an AD/CE date from an Afghan solar year, add 621 to the Afghan year (for example, 1384 *shamsi* = 2004/2005 CE/AD).

When there is a CE leap year, 1 Hamal falls on 20 March and the additional day in the Afghan solar year is added to the last month of the equivalent Afghan solar year (Hut), that is, in mid March of the following CE year.

The Afghan solar calendar is divided into four seasons of three months each: spring (*bahar*), summer (*tabistan*), autumn (*khazan*, or *tirmah* in Herat) and winter (*zimistan*).

Season	Afghan solar ( <i>shamsi</i> ) month	CE/AD equivalents (non-leap year)
Spring ( <i>bahar</i> )	Hamal	21 March to 20 April
	Sawr	21 April to 20 May
	Jawza	22 May to 21 June
Summer ( <i>tabistan</i> )	Saratan	22 June to 22 July
	Asad	23 July to 22 August
	Sonbola	23 August to 22 September
Autumn ( <i>khazan/tirmah</i> )	Mizan	23 September to 22 October
	Aqrab	23 October to 21 November
	Qaws	22 November to 21 December
Winter ( <i>zimistan</i> )	Jaddi	22 December to 20 January
	Dalw	21 January to 19 February
	Hut	20 February to 20 March

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